

52nd Annual Group Meet of AICRP on Soybean



SUMMARY TABLES OF EXPERIMENTS & PRINCIPAL INVESTIGATORS' REPORT

MAY 17-18, 2022



ICAR-Indian Institute of Soybean Research
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**Summary Tables of Experiments & Principal
Investigator's Report**

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Plant Breeding

Principal Investigator

Dr. Sanjay Gupta, ICAR-IISR, Indore

Northern Hill Zone

Palampur (Himachal Pradesh)
Almora (Uttarakhand)
Majhera (Uttarakhand)
Srinagar (J&K)
Wadura, Sopore (J&K)

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Dr. Anuradha Bhartiya
Dr. Anjuli Agarwal
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Dr. Ashraf Bhat

Northern Plain Zone

Pantnagar (Uttarakhand)
New Delhi
Ludhiana (Punjab)

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Dr. S.K. Lal
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Eastern Zone

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Raipur (Chattisgarh)
Bhawanipatna (Orissa)
Dholi (Bihar)

Dr. Nutan Verma
Dr. Sunil Kumar Nag
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North Eastern Hill Zone

Jorhat (Assam)
Imphal (Manipur)
Umiam (Meghalaya)

Dr. Zafar Ullah
Dr. Heisnam Nanita Devi
Dr. Amit Kumar

Central Zone

Indore (Madhya Pradesh)
Sehore (Madhya Pradesh)
Nagpur (Maharashtra)
Kota (Rajasthan)
Jabalpur (Madhya Pradesh)
Amravati (Maharashtra)
Morena (Madhya Pradesh)
Parbhani
Lokbharti Sanosara (Gujarat)
Anand, Degadh Baria (Gujarat)
Junagarh Amreli (Gujarat)
Mandsaur

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Dr. Satish Nichal
Dr. Jagendra Singh
Dr. S.P. Mehtre
Dr. C.P. Singh
Dr. G.J. Patel
Dr. Viren Akbari
Dr. Ramraj Sen

Southern Zone

Dharwad (Karnataka)
Bidar (Karnataka)
Bangalore (Karnataka)
K. Digraj (Maharashtra)
Adilabad (Telangana)
Ugar Khurd, (Karnataka)

Dr. Gopal Krishna Naidu
Dr. Sidramappa
Dr. Onkarappa T.
Dr. M.P. Deshmukh
Dr. M. Rajendra Reddy
Dr. Jagadish S. Patwardhan

Table 1.1.1**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	SKAU-WSB-101	420	148	1235	828	XLVI
2	KBS 21-1	963	346	1284	1124	XLIII
3	MAUS 818	1407	864	1383	1395	XXXV
4	MAUS 791	1975	914	1481	1728	XVI
5	AMS 115	790	296	1457	1124	XLIII
6	AMS 19-01	1210	148	1309	1260	XLI
7	RVS 13-20	1901	370	1704	1803	XIV
8	RVS 13-15	1358	321	1358	1358	XXXIX
9	DLSb 3	1506	716	1580	1543	XXVI
10	DLSb 4	1185	543	2198	1692	XIX
11	DSb 39	1481	1284	1506	1494	XXXI
12	VLS 59 (C)	2321	889	2123	2222	II
13	AS 40	1704	1926	2049	1877	X
14	AS 24	1259	1185	1654	1457	XXXIV
15	JS 23-08	741	247	1407	1074	XLV
16	JS 23-05	1358	543	1802	1580	XXIV
17	<u>DS 1312</u>	2025	889	1802	1914	IX
18	DS 3163	1654	593	2074	1864	XI
19	DS 3168	2000	765	1975	1988	V
20	DS 3124	1160	642	1605	1383	XXXVI
21	SL 1282	1753	1062	1284	1519	XXVIII
22	SL 1230	2049	420	1802	1926	VIII
23	HIMSO-1694	2123	1160	1506	1815	XIII
24	HIMSO-1693	2074	1037	1802	1938	VII
25	VLS 103	2296	741	1728	2012	IV
26	VLS 102	2025	469	1852	1939	VI
27	VLS 89 (C)	2395	519	2074	2235	I
28	PS 1605	1580	420	1778	1679	XX
29	PS 1689	1704	790	2000	1852	XII
30	PS 1682	1630	864	1778	1704	XVIII
31	RSC 11-48	1259	1506	1481	1370	XXXVIII
32	RSC 11-42	1432	1037	1556	1494	XXX
33	BAUS(M)-3	1778	395	1506	1642	XXII
34	BAUS-116	1926	914	1407	1667	XXI
35	CAUMS 2	2000	2123	1432	1716	XVII

36	NRC 195	1975	1556	1778	1877	X
37	NRC 203	1309	716	1432	1371	XXXVII
38	NRC 193	2049	716	1432	1741	XV
39	NRC 192	1506	1802	1506	1506	XXIX
40	NRC 191	1506	395	1457	1482	XXXII
41	NRC 190	1605	1185	1481	1543	XXVI
42	VLS 63 (C)	2889	691	1506	2198	III
43	NRC 189	1531	1062	1383	1457	XXXIII
44	RVSM 16-20	1827	1111	1506	1667	XXI
45	KDS 1175	1210	1185	1901	1556	XXV
46	KDS 1187	1605	988	1679	1642	XXII
47	KDS 1149	2000	1506	1827	1914	IX
48	MACS 1672	296	148	1877	1087	XLIV
49	ACS 1735	1086	1160	1556	1321	XL
50	ASb 15	444	1630	1827	1136	XLII
51	TS 21-2	1531	1383	1531	1531	XXVII
52	TS 21-1	1556	1580	1679	1618	XXIII
53	LOKSOY-1	1284	765	1432	1358	XXXIX
54	KSS 204	1556	790	1728	1642	XXII
	Mean	1577.91	878.8	1638.7		
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-06-21	17-06-21	21-06-21		
	CD	370.37	246.91	320.99		
	CV	14.83	18	11.91		

- Trial failed at both of the centres of Kashmir viz Budgam and Wadura.
- Data of Majhera centre was rejected due to <1000 Kg/ha grain yield.

Table 1.1.2**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : Days To Flower**

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	SKAU-WSB-101	42	49	40	44	I
2	KBS 21-1	50	56	60	55	VIII
3	MAUS 818	55	62	62	60	XVI
4	MAUS 791	53	55	63	57	XI
5	AMS 115	56	70	62	63	XXIII
6	AMS 19-01	59	65	44	56	IX
7	RVS 13-20	49	63	49	54	V
8	RVS 13-15	54	66	64	61	XXI
9	DLSb 3	58	64	65	62	XXII
10	DLSb 4	54	61	67	61	XIX
11	DSb 39	54	61	63	59	XV
12	VLS 59 (C)	52	54	62	56	IX
13	AS 40	60	67	68	65	XXVIII
14	AS 24	56	65	63	61	XXI
15	JS 23-08	50	55	61	55	VIII
16	JS 23-05	52	56	61	56	X
17	<u>DS 1312</u>	52	62	62	59	XIV
18	DS 3163	56	70	62	63	XXIII
19	DS 3168	56	63	63	61	XIX
20	DS 3124	57	67	64	63	XXIII
21	SL 1282	57	65	66	63	XXIII
22	SL 1230	54	65	62	60	XVIII
23	HIMSO-1694	52	60	53	55	VII
24	HIMSO-1693	54	56	54	55	VI
25	VLS 103	53	55	61	56	X
26	VLS 102	55	62	66	61	XX
27	VLS 89 (C)	52	61	67	60	XVII
28	PS 1605	53	62	60	58	XIII
29	PS 1689	62	70	72	68	XXXII
30	PS 1682	57	67	63	62	XXII
31	RSC 11-48	57	65	67	63	XXIV
32	RSC 11-42	57	64	66	62	XXII
33	BAUS(M)-3	61	68	73	67	XXXI

34	BAUS-116	59	65	70	65	XXVII
35	CAUMS 2	56	60	67	61	XX
36	NRC 195	55	65	67	62	XXII
37	NRC 203	46	55	46	49	II
38	NRC 193	59	67	67	64	XXVI
39	NRC 192	56	63	62	60	XVIII
40	NRC 191	43	58	51	51	III
41	NRC 190	56	64	58	59	XV
42	VLS 63 (C)	53	62	60	58	XIII
43	NRC 189	57	64	62	61	XX
44	RVSM 16-20	53	55	58	55	VIII
45	KDS 1175	54	57	58	56	X
46	KDS 1187	51	54	52	52	IV
47	KDS 1149	60	66	66	64	XXV
48	MACS 1672	51	65	56	57	XII
49	ACS 1735	51	59	56	55	VIII
50	ASb 15	50	54	53	52	IV
51	TS 21-2	54	60	62	59	XIV
52	TS 21-1	57	64	62	61	XX
53	LOKSOY-1	60	68	70	66	XXX
54	KSS 204	60	69	67	65	XXIX
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	44373	1	44368		

Table 1.1.3**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : Days To Maturity**

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	SKAU-WSB-101	96	128	119	114	III
2	KBS 21-1	106	130	116	117	VII
3	MAUS 818	109	132	121	121	XVI
4	MAUS 791	107	123	119	116	V
5	AMS 115	109	129	122	120	XIV
6	AMS 19-01	111	132	122	122	XIX
7	RVS 13-20	108	123	120	117	VI
8	RVS 13-15	108	126	121	118	IX
9	DLSb 3	113	130	127	123	XX
10	DLSb 4	116	132	125	124	XXIII
11	DSb 39	115	131	126	124	XXII
12	VLS 59 (C)	114	130	121	122	XIX
13	AS 40	116	135	122	124	XXIII
14	AS 24	107	129	119	118	IX
15	JS 23-08	105	128	121	118	VIII
16	JS 23-05	105	124	115	115	IV
17	DS 1312	108	124	123	118	IX
18	DS 3163	110	129	121	120	XIV
19	DS 3168	112	130	122	121	XVIII
20	DS 3124	114	134	125	124	XXIII
21	SL 1282	116	134	123	124	XXIII
22	SL 1230	112	129	119	120	XIV
23	HIMSO-1694	112	126	120	119	XII
24	HIMSO-1693	114	128	121	121	XVII
25	VLS 103	112	129	119	120	XIV
26	VLS 102	112	128	118	119	XII
27	VLS 89 (C)	113	127	117	119	XI
28	PS 1605	112	130	117	120	XIII
29	PS 1689	116	132	123	124	XXI
30	PS 1682	114	131	120	122	XIX
31	RSC 11-48	114	129	121	121	XVIII

32	RSC 11-42	109	129	123	120	XV
33	BAUS(M)-3	115	138	122	125	XXIV
34	BAUS-116	109	125	121	118	IX
35	CAUMS 2	107	123	121	117	VI
36	NRC 195	111	128	123	121	XVI
37	NRC 203	110	128	120	119	XII
38	NRC 193	112	129	121	121	XVI
39	NRC 192	110	128	118	119	X
40	NRC 191	84	122	117	108	I
41	NRC 190	107	129	115	117	VI
42	VLS 63 (C)	113	129	120	121	XVI
43	NRC 189	110	128	117	118	IX
44	RVSM 16-20	105	119	116	113	II
45	KDS 1175	112	127	120	120	XIII
46	KDS 1187	109	128	118	118	IX
47	KDS 1149	112	130	123	122	XIX
48	MACS 1672	110	127	118	118	IX
49	ACS 1735	109	130	116	118	IX
50	ASb 15	117	119	116	117	VII
51	TS 21-2	112	125	121	119	XII
52	TS 21-1	111	127	120	119	XII
53	LOKSOY-1	113	137	123	124	XXIII
54	KSS 204	110	131	121	121	XVI
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-06-21	01-01-00	21-06-21		

Table 1.1.4**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : Plant Height (cm)**

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	SKAU-WSB-101	48	28	50	42.00	XLV
2	KBS 21-1	93	57	82	77.33	III
3	MAUS 818	71	40	77	62.67	XVIII
4	MAUS 791	78	40	76	64.67	XV
5	AMS 115	59	28	54	47.00	XLIV
6	AMS 19-01	58	28	63	49.67	XLII
7	RVS 13-20	73	31	69	57.67	XXVII
8	RVS 13-15	66	30	54	50.00	XLI
9	DLSb 3	102	49	72	74.33	V
10	DLSb 4	93	41	85	73.00	VI
11	DSb 39	77	39	75	63.67	XVII
12	VLS 59 (C)	65	28	63	52.00	XXXV
13	AS 40	100	64	99	87.67	I
14	AS 24	65	37	71	57.67	XXVII
15	JS 23-08	56	33	57	48.67	XLIII
16	JS 23-05	54	34	65	51.00	XXXVIII
17	DS 1312	56	30	65	50.33	XL
18	DS 3163	67	27	61	51.67	XXXVI
19	DS 3168	65	34	55	51.33	XXXVII
20	DS 3124	72	31	64	55.67	XXIX
21	SL 1282	74	45	68	62.33	XIX
22	SL 1230	61	25	66	50.67	XXXIX
23	HIMSO-1694	80	39	58	59.00	XXIV
24	HIMSO-1693	69	32	62	54.33	XXXI
25	VLS 103	69	27	58	51.33	XXXVII
26	VLS 102	77	31	69	59.00	XXIV
27	VLS 89 (C)	87	37	84	69.33	IX
28	PS 1605	65	30	73	56.00	XXVIII
29	PS 1689	99	53	81	77.67	II
30	PS 1682	65	38	64	55.67	XXIX
31	RSC 11-48	78	43	75	65.33	XIV
32	RSC 11-42	83	41	79	67.67	XII
33	BAUS(M)-3	81	41	80	67.33	XIII
34	BAUS-116	70	36	70	58.67	XXV

35	CAUMS 2	72	40	64	58.67	XXV
36	NRC 195	81	44	79	68.00	XI
37	NRC 203	69	42	80	63.67	XVII
38	NRC 193	73	45	89	69.00	X
39	NRC 192	87	52	91	76.67	IV
40	NRC 191	66	31	62	53.00	XXXII
41	NRC 190	60	42	63	55.00	XXX
42	VLS 63 (C)	64	24	70	52.67	XXXIII
43	NRC 189	62	35	77	58.00	XXVI
44	RVSM 16-20	73	32	71	58.67	XXV
45	KDS 1175	67	38	73	59.33	XXIII
46	KDS 1187	89	50	72	70.33	VIII
47	KDS 1149	63	55	64	60.67	XXI
48	MACS 1672	44	37	65	48.67	XLIII
49	ACS 1735	63	39	71	57.67	XXVII
50	ASb 15	74	36	75	61.67	XX
51	TS 21-2	62	33	62	52.33	XXXIV
52	TS 21-1	102	60	51	71.00	VII
53	LOKSOY-1	75	40	77	64.00	XVI
54	KSS 204	67	37	77	60.33	XXII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-06-21	01-01-00	21-06-21		

Table 1.1.5**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	SKAU-WSB-101	35.69	23.47	17.67	25.61	I
2	KBS 21-1	14.85	13.26	13.33	13.81	XVII
3	MAUS 818	17.29	14.84	13.33	15.15	VII
4	MAUS 791	14.11	13.25	14.67	14.01	XIV
5	AMS 115	14.67	12.63	12.5	13.27	XXVII
6	AMS 19-01	14.46	10.36	16.03	13.62	XXI
7	RVS 13-20	14.13	11.32	15.53	13.66	XIX
8	RVS 13-15	13.58	10.25	12.5	12.11	XXXV
9	DLSb 3	14.15	12.55	14.43	13.71	XVIII
10	DLSb 4	15.73	14.71	14.33	14.92	VIII
11	DSb 39	13.68	11.82	11.67	12.39	XXXIII
12	VLS 59 (C)	16.41	16.66	13.5	15.52	V
13	AS 40	10.06	9.49	12.43	10.66	XLIX
14	AS 24	10.59	11.09	10.27	10.65	L
15	JS 23-08	12.73	10.16	12.9	11.93	XXXIX
16	JS 23-05	12.98	12.33	12.13	12.48	XXX
17	<u>DS 1312</u>	11.48	11.51	11	11.33	XLV
18	DS 3163	12.68	12	11.57	12.08	XXXVI
19	DS 3168	11.4	11.98	10.87	11.42	XLIII
20	DS 3124	13.52	11.46	12.27	12.42	XXXII
21	SL 1282	10.55	11.42	10.83	10.93	XLVII
22	SL 1230	14.21	15.06	12.57	13.95	XV
23	HIMSO-1694	12.05	10.92	13.03	12.00	XXXVII
24	HIMSO-1693	12.07	13.67	11.33	12.36	XXXIV
25	VLS 103	17.12	15.98	15.27	16.12	III
26	VLS 102	17.23	14.09	13	14.77	X
27	VLS 89 (C)	14.68	14.84	14.63	14.72	XI
28	PS 1605	12.52	14.31	13.47	13.43	XXV
29	PS 1689	11.65	11.68	11.43	11.59	XLI
30	PS 1682	12.97	11.92	14.83	13.24	XXVIII
31	RSC 11-48	11.1	9.65	9.5	10.08	
32	RSC 11-42	11.16	9.65	11.9	10.90	XLVIII
33	BAUS(M)-3	14.22	12.55	10.63	12.47	XXXI
34	BAUS-116	12	9.55	10.1	10.55	
35	CAUMS 2	12.19	11.05	10.83	11.36	XLIV

36	NRC 195	14.11	13.05	13.37	13.51	XXIII
37	NRC 203	16.53	13.13	13.33	14.33	XIII
38	NRC 193	11.8	11.14	10.43	11.12	XLVI
39	NRC 192	13.15	10.48	11.73	11.79	XL
40	NRC 191	17.28	15.69	17.5	16.82	II
41	NRC 190	10.19	9.1	12.47	10.59	LI
42	VLS 63 (C)	17.72	16.74	13.47	15.98	IV
43	NRC 189	12.3	10.13	13.53	11.99	XXXVIII
44	RVSM 16-20	12.36	10.66	11.23	11.42	XLIII
45	KDS 1175	14.52	11.58	13.9	13.33	XXVI
46	KDS 1187	15.61	13.85	14.6	14.69	XII
47	KDS 1149	12.96	10.52	11	11.49	XLII
48	MACS 1672	15.65	12.23	13	13.63	XX
49	ACS 1735	13.86	12.03	14.7	13.53	XXII
50	ASb 15	16.73	13.68	14.2	14.87	IX
51	TS 21-2	14.86	13.1	13.57	13.84	XVI
52	TS 21-1	14.55	12.69	13.2	13.48	XXIV
53	LOKSOY-1	16.35	13.11	16.03	15.16	VI
54	KSS 204	13.8	12.32	13.07	13.06	XXIX
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-06-21	01-01-00	21-06-21		

Table 1.1.6**Trial : Initial Varietal Trial****Zone : NORTHERN HILL ZONE****Character : Oil Content (%)**

S.No	Varieties	Almora	Palampur	Mean	Rank
1	SKAU-WSB-101	22.31	18.77	20.54	XXII
2	KBS 21-1	20.445	18.74	19.59	XLV
3	MAUS 818	22.355	20.24	21.30	II
4	MAUS 791	20.825	19.21	20.02	XXXV
5	AMS 115		20.97	20.97	V
6	AMS 19-01	20.77	17.38	19.07	XLIX
7	RVS 13-20	20.04	20.31	20.17	XXXI
8	RVS 13-15	20.625	19.20	19.91	XL
9	DLSb 3	20.875	18.53	19.70	XLIII
10	DLSb 4	21.11	19.08	20.09	XXXIII
11	DSb 39	19.82	18.15	18.99	L
12	VLS 59 (C)	20.185	20.43	20.31	XXVIII
13	AS 40	19.43	19.14	19.29	XLVII
14	AS 24	19.775	21.00	20.39	XXV
15	JS 23-08	19.37	21.71	20.54	XXI
16	JS 23-05	21.23	19.40	20.31	XXVII
17	<u>DS 1312</u>	21.035	20.64	20.84	XII
18	DS 3163	21.52	19.37	20.44	XXIII
19	DS 3168	21.49	17.86	19.67	XLIV
20	DS 3124	22.15	19.36	20.76	XIV
21	SL 1282	22.015	19.19	20.60	XVIII
22	SL 1230	22.15	19.54	20.85	XI
23	HIMSO-1694	19.545	22.34	20.94	VI
24	HIMSO-1693	21.44	20.38	20.91	IX
25	VLS 103	20.34	21.43	20.88	X
26	VLS 102	21.83	21.73	21.78	I
27	VLS 89 (C)	21.045	20.33	20.69	XVI
28	PS 1605	19.825	20.21	20.02	XXXV
29	PS 1689	19.425	20.44	19.93	XXXIX
30	PS 1682	21.485	19.94	20.71	XV
31	RSC 11-48	19.855	20.19	20.02	XXXIV
32	RSC 11-42	20.45	20.93	20.69	XVI
33	BAUS(M)-3	20.01	19.93	19.97	XXXVI
34	BAUS-116	21.06	21.18	21.12	IV
35	CAUMS 2	21.735	19.05	20.39	XXIV
36	NRC 195	21.05	20.57	20.81	XIII

37	NRC 203	20.155	21.02	20.59	XX
38	NRC 193	20.8	20.45	20.62	XVII
39	NRC 192	20.45	18.54	19.49	XLVI
40	NRC 191	21.43	19.24	20.33	XXVI
41	NRC 190	20.205	19.29	19.75	XLI
42	VLS 63 (C)	20.555	21.31	20.93	VIII
43	NRC 189	20.785	19.81	20.30	XXIX
44	RVSM 16-20	19.735	20.18	19.96	XXXVII
45	KDS 1175	19.97	21.23	20.60	XIX
46	KDS 1187	19.05	18.90	18.97	LI
47	KDS 1149	21.625	20.25	20.94	VII
48	MACS 1672	21.11	21.41	21.26	III
49	ACS 1735	20.04	18.23	19.14	XLVIII
50	ASb 15	22.125	18.07	20.10	XXXII
51	TS 21-2	21.305	18.58	19.94	XXXVIII
52	TS 21-1	21.295	20.52	20.91	IX
53	LOKSOY-1	22.425	18.16	20.29	XXX
54	KSS 204	20.46	19.03	19.74	XLII
	Mean	20.80	19.84		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	26-06-21	21-06-21		

Table 1.1.7

Trial : Initial Varietal Trial
 Zone : NORTHERN HILL ZONE
 Character : Oil Yield (kg/ha)

S.No	Varieties	Almora	Palampur	Mean	Rank
1	SKAU-WSB-101	93.7	231.7	162.7	LIV
2	KBS 21-1	196.9	240.6	218.8	LII
3	MAUS 818	314.5	279.9	297.2	XXXIX
4	MAUS 791	411.3	284.4	347.9	XXI
5	AMS 115		305.5	305.5	XXXIII
6	AMS 19-01	251.3	227.4	239.4	XLIX
7	RVS 13-20	381.0	346.0	363.5	XV
8	RVS 13-15	280.1	260.7	270.4	XLVII
9	DLSb 3	314.4	292.8	303.6	XXXVI
10	DLSb 4	250.2	419.3	334.7	XXIV
11	DSb 39	293.5	273.3	283.4	XLIII
12	VLS 59 (C)	468.5	433.6	451.1	III
13	AS 40	331.1	392.2	361.6	XVI
14	AS 24	249.0	347.3	298.2	XXXVIII
15	JS 23-08	143.5	305.5	224.5	LI
16	JS 23-05	288.3	349.5	318.9	XXIX
17	<u>DS 1312</u>	426.0	371.9	398.9	IX
18	DS 3163	355.9	401.6	378.8	XII
19	DS 3168	429.8	352.6	391.2	X
20	DS 3124	256.9	310.7	283.8	XLII
21	SL 1282	385.9	246.4	316.2	XXX
22	SL 1230	453.9	352.1	403.0	VII
23	HIMSO-1694	414.9	336.4	375.7	XIII
24	HIMSO-1693	444.7	367.2	405.9	VI
25	VLS 103	467.0	370.2	418.6	V
26	VLS 102	442.1	402.3	422.2	IV
27	VLS 89 (C)	504.0	421.6	462.8	I
28	PS 1605	313.2	359.2	336.2	XXIII
29	PS 1689	331.0	408.7	369.9	XIV
30	PS 1682	350.2	354.5	352.4	XIX
31	RSC 11-48	250.0	298.9	274.5	XLV
32	RSC 11-42	292.8	325.6	309.2	XXXII
33	BAUS(M)-3	355.8	300.1	327.9	XXVI
34	BAUS-116	405.6	297.9	351.8	XX
35	CAUMS 2	434.7	272.8	353.7	XVIII
36	NRC 195	415.7	365.6	390.7	XI

37	NRC 203	263.8	300.9	282.4	XLIV
38	NRC 193	426.2	292.8	359.5	XVII
39	NRC 192	308.0	279.1	293.6	XLI
40	NRC 191	322.7	280.3	301.5	XXXVII
41	NRC 190	324.3	285.7	305.0	XXXV
42	VLS 63 (C)	593.8	320.9	457.3	II
43	NRC 189	318.2	273.9	296.1	XL
44	RVSM 16-20	360.6	303.9	332.2	XXV
45	KDS 1175	241.6	403.5	322.6	XXVIII
46	KDS 1187	305.8	317.2	311.5	XXXI
47	KDS 1149	432.5	369.9	401.2	VIII
48	MACS 1672	62.5	401.9	232.2	L
49	ACS 1735	217.6	283.7	250.6	XLVIII
50	ASb 15	98.2	330.1	214.2	LIII
51	TS 21-2	326.2	284.4	305.3	XXXIV
52	TS 21-1	331.4	344.5	337.9	XXII
53	LOKSOY-1	287.9	260.0	274.0	XLVI
54	KSS 204	318.4	328.8	323.6	XXVII
	Mean	330.9	325.3		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	26-06-21	21-06-21		

Table 1.1.8**Trial : Initial Varietal Trial : Early****Zone : NORTHERN HILL ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819	1654	963	1309	VI
2	MAUS 795	1185	1358	1272	VII
3	KDS 1201	1506	1580	1543	I
4	KDS 1173	1160	1605	1383	III
5	KDS 1172	1185	1309	1247	X
6	KDS 1169	543	988	766	XX
7	KDS 1194	1012	1407	1210	XIII
8	RVS 13-7	1457	988	1223	XI
9	JS 23-09	1111	1037	1074	XVII
10	Palam Early Soya (C)	1333	1012	1173	XV
11	JS 23-03	1309	1062	1186	XIV
12	PS 1569	790	1309	1050	XIX
13	PS 1660	1630	1111	1371	IV
14	PS 1675	1160	1284	1222	XII
15	VLS 89 (C)	914	1605	1260	VIII
16	RSC 11-60	1457	1531	1494	II
17	NRC 186	1630	1086	1358	V
18	NRC 202	1185	963	1074	XVII
19	NRC 201	617	889	753	XXI
20	NRC 198	321	1012	667	XXII
21	NRC 197	1358	1160	1259	IX
22	VLS 63 (C)	642	1481	1062	XVIII
23	NRC 196	1235	1210	1223	XI
24	AMS 77-3-6	296	1012	654	XXIII
25	AMS 83	1136	1062	1099	XVI
26	MACS 1724	1086	1037	1062	XVIII
	Mean	1112	1194.65		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		
	CD	197.53	222.22		
	CV	10.96	11.81		
	Zonal CD (50%)			70	

- Almora centre could not conduct trial.

Table 1.1.9**Trial : Initial Varietal Trial : Early****Zone : NORTHERN HILL ZONE****Character : Days To Flower**

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819	54	52	53	VII
2	MAUS 795	43	53	48	III
3	KDS 1201	58	59	59	XIV
4	KDS 1173	57	60	59	XIV
5	KDS 1172	57	57	57	XII
6	KDS 1169	39	49	44	II
7	KDS 1194	55	60	58	XIII
8	RVS 13-7	60	67	64	XIX
9	JS 23-09	42	60	51	VI
10	Palam Early Soya (C)	51	51	51	VI
11	JS 23-03	43	56	50	V
12	PS 1569	43	54	49	IV
13	PS 1660	61	65	63	XVIII
14	PS 1675	60	67	64	XIX
15	VLS 89 (C)	57	62	60	XV
16	RSC 11-60	59	67	63	XVIII
17	NRC 186	60	67	64	XIX
18	NRC 202	58	64	61	XVI
19	NRC 201	46	56	51	VI
20	NRC 198	52	63	58	XIII
21	NRC 197	48	60	54	VIII
22	VLS 63 (C)	51	60	56	IX
23	NRC 196	51	61	56	X
24	AMS 77-3-6	58	66	62	XVII
25	AMS 83	54	65	60	XV
26	MACS 1724	53	60	57	XI
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		

Table 1.1.10**Trial : Initial Varietal Trial : Early****Zone : NORTHERN HILL ZONE****Character : Days To Maturity**

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819	113	114	114	VIII
2	MAUS 795	116	108	112	VI
3	KDS 1201	120	108	114	IX
4	KDS 1173	124	114	119	XVI
5	KDS 1172	121	113	117	XIII
6	KDS 1169	104	104	104	III
7	KDS 1194	119	114	117	XII
8	RVS 13-7	120	112	116	XI
9	JS 23-09	103	103	103	II
10	Palam Early Soya (C)	117	102	110	V
11	JS 23-03	105	107	106	IV
12	PS 1569	119	112	116	X
13	PS 1660	124	115	120	XVII
14	PS 1675	125	114	120	XVII
15	VLS 89 (C)	118	114	116	XI
16	RSC 11-60	120	117	119	XV
17	NRC 186	119	109	114	IX
18	NRC 202	120	116	118	XIV
19	NRC 201	108	111	110	V
20	NRC 198	109	116	113	VII
21	NRC 197	109	115	112	VI
22	VLS 63 (C)	124	113	119	XV
23	NRC 196	109	115	112	VI
24	AMS 77-3-6	124	115	120	XVII
25	AMS 83	115	116	116	X
26	MACS 1724	114	113	114	VIII
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		
	Zonal CD			1.98	

Table 1.1.11**Trial : Initial Varietal Trial : Early****Zone : NORTHERN HILL ZONE****Character : Plant Height (cm)**

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819	61	45	53.00	X
2	MAUS 795	38	39	38.50	XX
3	KDS 1201	58	51	54.50	VIII
4	KDS 1173	90	56	73.00	II
5	KDS 1172	88	70	79.00	I
6	KDS 1169	38	41	39.50	XIX
7	KDS 1194	65	55	60.00	VII
8	RVS 13-7	58	46	52.00	XII
9	JS 23-09	42	46	44.00	XVI
10	Palam Early Soya (C)	43	47	45.00	XV
11	JS 23-03	41	41	41.00	XVIII
12	PS 1569	39	38	38.50	XX
13	PS 1660	66	56	61.00	V
14	PS 1675	60	62	61.00	V
15	VLS 89 (C)	66	68	67.00	IV
16	RSC 11-60	63	58	60.50	VI
17	NRC 186	58	50	54.00	IX
18	NRC 202	78	59	68.50	III
19	NRC 201	43	43	43.00	XVII
20	NRC 198	53	46	49.50	XIII
21	NRC 197	75	59	67.00	IV
22	VLS 63 (C)	39	47	43.00	XVII
23	NRC 196	52	53	52.50	XI
24	AMS 77-3-6	52	54	53.00	X
25	AMS 83	65	39	52.00	XII
26	MACS 1724	46	47	46.50	XIV
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		

Table 1.1.12

Trial : Initial Varietal Trial : Early
Zone : NORTHERN HILL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819	14.22	19.07	16.65	III
2	MAUS 795	17.3	18.43	17.87	I
3	KDS 1201	10.61	12.93	11.77	XXII
4	KDS 1173	10.68	14.07	12.38	XVIII
5	KDS 1172	10.48	14.13	12.31	XIX
6	KDS 1169	15.02	13.77	14.40	IX
7	KDS 1194	12.01	13.2	12.61	XVII
8	RVS 13-7	13.08	13.7	13.39	XIII
9	JS 23-09	11.32	14.27	12.80	XVI
10	Palam Early Soya (C)	13.54	15.7	14.62	VIII
11	JS 23-03	13.5	16.1	14.80	VII
12	PS 1569	12.29	14.07	13.18	XIV
13	PS 1660	9.43	12.63	11.03	XXIV
14	PS 1675	13.87	16.7	15.29	V
15	VLS 89 (C)	13.65	16.2	14.93	VI
16	RSC 11-60	10.22	14.1	12.16	XXI
17	NRC 186	9.23	11.17	10.20	XXV
18	NRC 202	10.7	12.83	11.77	XXII
19	NRC 201	16.2	16.17	16.19	IV
20	NRC 198	12.51	14.97	13.74	XI
21	NRC 197	11.75	14.27	13.01	XV
22	VLS 63 (C)	15.46	18.63	17.05	II
23	NRC 196	10.72	13.8	12.26	XX
24	AMS 77-3-6	12.74	15.03	13.89	X
25	AMS 83	10.7	12.4	11.55	XXIII
26	MACS 1724	12.75	14.6	13.68	XII
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		

Table 1.1.13

Trial : Initial Varietal Trial : Early
Zone : NORTHERN HILL ZONE
Character : Oil Content (%)

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819		18.16	18.2	XXIII
2	MAUS 795	20.52	18.69	19.6	VI
3	KDS 1201	18.41	19.01	18.7	XIX
4	KDS 1173	17.84	20.75	19.3	VIII
5	KDS 1172	18.70	19.69	19.2	XV
6	KDS 1169	17.61	20.88	19.2	XII
7	KDS 1194	16.76	19.08	17.9	XXVI
8	RVS 13-7	16.87	21.59	19.2	XIV
9	JS 23-09	17.04	21.44	19.2	XIII
10	Palam Early Soya (C)	18.59	22.23	20.4	III
11	JS 23-03	20.48	20.66	20.6	I
12	PS 1569	19.16	19.79	19.5	VII
13	PS 1660	18.89	19.68	19.3	X
14	PS 1675	20.02	20.19	20.1	V
15	VLS 89 (C)	19.80	21.04	20.4	II
16	RSC 11-60	17.61	20.07	18.8	XVIII
17	NRC 186	18.79	18.95	18.9	XVII
18	NRC 202	17.74	19.52	18.6	XX
19	NRC 201	17.82	18.82	18.3	XXI
20	NRC 198	18.33	20.22	19.3	XI
21	NRC 197	17.31	18.96	18.1	XXIV
22	VLS 63 (C)	19.59	20.88	20.2	IV
23	NRC 196	18.26	20.31	19.3	IX
24	AMS 77-3-6	17.56	19.00	18.3	XXII
25	AMS 83	16.84	19.14	18.0	XXV
26	MACS 1724	18.18	20.07	19.1	XVI
	Mean	18.35	19.95		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		

Table 1.1.14**Trial : Initial Varietal Trial : Early****Zone : NORTHERN HILL ZONE****Character : Oil Yield (kg/ha)**

S.No	Varieties	Majhera	Palampur	Mean	Rank
1	MAUS 819		174.8	174.8	XXII
2	MAUS 795	243.1	253.7	248.4	VII
3	KDS 1201	277.2	300.3	288.7	I
4	KDS 1173	206.9	333.0	269.9	III
5	KDS 1172	221.5	257.7	239.6	X
6	KDS 1169	95.6	206.2	150.9	XXIII
7	KDS 1194	169.6	268.4	219.0	XV
8	RVS 13-7	245.8	213.3	229.5	XIII
9	JS 23-09	189.3	222.3	205.8	XVII
10	Palam Early Soya (C)	247.7	225.0	236.4	XI
11	JS 23-03	268.0	219.4	243.7	IX
12	PS 1569	151.3	259.1	205.2	XVIII
13	PS 1660	307.8	218.6	263.2	IV
14	PS 1675	232.2	259.2	245.7	VIII
15	VLS 89 (C)	181.0	337.7	259.3	V
16	RSC 11-60	256.6	307.2	281.9	II
17	NRC 186	306.3	205.8	256.0	VI
18	NRC 202	210.2	187.9	199.0	XX
19	NRC 201	109.9	167.3	138.6	XXIV
20	NRC 198	58.8	204.6	131.7	XXV
21	NRC 197	235.1	219.9	227.5	XIV
22	VLS 63 (C)	125.8	309.2	217.5	XVI
23	NRC 196	225.5	245.8	235.6	XII
24	AMS 77-3-6	52.0	192.2	122.1	XXVI
25	AMS 83	191.3	203.2	197.3	XXI
26	MACS 1724	197.4	208.1	202.8	XIX
	Mean	200.2	238.5		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	23-06-21	25-06-21		

Table 1.1.15

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	VLS 99	2237	375	2611	2424	I
2	VLS 89(C)	2000	685	2620	2310	II
3	PS 1556(C)	1452	1231	2991	2222	III
4	VLS 63(C)	2000	509	2366	2183	IV
	Mean	1922.25	700	2647		
	N.P.S.(Sqm)	6.75	21.6	21.6		
	DOS	25-06-21	23-06-21	22-06-21		
	CD	192.59	64.81	518.52		
	CV	6.11	5.69	12.29		
	Zonal CD (5%)				144	

Table 1.1.16

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Days to Flower

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	VLS 99	55	56	58	56	I
2	VLS 89(C)	56	58	62	59	II
3	PS 1556(C)	58	57	63	59	III
4	VLS 63(C)	55	56	58	56	I
	N.P.S.(Sqm)	6.75	21.6	21.6		
	DOS	25-06-21	23-06-21	22-06-21		

Table 1.1.17

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Days to Maturity

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	VLS 99	114	124	127	122	II
2	VLS 89(C)	115	128	125	123	III
3	PS 1556(C)	116	127	128	124	IV
4	VLS 63(C)	110	121	127	119	I
	N.P.S.(Sqm)	6.75	21.6	21.6		
	DOS	25-06-21	23-06-21	22-06-21		

Table 1.1.18

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Plant Height (cm)

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	VLS 99	65	55	69	63.00	III
2	VLS 89(C)	78	79	78	78.33	I
3	PS 1556(C)	64	74	64	67.33	II
4	VLS 63(C)	63	58	59	60.00	IV
	N.P.S.(Sqm)	6.75	21.6	21.6		
	DOS	25-06-21	23-06-21	22-06-21		

Table 1.1.19

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Almora	Majhera	Palampur	Mean	Rank
1	VLS 99	15.25	15.93	15.13	15.44	II
2	VLS 89(C)	13.25	15.66	16.95	15.29	III
3	PS 1556(C)	9.47	11.51	13.35	11.44	IV
4	VLS 63(C)	14.38	16.31	19.60	16.76	I
	N.P.S.(Sqm)	6.75	21.6	21.6		
	DOS	25-06-21	23-06-21	22-06-21		

Table 1.1.20

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Oil Content (%)

S.No	Varieties	Almora	Palampur	Mean	Rank
1	VLS 99	22.90	17.47	20.18	I
2	VLS 89(C)	20.33	17.71	19.02	III
3	PS 1556(C)	20.94	18.15	19.54	II
4	VLS 63(C)	19.95	17.64	18.80	IV
	Mean	21.03	17.74		
	N.P.S.(Sqm)	6.75	21.6		
	DOS	25-06-21	22-06-21		

Table 1.1.21

Trial : Advanced Varietal Trial II
Zone : NORTHERN HILL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Almora	Palampur	Mean	Rank
1	VLS 99	512.2	456.1	484.2	I
2	VLS 89(C)	406.6	464.0	435.3	II
3	PS 1556(C)	304.0	542.7	423.3	III
4	VLS 63(C)	399.0	417.4	408.2	IV
	Mean	405.4	470.1		
	N.P.S.(Sqm)	6.75	21.6		
	DOS	25-06-21	22-06-21		

Table 1.2.1**Trial : Initial Varietal Trial****Zone : NORTHERN PLAIN ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	SKAU-WSB-101	0	0	0	0	
2	KBS 21-1	0	0	691	230	XLV
3	MAUS 818	0	0	1605	535	XXXIV
4	MAUS 791	0	1136	1531	889	XXIII
5	AMS 115	0	1358	617	658	XXXI
6	AMS 19-01	0	0	1778	593	XXXIII
7	RVS 13-20	0	1827	1654	1160	XV
8	RVS 13-15	0	667	1802	823	XXV
9	DLSb 3	1062	840	1802	1235	XII
10	DLSb 4	1136	963	1432	1177	XIV
11	DSb 39	0	593	1802	798	XXVI
12	SL 955 (C)	2222	1457	815	1498	VI
13	AS 40	0	593	2148	914	XXI
14	AS 24	0	1062	2519	1194	XIII
15	JS 23-08	0	1407	667	691	XXIX
16	JS 23-05	840	2123	1407	1457	VIII
17	DS 1312	1407	1062	864	1111	XVI
18	DS 3163	1383	1333	1358	1358	X
19	DS 3168	1679	1605	1062	1449	IX
20	DS 3124	963	1235	1556	1251	XI
21	SL 1282	1901	1827	1531	1753	III
22	SL 1230	1086	0	1605	897	XXII
23	HIMSO-1694	0	691	1531	741	XXVII
24	HIMSO-1693	0	741	815	519	XXXV
25	VLS 103	0	0	0	0	
26	VLS 102	0	0	790	263	XLIII
27	SL 1074 (C)	1383	1383	2025	1597	IV
28	PS 1605	864	1333	1284	1160	XV
29	PS 1689	864	1136	2716	1572	V
30	PS 1682	1284	2049	1975	1769	II
31	RSC 11-48	0	642	2222	955	XX
32	RSC 11-42	1037	691	1531	1086	XVIII
33	BAUS(M)-3	0	0	741	247	XLIV
34	BAUS-116	0	0	1531	510	XXXVI
35	CAUMS 2	0	691	1309	667	XXX

36	NRC 195	1432	2790	2173	2132	I
37	NRC 203	0	617	1481	699	XXVIII
38	NRC 193	963	815	1975	1251	XI
39	NRC 192	1037	840	2543	1473	VII
40	NRC 191	0	1012	0	337	XL
41	NRC 190	0	815	1802	872	XXIV
42	PS 26 (C)	963	1037	1037	1012	XIX
43	NRC 189	790	790	1728	1103	XVII
44	RVSM 16-20	0	0	1778	593	XXXIII
45	KDS 1175	0	0	790	263	XLIII
46	KDS 1187	0	0	864	288	XLII
47	KDS 1149	0	0	938	313	XLI
48	MACS 1672	0	0	321	107	XLVI
49	ACS 1735	0	0	864	288	XLII
50	ASb 15	0	741	864	535	XXXIV
51	TS 21-2	0	0	1185	395	XXXIX
52	TS 21-1	0	691	1160	617	XXXII
53	LOKSOY-1	0	667	815	494	XXXVII
54	KSS 204	0	0	1309	436	XXXVIII
	Mean	1214.8	1115.14	1418.49		
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		
	CD	172.84	148.15	345.68		
	CV	22.26	13.2	15.45		
	Zonal CD (5%)				406	

Table 1.2.2

Trial : Initial Varietal Trial

Zone : NORTHERN PLAIN ZONE

Character : Days to Flower

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	SKAU-WSB-101	-	-	-	-	
2	KBS 21-1	-	-	48	48	VI
3	MAUS 818	-	-	58	58	XXVI
4	MAUS 791	-	60	48	54	XVI
5	AMS 115	-	58	58	58	XXVI
6	AMS 19-01	-	-	56	56	XXI
7	RVS 13-20	-	56	52	54	XVI
8	RVS 13-15	-	57	54	56	XIX
9	DLSb 3	48	65	57	57	XXIII
10	DLSb 4	47	60	55	54	XVI
11	DSb 39	-	61	49	55	XVII
12	SL 955 (C)	50	60	65	58	XXVII
13	AS 40	-	63	59	61	XXXI
14	AS 24	-	62	55	59	XXVIII
15	JS 23-08	-	58	55	57	XXII
16	JS 23-05	46	59	54	53	XII
17	DS 1312	42	58	57	52	XI
18	DS 3163	47	62	58	56	XX
19	DS 3168	48	58	55	54	XV
20	DS 3124	48	60	60	56	XXI
21	SL 1282	49	51	60	53	XIII
22	SL 1230	43	-	55	49	VII
23	HIMSO-1694	-	59	48	54	XIV
24	HIMSO-1693	-	69	48	59	XXVIII
25	VLS 103	-	-	-	-	
26	VLS 102	-	-	53	53	XII
27	SL 1074 (C)	53	67	60	60	XXX
28	PS 1605	44	59	50	51	IX
29	PS 1689	53	65	57	58	XXVII
30	PS 1682	48	65	59	57	XXV
31	RSC 11-48	-	62	57	60	XXIX
32	RSC 11-42	48	62	55	55	XVII

33	BAUS(M)-3	-	-	61	61	XXXI
34	BAUS-116	-	-	58	58	XXVI
35	CAUMS 2	-	59	54	57	XXII
36	NRC 195	48	65	57	57	XXIII
37	NRC 203	-	48	50	49	VII
38	NRC 193	48	63	55	55	XVIII
39	NRC 192	46	65	56	56	XX
40	NRC 191	-	40	-	40	II
41	NRC 190	-	63	56	60	XXIX
42	PS 26 (C)	49	65	60	58	XXVI
43	NRC 189	47	62	57	55	XVIII
44	RVSM 16-20	-	-	49	49	VII
45	KDS 1175	-	-	52	52	X
46	KDS 1187	-	-	44	44	III
47	KDS 1149	-	-	56	56	XXI
48	MACS 1672	-	-	54	54	XVI
49	ACS 1735	-	-	47	47	V
50	ASb 15	-	49	43	46	IV
51	TS 21-2	-	-	50	50	VIII
52	TS 21-1	-	57	53	55	XVII
53	LOKSOY-1	-	-	57	57	XXIV
54	KSS 204	-	-	56	56	XXI
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		

Table 1.2.3

Trial : Initial Varietal Trial
Zone : NORTHERN PLAIN ZONE
Character : Days to Maturity

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	SKAU-WSB-101	-	-	-	-	
2	KBS 21-1	-	-	115	115	X
3	MAUS 818	-	-	121	121	XXV
4	MAUS 791	-	108	115	112	III
5	AMS 115	-	103	115	109	II
6	AMS 19-01	-	-	120	120	XXII
7	RVS 13-20	-	110	116	113	VI
8	RVS 13-15	-	110	116	113	VI
9	DLSb 3	117	127	118	121	XXIV
10	DLSb 4	112	115	118	115	X
11	DSb 39	-	113	118	116	XII
12	SL 955 (C)	120	127	115	121	XXIV
13	AS 40	-	108	116	112	IV
14	AS 24	-	124	113	119	XXI
15	JS 23-08	-	111	113	112	IV
16	JS 23-05	107	116	116	113	VI
17	<u>DS 1312</u>	111	115	120	115	XI
18	DS 3163	116	115	120	117	XVII
19	DS 3168	116	126	122	121	XXVI
20	DS 3124	117	129	125	124	XXIX
21	SL 1282	122	115	124	120	XXIII
22	SL 1230	119	-	116	118	XVIII
23	HIMSO-1694	-	111	115	113	VI
24	HIMSO-1693	-	112	113	113	V
25	VLS 103	-	-	-	-	
26	VLS 102	-	-	113	113	VI
27	SL 1074 (C)	120	114	116	117	XVI
28	PS 1605	111	125	113	116	XV
29	PS 1689	118	130	118	122	XXVIII
30	PS 1682	116	129	120	122	XXVII
31	RSC 11-48	-	115	117	116	XIV
32	RSC 11-42	113	115	115	114	VIII
33	BAUS(M)-3	-	-	118	118	XX

34	BAUS-116	-	-	114	114	VII
35	CAUMS 2	-	110	113	112	III
36	NRC 195	115	129	116	120	XXII
37	NRC 203	-	118	116	117	XVII
38	NRC 193	112	116	118	115	XI
39	NRC 192	114	121	118	118	XIX
40	NRC 191	-	125	-	125	XXX
41	NRC 190	-	124	116	120	XXII
42	PS 26 (C)	121	125	120	122	XXVIII
43	NRC 189	110	121	116	116	XIII
44	RVSM 16-20	-	-	116	116	XIV
45	KDS 1175	-	-	113	113	VI
46	KDS 1187	-	-	112	112	IV
47	KDS 1149	-	-	115	115	X
48	MACS 1672	-	-	115	115	X
49	ACS 1735	-	-	113	113	VI
50	ASb 15	-	115	114	115	IX
51	TS 21-2	-	-	118	118	XX
52	TS 21-1	-	110	115	113	V
53	LOKSOY-1	-	-	115	115	X
54	KSS 204	-	-	120	120	XXII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		

Table 1.2.4**Trial : Initial Varietal Trial****Zone : NORTHERN PLAIN ZONE****Character : Plant Height (cm)**

S.No.	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	SKAU-WSB-101	-	-	-	-	
2	KBS 21-1	-	-	60	60.00	XX
3	MAUS 818	-	-	71	71.00	III
4	MAUS 791	-	68	57	62.50	XV
5	AMS 115	-	65	49	57.00	XXIV
6	AMS 19-01	-	-	57	57.00	XXIV
7	RVS 13-20	-	61	61	61.00	XIX
8	RVS 13-15	-	58	58	58.00	XXII
9	DLSb 3	71	74	94	79.67	I
10	DLSb 4	61	66	81	69.33	V
11	DSb 39	-	64	60	62.00	XVII
12	SL 955 (C)	61	65	47	57.67	XXIII
13	AS 40	-	62	73	67.50	VII
14	AS 24	-	48	65	56.50	XXV
15	JS 23-08	-	58	47	52.50	XXX
16	JS 23-05	52	72	50	58.00	XXII
17	<u>DS 1312</u>	47	63	44	51.33	XXXI
18	DS 3163	49	72	52	57.67	XXIII
19	DS 3168	58	69	48	58.33	XXI
20	DS 3124	49	63	54	55.33	XXVII
21	SL 1282	50	69	68	62.33	XVI
22	SL 1230	51	-	50	50.50	XXXII
23	HIMSO-1694	-	71	61	66.00	XI
24	HIMSO-1693	-	44	51	47.50	XXXIV
25	VLS 103	-	-	-	-	
26	VLS 102	-	-	55	55.00	XXVIII
27	SL 1074 (C)	50	74	59	61.00	XIX
28	PS 1605	47	64	57	56.00	XXVI
29	PS 1689	70	86	76	77.33	II
30	PS 1682	52	67	47	55.33	XXVII
31	RSC 11-48	-	59	61	60.00	XX
32	RSC 11-42	69	68	62	66.33	X
33	BAUS(M)-3	-	-	63	63.00	XIV

34	BAUS-116	-	-	56	56.00	XXVI
35	CAUMS 2	-	66	57	61.50	XVIII
36	NRC 195	64	67	63	64.67	XIII
37	NRC 203	-	66	57	61.50	XVIII
38	NRC 193	58	54	62	58.00	XXII
39	NRC 192	56	81	72	69.67	IV
40	NRC 191	-	43	-	43.00	XXXV
41	NRC 190	-	60	53	56.50	XXV
42	PS 26 (C)	59	87	56	67.33	VIII
43	NRC 189	46	66	47	53.00	XXIX
44	RVSM 16-20	-	-	50	50.00	XXXIII
45	KDS 1175	-	-	67	67.00	IX
46	KDS 1187	-	-	69	69.00	VI
47	KDS 1149	-	-	50	50.00	XXXIII
48	MACS 1672	-	-	36	36.00	XXXVI
49	ACS 1735	-	-	53	53.00	XXIX
50	ASb 15	-	55	51	53.00	XXIX
51	TS 21-2	-	-	65	65.00	XII
52	TS 21-1	-	47	76	61.50	XVIII
53	LOKSOY-1	-	-	55	55.00	XXVIII
54	KSS 204	-	-	58	58.00	XXII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		

Table 1.2.5

Trial : Initial Varietal Trial
Zone : NORTHERN PLAIN ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	SKAU-WSB-101	-	-	-	-	
2	KBS 21-1	-	-	13.08	13.08	II
3	MAUS 818	-	-	12.64	12.64	III
4	MAUS 791	-	7.89	15	11.45	VI
5	AMS 115	-	6.88	8.63	7.76	XXXV
6	AMS 19-01	-	-	9.46	9.46	XVIII
7	RVS 13-20	-	7.22	11.21	9.22	XXI
8	RVS 13-15	-	5.8	10	7.90	XXXII
9	DLSb 3	7.83	8.27	10.09	8.73	XXIV
10	DLSb 4	8.5	8.21	10.22	8.98	XXII
11	DSb 39	-	5.23	8.37	6.80	XLV
12	SL 955 (C)	7.93	7.28	7.61	7.61	XXXVII
13	AS 40	-	5.71	7.14	6.43	XLVIII
14	AS 24	-	8.69	8.28	8.49	XXVI
15	JS 23-08	-	8.2	11.13	9.67	XV
16	JS 23-05	8.49	7.55	10.63	8.89	XXIII
17	<u>DS 1312</u>	7.32	5.78	8.7	7.27	XL
18	DS 3163	7.87	7.31	9.6	8.26	XXXI
19	DS 3168	7.7	7.09	8.52	7.77	XXXIV
20	DS 3124	8.04	8.59	8.66	8.43	XXVIII
21	SL 1282	6.6	7.29	7.69	7.19	XLI
22	SL 1230	9.4	-	9.38	9.39	XX
23	HIMSO-1694	-	5.86	7.75	6.81	XLIV
24	HIMSO-1693	-	6.11	9.48	7.80	XXXIII
25	VLS 103	-	-	-	-	
26	VLS 102	-	-	11.77	11.77	V
27	SL 1074 (C)	7.39	5.49	7.21	6.70	XLVI
28	PS 1605	8.13	10.65	9.53	9.44	XIX
29	PS 1689	6.16	6.26	9.38	7.27	XL
30	PS 1682	8.01	8.3	9.09	8.47	XXVII
31	RSC 11-48	-	6.53	9.06	7.80	XXXIII
32	RSC 11-42	5.88	6.02	6.98	6.29	XLIX
33	BAUS(M)-3	-	-	8.5	8.50	XXV
34	BAUS-116	-	-	8.27	8.27	XXX
35	CAUMS 2	-	5.53	8.07	6.80	XLV

36	NRC 195	10.02	10.12	10.53	10.22	XIII
37	NRC 203	-	9.19	13.66	11.43	VII
38	NRC 193	5.87	5.13	9.73	6.91	XLIII
39	NRC 192	216.31	6.25	10.6	77.72	I
40	NRC 191	-	10.56	-	10.56	XII
41	NRC 190	-	6.29	8.53	7.41	XXXVIII
42	PS 26 (C)	6.74	6.34	8.08	7.05	XLII
43	NRC 189	6.05	6.25	7.41	6.57	XLVII
44	RVSM 16-20	-	-	10.81	10.81	XI
45	KDS 1175	-	-	9.51	9.51	XVII
46	KDS 1187	-	-	10.09	10.09	XIV
47	KDS 1149	-	-	7.73	7.73	XXXVI
48	MACS 1672	-	-	10.95	10.95	X
49	ACS 1735	-	-	9.53	9.53	XVI
50	ASb 15	-	5.86	10.95	8.41	XXIX
51	TS 21-2	-	-	11.09	11.09	IX
52	TS 21-1	-	5.53	9.13	7.33	XXXIX
53	LOKSOY-1	-	-	12.2	12.20	IV
54	KSS 204	-	-	11.24	11.24	VIII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		

Table 1.2.6

Trial : Initial Varietal Trial

Zone : NORTHERN PLAIN ZONE

Character : Oil Content (%)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank
1	SKAU-WSB-101				
2	KBS 21-1				
3	MAUS 818				
4	MAUS 791		22.03	22.03	VIII
5	AMS 115				
6	AMS 19-01				
7	RVS 13-20		20.53	20.53	XXIII
8	RVS 13-15				
9	DLSb 3	22.55		22.55	VII
10	DLSb 4	21.96		21.96	XI
11	DSb 39				
12	SL 955 (C)	21.94		21.94	XII
13	AS 40				
14	AS 24				
15	JS 23-08		19.42	19.42	XXV
16	JS 23-05	22.84	20.95	21.89	XIII
17	<u>DS 1312</u>	22.54	21.39	21.96	X
18	DS 3163	21.77	22.25	22.01	IX
19	DS 3168	21.63	20.42	21.02	XIX
20	DS 3124	21.25	21.38	21.32	XVII
21	SL 1282	22.25	22.93	22.59	VI
22	SL 1230	22.77		22.77	III
23	HIMSO-1694				
24	HIMSO-1693				
25	VLS 103				
26	VLS 102				
27	SL 1074 (C)	22.90		22.90	I
28	PS 1605	24.53	20.83	22.68	V
29	PS 1689	22.86		22.86	II
30	PS 1682	23.02	20.35	21.68	XIV
31	RSC 11-48				
32	RSC 11-42	23.04	19.92	21.48	XVI
33	BAUS(M)-3				
34	BAUS-116				

35	CAUMS 2				
36	NRC 195	23.62	19.56	21.59	XV
37	NRC 203		20.35	20.35	XXIV
38	NRC 193	21.92	19.80	20.86	XXI
39	NRC 192	21.16	20.86	21.01	XX
40	NRC 191		21.22	21.22	XVIII
41	NRC 190		18.51	18.51	XXVI
42	PS 26 (C)	22.72		22.72	IV
43	NRC 189	22.69	18.45	20.57	XXII
44	RVSM 16-20				
45	KDS 1175				
46	KDS 1187				
47	KDS 1149				
48	MACS 1672				
49	ACS 1735				
50	ASb 15				
51	TS 21-2				
52	TS 21-1				
53	LOKSOY-1				
54	KSS 204				
	Mean	22.50	20.59		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	15-07-21	21-06-21		

Table 1.2.7

Trial : Initial Varietal Trial
Zone : NORTHERN PLAIN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank	Rank
1	SKAU-WSB-101					
2	KBS 21-1					
3	MAUS 818					
4	MAUS 791		250.2	250.2	12	XII
5	AMS 115					
6	AMS 19-01					
7	RVS 13-20		375.1	375.1	4	IV
8	RVS 13-15					
9	DLSb 3	239.5		239.5	16	XVI
10	DLSb 4	249.5		249.5	13	XIII
11	DSb 39					
12	SL 955 (C)	487.5		487.5	1	I
13	AS 40					
14	AS 24					
15	JS 23-08		273.3	273.3	10	X
16	JS 23-05	191.8	444.7	318.3	7	VII
17	DS 1312	317.1	227.2	272.1	11	XI
18	DS 3163	301.0	296.5	298.8	9	IX
19	DS 3168	363.1	327.7	345.4	6	VI
20	DS 3124	204.6	264.1	234.4	17	XVII
21	SL 1282	423.0	418.9	420.9	3	III
22	SL 1230	247.2		247.2	14	XIV
23	HIMSO-1694					
24	HIMSO-1693					
25	VLS 103					
26	VLS 102					
27	SL 1074 (C)	316.6		316.6	8	VIII
28	PS 1605	211.9	277.6	244.8	15	XV
29	PS 1689	197.5		197.5	20	XX
30	PS 1682	295.6	416.9	356.2	5	V
31	RSC 11-48					
32	RSC 11-42	238.9	137.6	188.3	22	XXII
33	BAUS(M)-3					
34	BAUS-116					
35	CAUMS 2					

36	NRC 195	338.2	545.6	441.9	2	II
37	NRC 203		125.6	125.6	26	XXVI
38	NRC 193	211.0	161.3	186.2	23	XXIII
39	NRC 192	219.4	175.2	197.3	21	XXI
40	NRC 191		214.8	214.8	19	XIX
41	NRC 190		150.9	150.9	25	XXV
42	PS 26 (C)	218.8		218.8	18	XVIII
43	NRC 189	179.3	145.8	162.5	24	XXIV
44	RVSM 16-20					
45	KDS 1175					
46	KDS 1187					
47	KDS 1149					
48	MACS 1672					
49	ACS 1735					
50	ASb 15					
51	TS 21-2					
52	TS 21-1					
53	LOKSOY-1					
54	KSS 204					
	Mean	272.6	275.2			
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.8

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	MAUS 819	173	1086	1728	1407	IX
2	MAUS 795	222	1185	1235	1210	XIII
3	KDS 1201	444	1062	1728	1395	X
4	KDS 1173	74	0	815	408	XXIII
5	KDS 1172	74	0	1062	531	XX
6	KDS 1169	25	963	0	482	XXI
7	KDS 1194	0	1383	0	692	XVIII
8	RVS 13-7	173	889	1975	1432	VIII
9	JS 23-09	247	1259	1531	1395	X
10	SL 955 (C)	1012	4395	1778	3087	I
11	JS 23-03	494	1012	1284	1148	XVI
12	PS 1569	123	0	1160	580	XIX
13	PS 1660	617	2049	2222	2136	IV
14	PS 1675	593	2593	2469	2531	III
15	PS 26 (C)	321	1259	1284	1272	XII
16	RSC 11-60	321	840	1531	1186	XIV
17	NRC 186	1012	1160	2173	1667	VI
18	NRC 202	519	1235	1185	1210	XIII
19	NRC 201	370	1284	1062	1173	XV
20	NRC 198	272	1481	1309	1395	X
21	NRC 197	420	1160	1481	1321	XI
22	SL 1104 (C)	1037	1580	2346	1963	V
23	NRC 196	494	3704	1852	2778	II
24	AMS 77-3-6	494	1383	1556	1470	VII
25	AMS 83	49	0	914	457	XXII
26	MACS 1724	395	938	988	963	XVII
	Mean	399	1540.91	1527.83		
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	15-07-21	21-06-21	26-06-21		
	CD	74.07	222.22	246.91		
	CV	12.19	10.44	11.4		
	Zonal CD (10%)				194	

- Data of Delhi centre was rejected due to <1000kg/ha mean yield.

Table 1.2.9

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Days to Flower

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	MAUS 819	48	58	51	52	X
2	MAUS 795	38	48	44	43	IV
3	KDS 1201	46	63	57	55	XVI
4	KDS 1173	50	-	58	54	XIII
5	KDS 1172	49	-	57	53	XI
6	KDS 1169	33	67	-	50	VII
7	KDS 1194	49	63	-	56	XVIII
8	RVS 13-7	49	66	57	57	XIX
9	JS 23-09	43	49	48	47	VI
10	SL 955 (C)	51	70	61	61	XXII
11	JS 23-03	41	48	45	45	V
12	PS 1569	41	-	44	43	III
13	PS 1660	52	65	60	59	XX
14	PS 1675	50	62	54	55	XVI
15	PS 26 (C)	52	70	59	60	XXI
16	RSC 11-60	47	58	51	52	IX
17	NRC 186	48	64	55	56	XVII
18	NRC 202	47	63	53	54	XIV
19	NRC 201	36	41	49	42	II
20	NRC 198	49	56	54	53	XI
21	NRC 197	44	56	51	50	VIII
22	SL 1104 (C)	50	62	54	55	XVI
23	NRC 196	45	57	54	52	IX
24	AMS 77-3-6	48	59	57	55	XV
25	AMS 83	50	-	57	54	XII
26	MACS 1724	43	57	50	50	VII
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.10

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Days to Maturity

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	MAUS 819	119	125	126	123	XX
2	MAUS 795	110	119	115	115	XI
3	KDS 1201	111	125	115	117	XV
4	KDS 1173	121	-	127	124	XXIII
5	KDS 1172	121	-	126	124	XXI
6	KDS 1169	103	123	-	113	VIII
7	KDS 1194	-	115	-	115	XII
8	RVS 13-7	118	123	117	119	XVII
9	JS 23-09	98	111	114	108	III
10	SL 955 (C)	117	130	116	121	XIX
11	JS 23-03	106	117	114	112	VII
12	PS 1569	104	-	113	109	V
13	PS 1660	112	126	117	118	XVI
14	PS 1675	116	129	115	120	XVIII
15	PS 26 (C)	120	120	123	121	XIX
16	RSC 11-60	106	117	114	112	VII
17	NRC 186	111	120	115	115	XIII
18	NRC 202	109	119	113	114	IX
19	NRC 201	105	103	113	107	II
20	NRC 198	107	103	115	108	IV
21	NRC 197	109	118	115	114	X
22	SL 1104 (C)	119	125	127	124	XXII
23	NRC 196	107	124	114	115	XII
24	AMS 77-3-6	109	115	113	112	VII
25	AMS 83	110	-	112	111	VI
26	MACS 1724	110	124	114	116	XIV
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.11

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Plant Height (cm)

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	MAUS 819	41	45	58	48.00	XVII
2	MAUS 795	38	46	61	48.33	XVI
3	KDS 1201	50	51	79	60.00	VII
4	KDS 1173	39	-	112	75.50	II
5	KDS 1172	53	-	111	82.00	I
6	KDS 1169	37	39	-	38.00	XX
7	KDS 1194	-	46	-	46.00	XVIII
8	RVS 13-7	42	55	61	52.67	XIII
9	JS 23-09	47	46	59	50.67	XV
10	SL 955 (C)	40	66	58	54.67	XI
11	JS 23-03	48	53	57	52.67	XIII
12	PS 1569	31	-	47	39.00	XIX
13	PS 1660	43	65	72	60.00	VII
14	PS 1675	47	79	63	63.00	V
15	PS 26 (C)	49	70	69	62.67	VI
16	RSC 11-60	45	51	61	52.33	XIV
17	NRC 186	45	55	64	54.67	XI
18	NRC 202	52	74	70	65.33	IV
19	NRC 201	48	57	47	50.67	XV
20	NRC 198	55	49	67	57.00	X
21	NRC 197	55	60	89	68.00	III
22	SL 1104 (C)	48	66	61	58.33	VIII
23	NRC 196	54	60	58	57.33	IX
24	AMS 77-3-6	64	45	66	58.33	VIII
25	AMS 83	44	-	70	57.00	X
26	MACS 1724	43	58	59	53.33	XII
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.12**Trial : Initial Varietal Trial : Early****Zone : NORTHERN PLAIN ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	MAUS 819	7.7	10.24	15.27	11.07	II
2	MAUS 795	7.72	10.04	15.02	10.93	IV
3	KDS 1201	4.88	6.53	10.63	7.35	XIX
4	KDS 1173	4.63	-	8.23	6.43	XXV
5	KDS 1172	5.32	-	8.54	6.93	XXIII
6	KDS 1169	4.46	8.25	-	6.36	XXVI
7	KDS 1194	-	12.32	-	12.32	I
8	RVS 13-7	6	6.5	9.59	7.36	XVIII
9	JS 23-09	7.11	7.03	9.87	8.00	XV
10	SL 955 (C)	7.29	7.86	7.58	7.58	XVI
11	JS 23-03	6.98	7.75	11.62	8.78	XI
12	PS 1569	7.56	-	12.23	9.90	VI
13	PS 1660	6.85	7.06	8.72	7.54	XVII
14	PS 1675	9.79	10.83	12.54	11.05	III
15	PS 26 (C)	6.82	6.43	7.64	6.96	XXII
16	RSC 11-60	5.93	8.48	12.65	9.02	VIII
17	NRC 186	6.16	6.11	8.26	6.84	XXIV
18	NRC 202	6.57	5.97	8.72	7.09	XXI
19	NRC 201	8.06	7.84	13.47	9.79	VII
20	NRC 198	8.36	6.71	11.18	8.75	XII
21	NRC 197	6.89	8.34	10.44	8.56	XIV
22	SL 1104 (C)	8.38	10.1	13.29	10.59	V
23	NRC 196	7.39	9.8	9.72	8.97	IX
24	AMS 77-3-6	7.32	7.6	11.63	8.85	X
25	AMS 83	6.07	-	8.6	7.34	XX
26	MACS 1724	6.99	8.67	10.56	8.74	XIII
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.13

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Oil Content (%)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank
1	MAUS 819				
2	MAUS 795	21.68	22.12	21.90	XII
3	KDS 1201	22.61		22.61	VIII
4	KDS 1173	21.92		21.92	XI
5	KDS 1172				
6	KDS 1169				
7	KDS 1194				
8	RVS 13-7		20.27	20.27	XVI
9	JS 23-09	22.06	23.05	22.55	IX
10	SL 955 (C)	24.99	21.67	23.33	II
11	JS 23-03	22.48	18.32	20.40	XV
12	PS 1569				
13	PS 1660	20.62	19.91	20.27	XVII
14	PS 1675	22.39	23.02	22.70	VII
15	PS 26 (C)	21.42	18.31	19.86	XVIII
16	RSC 11-60				
17	NRC 186	22.43	20.78	21.60	XIII
18	NRC 202	19.74	19.95	19.84	XIX
19	NRC 201	22.28	20.68	21.48	XIV
20	NRC 198	22.94	23.06	23.00	IV
21	NRC 197	23.56		23.56	I
22	SL 1104 (C)	23.01	23.08	23.05	III
23	NRC 196	22.88		22.88	V
24	AMS 77-3-6	23.03	21.15	22.09	X
25	AMS 83				
26	MACS 1724	22.12	23.57	22.84	VI
	Mean	22.34	21.26		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	15-07-21	21-06-21		

Table 1.2.14

Trial : Initial Varietal Trial : Early
Zone : NORTHERN PLAIN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank	Rank
1	MAUS 819					
2	MAUS 795	48.1	262.1	155.1	12	XII
3	KDS 1201	100.4		100.4	17	XVII
4	KDS 1173	16.2		16.2	19	XIX
5	KDS 1172					
6	KDS 1169					
7	KDS 1194					
8	RVS 13-7		180.2	180.2	8	VIII
9	JS 23-09	54.5	290.2	172.4	11	XI
10	SL 955 (C)	252.8	952.5	602.7	1	I
11	JS 23-03	111.1	185.4	148.2	15	XV
12	PS 1569					
13	PS 1660	127.2	408.0	267.6	4	IV
14	PS 1675	132.7	597.0	364.9	2	II
15	PS 26 (C)	68.7	230.5	149.6	14	XIV
16	RSC 11-60					
17	NRC 186	226.9	241.0	234.0	5	V
18	NRC 202	102.5	246.4	174.4	9	IX
19	NRC 201	82.4	265.5	173.9	10	X
20	NRC 198	62.4	341.5	202.0	7	VII
21	NRC 197	98.9		98.9	18	XVIII
22	SL 1104 (C)	238.6	364.7	301.7	3	III
23	NRC 196	113.0		113.0	16	XVI
24	AMS 77-3-6	113.7	292.5	203.1	6	VI
25	AMS 83					
26	MACS 1724	87.4	221.1	154.2	13	XIII
	Mean	113.2	338.6			
	N.P.S.(Sqm)	4.05	4.05			
	DOS	15-07-21	21-06-21			

Table 1.2.15

Trial : Advanced Varietal Trial I+II**Zone : NORTHERN PLAIN ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	NRC 149**	2546	1986	1866	2133	II
2	PS 1670	2167	2264	2750	2394	I
3	DS 9421	1042	764	1111	972	VIII
4	DS 9422	963	1199	671	944	IX
5	SL 955(C)	2056	1824	1662	1847	III
6	SL 1074(C)	1403	634	1528	1188	VI
7	SL 1104(C)	-	704	-	704	X
8	DS 9712@(C)	1301	699	1366	1122	VII
9	SL 958(C)	1681	611	1602	1298	V
10	PS 1347(C)	1560	1546	1671	1592	IV
	Mean	1635.44	1223.1	1580.78		
	N.P.S.(Sqm)	21.6	21.6	21.6		
	DOS	15-07-21	21-06-21	28-06-21		
	CD	125	157.41	175.93		
	CV	5.85	8.95	8.62		
	Zonal CD (5%)				151	

Table 1.2.16

Trial : Advanced Varietal Trial I**Zone : NORTHERN PLAIN ZONE****Character : Days to Flower**

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	NRC 149**	48	66	53	56	V
2	PS 1670	48	65	53	55	IV
3	DS 9421	45	58	50	51	I
4	DS 9422	45	59	50	51	II
5	SL 955(C)	51	64	61	59	VIII
6	SL 1074(C)	52	62	61	58	VII
7	SL 1104(C)	-	62	-	62	IX
8	DS 9712@(C)	45	59	53	52	III
9	SL 958(C)	45	66	55	55	IV
10	PS 1347(C)	50	61	57	56	VI
	N.P.S.(Sqm)	21.6	21.6	21.6		
	DOS	15-07-21	21-06-21	28-06-21		

Table 1.2.17

Trial : Advanced Varietal Trial I
Zone : NORTHERN PLAIN ZONE
Character : Days to Maturity

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	NRC 149**	119	131	122	124	V
2	PS 1670	116	131	119	122	IV
3	DS 9421	110	128	118	119	I
4	DS 9422	110	130	119	120	II
5	SL 955(C)	124	132	119	125	VII
6	SL 1074(C)	119	132	125	125	VIII
7	SL 1104(C)	119	129	-	124	V
8	DS 9712@(C)	113	128	120	120	III
9	SL 958(C)	123	134	123	127	IX
10	PS 1347(C)	123	129	121	124	VI
	N.P.S.(Sqm)	21.6	21.6	21.6		
	DOS	15-07-21	21-06-21	28-06-21		

Table 1.2.18

Trial : Advanced Varietal Trial I
Zone : NORTHERN PLAIN ZONE
Character : Plant Height (cm)

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	NRC 149**	75	100	109	94.67	II
2	PS 1670	63	82	66	70.33	IV
3	DS 9421	50	61	49	53.33	VIII
4	DS 9422	53	64	40	52.33	IX
5	SL 955(C)	55	90	62	69.00	V
6	SL 1074(C)	64	90	67	73.67	III
7	SL 1104(C)	-	66	-	66.00	VI
8	DS 9712@(C)	59	66	73	66.00	VI
9	SL 958(C)	76	101	111	96.00	I
10	PS 1347(C)	53	80	47	60.00	VII
	N.P.S.(Sqm)	21.6	21.6	21.6		
	DOS	15-07-21	21-06-21	28-06-21		

Table 1.2.19

Trial : Advanced Varietal Trial I
Zone : NORTHERN PLAIN ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Delhi	Ludhiana	Pantnagar	Mean	Rank
1	NRC 149**	8.51	9.86	11.06	9.81	I
2	PS 1670	7.94	9.26	10.54	9.25	II
3	DS 9421	7.3	7.47	10.03	8.27	V
4	DS 9422	6.89	7.68	10.1	8.22	VI
5	SL 955(C)	7.72	6.76	8.29	7.59	VIII
6	SL 1074(C)	7.06	5.6	7.06	6.57	X
7	SL 1104(C)	-	7.95	-	7.95	VII
8	DS 9712@(C)	6.83	6.85	9.02	7.57	IX
9	SL 958(C)	8.12	7.18	9.56	8.29	IV
10	PS 1347(C)	7.26	9.97	9.6	8.94	III
	N.P.S.(Sqm)	21.6	21.6	21.6		
	DOS	15-07-21	21-06-21	28-06-21		

Table 1.2.20

Trial : Advanced Varietal Trial I
Zone : NORTHERN PLAIN ZONE
Character : Oil Content (%)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank
1	NRC 149**	22.55	22.41	22.48	VII
2	PS 1670	23.14	21.29	22.21	VIII
3	DS 9421	23.57	21.56	22.57	VI
4	DS 9422	22.98	21.42	22.20	IX
5	SL 955(C)	23.78	23.11	23.44	I
6	SL 1074(C)	23.24	22.03	22.63	V
7	SL 1104(C)	-	21.17	21.17	X
8	DS 9712@(C)	23.12	22.55	22.83	III
9	SL 958(C)	23.32	22.53	22.92	II
10	PS 1347(C)	23.50	21.96	22.73	IV
	Mean	23.24	22.00		
	N.P.S.(Sqm)	21.6	21.6		
	DOS	15-07-21	21-06-21		

Table 1.2.21

Trial : Advanced Varietal Trial I
Zone : NORTHERN PLAIN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Delhi	Ludhiana	Mean	Rank
1	NRC 149**	574.1	445.1	509.6	I
2	PS 1670	501.4	481.9	491.7	II
5	SL 955(C)	488.8	421.5	455.2	III
10	PS 1347(C)	366.6	339.5	353.0	IV
9	SL 958(C)	391.9	137.7	264.8	V
4	DS 9422	221.3	256.8	239.1	VI
6	SL 1074(C)	326.1	139.7	232.9	VII
8	DS 9712@(C)	300.7	157.6	229.2	VIII
3	DS 9421	245.6	164.7	205.2	IX
7	SL 1104(C)	-	149.0	149.0	X
	Mean	379.6	269.4		
	N.P.S.(Sqm)	21.6	21.6		
	DOS	15-07-21	21-06-21		

Table 1.3.1

Trial : Initial Varietal Trial
Zone : NORTH EASTERN HILL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	SKAU-WSB-101	1654	1580	1200	1617	XLIX
2	KBS 21-1	2420	1309	1567	1865	XLV
3	MAUS 818	3235	2148	1367	2692	XX
4	MAUS 791	3654	2148	1333	2901	VIII
5	AMS 115	2667	1580	300	2124	XLI
6	AMS 19-01	3753	1556	500	2655	XXII
7	RVS 13-20	3556	-	1067	3556	III
8	RVS 13-15	2790	1407	867	2099	XLII
9	DLSb 3	3185	1877	1000	2531	XXV
10	DLSb 4	2864	1827	1767	2346	XXXII
11	DSb 39	3407	2049	1700	2728	XVII
12	MACS 1407 (C)	2840	1605	733	2223	XXXVI
13	AS 40	2667	1506	1133	2087	XLIII
14	AS 24	2691	2074	800	2383	XXX
15	JS 23-08	2049	1556	333	1803	XLVI
16	JS 23-05	3086	1630	867	2358	XXXI
17	<u>DS 1312</u>	2444	-	900	2444	XXVIII
18	DS 3163	3605	1852	733	2729	XVI
19	DS 3168	3926	1605	800	2766	XIII
20	DS 3124	3852	1284	1000	2568	XXIV
21	SL 1282	2593	1753	1000	2173	XXXIX
22	SL 1230	3556	1580	800	2568	XXIV
23	HIMSO-1694	4469	1580	1600	3025	V
24	HIMSO-1693	4025	1556	1267	2791	XII
25	VLS 103	2938	1481	867	2210	XXXVIII
26	VLS 102	4049	1457	1267	2753	XIV
27	JS 20-116 (C)	3728	-	900	3728	II
28	PS 1605	2296	1284	533	1790	XLVII
29	PS 1689	2519	1654	967	2087	XLIII
30	PS 1682	2444	1556	300	2000	XLIV
31	RSC 11-48	3630	1383	1267	2507	XXVI
32	RSC 11-42	2617	1383	800	2000	XLIV
33	BAUS(M)-3	2593	1580	1000	2087	XLIII
34	BAUS-116	2889	1605	767	2247	XXXV

35	CAUMS 2	4099	1605	933	2852	IX
36	NRC 195	3679	1556	833	2618	XXIII
37	NRC 203	2914	-	567	2914	VII
38	NRC 193	3901	1531	900	2716	XVIII
39	NRC 192	3679	1802	1000	2741	XV
40	NRC 191	4074	1852	333	2963	VI
41	NRC 190	4049	1654	1100	2852	X
42	RKS 113 (C)	-	-	333	-	
43	NRC 189	4272	1136	700	2704	XIX
44	RVSM 16-20	4198	1136	733	2667	XXI
45	KDS 1175	3259	1753	1633	2506	XXVII
46	KDS 1187	3160	1284	1867	2222	XXXVII
47	KDS 1149	4025	-	1667	4025	I
48	MACS 1672	2864	1457	300	2161	XL
49	ACS 1735	3185	1407	1433	2296	XXXIII
50	ASb 15	1975	1407	1033	1691	XLVIII
51	TS 21-2	2815	-	1467	2815	XI
52	TS 21-1	2395	-	1200	2395	XXIX
53	LOKSOY-1	2272	-	433	2272	XXXIV
54	KSS 204	3210	-	767	3210	IV
	Mean	3183.32	1591.48	972.85		
	N.P.S.(Sqm)	4.05	4.05	3.00		
	DOS	22-06-21	24-06-21	17-07-21		
	CD	617.28	24.69	466.67		
	CV	12.16	1.13	29.2		
	Zonal CD				432	

- Data of Umiam centre was rejected due to mean grain yield less than 10 Q/ha and high CV

Table 1.3.2

Trial : Initial Varietal Trial
Zone : NORTH EASTERN HILL ZONE
Character : Days to Flower

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	SKAU-WSB-101	31	45	38	38	I
2	KBS 21-1	45	44	42	44	VIII
3	MAUS 818	44	42	43	43	VI
4	MAUS 791	42	44	42	43	V
5	AMS 115	47	43	43	44	X
6	AMS 19-01	54	41	44	46	XVI
7	RVS 13-20	44	-	43	44	VII
8	RVS 13-15	48	42	43	44	X
9	DLSb 3	52	43	42	46	XIV
10	DLSb 4	48	42	46	45	XIII
11	DSb 39	52	43	46	47	XVIII
12	MACS 1407 (C)	51	43	46	47	XVII
13	AS 40	54	44	47	48	XXIII
14	AS 24	49	43	44	45	XIII
15	JS 23-08	43	45	44	44	IX
16	JS 23-05	45	43	44	44	IX
17	<u>DS 1312</u>	43	-	44	44	VII
18	DS 3163	48	42	42	44	IX
19	DS 3168	49	41	44	45	XI
20	DS 3124	47	42	47	45	XIII
21	SL 1282	56	42	43	47	XVIII
22	SL 1230	49	41	44	45	XI
23	HIMSO-1694	47	44	41	44	IX
24	HIMSO-1693	58	41	41	47	XVII
25	VLS 103	47	44	38	43	VI
26	VLS 102	48	43	42	44	X
27	JS 20-116 (C)	53	-	45	49	XXV
28	PS 1605	48	42	42	44	IX
29	PS 1689	56	42	46	48	XXII
30	PS 1682	54	40	44	46	XV
31	RSC 11-48	53	41	44	46	XV
32	RSC 11-42	53	42	44	46	XVI
33	BAUS(M)-3	56	43	43	47	XIX
34	BAUS-116	54	42	45	47	XVIII

35	CAUMS 2	49	43	46	46	XV
36	NRC 195	52	42	43	46	XIV
37	NRC 203	43	-	40	42	III
38	NRC 193	57	44	46	49	XXV
39	NRC 192	48	43	42	44	X
40	NRC 191	43	41	38	41	II
41	NRC 190	53	43	44	47	XVII
42	RKS 113 (C)	-	-	46	46	XV
43	NRC 189	55	43	45	48	XXI
44	RVSM 16-20	49	41	42	44	IX
45	KDS 1175	48	42	42	44	IX
46	KDS 1187	43	42	42	42	IV
47	KDS 1149	54	-	43	49	XXIV
48	MACS 1672	53	42	43	46	XV
49	ACS 1735	46	45	44	45	XII
50	ASb 15	45	43	44	44	IX
51	TS 21-2	49	-	46	48	XX
52	TS 21-1	51	-	45	48	XXII
53	LOKSOY-1	49	-	45	47	XVIII
54	KSS 204	52	-	45	49	XXIV
	N.P.S.(Sqm)	4.05	4.05	3.00		
	DOS	22-06-21	24-06-21	17-07-21		

Table 1.3.3

Trial : Initial Varietal Trial**Zone : NORTH EASTERN HILL ZONE****Character : Days to Maturity**

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	SKAU-WSB-101	100	92	105	99	IV
2	KBS 21-1	101	94	102	99	IV
3	MAUS 818	113	91	105	103	XV
4	MAUS 791	101	87	103	97	I
5	AMS 115	109	90	105	101	XI
6	AMS 19-01	112	82	105	100	VI
7	RVS 13-20	101	-	105	103	XV
8	RVS 13-15	103	85	103	97	I
9	DLSb 3	109	87	103	100	VI
10	DLSb 4	108	86	105	100	VI
11	DSb 39	114	89	104	102	XIV
12	MACS 1407 (C)	116	94	104	105	XIX
13	AS 40	114	93	106	104	XVIII
14	AS 24	107	91	103	100	VIII
15	JS 23-08	102	94	103	100	VI
16	JS 23-05	104	88	102	98	II
17	<u>DS 1312</u>	110	-	103	107	XXI
18	DS 3163	113	86	103	101	IX
19	DS 3168	114	86	104	101	XI
20	DS 3124	111	86	102	100	VI
21	SL 1282	118	91	103	104	XVII
22	SL 1230	113	88	105	102	XIII
23	HIMSO-1694	115	95	102	104	XVII
24	HIMSO-1693	115	94	101	103	XVI
25	VLS 103	113	94	103	103	XVI
26	VLS 102	111	94	102	102	XIV
27	JS 20-116 (C)	102	-	104	103	XV
28	PS 1605	111	81	104	99	III
29	PS 1689	117	84	104	102	XII
30	PS 1682	116	83	105	101	XI
31	RSC 11-48	112	83	105	100	VII
32	RSC 11-42	113	85	104	101	IX
33	BAUS(M)-3	117	86	101	101	XI
34	BAUS-116	114	87	103	101	XI

35	CAUMS 2	108	88	105	100	VIII
36	NRC 195	110	91	102	101	X
37	NRC 203	110	-	104	107	XXII
38	NRC 193	113	87	103	101	X
39	NRC 192	111	89	101	100	VIII
40	NRC 191	104	89	104	99	IV
41	NRC 190	106	89	103	99	V
42	RKS 113 (C)	-	-	103	103	XV
43	NRC 189	112	87	101	100	VII
44	RVSM 16-20	108	87	103	99	V
45	KDS 1175	112	88	106	102	XIII
46	KDS 1187	106	87	105	99	V
47	KDS 1149	114	-	101	108	XXIII
48	MACS 1672	109	88	104	100	VIII
49	ACS 1735	105	95	101	100	VIII
50	ASb 15	104	92	102	99	V
51	TS 21-2	110	-	106	108	XXIV
52	TS 21-1	113	-	105	109	XXV
53	LOKSOY-1	117	-	104	111	XXVI
54	KSS 204	111	-	101	106	XX
	N.P.S.(Sqm)	4.05	4.05	3.00		
	DOS	22-06-21	24-06-21	17-07-21		

Table 1.3.4

Trial : Initial Varietal Trial**Zone : NORTH EASTERN HILL ZONE****Character : Plant Height (cm)**

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	SKAU-WSB-101	34	77	30	47.00	XLIII
2	KBS 21-1	75	120	81	92.00	I
3	MAUS 818	58	127	46	77.00	XIII
4	MAUS 791	53	116	50	73.00	XVII
5	AMS 115	43	92	38	57.67	XXXIV
6	AMS 19-01	62	95	41	66.00	XXVII
7	RVS 13-20	49	-	47	48.00	XLII
8	RVS 13-15	48	121	40	69.67	XXII
9	DLSb 3	75	114	52	80.33	X
10	DLSb 4	69	121	54	81.33	VII
11	DSb 39	61	132	52	81.67	VI
12	MACS 1407 (C)	65	122	41	76.00	XIV
13	AS 40	68	117	64	83.00	V
14	AS 24	61	81	50	64.00	XXX
15	JS 23-08	43	98	38	59.67	XXXI
16	JS 23-05	52	92	28	57.33	XXXVI
17	<u>DS 1312</u>	42	-	33	37.50	XLIV
18	DS 3163	51	121	33	68.33	XXIII
19	DS 3168	50	116	37	67.67	XXIV
20	DS 3124	47	111	39	65.67	XXVIII
21	SL 1282	53	119	48	73.33	XVI
22	SL 1230	53	108	37	66.00	XXVII
23	HIMSO-1694	54	118	41	71.00	XIX
24	HIMSO-1693	46	116	38	66.67	XXV
25	VLS 103	46	90	39	58.33	XXXIII
26	VLS 102	55	120	49	74.67	XV
27	JS 20-116 (C)	69	-	40	54.50	XL
28	PS 1605	45	92	33	56.67	XXXVII
29	PS 1689	58	135	51	81.33	VII
30	PS 1682	51	84	35	56.67	XXXVII
31	RSC 11-48	69	115	48	77.33	XII
32	RSC 11-42	63	132	48	81.00	VIII
33	BAUS(M)-3	62	142	56	86.67	IV
34	BAUS-116	67	112	39	72.67	XVIII

35	CAUMS 2	70	90	52	70.67	XX
36	NRC 195	62	136	44	80.67	IX
37	NRC 203	54	-	42	48.00	XLII
38	NRC 193	57	137	45	79.67	XI
39	NRC 192	63	150	52	88.33	II
40	NRC 191	41	121	31	64.33	XXIX
41	NRC 190	47	124	38	69.67	XXII
42	RKS 113 (C)	-	-	29	29.00	XLV
43	NRC 189	59	110	41	70.00	XXI
44	RVSM 16-20	50	89	39	59.33	XXXII
45	KDS 1175	66	124	52	80.67	IX
46	KDS 1187	62	138	62	87.33	III
47	KDS 1149	55	-	46	50.50	XLI
48	MACS 1672	40	92	34	55.33	XXXVIII
49	ACS 1735	45	102	46	64.33	XXIX
50	ASb 15	51	112	47	70.00	XXI
51	TS 21-2	65	-	50	57.50	XXXV
52	TS 21-1	75	-	58	66.50	XXVI
53	LOKSOY-1	56	-	40	48.00	XLII
54	KSS 204	61	-	49	55.00	XXXIX
	N.P.S.(Sqm)	4.05	4.05	3.00		
	DOS	22-06-21	24-06-21	17-07-21		

Table 1.3.5

Trial : Initial Varietal Trial**Zone : NORTH EASTERN HILL ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	SKAU-WSB-101	41.00	13.00	34.84	29.61	I
2	KBS 21-1	16.27	11.00	14.07	13.78	XXI
3	MAUS 818	19.38	13.00	13.99	15.46	VI
4	MAUS 791	15.75	12.00	14.33	14.03	XVI
5	AMS 115	14.68	14.00	13.19	13.96	XIX
6	AMS 19-01	13.09	11.00	5.58	9.89	LI
7	RVS 13-20	15.35	-	14.20	14.78	IX
8	RVS 13-15	12.23	12.00	12.19	12.14	XXXIX
9	DLSb 3	15.36	13.00	13.75	14.04	XV
10	DLSb 4	16.65	12.00	14.44	14.36	XII
11	DSb 39	13.95	12.00	13.84	13.26	XXV
12	MACS 1407 (C)	12.72	11.00	13.56	12.43	XXXV
13	AS 40	13.47	11.00	10.79	11.75	XL
14	AS 24	11.59	13.00	10.58	11.72	XLI
15	JS 23-08	13.48	13.00	12.33	12.94	XXX
16	JS 23-05	14.85	11.00	13.58	13.14	XXVIII
17	<u>DS 1312</u>	13.62	-	12.19	12.91	XXXII
18	DS 3163	14.25	12.00	13.33	13.19	XXVII
19	DS 3168	15.60	12.00	11.79	13.13	XXIX
20	DS 3124	15.67	11.00	13.98	13.55	XXIII
21	SL 1282	13.57	11.00	10.20	11.59	XLIII
22	SL 1230	20.19	12.00	16.10	16.10	V
23	HIMSO-1694	15.94	12.00	13.33	13.76	XXII
24	HIMSO-1693	17.39	13.00	13.99	14.79	VIII
25	VLS 103	17.16	11.00	15.89	14.68	XI
26	VLS 102	19.14	11.00	15.43	15.19	VII
27	JS 20-116 (C)	11.64	-	10.00	10.82	XLVII
28	PS 1605	16.71	10.00	11.07	12.59	XXXIV
29	PS 1689	11.57	15.00	10.69	12.42	XXXVI
30	PS 1682	13.37	12.00	12.98	12.78	XXXIII
31	RSC 11-48	11.43	11.00	11.93	11.45	XLIV
32	RSC 11-42	11.52	11.00	9.87	10.80	XLVIII
33	BAUS(M)-3	14.40	13.00	11.37	12.92	XXXI
34	BAUS-116	11.01	11.00	9.66	10.56	L
35	CAUMS 2	12.91	12.00	10.06	11.66	XLII
36	NRC 195	15.84	12.00	14.75	14.20	XIV

37	NRC 203	21.35	-	16.12	18.74	II
38	NRC 193	13.55	12.00	11.45	12.33	XXXVIII
39	NRC 192	12.39	15.00	12.04	13.14	XXVIII
40	NRC 191	22.37	14.00	14.07	16.81	IV
41	NRC 190	11.39	12.00	10.54	11.31	XLV
42	RKS 113 (C)	-	-	9.48	9.48	LII
43	NRC 189	11.18	11.00	9.81	10.66	XLIX
44	RVSM 16-20	14.93	8.00	10.95	11.29	XLVI
45	KDS 1175	14.20	14.00	13.64	13.95	XX
46	KDS 1187	16.51	10.00	15.40	13.97	XVIII
47	KDS 1149	13.22	-	13.40	13.31	XXIV
48	MACS 1672	16.97	12.00	11.67	13.55	XXIII
49	ACS 1735	15.43	11.00	13.32	13.25	XXVI
50	ASb 15	17.19	11.00	13.80	14.00	XVII
51	TS 21-2	13.01	-	11.69	12.35	XXXVII
52	TS 21-1	14.43	-	14.06	14.25	XIII
53	LOKSOY-1	19.62	-	15.76	17.69	III
54	KSS 204	16.43	-	12.95	14.69	X
	N.P.S.(Sqm)	4.05	4.05	3.00		
	DOS	22-06-21	24-06-21	17-07-21		

Table 1.3.6

Trial : Initial Varietal Trial
Zone : NORTH EASTERN HILL ZONE
Character : Oil Content (%)

S.No	Varieties	Imphal	Rank
1	SKAU-WSB-101	16.53	I
2	KBS 21-1	16.33	IV
3	MAUS 818	15.60	XI
4	MAUS 791	14.00	XXXVIII
5	AMS 115	13.93	XL
6	AMS 19-01	13.93	XLI
7	RVS 13-20	14.80	XXV
8	RVS 13-15	15.67	IX
9	DLSb 3	16.40	II
10	DLSb 4	14.93	XIX
11	DSb 39	14.87	XXI
12	MACS 1407 (C)	13.47	LI
13	AS 40	15.20	XIII
14	AS 24	14.40	XXXII

15	JS 23-08	15.13	XV
16	JS 23-05	15.00	XVII
17	DS 1312	16.27	V
18	DS 3163	14.27	XXXVI
19	DS 3168	14.67	XXVIII
20	DS 3124	15.00	XVIII
21	SL 1282	13.87	XLIV
22	SL 1230	13.73	XLVII
23	HIMSO-1694	14.53	XXXI
24	HIMSO-1693	13.60	L
25	VLS 103	15.20	XIV
26	VLS 102	15.93	VII
27	JS 20-116 (C)	13.87	XLV
28	PS 1605	14.87	XXII
29	PS 1689	16.20	VI
30	PS 1682	14.40	XXXIII
31	RSC 11-48	12.60	LIII
32	RSC 11-42	13.93	XLII
33	BAUS(M)-3	14.60	XXIX
34	BAUS-116	13.93	XLIII
35	CAUMS 2	16.40	III
36	NRC 195	14.80	XXVI
37	NRC 203	14.40	XXXIV
38	NRC 193	14.87	XXIII
39	NRC 192	14.33	XXXV
40	NRC 191	13.27	LII
41	NRC 190	14.93	XX
42	RKS 113 (C)	-	
43	NRC 189	13.73	XLVIII
44	RVSM 16-20	15.67	X
45	KDS 1175	14.00	XXXIX
46	KDS 1187	13.73	XLIX
47	KDS 1149	15.13	XVI
48	MACS 1672	14.87	XXIV
49	ACS 1735	14.60	XXX
50	ASb 15	15.47	XII
51	TS 21-2	14.27	XXXVII
52	TS 21-1	14.73	XXVII
53	LOKSOY-1	13.87	XLVI

54	KSS 204	15.93	VIII
	Mean	14.73	
	N.P.S.(Sqm)	4.05	
	DOS	22-06-21	

Table 1.3.7

Trial : Initial Varietal Trial

Zone : NORTH EASTERN HILL ZONE

Character : Oil Yield (kg/ha)

S.No	Varieties	Imphal	Rank
1	SKAU-WSB-101	267.3	LI
2	KBS 21-1	304.5	XLIV
3	MAUS 818	419.9	IX
4	MAUS 791	406.1	XIII
5	AMS 115	295.8	XLVII
6	AMS 19-01	369.8	XXVI
7	RVS 13-20	526.3	II
8	RVS 13-15	328.8	XXXVI
9	DLSb 3	415.1	XII
10	DLSb 4	350.2	XXXI
11	DSb 39	405.7	XV
12	MACS 1407 (C)	299.4	XLVI
13	AS 40	317.1	XXXVIII
14	AS 24	343.1	XXXII
15	JS 23-08	272.7	L
16	JS 23-05	353.7	XXVII
17	DS 1312	397.6	XVIII
18	DS 3163	389.4	XXI
19	DS 3168	405.7	XIV
20	DS 3124	385.2	XXIII
21	SL 1282	301.4	XLV
22	SL 1230	352.6	XXIX
23	HIMSO-1694	439.5	VI
24	HIMSO-1693	379.5	XXIV
25	VLS 103	335.8	XXXIV
26	VLS 102	438.6	VII
27	JS 20-116 (C)	517.1	III
28	PS 1605	266.2	LII
29	PS 1689	338.0	XXXIII
30	PS 1682	288.0	XLVIII

31	RSC 11-48	315.8	XXXIX
32	RSC 11-42	278.6	XLIX
33	BAUS(M)-3	304.6	XLIII
34	BAUS-116	313.0	XLI
35	CAUMS 2	467.7	V
36	NRC 195	387.4	XXII
37	NRC 203	419.6	X
38	NRC 193	403.9	XVI
39	NRC 192	392.7	XX
40	NRC 191	393.2	XIX
41	NRC 190	425.7	VIII
42	RKS 113 (C)		
43	NRC 189	371.3	XXV
44	RVSM 16-20	417.9	XI
45	KDS 1175	350.8	XXX
46	KDS 1187	305.1	XLII
47	KDS 1149	609.0	I
48	MACS 1672	321.3	XXXVII
49	ACS 1735	335.2	XXXV
50	ASb 15	261.6	LIII
51	TS 21-2	401.7	XVII
52	TS 21-1	352.8	XXVIII
53	LOKSOY-1	315.1	XL
54	KSS 204	511.4	IV
	Mean	369.2	
	N.P.S.(Sqm)	4.05	
	DOS	22-06-21	

Table 1.3.8

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	KDS 1096	3056	1753	3200	3056	I
2	DLSb 1	3017	2296	-	3017	II
3	DS 3108&	2744	2864	1433	2744	V
4	DSb 38	2667	-	-	2667	VI
5	MACS 1460(C)	2278	2321	2567	2278	IX
6	JS 20-116(C)	2533	-	1833	2533	VII
7	RKS 113(C)	2339	-	2300	2339	VIII
8	JS 335%(C)	2861	2543	-	2861	IV
9	RKS 18%(C)	2244	-	367	2244	X
10	JS 97-52%(C)	2917	-	433	2917	III
	Mean	2665.6	2355.4	1733.29		
	N.P.S.(Sqm)	18	8.1	3		
	DOS	02-06-21	04-08-21	19-07-21		
	CD	422.22	925.93	933.33		
	CV	10.97	72.01	70.71		
	Zona CD				773	

- Data of Jorhat and Umiam centres was rejected due to high CV

Table 1.3.9

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Days to Flower

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	KDS 1096	51	42	44	46	V
2	DLSb 1	49	42	-	46	IV
3	DS 3108	50	42	41	44	II
4	DSb 38	52	-	-	52	IX
5	MACS 1460(C)	51	42	42	45	III
6	JS 20-116(C)	52	-	43	48	VI
7	RKS 113(C)	49	-	42	46	IV
8	JS 335%(C)	48	40	-	44	I
9	RKS 18%(C)	52	-	44	48	VII
10	JS 97-52%(C)	57	-	43	50	VIII
	N.P.S.(Sqm)	18	8.1	3		
	DOS	02-06-21	04-08-21	19-07-21		

Table 1.3.10

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Days to Maturity

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	KDS 1096	112	92	102	102	II
2	DLSb 1	118	89	-	104	V
3	DS 3108&	111	94	103	103	IV
4	DSb 38	112	-	-	112	X
5	MACS 1460(C)	112	91	104	102	III
6	JS 20-116(C)	111	-	102	107	VI
7	RKS 113(C)	117	-	103	110	VIII
8	JS 335%(C)	112	90	-	101	I
9	RKS 18%(C)	111	-	103	107	VII
10	JS 97-52%(C)	119	-	103	111	IX
	N.P.S.(Sqm)	18	8.1	3		
	DOS	02-06-21	04-08-21	19-07-21		

Table 1.3.11

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Plant Height (cm)

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	KDS 1096	74	59	71	68.00	II
2	DLSb 1	62	70	-	66.00	IV
3	DS 3108&	44	59	36	46.33	X
4	DSb 38	60	-	-	60.00	VI
5	MACS 1460(C)	68	68	47	61.00	V
6	JS 20-116(C)	81	-	58	69.50	I
7	RKS 113(C)	70	-	44	57.00	VII
8	JS 335%(C)	73	60	-	66.50	III
9	RKS 18%(C)	62	-	37	49.50	IX
10	JS 97-52%(C)	74	-	36	55.00	VIII
	N.P.S.(Sqm)	18	8.1	3		
	DOS	02-06-21	04-08-21	19-07-21		

Table 1.3.12

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Imphal	Jorhat	Umiam	Mean	Rank
1	KDS 1096	13.96	10.33	14.25	12.85	VII
2	DLSb 1	17.15	11.67	-	14.41	III
3	DS 3108&	16.06	10.67	14.3	13.68	IV
4	DSb 38	14.72	-	-	14.72	I
5	MACS 1460(C)	12.96	12.67	12.65	12.76	VIII
6	JS 20-116(C)	12.76	-	13.77	13.27	V
7	RKS 113(C)	13.56	-	11	12.28	IX
8	JS 335%(C)	14.55	11.67	-	13.11	VI
9	RKS 18%(C)	13.58	-	15.71	14.65	II
10	JS 97-52%(C)	12.53	-	10.98	11.76	X
	N.P.S.(Sqm)	18	8.1	3		
	DOS	02-06-21	04-08-21	19-07-21		

Table 1.3.13

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Oil Content (%)

S.No	Varieties	Imphal	Rank
1	KDS 1096	12.00	IX
2	DLSb 1	13.80	V
3	DS 3108&	15.15	I
4	DSb 38	15.00	II
5	MACS 1460(C)	13.00	VIII
6	JS 20-116(C)	14.75	III
7	RKS 113(C)	13.40	VII
8	JS 335%(C)	11.75	X
9	RKS 18%(C)	13.50	VI
10	JS 97-52%(C)	14.60	IV
	Mean	13.70	
	N.P.S.(Sqm)	18	
	DOS	02-06-21	

Table 1.3.14

Trial : Advanced Varietal Trial I & II
Zone : NORTH EASTERN HILL ZONE
Character : Oil Yield (kg/ha)

Time s	Varieties	Imphal	Rank
1	KDS 1096	366.7	VI
2	DLSb 1	416.3	II
3	DS 3108&	415.7	III
4	DSb 38	400.1	IV
5	MACS 1460(C)	296.1	X
6	JS 20-116(C)	373.6	V
7	RKS 113(C)	313.4	VIII
8	JS 335%(C)	336.2	VII
9	RKS 18%(C)	302.9	IX
10	JS 97-52%(C)	425.9	I
	Mean	364.7	
	N.P.S.(Sqm)	18	
	DOS	02-06-21	

Table 1.4.1

Trial : Initial Varietal Trial**Zone : EASTERN ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	SKAU-WSB-101	1679	1235	1235	1383	XLIV
2	KBS 21-1	2148	2074	1407	1876	XXXI
3	MAUS 818	2099	2469	1284	1951	XXVII
4	MAUS 791	2173	3012	2691	2625	III
5	AMS 115	963	1086	1333	1127	XLVI
6	AMS 19-01	1975	2074	1407	1819	XXXIV
7	RVS 13-20	2247	3136	2593	2659	I
8	RVS 13-15	2049	2148	1284	1827	XXXIII
9	DLSb 3	2173	2593	2543	2436	VII
10	DLSb 4	1457	2593	2815	2288	X
11	DSb 39	2173	1951	2469	2198	XV
12	NRC 128 (C)	1877	2691	1432	2000	XXIII
13	AS 40	1951	2296	2840	2362	VIII
14	AS 24	2272	2716	2642	2543	V
15	JS 23-08	1284	1358	1185	1276	XLV
16	JS 23-05	2519	2963	1556	2346	IX
17	<u>DS 1312</u>	2099	1333	1630	1687	XXXVII
18	DS 3163	2049	2247	2444	2247	XIV
19	DS 3168	2123	1778	2420	2107	XX
20	DS 3124	1679	2049	2395	2041	XXII
21	SL 1282	2420	1877	2790	2362	VIII
22	SL 1230	1901	1358	2346	1868	XXXII
23	HIMSO-1694	2346	1062	3407	2272	XI
24	HIMSO-1693	2049	1235	1062	1449	XLII
25	VLS 103	2716	1012	3062	2263	XII
26	VLS 102	2519	1778	3037	2445	VI
27	JS 20-116 (C)	1975	2691	1086	1917	XXX
28	PS 1605	1901	2938	1506	2115	XIX
29	PS 1689	1605	2642	1679	1975	XXVI
30	PS 1682	1778	1235	1185	1399	XLIII
31	RSC 11-48	1778	3136	1605	2173	XVI
32	RSC 11-42	1654	3333	2790	2592	IV
33	BAUS(M)-3	1802	1605	2963	2123	XVIII
34	BAUS-116	1531	2222	1037	1597	XL
35	CAUMS 2	2099	2889	2889	2626	II
36	NRC 195	1926	2963	1506	2132	XVII
37	NRC 203	1728	2543	1185	1819	XXXIV

38	NRC 193	1556	1012	2395	1654	XXXVIII
39	NRC 192	2296	2395	1259	1983	XXV
40	NRC 191	1926	2222	1481	1876	XXXI
41	NRC 190	2123	2988	1284	2132	XVII
42	AMS 2014-1 (C)	1481	2395	1309	1728	XXXVI
43	NRC 189	1901	2741	1185	1942	XXVIII
44	RVSM 16-20	2247	2494	1654	2132	XVII
45	KDS 1175	1605	1531	1654	1597	XL
46	KDS 1187	1827	2543	1383	1918	XXIX
47	KDS 1149	2420	1877	3012	2436	VII
48	MACS 1672	1432	1259	1679	1457	XLI
49	ACS 1735	2494	2025	1704	2074	XXI
50	ASb 15	2148	2420	1358	1975	XXVI
51	TS 21-2	2099	1407	1753	1753	XXXV
52	TS 21-1	2074	1210	2691	1992	XXIV
53	LOKSOY-1	2123	1407	1358	1629	XXXIX
54	KSS 204	2049	2123	2617	2263	XIII
	Mean	1972.56	2117.96	1935.48		
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	20-07-21	28-06-21	24-06-21		
	CD	320.99	395.06	419.75		
	CV	10.13	11.63	13.71		
	Zonal CD (5%)				383	

- Trials could not be conducted at Dholi centre due to heavy rains.

Table 1.4.2

Trial : Initial Varietal Trial**Zone : EASTERN ZONE****Character : Days to Flower**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	SKAU-WSB-101	30	31	47	36	II
2	KBS 21-1	37	35	42	38	IV
3	MAUS 818	39	41	47	42	XV
4	MAUS 791	36	35	43	38	IV
5	AMS 115	36	36	46	39	VII
6	AMS 19-01	41	47	41	43	XVII
7	RVS 13-20	34	36	47	39	VI
8	RVS 13-15	37	36	44	39	VI
9	DLSb 3	38	45	47	43	XVIII
10	DLSb 4	39	45	40	41	XIII
11	DSb 39	41	49	44	45	XXI
12	NRC 128 (C)	40	46	44	43	XVIII
13	AS 40	40	46	48	45	XXI
14	AS 24	39	46	47	44	XX
15	JS 23-08	36	36	45	39	VI
16	JS 23-05	33	37	51	40	X
17	<u>DS 1312</u>	36	38	45	40	VIII
18	DS 3163	37	41	40	39	VII
19	DS 3168	37	41	45	41	XII
20	DS 3124	38	41	44	41	XII
21	SL 1282	37	42	44	41	XII
22	SL 1230	34	39	44	39	VI
23	HIMSO-1694	34	38	48	40	IX
24	HIMSO-1693	34	39	44	39	VI
25	VLS 103	32	39	44	38	V
26	VLS 102	36	39	43	39	VII
27	JS 20-116 (C)	41	41	42	41	XIII
28	PS 1605	36	41	41	39	VII
29	PS 1689	44	57	44	48	XXIII
30	PS 1682	39	41	44	41	XIII
31	RSC 11-48	42	45	41	43	XVI
32	RSC 11-42	40	45	51	45	XXII
33	BAUS(M)-3	41	46	47	45	XXI
34	BAUS-116	40	45	47	44	XX
35	CAUMS 2	37	44	44	42	XIV
36	NRC 195	38	46	47	44	XIX
37	NRC 203	33	34	44	37	III

38	NRC 193	41	47	44	44	XX
39	NRC 192	36	41	45	41	XI
40	NRC 191	29	39	39	36	I
41	NRC 190	41	44	47	44	XX
42	AMS 2014-1 (C)	36	45	44	42	XIV
43	NRC 189	40	46	39	42	XIV
44	RVSM 16-20	36	38	44	39	VII
45	KDS 1175	37	39	46	41	XI
46	KDS 1187	36	39	43	39	VII
47	KDS 1149	38	46	41	42	XIV
48	MACS 1672	36	39	44	40	VIII
49	ACS 1735	37	38	40	38	V
50	ASb 15	33	39	46	39	VII
51	TS 21-2	39	41	41	40	X
52	TS 21-1	37	43	41	40	X
53	LOKSOY-1	37	47	44	43	XVI
54	KSS 204	39	46	44	43	XVII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	20-07-21	28-06-21	24-06-21		

Table 1.4.3

Trial : Initial Varietal Trial
Zone : EASTERN ZONE
Character : Days to Maturity

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	SKAU-WSB-101	85	84	115	95	II
2	KBS 21-1	85	88	109	94	I
3	MAUS 818	98	114	112	108	XXVIII
4	MAUS 791	87	91	115	98	III
5	AMS 115	92	97	117	102	XIII
6	AMS 19-01	92	112	119	108	XXVII
7	RVS 13-20	89	91	115	98	V
8	RVS 13-15	87	90	117	98	IV
9	DLSb 3	95	103	116	105	XXI
10	DLSb 4	97	103	112	104	XIX
11	DSb 39	97	103	114	105	XXI
12	NRC 128 (C)	98	112	115	108	XXIX
13	AS 40	96	103	114	104	XX
14	AS 24	88	97	112	99	VI
15	JS 23-08	88	96	117	100	VIII
16	JS 23-05	89	98	115	101	IX
17	<u>DS 1312</u>	90	100	114	101	XI
18	DS 3163	90	100	111	100	VIII
19	DS 3168	98	107	112	106	XXII
20	DS 3124	96	113	114	108	XXVII
21	SL 1282	102	115	114	110	XXXII
22	SL 1230	96	114	115	108	XXIX
23	HIMSO-1694	94	109	116	106	XXIV
24	HIMSO-1693	94	108	116	106	XXIII
25	VLS 103	96	101	116	104	XX
26	VLS 102	96	102	113	104	XVIII
27	JS 20-116 (C)	88	97	113	99	VII
28	PS 1605	95	101	113	103	XVI
29	PS 1689	100	112	117	110	XXXI
30	PS 1682	97	114	118	110	XXXI
31	RSC 11-48	95	94	117	102	XIII
32	RSC 11-42	94	96	113	101	X
33	BAUS(M)-3	96	110	114	107	XXV
34	BAUS-116	95	109	114	106	XXIII
35	CAUMS 2	90	100	114	101	XI
36	NRC 195	92	103	116	104	XVIII
37	NRC 203	95	113	114	107	XXVI

38	NRC 193	96	109	117	107	XXVI
39	NRC 192	95	110	117	107	XXVI
40	NRC 191	92	95	116	101	X
41	NRC 190	93	99	115	102	XIV
42	AMS 2014-1 (C)	92	101	112	102	XII
43	NRC 189	96	101	113	103	XVII
44	RVSM 16-20	90	98	114	101	IX
45	KDS 1175	95	101	116	104	XIX
46	KDS 1187	96	102	116	105	XXI
47	KDS 1149	97	112	117	109	XXX
48	MACS 1672	94	100	118	104	XIX
49	ACS 1735	93	101	111	102	XII
50	ASb 15	93	100	113	102	XIII
51	TS 21-2	92	104	115	104	XVIII
52	TS 21-1	94	103	111	103	XV
53	LOKSOY-1	95	104	113	104	XIX
54	KSS 204	94	103	114	104	XVIII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	20-07-21	28-06-21	24-06-21		

Table 1.4.4

Trial : Initial Varietal Trial**Zone : EASTERN ZONE****Character : Plant Height (cm)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	SKAU-WSB-101	39	41	50	43.33	XLII
2	KBS 21-1	70	98	47	71.67	IV
3	MAUS 818	61	72	48	60.33	X
4	MAUS 791	52	54	49	51.67	XXVII
5	AMS 115	37	50	42	43.00	XLIII
6	AMS 19-01	49	50	47	48.67	XXXI
7	RVS 13-20	47	56	46	49.67	XXIX
8	RVS 13-15	43	47	44	44.67	XL
9	DLSb 3	94	123	48	88.33	I
10	DLSb 4	83	90	43	72.00	III
11	DSb 39	53	81	47	60.33	X
12	NRC 128 (C)	45	74	55	58.00	XV
13	AS 40	62	87	51	66.67	VII
14	AS 24	51	69	46	55.33	XX
15	JS 23-08	42	46	49	45.67	XXXIX
16	JS 23-05	50	60	56	55.33	XX
17	<u>DS 1312</u>	41	52	47	46.67	XXXVI
18	DS 3163	42	57	45	48.00	XXXII
19	DS 3168	44	57	46	49.00	XXX
20	DS 3124	48	71	46	55.00	XXI
21	SL 1282	53	76	46	58.33	XIV
22	SL 1230	37	59	47	47.67	XXXIII
23	HIMSO-1694	49	60	52	53.67	XXV
24	HIMSO-1693	45	53	51	49.67	XXIX
25	VLS 103	41	53	48	47.33	XXXIV
26	VLS 102	51	76	43	56.67	XIX
27	JS 20-116 (C)	59	70	44	57.67	XVI
28	PS 1605	43	51	47	47.00	XXXV
29	PS 1689	71	82	48	67.00	VI
30	PS 1682	37	49	47	44.33	XLI
31	RSC 11-48	73	62	44	59.67	XI
32	RSC 11-42	60	66	52	59.33	XII
33	BAUS(M)-3	76	81	44	67.00	VI
34	BAUS-116	54	53	45	50.67	XXVIII
35	CAUMS 2	53	59	51	54.33	XXIII
36	NRC 195	45	59	43	49.00	XXX
37	NRC 203	45	49	44	46.00	XXXVIII

38	NRC 193	54	59	46	53.00	XXVI
39	NRC 192	56	70	47	57.67	XVI
40	NRC 191	36	42	48	42.00	XLIV
41	NRC 190	57	62	45	54.67	XXII
42	AMS 2014-1 (C)	78	83	46	69.00	V
43	NRC 189	63	62	46	57.00	XVIII
44	RVSM 16-20	44	50	45	46.33	XXXVII
45	KDS 1175	71	74	54	66.33	VIII
46	KDS 1187	74	96	45	71.67	IV
47	KDS 1149	60	66	46	57.33	XVII
48	MACS 1672	39	45	50	44.67	XL
49	ACS 1735	51	57	62	56.67	XIX
50	ASb 15	57	61	44	54.00	XXIV
51	TS 21-2	64	83	50	65.67	IX
52	TS 21-1	81	90	57	76.00	II
53	LOKSOY-1	53	71	48	57.33	XVII
54	KSS 204	62	68	46	58.67	XIII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	20-07-21	28-06-21	24-06-21		

Table 1.4.5

Trial : Initial Varietal Trial**Zone : EASTERN ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	SKAU-WSB-101	30.80	19.19	19.68	23.22	II
2	KBS 21-1	13.94	9.74	9.96	11.21	XVIII
3	MAUS 818	14.29	13.21	13.27	13.59	IV
4	MAUS 791	13.92	11.60	11.56	12.36	XI
5	AMS 115	11.71	9.93	10.04	10.56	XXXVII
6	AMS 19-01	8.69	9.18	9.22	9.03	XLII
7	RVS 13-20	12.50	9.84	9.75	10.70	XXV
8	RVS 13-15	11.44	8.43	8.40	9.42	XXXIII
9	DLSb 3	10.04	11.33	11.34	10.90	XXII
10	DLSb 4	11.43	10.93	10.47	10.94	XX
11	DSb 39	11.11	9.22	9.51	9.95	XXX
12	NRC 128 (C)	10.00	10.74	10.92	10.55	XXVIII
13	AS 40	8.00	6.85	7.23	7.36	LI
14	AS 24	10.44	7.70	8.17	8.77	XLVII
15	JS 23-08	12.55	9.74	9.64	10.64	XXVI
16	JS 23-05	14.26	9.67	9.44	11.12	XIX
17	<u>DS 1312</u>	9.90	8.16	8.42	8.83	XLV
18	DS 3163	10.14	8.95	9.07	9.39	XXXIV
19	DS 3168	9.11	8.17	8.35	8.54	XLVIII
20	DS 3124	10.22	8.91	8.98	9.37	XXXV
21	SL 1282	10.07	8.80	8.97	9.28	XXXVIII
22	SL 1230	12.41	13.13	13.12	12.89	VIII
23	HIMSO-1694	10.82	9.27	9.56	9.88	XXXI
24	HIMSO-1693	12.01	11.08	11.19	11.43	XVI
25	VLS 103	15.35	12.61	12.56	13.51	V
26	VLS 102	13.05	11.58	11.64	12.09	XIII
27	JS 20-116 (C)	9.39	7.25	7.83	8.16	L
28	PS 1605	12.48	10.83	10.88	11.40	XVII
29	PS 1689	8.98	8.59	9.02	8.86	XLIV
30	PS 1682	10.31	9.44	9.54	9.76	XXXII
31	RSC 11-48	9.66	9.09	9.34	9.36	XXXVI
32	RSC 11-42	8.31	9.26	9.43	9.00	XLIII
33	BAUS(M)-3	10.65	10.52	10.94	10.70	XXV
34	BAUS-116	9.96	8.00	8.62	8.86	XLIV
35	CAUMS 2	10.92	8.61	8.53	9.35	XXXVII
36	NRC 195	12.34	12.19	12.00	12.18	XII
37	NRC 203	15.95	11.92	11.9	13.26	VI

38	NRC 193	8.67	9.14	9.36	9.06	XL
39	NRC 192	11.43	9.26	9.17	9.95	XXX
40	NRC 191	17.9	14.15	14.08	15.38	III
41	NRC 190	9.52	8.12	8.77	8.80	XLVI
42	AMS 2014-1 (C)	7.68	8.14	8.80	8.21	XLIX
43	NRC 189	9.62	8.87	8.78	9.09	XXXIX
44	RVSM 16-20	12.23	9.05	8.67	9.98	XXIX
45	KDS 1175	12.16	10.06	10.07	10.76	XXIII
46	KDS 1187	14.46	11.80	11.41	12.56	IX
47	KDS 1149	10.34	8.16	8.65	9.05	XLI
48	MACS 1672	14.84	348.36	10.10	124.43	I
49	ACS 1735	14.49	10.18	10.33	11.67	XIV
50	ASb 15	14.75	11.40	11.33	12.49	X
51	TS 21-2	12.57	10.12	10.09	10.93	XXI
52	TS 21-1	14.09	8.98	9.15	10.74	XXIV
53	LOKSOY-1	16.80	11.13	11.18	13.04	VII
54	KSS 204	14.65	10.07	10.21	11.64	XV
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	20-07-21	28-06-21	24-06-21		

Table 1.4.6

Trial : Initial Varietal Trial
Zone : EASTERN ZONE
Character : Oil Content (%)

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	SKAU-WSB-101	22.21	24.88	23.54	I
2	KBS 21-1	20.77	17.57	19.17	XLIX
3	MAUS 818	20.82	22.01	21.42	VI
4	MAUS 791	20.09	22.34	21.22	X
5	AMS 115	20.79	19.98	20.39	XXIV
6	AMS 19-01	19.91	21.66	20.78	XVII
7	RVS 13-20	19.79		19.79	XXXVI
8	RVS 13-15	19.79	19.21	19.50	XLIII
9	DLSb 3	19.03	19.29	19.16	L
10	DLSb 4	20.45	22.11	21.28	VIII
11	DSb 39	19.74	20.75	20.25	XXVII
12	NRC 128 (C)	19.64	20.47	20.05	XXXIII
13	AS 40	18.69	20.8	19.74	XXXVIII
14	AS 24	20.26	18.38	19.32	XLVI
15	JS 23-08	20.26	21.05	20.65	XXII
16	JS 23-05	19.94	21.46	20.70	XXI
17	DS 1312	18.53	18.8	18.67	LII
18	DS 3163	19.31	20.19	19.75	XXXVII
19	DS 3168	18.14	21.04	19.59	XLI
20	DS 3124	18.60	20.99	19.79	XXXV
21	SL 1282	17.56	20.8	19.18	XLVIII
22	SL 1230	17.92	21.22	19.57	XLII
23	HIMSO-1694	18.24	20.72	19.48	XLIV
24	HIMSO-1693	18.89	20.37	19.63	XL
25	VLS 103	20.73	21.12	20.93	XIV
26	VLS 102	20.50	22.06	21.28	VII
27	JS 20-116 (C)	18.92	22.36	20.64	XXIII
28	PS 1605	21.18	17.45	19.31	XLVII
29	PS 1689	19.70		19.70	XXXIX
30	PS 1682	20.11	23	21.55	V
31	RSC 11-48	20.87	16.14	18.50	LIV
32	RSC 11-42	19.35	21.06	20.20	XXIX
33	BAUS(M)-3	18.98	19.85	19.42	XLV
34	BAUS-116	19.32	20.86	20.09	XXXI
35	CAUMS 2	20.07	17.85	18.96	LI
36	NRC 195	20.21	21.39	20.80	XV
37	NRC 203	19.39	22.03	20.71	XX
38	NRC 193	20.05	19.92	19.98	XXXIV
39	NRC 192	20.27	20.43	20.35	XXV
40	NRC 191	21.59	20.86	21.22	IX
41	NRC 190	19.58	17.59	18.58	LIII
42	AMS 2014-1 (C)	20.96		20.96	XIII
43	NRC 189	19.77	21.82	20.80	XVI

44	RVSM 16-20	20.05	20.55	20.30	XXVI
45	KDS 1175	20.95	22.58	21.77	III
46	KDS 1187	21.58		21.58	IV
47	KDS 1149	19.28	20.85	20.06	XXXII
48	MACS 1672	20.87	23.13	22.00	II
49	ACS 1735	21.76	20.33	21.04	XII
50	ASb 15	20.30	20.13	20.21	XXVIII
51	TS 21-2	20.65	21.71	21.18	XI
52	TS 21-1	20.74	20.79	20.76	XVIII
53	LOKSOY-1	19.27	20.93	20.10	XXX
54	KSS 204	21.41	20.07	20.74	XIX
	Mean	19.96	20.659		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	20-07-21	28-06-21		

Table 1.4.7

Trial : Initial Varietal Trial
Zone : EASTERN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	SKAU-WSB-101	372.8	307.3	340.1	XLII
2	KBS 21-1	446.2	364.4	405.3	XXXII
3	MAUS 818	437.1	543.4	490.2	V
4	MAUS 791	436.6	672.9	554.8	II
5	AMS 115	200.2	217.0	208.6	LIV
6	AMS 19-01	393.2	449.2	421.2	XXVII
7	RVS 13-20	444.7		444.7	XX
8	RVS 13-15	405.5	412.6	409.1	XXX
9	DLSb 3	413.5	500.2	456.8	XVII
10	DLSb 4	297.9	573.3	435.6	XXIII
11	DSb 39	429.0	404.8	416.9	XXIX
12	NRC 128 (C)	368.6	550.8	459.7	XV
13	AS 40	364.5	477.6	421.1	XXVIII
14	AS 24	460.2	499.2	479.7	IX
15	JS 23-08	260.1	285.9	273.0	LII
16	JS 23-05	502.2	635.9	569.0	I
17	DS 1312	389.0	250.6	319.8	XLVI
18	DS 3163	395.6	453.7	424.7	XXVI
19	DS 3168	385.0	374.1	379.5	XXXVI
20	DS 3124	312.3	430.1	371.2	XXXVII
21	SL 1282	424.9	390.4	407.6	XXXI
22	SL 1230	340.6	288.2	314.4	XLIX
23	HIMSO-1694	428.0	220.0	324.0	XLIV
24	HIMSO-1693	387.1	251.6	319.3	XLVII
25	VLS 103	563.1	213.7	388.4	XXXIV
26	VLS 102	516.5	392.2	454.3	XVIII
27	JS 20-116 (C)	373.7	601.7	487.7	VI
28	PS 1605	402.6	512.7	457.6	XVI
29	PS 1689	316.1		316.1	XLVIII
30	PS 1682	357.5	284.1	320.8	XLV
31	RSC 11-48	371.0	506.2	438.6	XXII
32	RSC 11-42	320.0	701.9	510.9	IV
33	BAUS(M)-3	342.1	318.6	330.3	XLIII
34	BAUS-116	295.7	463.5	379.6	XXXV
35	CAUMS 2	421.2	515.7	468.4	XIII
36	NRC 195	389.2	633.8	511.5	III
37	NRC 203	335.1	560.2	447.6	XIX
38	NRC 193	312.0	201.6	256.8	LIII
39	NRC 192	465.3	489.3	477.3	X
40	NRC 191	415.7	463.5	439.6	XXI
41	NRC 190	415.6	525.6	470.6	XII
42	AMS 2014-1 (C)	310.5		310.5	L
43	NRC 189	375.9	598.1	487.0	VII

44	RVSM 16-20	450.5	512.5	481.5	VIII
45	KDS 1175	336.3	345.7	341.0	XL
46	KDS 1187	394.2		394.2	XXXIII
47	KDS 1149	466.5	391.4	428.9	XXV
48	MACS 1672	298.8	291.2	295.0	LI
49	ACS 1735	542.7	411.7	477.2	XI
50	ASb 15	436.0	487.1	461.6	XIV
51	TS 21-2	433.5	305.5	369.5	XXXVIII
52	TS 21-1	430.1	251.6	340.8	XLI
53	LOKSOY-1	409.0	294.5	351.7	XXXIX
54	KSS 204	438.6	426.1	432.4	XXIV
	Mean	393.1	425.1		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	20-07-21	28-06-21		

Table 1.4.8

Trial : Initial Varietal Trial : Early
Zone : EASTERN ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	MAUS 819	1309	3259	1333	1967	II
2	MAUS 795	1358	3160	1185	1901	IV
3	KDS 1201	889	2543	1704	1712	IX
4	KDS 1173	1012	1407	1136	1185	XXIV
5	KDS 1172	1383	2222	1185	1597	XIV
6	KDS 1169	1235	1901	1136	1424	XX
7	KDS 1194	1210	1062	1827	1366	XXI
8	RVS 13-7	963	1852	1185	1333	XXII
9	JS 23-09	1654	2840	1185	1893	V
10	RSC 11-07 (C)	1284	2494	1136	1638	XII
11	JS 23-03	1951	2889	1062	1967	I
12	PS 1569	1457	1531	1012	1333	XXII
13	PS 1660	1358	2617	1086	1687	X
14	PS 1675	1185	2000	1556	1580	XVI
15	JS 20-116 (C)	1333	2914	1012	1753	VII
16	RSC 11-60	1309	3383	1136	1943	III
17	NRC 186	1160	3160	1210	1843	VI
18	NRC 202	1556	2247	963	1589	XV
19	NRC 201	1481	2716	1062	1753	VII
20	NRC 198	790	2000	1185	1325	XXIII
21	NRC 197	1407	1926	1111	1481	XIX
22	MACS 1460 (C)	1062	2519	1037	1539	XVII
23	NRC 196	1259	2642	1062	1654	XI
24	AMS 77-3-6	1432	1975	1506	1638	XIII
25	AMS 83	1383	2099	1062	1515	XVIII
26	MACS 1724	1309	2840	1086	1745	VIII
	Mean	1297.27	2392.23	1198.46		
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-07-21	30-06-21	25-06-21		
	CD	296.3	296.3	271.6		
	CV	14.36	7.7	14.71		
	Zonal CD (10%)				237	

- Trial was not conducted at Dholi due to heavy rains.

Table 1.4.9

Trial : Initial Varietal Trial : Early**Zone : EASTERN ZONE****Character : Days to Flower**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	MAUS 819	38	45	46	43	XIII
2	MAUS 795	35	37	38	37	IV
3	KDS 1201	37	45	46	43	XII
4	KDS 1173	37	45	45	42	XI
5	KDS 1172	40	41	44	42	IX
6	KDS 1169	28	32	37	32	II
7	KDS 1194	37	46	43	42	X
8	RVS 13-7	37	43	46	42	X
9	JS 23-09	36	36	37	36	III
10	RSC 11-07 (C)	41	45	47	44	XVI
11	JS 23-03	34	37	39	37	IV
12	PS 1569	34	31	44	36	III
13	PS 1660	39	47	43	43	XIII
14	PS 1675	40	44	46	43	XIV
15	JS 20-116 (C)	39	45	43	42	XI
16	RSC 11-60	39	43	47	43	XIII
17	NRC 186	41	45	38	41	VIII
18	NRC 202	42	45	48	45	XVII
19	NRC 201	31	36	47	38	V
20	NRC 198	38	44	47	43	XIII
21	NRC 197	38	39	46	41	VII
22	MACS 1460 (C)	36	45	47	43	XII
23	NRC 196	37	39	46	41	VI
24	AMS 77-3-6	42	46	38	42	X
25	AMS 83	41	47	43	44	XV
26	MACS 1724	39	44	43	42	X
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-07-21	30-06-21	25-06-21		

Table 1.4.10

Trial : Initial Varietal Trial : Early
Zone : EASTERN ZONE
Character : Days to Maturity

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	MAUS 819	91	109	109	103.00	XVI
2	MAUS 795	89	85	108	94.00	II
3	KDS 1201	80	96	110	95.33	VI
4	KDS 1173	95	107	111	104.33	XVIII
5	KDS 1172	96	102	114	104.00	XVII
6	KDS 1169	84	87	113	94.67	IV
7	KDS 1194	87	96	114	99.00	XIV
8	RVS 13-7	81	92	114	95.67	VII
9	JS 23-09	83	87	113	94.33	III
10	RSC 11-07 (C)	81	94	112	95.67	VII
11	JS 23-03	85	87	113	95.00	V
12	PS 1569	81	85	115	93.67	I
13	PS 1660	90	109	114	104.33	XVIII
14	PS 1675	90	109	113	104.00	XVII
15	JS 20-116 (C)	82	96	115	97.67	XII
16	RSC 11-60	85	90	113	96.00	VIII
17	NRC 186	83	92	114	96.33	IX
18	NRC 202	84	95	113	97.33	XI
19	NRC 201	80	93	115	96.00	VIII
20	NRC 198	82	95	111	96.00	VIII
21	NRC 197	87	92	114	97.67	XII
22	MACS 1460 (C)	81	96	114	97.00	X
23	NRC 196	81	92	115	96.00	VIII
24	AMS 77-3-6	84	93	115	97.33	XI
25	AMS 83	85	98	116	99.67	XV
26	MACS 1724	81	98	115	98.00	XIII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-07-21	30-06-21	25-06-21		
	Zonal CD (50%)				0.88	

Table 1.4.11

Trial : Initial Varietal Trial : Early**Zone : EASTERN ZONE****Character : Plant Height(cm)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	MAUS 819	47	66	32	48.33	XI
2	MAUS 795	48	58	35	47.00	XIV
3	KDS 1201	63	71	45	59.67	IV
4	KDS 1173	96	104	62	87.33	I
5	KDS 1172	96	102	55	84.33	II
6	KDS 1169	38	64	35	45.67	XVII
7	KDS 1194	66	76	45	62.33	III
8	RVS 13-7	39	59	31	43.00	XX
9	JS 23-09	42	58	30	43.33	XIX
10	RSC 11-07 (C)	54	62	28	48.00	XII
11	JS 23-03	50	58	32	46.67	XV
12	PS 1569	42	43	33	39.33	XXIII
13	PS 1660	46	50	41	45.67	XVII
14	PS 1675	40	58	37	45.00	XVIII
15	JS 20-116 (C)	64	69	31	54.67	VI
16	RSC 11-60	51	54	30	45.00	XVIII
17	NRC 186	54	64	31	49.67	IX
18	NRC 202	61	64	34	53.00	VII
19	NRC 201	47	46	35	42.67	XXI
20	NRC 198	47	60	36	47.67	XIII
21	NRC 197	47	80	32	53.00	VII
22	MACS 1460 (C)	60	74	32	55.33	V
23	NRC 196	47	58	33	46.00	XVI
24	AMS 77-3-6	53	54	41	49.33	X
25	AMS 83	41	56	30	42.33	XXII
26	MACS 1724	52	64	38	51.33	VIII
	N.P.S.(Sqm)	4.05	4.05	4.05		
	DOS	26-07-21	30-06-21	25-06-21		

Table 1.4.12

Trial : Initial Varietal Trial : Early**Zone : EASTERN ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	MAUS 819	12.69	16.32	15.90	14.97	I
2	MAUS 795	12.53	13.07	16.35	13.98	II
3	KDS 1201	7.50	9.22	12.38	9.70	XVII
4	KDS 1173	9.05	8.82	13.25	10.37	XI
5	KDS 1172	9.14	9.20	11.90	10.08	XV
6	KDS 1169	11.86	12.27	11.92	12.02	V
7	KDS 1194	7.83	9.19	10.70	9.24	XX
8	RVS 13-7	9.08	10.20	11.85	10.38	X
9	JS 23-09	10.28	9.76	11.69	10.58	IX
10	RSC 11-07 (C)	7.27	8.17	11.89	9.11	XXI
11	JS 23-03	11.49	11.08	14.37	12.31	IV
12	PS 1569	9.89	9.84	12.01	10.58	IX
13	PS 1660	8.45	9.67	12.33	10.15	XII
14	PS 1675	9.73	11.60	12.19	11.17	VII
15	JS 20-116 (C)	7.01	7.68	12.02	8.90	XXII
16	RSC 11-60	7.89	8.18	11.66	9.24	XX
17	NRC 186	6.60	8.18	10.79	8.52	XXIII
18	NRC 202	7.41	9.65	11.29	9.45	XIX
19	NRC 201	10.80	13.07	14.36	12.74	III
20	NRC 198	8.62	10.91	10.88	10.14	XIII
21	NRC 197	7.61	10.98	10.59	9.73	XVI
22	MACS 1460 (C)	7.97	8.86	10.50	9.11	XXI
23	NRC 196	7.94	9.38	11.65	9.66	XVIII
24	AMS 77-3-6	10.46	11.70	11.64	11.27	VI
25	AMS 83	7.97	9.52	12.80	10.10	XIV
26	MACS 1724	9.37	12.02	12.03	11.14	VIII
	N.P.S.(Sq m)	4.05	4.05	4.05		
	DOS	26-07-21	30-06-21	25-06-21		

Table 1.4.13

Trial : Initial Varietal Trial : Early**Zone : EASTERN ZONE****Character : Oil Content (%)**

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	MAUS 819	18.61		18.61	XVII
2	MAUS 795	20.12	17.39	18.75	XVI
3	KDS 1201	18.42	17.92	18.17	XIX
4	KDS 1173	19.95	15.77	17.86	XX
5	KDS 1172	21.20	18.56	19.88	VIII
6	KDS 1169	20.88	18.37	19.63	XII
7	KDS 1194	18.19	20.12	19.15	XIV
8	RVS 13-7	19.02	22.07	20.55	V
9	JS 23-09	20.10	17.77	18.94	XV
10	RSC 11-07 (C)	17.90	21.03	19.46	XIII
11	JS 23-03	19.91	22.18	21.05	II
12	PS 1569	20.10	21.96	21.03	III
13	PS 1660	17.13	17.57	17.35	XXV
14	PS 1675	19.72	21.5	20.61	IV
15	JS 20-116 (C)	19.99	19.28	19.64	XI
16	RSC 11-60	20.15	19.59	19.87	IX
17	NRC 186	18.63	15.03	16.83	XXVI
18	NRC 202	18.29	16.9	17.60	XXIII
19	NRC 201	20.91	19.91	20.41	VII
20	NRC 198	20.21	23.35	21.78	I
21	NRC 197	19.18	21.88	20.53	VI
22	MACS 1460 (C)	17.87	17.27	17.57	XXIV
23	NRC 196	18.16	17.44	17.80	XXII
24	AMS 77-3-6	16.18	20.78	18.48	XVIII
25	AMS 83	18.82	16.8	17.81	XXI
26	MACS 1724	18.25	21.33	19.79	X
	Mean	19.15	19.27		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	26-07-21	30-06-21		

Table 1.4.14

Trial : Initial Varietal Trial : Early**Zone : EASTERN ZONE****Character : Oil Yield (kg/ha)**

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	MAUS 819	243.6		243.6	XXIV
2	MAUS 795	273.2	549.5	411.4	VII
3	KDS 1201	163.7	455.7	309.7	XX
4	KDS 1173	201.9	221.9	211.9	XXVI
5	KDS 1172	293.2	412.4	352.8	IX
6	KDS 1169	257.9	349.2	303.6	XXII
7	KDS 1194	220.1	213.7	216.9	XXV
8	RVS 13-7	183.2	408.7	295.9	XXIII
9	JS 23-09	332.5	504.7	418.6	V
10	RSC 11-07 (C)	229.8	524.5	377.1	VIII
11	JS 23-03	388.5	640.8	514.6	I
12	PS 1569	292.8	336.2	314.5	XVII
13	PS 1660	232.7	459.8	346.2	X
14	PS 1675	233.6	430.0	331.8	XV
15	JS 20-116 (C)	266.5	561.8	414.2	VI
16	RSC 11-60	263.8	662.7	463.2	II
17	NRC 186	216.1	474.9	345.5	XII
18	NRC 202	284.7	379.7	332.2	XIV
19	NRC 201	309.6	540.8	425.2	III
20	NRC 198	159.7	467.0	313.3	XVIII
21	NRC 197	269.9	421.4	345.7	XI
22	MACS 1460 (C)	189.7	435.0	312.4	XIX
23	NRC 196	228.6	460.8	344.7	XIII
24	AMS 77-3-6	231.7	410.4	321.0	XVI
25	AMS 83	260.3	352.6	306.5	XXI
26	MACS 1724	238.9	605.8	422.3	IV
	Mean	248.7	451.2		
	N.P.S.(Sqm)	4.05	4.05		
	DOS	26-07-21	30-06-21		

Table 1.4.15

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	KDS 1096	2191	1667	2809	2222	IV
2	RSC 11-35	1883	3489	2577	2650	I
3	JS 20-116(C)	2099	2394	2508	2334	III
4	RSC 10-46(C)	1914	2967	2623	2501	II
5	MACS 1460(C)	2292	1361	2955	2203	V
	Mean	2075.8	2375.6	2694.4		
	N.P.S.(Sqm)	12.96	18	12.96		
	DOS	25-07-21	30-06-21	26-06-21		
	CD	300.93	200	455.25		
	CV	9.31	5.41	11.05		
	Zonal CD (5%)				312	

- Trial was not conducted at Dholi due to heavy rains.

Table 1.4.16

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Days to Flower**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	KDS 1096	44	42	47	44	III
2	RSC 11-35	45	45	47	46	V
3	JS 20-116(C)	42	45	45	44	II
4	RSC 10-46(C)	43	45	46	45	IV
5	MACS 1460(C)	37	42	45	41	I
	N.P.S.(Sqm)	12.96	18	12.96		
	DOS	25-07-21	30-06-21	26-06-21		

Table 1.4.17

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Days to Maturity**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	KDS 1096	91	98	116	102	II
2	RSC 11-35	95	99	117	104	III
3	JS 20-116(C)	89	99	117	102	II
4	RSC 10-46(C)	95	101	116	104	IV
5	MACS 1460(C)	87	98	116	100	I
	N.P.S.(Sqm)	12.96	18	12.96		
	DOS	25-07-21	30-06-21	26-06-21		

Table 1.4.18

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Plant Height (cm)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	KDS 1096	76	81	51	69.33	II
2	RSC 11-35	82	91	53	75.33	I
3	JS 20-116(C)	80	65	49	64.67	IV
4	RSC 10-46(C)	71	87	49	69.00	III
5	MACS 1460(C)	56	72	51	59.67	V
	N.P.S.(Sqm)	12.96	18	12.96		
	DOS	25-07-21	30-06-21	26-06-21		

Table 1.4.19

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Bhawanipatna	Raipur	Ranchi	Mean	Rank
1	KDS 1096	9.86	8.86	9.81	9.51	IV
2	RSC 11-35	10.08	10.93	11.67	10.89	II
3	JS 20-116(C)	9.33	8.80	9.58	9.24	V
4	RSC 10-46(C)	9.21	11.29	13.78	11.43	I
5	MACS 1460(C)	11.18	8.31	10.89	10.13	III
	N.P.S.(Sqm)	12.96	18	12.96		
	DOS	25-07-21	30-06-21	26-06-21		

Table 1.4.20

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Oil Content (%)**

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	KDS 1096	18.27	20.55	19.41	II
2	RSC 11-35	20.46	21.71	21.08	I
3	JS 20-116(C)	20.81	17.35	19.08	IV
4	RSC 10-46(C)	19.46	18.36	18.91	V
5	MACS 1460(C)	19.33	19.29	19.31	III
	Mean	19.67	19.45		
	N.P.S.(Sqm)	12.96	18		
	DOS	25-07-21	30-06-21		

Table 1.4.21

Trial : Advanced Varietal Trial I**Zone : EASTERN ZONE****Character : Oil Yield (kg/ha)**

S.No	Varieties	Bhawanipatna	Raipur	Mean	Rank
1	KDS 1096	400.3	342.5	371.4	IV
2	RSC 11-35	385.3	757.3	571.3	I
3	JS 20-116(C)	436.7	415.4	426.0	III
4	RSC 10-46(C)	372.5	544.7	458.6	II
5	MACS 1460(C)	443.1	262.5	352.8	V
	Mean	407.6	464.5		
	N.P.S.(Sqm)	12.96	18		
	DOS	25-07-21	30-06-21		

Table 1.5.1

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Amravati	Anreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand-saur	Morena	Nagpur	Parbhani	Sohore	Mean	Rank
1	SKAU-WSB-101	420	1531	1185	370	543	642	963	617	111	-	1160	494	867	XLVI
2	KBS 21-1	914	1580	1457	741	296	864	395	420	56	-	2617	815	1117	XLIV
3	MAUS 818	1975	3481	1827	1086	864	864	2494	1136	583	617	2938	741	1898	XXIII
4	MAUS 791	2914	2198	1284	938	1852	2049	1654	617	167	1951	3481	914	2043	XV
5	AMS 115	1333	2889	1481	889	395	691	1951	914	278	-	2321	1852	1614	XXXI
6	AMS 19-01	2420	3136	1457	864	1012	1136	2198	1185	972	543	1975	2025	1920	XXII
7	RVS 13-20	2173	2000	1407	2025	2840	2000	2370	1679	333	765	2148	914	1982	XX
8	RVS 13-15	2025	2099	1778	815	1037	1580	2765	1309	333	1358	2025	173	1685	XXVIII
9	DLsb 3	1111	3506	1605	346	617	840	2741	864	556	-	1877	617	1614	XXXI
10	DLsb 4	790	2914	1630	-	346	864	2198	568	583	-	1704	1185	1454	XL
11	DSb 39	1630	3481	2148	321	1111	1037	3481	1753	750	-	2494	1111	2062	XIV
12	RVSM 2011-35 (C.)	3062	2765	1630	1432	1704	2049	3086	1407	583	1457	2025	938	2157	X
13	AS 40	1605	2395	1506	1457	2420	1259	3358	914	1028	1062	1704	642	1861	XXIV
14	AS 24	2568	3679	2716	2198	2272	2222	3630	765	583	1037	2469	667	2528	II
15	JS 23-08	1284	1654	963	1432	2049	988	1951	963	694	1037	2074	1802	1596	XXXII
16	JS 23-05	2321	1975	1580	988	2148	1728	2222	1753	333	1531	2074	2296	2043	XV
17	DS 1312	2074	2519	1605	370	864	1111	3383	1531	1111	173	2444	2543	2068	XIII
18	DS 3163	1136	2741	1506	247	864	1136	3951	494	1306	-	2395	1160	1861	XXIV
19	DS 3168	988	1901	1235	568	741	938	3284	444	1111	-	2074	1407	1571	XXXIV
20	DS 3124	1481	2864	1778	765	1358	1160	3481	963	1056	346	2198	1802	2015	XVII
21	SL 1282	1506	2963	1580	790	667	1136	3086	1630	750	889	1309	765	1627	XXX
22	SL 1230	593	2889	1556	543	370	1086	2741	1136	833	-	1704	1284	1528	XXXVII
23	HIMSO-1694	395	2543	1358	420	296	864	2988	642	611	-	2148	1605	1525	XXXVIII
24	HIMSO-1693	321	2716	1333	346	272	716	2395	642	722	-	1358	1679	1349	XLIII
25	VLS 103	667	938	1062	-	0	716	790	272	306	-	2469	1185	978	XLV
26	VLS 102	617	2790	1160	346	617	667	3012	370	833	-	2617	815	1537	XXXVI
27	AMS 100-39 (C.)	1802	2543	1457	617	1284	1111	2469	1210	694	370	2395	765	1728	XXV
28	PS 1605	1926	2938	2173	1333	914	1531	3309	1333	722	148	1951	691	1929	XXI

29	PS 1689	1654	2593	1432	568	1136	1284	2988	938	778	568	1926	667	1710	XXVII
30	PS 1682	2074	3605	2222	765	1407	2198	3407	1358	528	1556	2049	1136	2262	VIII
31	RSC 11 48	2074	2642	1358	815	1407	2074	3012	1432	806	1136	1901	1802	2034	XVI
32	RSC 11 42	2444	2716	2519	889	2346	2222	2593	914	944	1407	2914	2346	2513	III
33	BAUS(M)-3	420	3605	2395	222	790	840	3901	889	917	-	3111	1679	2093	XI
34	BAUS-116	2469	2222	1802	864	1185	1358	2938	1259	556	1605	1778	2296	2006	XIX
35	CAUMS 2	1358	2741	1679	790	864	1605	3506	1802	417	1086	2025	2296	2009	XVIII
36	NRC 195	2691	3457	1457	593	1160	1901	3531	1728	750	1630	2642	840	2210	IX
37	NRC 203	1728	1827	1580	1160	1185	1111	1951	963	472	864	2247	1481	1639	XXIX
38	NRC 193	3086	2741	1654	617	1605	1284	3506	1432	778	1259	2617	1802	2287	VII
39	NRC 192	2790	3086	1778	1333	2049	2222	3432	2247	944	1062	2914	2025	2537	I
40	NRC 191	840	1654	1531	1111	988	1630	1827	1235	361	1185	1951	2025	1556	XXXV
41	NRC 190	2593	2222	1531	1728	2198	2173	3284	2691	694	1309	3037	2519	2445	V
42	RSC 10-52 (C)	1975	3235	1679	963	889	840	2840	1654	278	444	2247	2346	2006	XIX
43	NRC 189	2667	3383	2272	1457	1531	2123	3432	1753	944	1383	2815	1605	2479	IV
44	RVSM 16-20	2395	1877	1679	1111	1654	2049	3877	1556	639	1506	2395	2395	2290	VI
45	KDS 1175	889	2494	1383	444	370	1728	1086	1037	139	-	1704	1926	1448	XLII
46	KDS 1187	1481	1975	1556	222	790	938	2173	1481	278	-	3679	2296	1861	XXIV
47	KDS 1149	667	3062	1753	568	988	840	4148	1136	1111	148	2469	2148	2009	XVIII
48	MACS 1672	914	3062	1679	-	420	667	2420	1136	333	-	1778	1802	1593	XXXIII
49	ACS 1735	1185	2370	1605	395	494	815	1580	1062	778	-	3235	938	1528	XXXVII
50	ASb 15	2025	3160	1728	864	1185	1358	3654	1630	556	1037	2642	914	2083	XII
51	TS 21-2	1284	3012	1728	-	173	667	2099	815	472	-	2321	321	1451	XL.I
52	TS 21-1	1210	2642	1457	-	420	642	2815	765	861	-	2148	691	1503	XXXIX
53	LOKSOY-1	1259	2568	1531	-	568	815	2741	1012	806	272	2444	1185	1639	XXIX
54	KSS 204	519	3358	1630	765	593	741	3481	1531	917	-	2667	741	1716	XXVI
	Mean	1606.33	2646.98	1631.02	843.56	1097.13	1279.81	2751.26	1166.43	649.17	992.15	2292.67	1390.91		
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6	4.05	4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	06-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	21-06-21	28-06-21		
	CD	370	519	222	765	198	247	667	469	556	74	494	370		
	CV	14.04	11.82	8.24	62.37	11.48	11.83	15.11	25.43	53.37	8.04	13.29	16.25		
	Zonal CD													409	

· Data of Indore and Morena was rejected due to low mean and high CV
· Data of Mandasaur and Nagpur was rejected due to high CV and low mean, respectively.

Table 1.5.2

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Days to Flower

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosa ra	Mand- saur	Morena	Nagpur	Parbhani	Schore	Mean	Rank
1	SKAU-WSB-101	33	29	31	39	35	30	30	38	45	37	30	45	35	I
2	KBS 21-1	41	36	34	44	42	38	41	44	44	42	43	39	41	VIII
3	MAUS 818	41	37	43	45	44	39	42	47	50	42	42	46	43	XXIV
4	MAUS 791	38	34	40	44	41	36	40	46	44	41	38	41	40	VI
5	AMS 115	39	35	37	43	42	37	43	49	45	42	40	49	42	XV
6	AMS 19-01	42	41	42	48	46	45	42	51	52	44	43	41	45	XXXVI
7	RVS 13-20	38	34	31	42	38	37	40	37	42	42	38	46	39	III
8	RVS 13-15	41	36	30	45	41	38	42	50	48	42	41	43	41	XII
9	DLSb 3	42	38	43	45	46	40	43	50	51	44	43	41	44	XXX
10	DLSb 4	41	40	42	47	47	43	44	55	44	43	45	43	45	XXXIV
11	DSb 39	41	40	39	48	46	40	42	53	43	44	44	33	43	XIX
12	RVSM 2011-35(C)	38	36	37	44	41	40	42	46	46	42	40	47	42	XIV
13	AS 40	41	42	43	48	51	47	43	52	41	48	49	47	46	XL
14	AS 24	41	39	38	46	43	41	42	51	47	45	44	43	43	XXVI
15	JS 23-08	39	35	38	43	40	37	41	42	45	42	38	48	41	VIII
16	JS 23-05	39	36	38	48	42	38	42	46	49	43	40	49	43	XVIII
17	DS 1312	39	36	37	50	42	38	42	47	45	42	39	42	42	XIV
18	DS 3163	38	38	41	50	42	41	42	50	46	46	40	43	43	XXIII
19	DS 3168	39	37	43	49	42	39	43	52	50	47	41	43	44	XXIX
20	DS 3124	41	39	42	49	48	40	42	51	47	47	43	45	45	XXXIV
21	SL 1282	41	39	42	51	48	43	44	50	46	49	41	43	45	XXXVI
22	SL 1230	39	35	43	49	39	38	42	48	44	43	39	44	42	XVI
23	HIMSO-1694	38	34	36	48	42	37	42	46	43	42	37	45	41	IX
24	HIMSO-1693	39	35	37	46	40	37	42	50	43	43	36	51	42	XIV
25	VLS 103	38	36	37	49	41	37	42	55	45	42	36	41	42	XIV
26	VLS 102	39	36	39	49	42	38	42	48	48	42	40	41	42	XVII
27	AMS 100-39 (C)	40	41	43	50	46	46	43	50	49	45	46	42	45	XXXVIII
28	PS 1605	40	36	40	48	42	39	42	49	50	43	38	43	43	XVIII
29	PS 1689	43	42	41	51	53	48	45	53	42	48	47	44	46	XLI

30	PS 1662	42	41	42	50	46	40	42	53	43	43	42	50	45	XXXIV
31	RSC 11-48	41	39	42	51	48	43	43	52	45	44	42	44	45	XXXIV
32	RSC 11-42	43	37	35	49	44	41	42	52	42	43	42	51	43	XXVII
33	BAUS(M)-3	42	44	43	50	48	46	46	56	45	45	45	50	47	XLII
34	BAUS-116	42	38	39	49	46	43	44	51	41	45	45	42	44	XXIX
35	CAUMS 2	41	39	41	51	43	41	42	53	47	45	42	44	44	XXXI
36	NIRC 195	41	39	41	49	42	40	43	51	47	45	42	51	44	XXXII
37	NIRC 203	36	34	36	43	38	36	40	45	44	42	34	46	40	IV
38	NIRC 193	42	41	42	51	48	43	42	55	46	46	44	45	45	XXXIX
39	NIRC 192	40	37	40	44	42	40	42	52	49	43	40	45	43	XX
40	NIRC 191	34	29	34	41	37	37	40	42	45	42	32	43	38	II
41	NIRC 190	42	40	42	49	45	41	45	54	46	45	43	44	45	XXXV
42	RSC 10-52 (C)	41	43	45	50	48	41	44	51	47	48	45	42	45	XXXIX
43	NIRC 189	41	38	40	48	43	42	42	52	44	44	41	40	43	XXI
44	RVSM 16-20	37	35	36	47	39	38	42	51	48	42	38	43	41	XI
45	KDS 1175	38	37	40	44	42	37	42	49	44	43	40	42	42	XIII
46	KDS 1187	38	33	34	43	40	36	40	43	47	42	40	42	40	V
47	KDS 1149	41	39	40	48	43	41	43	52	48	42	43	44	44	XXVIII
48	MACS 1672	38	36	38	-	43	38	40	47	49	43	38	43	41	X
49	ACS 1735	38	37	31	46	42	37	42	46	48	43	42	44	41	XI
50	ASb 15	39	34	31	47	40	35	40	44	51	42	38	45	41	VII
51	TS 21-2	41	36	38	49	45	39	42	51	49	43	43	43	43	XXV
52	TS 21-1	40	40	43	51	44	41	42	52	47	45	43	45	44	XXXIII
53	LOKSOY-1	41	38	37	-	43	40	43	52	50	44	44	41	43	XXII
54	KSS 204	41	40	42	50	44	47	43	51	48	45	43	45	45	XXXVII
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	06-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	21-06-21	28-06-21		

Table 1.5.3

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand - saur	Morena	Nagpur	Parbhani	Schore	Mean	Rank
1	SKAU-WSB-101	90	79	95	100	87	88	84	93	95	-	90	105	91	I
2	KBS 21-1	93	86	95	98	94	92	109	103	94	-	101	102	97	IV
3	MAUS 818	102	102	111	104	112	105	108	108	91	113	102	104	105	XXXIV
4	MAUS 791	91	87	109	96	94	92	95	100	94	111	99	104	98	VI
5	AMS 115	95	96	99	106	99	96	105	110	103	-	100	109	102	XVII
6	AMS 19-01	103	99	106	104	112	96	106	106	108	122	103	101	106	XXXV/III
7	RVS 13-20	92	86	82	97	94	92	93	90	95	113	99	110	95	II
8	RVS 13-15	91	86	83	96	95	92	93	102	94	117	102	106	96	III
9	DLSb 3	102	104	106	100	106	97	108	107	101	-	102	107	104	XXVII
10	DLSb 4	94	103	105	-	105	103	105	109	104	120	106	105	105	XXXVII
11	DSb 39	96	99	103	104	106	101	105	105	95	121	104	104	104	XXVI
12	RVSM 2011-35 (C)	100	97	105	97	98	98	106	106	103	118	100	107	103	XXIV
13	AS 40	102	104	107	104	107	97	109	103	95	123	111	105	106	XXXIX
14	AS 24	95	98	101	96	103	96	104	100	92	121	104	104	101	XV
15	JS 23-08	93	87	97	96	95	92	93	97	96	117	98	109	98	V
16	JS 23-05	98	90	95	96	96	92	108	99	112	119	100	111	101	XVI
17	DS 1312	101	98	101	418	105	93	108	110	109	118	99	105	130	XLVI
18	DS 3163	103	104	108	100	105	94	107	109	110	-	100	103	104	XXIX
19	DS 3168	100	107	109	98	105	98	107	108	111	-	101	106	105	XXXI
20	DS 3124	104	105	112	100	113	105	108	118	107	123	102	107	109	XLV
21	SL 1282	103	105	111	107	109	106	110	114	107	121	100	105	108	XLIII
22	SL 1230	96	104	109	98	102	103	108	115	102	-	98	108	104	XXIX
23	HIMSO-1694	90	103	108	97	98	96	107	103	105	-	98	114	102	XVIII
24	HIMSO-1693	92	101	107	97	108	92	108	106	109	-	96	116	103	XXIII
25	VLS 103	97	104	107	-	-	106	108	114	106	-	96	109	105	XXXV
26	VLS 102	101	99	101	98	112	95	107	115	110	-	100	103	104	XXXVIII
27	AMS 100-39 (C)	95	93	103	102	103	94	106	101	104	124	108	103	103	XXV
28	PS 1605	103	100	105	104	106	94	107	109	111	124	98	106	106	XXXIX
29	PS 1689	104	102	105	107	112	101	110	105	106	124	108	105	107	XLII

30	PS 1682	105	101	74	107	108	100	108	112	104	124	101	104	104	XXX
31	RSC 11-48	105	100	1438	106	106	99	103	106	103	120	101	110	216	XLVII
32	RSC 11-42	105	101	103	106	105	98	105	109	103	119	100	112	106	XXXVIII
33	BAUS(M)-3	100	107	109	107	113	103	110	115	102	123	104	107	108	XLIV
34	BAUS-116	100	99	101	108	105	94	109	104	105	120	104	106	105	XXXII
35	CAUMS 2	92	95	99	97	98	90	97	101	96	114	102	108	99	VIII
36	NRC 195	102	98	101	105	103	91	108	109	95	124	101	111	104	XXX
37	NRC 203	95	96	99	96	105	98	105	104	92	119	94	107	101	XIV
38	NRC 193	103	102	107	107	110	99	108	111	94	124	103	102	106	XL
39	NRC 192	99	100	108	105	106	94	77	114	107	119	100	105	103	XXII
40	NRC 191	94	92	96	97	98	94	101	104	102	117	92	104	99	X
41	NRC 190	95	94	100	97	105	97	106	106	105	119	102	107	103	XXI
42	RSC 10-52(C)	102	102	105	96	107	100	109	110	100	121	106	106	105	XXXVI
43	NRC 189	96	100	105	105	112	100	107	110	96	120	100	106	105	XXXIII
44	RVSM 16-20	97	95	98	96	98	94	104	104	94	114	98	106	100	XII
45	KDS 1175	97	101	105	96	105	100	107	104	102	-	100	108	102	XIX
46	KDS 1187	94	97	99	95	98	94	104	100	95	-	101	109	99	VII
47	KDS 1149	100	100	104	104	108	103	109	115	107	114	103	105	106	XLI
48	MACS 1672	90	98	101	-	104	100	104	111	111	-	98	109	103	XX
49	ACS 1735	92	90	86	96	96	92	105	100	104	-	101	105	97	IV
50	ASb 15	96	91	86	103	97	92	98	99	103	120	98	107	99	IX
51	TS 21-2	91	95	99	-	99	91	106	106	97	-	102	107	99	XI
52	TS 21-1	91	96	100	-	105	92	108	105	100	-	102	105	100	XIII
53	LOKSOY-1	95	99	102	-	107	100	108	108	107	123	105	105	105	XXXVII
54	KSS 204	94	101	106	104	106	99	108	106	108	120	103	109	105	XXXVI
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	06-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	21-06-21	28-06-21		

Table 1.5.4

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Plant Height (cm)

S. No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Morena	Nagpur	Parbhani	Sehore	Mean	Rank
1	SKAU-WSB-101	35	31	36	35	29	32	37	42	24	-	28	53	34.73	LI
2	KBS 21-1	84	65	47	77	53	58	71	90	34	-	93	41	64.82	IV
3	MAUS 818	56	35	41	62	45	45	62	74	30	66	58	67	53.42	XVI
4	MAUS 791	51	35	42	56	50	44	22	86	31	57	58	60	49.33	XXVIII
5	AMS 115	45	29	34	51	31	28	31	69	29	43	38	44	39.33	XLVII
6	AMS 19-01	59	37	43	62	40	41	62	70	30	61	53	44	50.17	XXVI
7	RVS 13-20	61	36	40	54	48	46	38	78	32	54	43	61	49.25	XXIX
8	RVS 13-15	56	32	35	40	45	43	40	71	30	61	53	38	45.33	XXXVIII
9	DLSh 3	92	90	88	51	49	80	71	52	45	-	79	46	67.55	II
10	DLSh 4	80	72	82	55	51	59	67	75	34	-	66	50	62.82	VI
11	DSb 39	64	42	48	61	42	44	55	80	35	-	52	48	51.91	XXI
12	RVSM 2011-35 (C)	66	28	32	52	39	37	43	76	34	54	48	70	48.25	XXXI
13	AS 40	72	56	64	62	55	60	73	74	43	43	53	60	59.58	VIII
14	AS 24	61	40	45	50	46	44	67	80	34	59	47	51	52.00	XX
15	JS 23-08	52	30	36	32	46	37	28	60	29	52	46	66	42.83	XLII
16	JS 23-05	54	34	40	42	47	35	38	59	27	54	37	58	43.75	XL
17	DS 1312	52	26	30	35	30	29	34	73	24	46	43	71	41.08	XLV
18	DS 3163	47	27	31	35	33	27	49	72	25	-	38	53	39.73	XLVI
19	DS 3168	43	30	34	34	38	37	38	72	27	55	42	71	43.42	XLI
20	DS 3124	54	26	30	37	38	33	47	62	26	56	44	59	42.67	XLIII
21	SL 1282	74	47	55	44	45	61	50	90	31	58	52	62	55.75	XII
22	SL 1230	58	30	33	45	40	31	38	75	28	45	47	70	45.00	XXXIX
23	HMSO-1694	51	39	44	43	46	41	54	62	31	-	43	57	46.45	XXXV
24	HMSO-1693	54	33	39	41	45	40	43	69	29	-	48	71	46.55	XXXIV
25	VLS 103	47	21	26	29	-	29	36	62	22	-	44	61	37.70	XLIX
26	VLS 102	56	40	46	28	46	36	53	76	36	68	48	59	49.33	XXVIII
27	AMS 100-39 (C)	56	41	45	33	44	35	31	60	35	58	53	57	45.67	XXXVII
28	PS 1605	47	24	57	39	35	35	35	61	26	50	53	59	43.42	XLI
29	PS 1689	78	59	67	67	53	62	74	80	41	87	83	68	68.25	I

30	PS 1682	59	38	55	40	32	40	59	63	28	52	43	59	47.33	XXXIII
31	RSC 11-48	66	31	38	51	37	52	63	74	40	56	50	47	50.42	XXV
32	RSC 11-42	65	37	41	56	47	50	55	84	44	75	72	84	59.17	IX
33	BAUS(M)-3	71	46	51	55	55	57	50	88	42	62	71	55	58.58	X
34	BAUS-116	62	36	40	51	35	43	53	56	32	58	49	66	48.42	XXX
35	CAUMS 2	56	37	43	40	32	43	51	72	34	67	49	83	50.58	XXIV
36	NRC 195	70	40	43	63	44	41	61	60	36	67	56	74	54.58	XIV
37	NRC 203	48	31	33	44	35	47	37	54	30	48	48	50	42.08	XLIV
38	NRC 193	70	43	50	43	48	52	63	44	37	71	73	65	54.92	XIII
39	NRC 192	55	36	44	56	51	58	58	86	40	67	62	68	56.75	XI
40	NRC 191	39	28	33	35	33	34	30	49	23	46	43	69	38.50	XLVIII
41	NRC 190	49	31	35	52	42	45	52	60	32	54	46	80	48.17	XXXII
42	RSC 10-52 (C)	62	38	42	42	47	38	63	75	34	64	57	74	53.00	XIX
43	NRC 189	59	31	39	55	46	46	47	76	33	60	46	53	49.25	XXIX
44	RVSM 16-20	53	34	40	41	45	34	41	63	33	50	45	70	45.75	XXXVI
45	KDS 1175	76	56	64	65	51	54	62	68	40	-	61	65	60.18	VII
46	KDS 1187	88	53	61	58	53	57	56	78	38	-	79	71	62.91	V
47	KDS 1149	61	42	46	45	43	36	65	74	32	56	56	53	50.75	XXIII
48	MACS 1672	43	27	33	-	29	26	34	41	26	-	43	61	36.30	L
49	ACS 1735	58	41	46	41	40	43	47	68	32	-	62	73	50.09	XXVII
50	ASb 15	61	50	57	53	48	35	52	71	32	58	62	61	53.33	XVIII
51	TS 21-2	69	49	56	47	46	53	49	84	34	-	58	54	54.45	XV
52	TS 21-1	81	62	71	46	46	73	78	90	40	-	89	62	67.09	III
53	LOKSOY-1	63	38	44	-	47	46	53	78	39	59	52	65	53.09	XVIII
54	KSS 204	62	35	44	46	40	53	53	74	38	-	59	60	51.27	XXII
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	06-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	21-06-21	28-06-21		

Table 1.5.5

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand-saur	Morena	Nagpur	Parbhani	Shore	Mean	Rank
1	SKAU-WSB-101	15.22	24.13	23.23	16.17	12.00	18.77	23.83	28.10	13.00	-	32.18	9.83	19.68	I
2	KBS 21-1	9.30	10.68	11.07	5.47	12.70	11.63	12.00	11.68	10.12	-	11.73	20.00	11.49	XII
3	MAUS 818	15.26	14.17	13.55	42.97	12.60	13.57	11.83	12.60	12.08	12.50	14.79	7.83	15.31	II
4	MAUS 791	11.98	11.93	11.13	11.33	12.77	13.18	11.50	13.67	7.54	13.47	13.52	10.50	11.88	VII
5	AMS 115	9.80	12.23	11.98	6.97	10.67	10.60	10.00	9.60	10.01	-	12.07	14.50	10.77	XVIII
6	AMS 19-01	10.74	9.28	9.81	7.30	10.50	8.77	7.83	9.88	8.77	8.80	10.49	12.50	9.56	XXXIII
7	RVS 13-20	10.92	10.63	10.07	10.97	11.57	12.10	9.83	10.48	7.26	10.90	11.01	13.17	10.74	XIX
8	RVS 13-15	9.45	9.55	8.88	10.20	11.10	10.70	10.33	10.17	10.38	10.07	10.45	7.50	9.90	XXVIII
9	DLsb 3	8.62	10.48	11.02	6.93	11.73	9.00	10.83	8.55	10.70	-	12.52	7.83	9.84	XXIX
10	DLsb 4	8.24	9.96	10.37	-	10.67	9.30	10.00	7.23	11.00	-	13.37	11.83	10.20	XXVI
11	DSb 39	7.99	10.71	10.47	6.37	9.60	8.30	9.00	8.90	8.31	-	11.00	10.50	9.20	XXXIX
12	RVSM 2011-35 (C)	11.65	12.13	11.46	10.20	12.13	12.57	10.33	14.33	9.43	11.45	13.03	7.83	11.38	XIII
13	AS 40	8.02	7.79	9.11	7.37	8.97	8.03	7.83	8.09	6.99	7.37	8.87	8.50	8.08	XLVII
14	AS 24	9.20	8.99	9.32	9.13	10.13	9.90	8.83	9.56	7.63	8.20	10.21	8.00	9.09	XLIII
15	JS 23-08	10.46	10.28	10.61	40.47	11.27	11.67	7.67	10.89	10.05	7.63	11.51	13.50	13.00	IV
16	JS 23-05	10.62	11.22	11.99	11.20	11.90	12.63	10.50	12.56	10.43	11.20	11.78	7.83	11.16	XV
17	DS 1312	9.49	10.98	10.31	6.67	9.60	8.57	10.50	10.79	8.87	7.10	10.72	10.50	9.51	XXXV
18	DS 3163	11.39	10.39	10.66	8.43	9.90	9.07	10.67	10.75	11.51	-	10.35	11.50	10.42	XXIII
19	DS 3168	7.94	9.43	10.02	7.20	8.63	8.57	9.00	7.33	8.69	-	9.86	13.50	9.11	XLI
20	DS 3124	7.91	11.15	10.86	6.53	9.37	8.83	10.33	6.83	10.64	7.43	11.04	10.50	9.29	XXXVII
21	SL 1282	8.70	8.64	9.73	6.33	11.97	8.33	8.50	6.67	8.83	11.27	9.57	9.67	9.02	XLIV
22	SL 1230	8.96	13.83	13.41	7.23	9.90	11.33	11.83	12.90	10.25	-	14.77	8.33	11.16	XV
23	HIMSO-1694	7.28	10.48	10.12	5.83	8.27	8.10	10.17	9.72	8.50	-	10.89	9.50	8.99	XLV
24	HIMSO-1693	6.61	11.93	10.87	6.27	8.23	8.60	10.33	8.43	9.62	-	11.59	8.50	9.18	XL
25	VLS 103	8.44	14.98	14.29	-	-	9.53	12.00	11.62	7.53	-	14.67	11.00	11.56	XI
26	VLS 102	8.87	14.40	13.83	7.53	11.23	9.90	12.67	12.54	12.28	-	14.85	9.50	11.60	X
27	AMS 100-39 (C)	11.48	12.08	11.59	8.80	13.60	12.47	10.83	13.12	9.51	7.00	11.03	9.50	10.92	XVI
28	PS 1605	9.72	13.51	12.61	9.37	12.87	11.03	11.17	12.84	9.92	6.63	14.21	11.50	11.28	XIV
29	PS 1689	9.78	10.20	9.74	6.37	9.87	9.80	7.33	12.37	9.34	9.03	10.33	10.50	9.56	XXXIII

30	PS 1662	10.81	10.14	10.01	8.10	11.33	11.83	10.00	10.13	7.71	12.93	11.54	12.50	10.59	XX
31	RSC 11-48	9.99	9.08	10.09	7.83	9.23	10.20	33.67	10.01	9.85	9.63	10.34	12.33	11.85	VIII
32	RSC 11-42	9.87	8.57	8.99	8.07	9.97	9.90	7.83	10.09	8.02	8.77	9.65	9.50	9.10	XLII
33	BAUS(M)-3	7.28	11.14	10.71	5.70	8.43	8.67	9.50	9.49	11.81	-	13.00	10.50	9.66	XXXI
34	BAUS-116	9.49	9.29	9.44	8.03	9.70	9.93	8.50	9.56	7.84	9.17	10.61	9.50	9.26	XXXVIII
35	CAUMS 2	8.09	10.24	10.50	8.07	8.33	9.30	10.00	10.12	8.19	9.57	10.08	9.50	9.33	XXXVI
36	NRC 195	13.47	13.00	12.32	9.73	11.63	11.40	11.17	13.19	10.68	12.37	13.64	8.50	11.76	IX
37	NRC 203	13.31	12.43	12.20	12.20	15.47	12.67	11.00	11.24	7.95	13.33	11.93	9.50	11.94	VI
38	NRC 193	10.40	8.86	10.18	7.00	10.80	8.77	9.00	9.57	8.87	10.27	10.10	10.50	9.53	XXXIV
39	NRC 192	10.89	10.29	10.98	6.70	13.47	11.00	9.33	11.48	8.49	10.17	10.98	12.33	10.51	XXII
40	NRC 191	15.84	16.12	15.40	13.63	16.67	11.03	13.83	17.63	12.76	13.23	17.35	13.33	14.74	III
41	NRC 190	8.05	9.19	9.95	6.80	9.33	10.80	8.83	8.47	7.43	8.50	9.53	9.50	8.87	XLVI
42	RSC 10-52 (C)	11.67	10.20	10.04	8.03	11.37	10.07	10.00	9.70	9.40	9.70	12.07	10.50	10.23	XXV
43	NRC 189	9.38	9.72	10.20	8.00	8.93	9.47	8.67	10.89	9.83	10.23	10.15	17.33	10.23	XXV
44	RVSM 16-20	9.29	9.60	10.28	8.60	10.30	10.87	9.67	10.38	6.11	9.63	10.79	9.33	9.57	XXXII
45	KDS 1175	10.49	10.44	10.90	8.20	10.20	10.67	9.83	10.68	9.28	-	12.41	11.33	10.40	XXIV
46	KDS 1187	10.94	14.48	14.02	7.70	14.73	10.43	12.67	13.53	11.29	-	16.22	10.50	12.41	V
47	KDS 1149	6.48	10.13	10.44	6.90	8.93	10.27	9.33	13.42	8.14	6.83	10.14	10.50	9.29	XXXVII
48	MACS 1672	8.37	13.58	12.80	-	11.33	11.37	12.17	10.59	11.26	-	12.94	10.50	11.49	XII
49	ACS 1735	8.73	10.30	10.87	6.57	10.47	9.17	11.33	8.80	8.67	-	11.89	10.50	9.75	XXX
50	ASb 15	12.73	12.98	12.29	8.17	12.73	10.87	13.83	12.13	10.43	9.57	13.29	7.50	11.38	XIII
51	TS 21-2	8.26	11.61	11.87	-	9.00	11.37	10.83	9.63	9.41	-	12.01	11.50	10.55	XXI
52	TS 21-1	9.98	9.77	10.28	-	8.40	8.70	11.83	10.51	10.58	-	12.16	9.50	10.17	XXVII
53	LOKSOY-1	12.63	13.22	12.56	-	11.93	10.67	12.67	11.97	10.70	8.10	14.43	10.50	11.76	IX
54	KSS 204	9.02	12.59	13.06	7.63	9.63	8.90	11.67	11.13	12.42	-	13.65	9.83	10.87	XVII
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.60		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	06-07-21	20-07-21	02-07-21	23-06-21	06-07-21		21-06-21	28-06-21		

Table 1.5.6

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Oil Content (%)

S.No	Varieties	Anravadi	Anreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand-saur	Nagpur	Parbham	Sehore	Mean	Rank
1	SKAU-WSB-101		24.35	30.89	22.21	25.58	21.045	23.54	25.29		25.44		24.79	I
2	KBS 21-1	23.82	20.91	22.55	20.77	21.16	17.435	17.78	17.52		22.22		20.46	XLIX
3	MAUS 818	23.75	23.68	21.3	20.82		18.23	20.44	20.71	21.59	22.82	21.03	21.44	XXI
4	MAUS 791	23.07	23.90	24.22	20.09	23.64	21.065	20.41	21.12	20.64	23.21	20.31	21.97	IX
5	AMS 115	21.49	23.05	22.03	20.79	22.73	17.73	18.07	18.79		21.76		20.71	XLV
6	AMS 19-01	22.03	23.27	22.31	19.91	22.45	17.2	21.23	18.9	20.46	24.68	19.72	21.10	XXX
7	RVS 13-20	22.05	21.57	17.14	19.79	20.67	20.495	21.24	16.89	19.99	22.71	21.53	20.37	L
8	RVS 13-15	23.11	23.69	23.86	19.79	23.13	18.395	22.62	20.18	21.83	22.53	20.08	21.75	XVI
9	DLSb 3	24.21	22.09	24.4	19.03	22.67	16.91	21.28	17.18		21.45		21.02	XXXV
10	DLSb 4	23.52	22.25	23.73		23.13	21.38	21.25	18.15		24.21	22.50	22.23	IV
11	DSb 39	22.70	21.68	22.38	19.74	22.69	19.8	18.18	19.67		23.42	22.32	21.26	XXVI
12	RVSM 2011-35 (C)	21.81	22.74	23.4	19.64	19.55		18.53	19.91		20.25	18.44	20.47	XLVIII
13	AS 40	19.46	20.88	23.69	18.69	21.13	17.73	17.49	17.29	21.15	21.04	18.80	19.76	LIII
14	AS 24	20.37	22.40	22.24	20.26	21.98	20.515	19.88	20.33	21.19	24.55	18.37	21.10	XXXI
15	JS 23-08	22.05	21.60	25.44	20.26	22.32	21.82	20.52	19.33	21.06	20.08	17.97	21.13	XXVIII
16	JS 23-05	20.57	21.43	21.86	19.94		16.6	17.6	19.11	21.24	19.21	17.31	19.48	LIV
17	DS 1312	23.48	23.41	24.29	18.53	24.28	20.355	21.33	18.11	23.08	23.99	19.09	21.81	XIV
18	DS 3163	21.68		22.78	19.31	22.25		18.94	18.05		20.77	17.62	20.17	LII
19	DS 3168	20.71	21.89	23.61	18.14	22.79		17.6	19.47		22.66	21.56	20.94	XXXVIII
20	DS 3124	22.81	22.98	25.62	18.60	22.44	21.42	19.61	19.9		24.51	18.82	21.67	XVIII
21	SL 1282	22.39	22.03	21.79	17.56	22.97	20.585	20.78	17.28	21.72	22.59	19.92	20.87	XL
22	SL 1230	20.90	23.39	23.96	17.92		17.41	21	22.47		24.30		21.42	XXII
23	HIMSO-1694	23.08		24.51	18.24	23.83	17.36	20.12	22.09		20.53	19.32	21.01	XXXVI
24	HIMSO-1693	23.19	23.08	23.94	18.89	23.01		19.95	22.37		22.75		22.15	VI
25	VLS 103	22.93	23.18	22.82			20.53	22.71	21.06		23.62	21.71	22.32	III
26	VLS 102	23.29	22.62	23.33	20.50	21.64	21.59	19.42	21.98		24.77	18.89	21.80	XV
27	AMS 100-39 (C)	21.67	20.33	22.2	18.92	21.53	16.87	21.01	20.76	23.52	21.42	18.51	20.61	XLVI
28	PS 1605	22.08	21.88	27.51	21.18	22.51	18.315	21.42	20.69	21.77	22.92	22.53	22.07	VIII
29	PS 1689	20.22	22.48	20.4	20.81	22.38	20.535	20.05	17.7	21.31	21.42	21.33	20.78	XLII
30	PS 1682	21.35	22.56	25.24	21.28	22.55	19.42	20.87	21.1	21.25	22.79	20.61	21.73	XXVII

31	RSC 11-48	20.79	21.52	22.91	22.06	22.87	19.485	20.36	21.29	22.32	19.43	18.32	21.03	XXXIV
32	RSC 11-42	22.79	22.75	24.38	20.77	22.93	17.025	20.98	17.89	20.05	20.71	19.62	20.90	XXXIX
33	BAUS(M)-3	24.09	21.27	22.82	20.53	22.26	17.86	21.28	21.05		20.71	21.96	21.38	XXIII
34	BAUS-116	21.29	21.28	21.22	20.92	22.98	16.965	21.48	19.88	20.99	21.34	19.75	20.74	XLIII
35	CAUMS 2	23.21	23.15	24.72	21.70	23.19			22.841	20.76	24.07	19.12	22.53	II
36	NRC 195	22.13	22.15	22.98	21.91	22.73	19.995	20.64	18.53	21.46	23.25	21.82	21.60	XIX
37	NRC 203	21.48	22.47	19.33	21.26	21.1	20.56	21.66	21.61	20.60	20.84	21.27	21.11	XXIX
38	NRC 193	19.43	21.46	23.39	21.95	22.34	18.675	21.75	21.19	21.97	21.93	20.55	21.33	XXV
39	NRC 192	19.60	21.46	19.61	22.24	21.67	17.025	20.58	21.86	20.17	20.48	21.31	20.55	XLVIII
40	NRC 191	20.77	22.56	24.09	23.53	20.26	20.515	20.59	20.31	22.48	22.55	23.53	21.92	X
41	NRC 190	22.71	22.66	24.18	21.80	20.27	21.435	19.29	22.1	21.38	20.00	21.08	21.54	XX
42	RSC 10-52(C)	20.26	21.54	19.44	23.15	20.35	19.505	21.34	17.19	21.97	19.45	18.60	20.25	LI
43	NRC 189	21.15	22.40	19.41	22.16	22.75	17.865	21.35	17.71	21.27	20.34	21.65	20.73	XLIV
44	RVSM 16-20	21.93	23.21	24.02	22.50	22.28	18.4		18.14	27.13	20.88	22.71	22.12	VII
45	KDS 1175	24.24	23.86	24.4	23.41	21.67	16.855	19.76	19.24		23.43	22.20	21.91	XI
46	KDS 1187	22.18	22.04	21.56	24.07	21.68	17.46	20.6	20.36		19.83	19.78	20.95	XXXVII
47	KDS 1149	24.54	23.21	23.63	22.07	20.98	18.555	19.65	20.58	20.96	23.25	22.57	21.82	XIII
48	MACS 1672	22.56	22.93	23.97		20.88	19.93	19.48			23.57	21.41	21.84	XII
49	ACS 1735	21.67	22.62	23.14	24.51	20.43	17.115	20.1	18.71		22.72	19.58	21.06	XXXII
50	ASb 15	21.51	22.91	22.03	23.27	20.84	18.955	19.51	19.22	21.37	21.77	20.23	21.05	XXXIII
51	TS 21-2	21.73	23.35	23.71		23.55		20.22	22.88		22.90	19.34	22.21	V
52	TS 21-1	21.13	22.53	20.1		21.67	18.45	22.24	20.63		24.19		21.37	XXIV
53	LOKSOY-1	22.89	22.00	20.62			20.92	18.4	21.34	21.92	19.98	19.32	20.82	XLI
54	KSS 204	21.55	22.01	19.5	24.73		21.51	20.51	21.39		21.03	18.30	21.17	XXVII
	Mean	22.06	22.43	22.94	20.84	22.18	19.08	20.32	23.87	21.56	22.17	20.26		
	N.P.S.(Sqmm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05		
	DOS	26-06-21	07-12-21	24-06-21	30-06-21	07-06-21	20-07-21	07-02-21	23-06-21	28-06-21	21-06-21	28-06-21		

Table 1.5.7

Trial : Initial Varietal Trial
Zone : CENTRAL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand-saur	Nagpur	Parbhani	Sehore	Mean	Rank
1	SKAU-WSB-101		372.7	366.0	82.2	138.9	135.1	226.7	156.0		295.0		221.6	LIII
2	KBS 21-1	217.7	330.4	328.6	153.9	62.6	150.6	70.2	73.6		581.4		218.8	LIV
3	MAUS 818	469.0	824.3	389.2	226.1		157.5	509.8	235.3	133.2	670.5	155.8	377.1	XVII
4	MAUS 791	672.1	525.3	311.0	188.5	437.8	431.6	337.6	130.3	402.6	807.9	185.6	402.8	XI
5	AMS 115	286.4	665.8	326.3	184.8	89.8	122.5	352.5	171.7		504.9		300.5	XLIII
6	AMS 19-01	533.1	729.6	325.1	172.0	227.2	195.4	466.6	224.0	111.1	487.3	399.2	351.9	XXVI
7	RVS 13-20	479.0	431.3	241.2	400.8	587.0	409.9	503.4	283.6	152.9	487.7	196.8	379.4	XVI
8	RVS 13-15	468.0	497.1	424.2	161.3	239.9	290.6	625.4	264.2	296.5	456.1	34.7	341.6	XXX
9	DLSb 3	268.9	774.3	391.6	65.8	139.9	142.0	583.3	148.4		402.5		324.1	XXXV
10	DLSb 4	185.8	648.2	386.8		80.0	184.7	467.1	103.1		412.5	266.6	303.9	XLI
11	DSb 39	369.9	754.5	480.7	63.4	252.1	205.3	632.8	344.8		584.1	248.0	393.6	XII
12	RVSM 2011-35 (C)	667.7	628.6	381.4	281.2	333.1		571.8	280.1		410.0	173.0	414.1	IX
13	AS 40	312.3	500.0	356.8	272.2	511.3	223.2	587.3	158.0	224.6	358.4	120.7	329.5	XXXIV
14	AS 24	523.0	823.9	604.0	445.2	499.4	455.8	721.6	155.5	219.7	606.0	122.5	470.6	II
15	JS 23-08	283.1	357.3	245.0	290.1	457.3	215.6	400.3	186.1	218.4	416.4	323.7	308.5	XL
16	JS 23-05	477.3	423.1	345.4	197.0		286.8	391.1	335.0	325.1	398.3	397.3	357.6	XXIV
17	DS 1312	486.9	589.6	389.9	68.6	209.8	226.1	721.6	277.3	39.9	586.3	485.5	371.0	XX
18	DS 3163	246.2		343.1	47.7	192.2		748.3	89.2		497.3	204.3	296.0	XLV
19	DS 3168	204.6	416.0	291.6	103.0	168.9		578.0	86.4		470.0	303.3	291.3	XLVII
20	DS 3124	337.8	658.1	455.5	142.3	304.7	248.5	682.6	191.6		538.6	339.1	389.9	XIII
21	SL 1282	337.2	652.7	344.3	138.7	153.2	233.8	641.3	281.7	193.1	295.7	152.3	311.3	XXXVIII
22	SL 1230	123.9	675.7	372.8	97.3		189.1	575.6	255.3		414.1		338.0	XXXI
23	HIMSO-1694	91.2		332.8	76.6	70.5	150.0	601.2	141.8		440.9	310.1	246.1	LI
24	HIMSO-1693	74.4	626.7	319.1	65.4	62.6		477.8	143.6		308.9		259.8	L
25	VLS 103	152.9	217.4	242.3			147.0	179.4	57.3		583.1	257.3	229.6	LII
26	VLS 102	143.7	631.0	270.6	70.9	133.5	144.0	584.9	81.3		648.2	154.0	286.2	XLIX
27	AMS 100-39 (C)	390.4	516.9	323.5	116.7	276.4	187.4	518.7	251.2	87.0	512.9	141.6	302.1	XLII
28	PS 1605	425.2	642.8	597.8	282.3	205.7	280.4	708.8	275.8	32.2	447.1	155.6	368.5	XXI

29	PS 1689	334.4	582.9	292.1	118.2	254.2	263.7	599.1	166.0	121.0	412.5	142.2	298.8	XLIV
30	PS 1682	442.8	813.1	560.8	162.8	317.3	426.9	711.0	286.5	330.6	466.9	234.1	432.1	VI
31	RSC 11-48	431.1	568.4	311.1	179.8	321.8	404.1	613.2	304.9	253.5	369.4	330.1	371.6	XIX
32	RSC 11-42	556.9	617.9	614.1	184.6	537.9	378.3	544.0	163.5	282.1	603.3	460.2	449.4	V
33	BAUS(M)-3	101.2	766.8	546.5	45.6	175.9	150.0	830.1	187.1		644.3	368.6	381.6	XV
34	BAUS-116	525.7	472.8	382.4	180.8	272.3	230.4	631.1	250.3	336.8	379.4	453.5	374.1	XVIII
35	CAUMS 2	315.1	634.4	415.0	171.4	200.4			411.6	225.4	487.4	439.0	366.6	XXII
36	NRC 195	595.5	765.6	334.8	130.0	263.7	380.1	728.8	320.2	349.8	614.1	183.3	424.2	VII
37	NRC 203	371.1	410.5	305.4	246.7	250.0	228.4	422.6	208.1	177.9	468.3	314.9	309.5	XXXIX
38	NRC 193	599.6	588.2	386.9	135.5	358.6	239.8	762.6	303.4	276.5	573.9	370.3	417.8	VIII
39	NRC 192	546.8	662.3	348.7	296.5	444.0	378.3	706.3	491.2	214.2	596.6	431.5	465.1	III
40	NRC 191	174.4	373.1	368.8	261.4	200.2	334.4	376.2	250.8	266.3	439.9	476.5	320.2	XXXVI
41	NRC 190	588.7	503.4	370.2	376.7	445.5	465.8	633.5	594.7	279.9	607.4	531.0	490.6	I
42	RSC 10-52 (C)	400.0	696.7	326.4	222.9	180.9	163.8	606.1	284.3	97.5	437.0	436.2	350.2	XXVIII
43	NRC 189	564.1	757.8	441.0	322.8	348.3	379.3	732.7	310.5	294.1	572.4	347.5	461.0	IV
44	RVSM 16-20	525.1	435.6	403.3	249.9	368.5	377.0		282.3	408.5	500.0	543.8	409.4	X
45	KDS 1175	215.4	594.9	337.5	103.9	80.2	291.3	214.6	199.5		399.2	427.5	286.4	XLVIII
46	KDS 1187	328.4	435.3	335.5	53.4	171.3	163.8	447.6	301.5		729.4	454.0	342.0	XXIX
47	KDS 1149	163.7	710.5	414.2	125.3	207.3	155.9	815.1	233.8	31.0	573.9	484.8	356.0	XXV
48	MACS 1672	206.2	702.0	402.5		87.7	132.9	471.4			419.0	385.7	350.9	XXVII
49	ACS 1735	256.8	536.0	371.4	96.8	100.9	139.5	317.6	198.7		735.0	183.7	293.6	XLVI
50	ASb 15	435.5	723.8	380.7	201.1	247.0	257.4	712.9	313.3	221.6	575.0	184.9	386.6	XIV
51	TS 21-2	278.9	703.3	409.7		40.7		424.4	186.5		531.5	62.1	329.6	XXXIII
52	TS 21-1	255.7	595.2	292.9		91.0	118.4	626.1	157.8		519.5		332.1	XXXII
53	LOKSOY-1	288.2	565.0	315.7			170.5	504.3	216.0	59.6	488.3	228.9	315.2	XXXVII
54	KSS 204	111.8	739.1	317.9	189.2		159.4	714.0	327.5		560.7	135.6	361.7	XXXIII
	Mean	355.5	355.5	355.5	176.0	355.5	355.5	355.5	355.5	355.5	355.5			
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05			
	DOS	26-06-21	07-12-21	24-06-21	30-06-21	07-06-21	20-07-21	07-02-21	23-06-21	28-06-21	21-06-21	28-06-21		

Table 1.5.8

Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : Yield(Kg/ha)

S.N o	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand - saur	Morena	Nagpur	Parbhani	Sehore	Mean	Rank
1	MAUS 819	1358	3704	1481	1086	815	1333	2815	2198	389	593	2593	2469	1936	VII
2	MAUS 795	1605	3333	1383	1309	864	2198	3136	1630	556	1506	1679	2222	1956	VI
3	KDS 1201	1753	3654	1802	691	2025	1407	2889	1111	778	1062	2864	2272	2084	IV
4	KDS 1173	519	3704	1630	247	543	691	3062	716	917	-	1654	790	1479	XIX
5	KDS 1172	444	3407	1506	321	321	568	2716	889	750	-	1926	1160	1437	XX
6	KDS 1169	519	1753	765	346	691	1407	1605	272	194	198	1136	1654	1000	XXV
7	KDS 1194	543	1185	1407	-	0	840	74	988	139	-	2000	1062	900	XXVI
8	RVS 13-7	2420	2716	1383	1358	1531	1630	2889	617	167	1185	1951	2173	1850	XI
9	JS 23-09	1160	2346	1062	1407	2000	1926	2815	-	278	1605	1531	1704	1794	XIII
10	JS 20-34 (C)	494	1852	938	1901	1210	2000	2395	716	667	864	1506	1556	1353	XXI
11	JS 23-03	568	2346	938	1827	1926	2198	3457	1481	278	1605	2025	2296	1884	IX
12	PS 1569	1111	2494	815	765	790	1457	2593	222	83	593	1457	1309	1284	XXII
13	PS 1660	2494	3309	1407	889	1852	1802	3679	1975	139	1556	1901	2593	2257	II
14	PS 1675	2173	3679	1333	914	2198	1185	2420	1877	139	1333	1358	2099	1966	V
15	JS 95-60 (C)	420	2198	790	667	346	1432	1086	988	361	593	1333	1037	1022	XXIV
16	RSC 11-60	1605	3111	1877	1333	1037	1753	2741	1037	556	889	1432	2272	1775	XV
17	NRC 186	2247	3630	1877	1605	2222	2395	2741	1926	889	617	1901	2519	2208	III
18	NRC 202	2123	3556	691	1506	2222	1704	1975	1062	361	889	2444	2296	1896	VIII
19	NRC 201	1679	3259	1704	1827	1481	1802	2914	988	167	963	1654	1654	1810	XII
20	NRC 198	1728	2519	1531	1185	1506	1556	2790	1481	194	1284	2074	1309	1778	XIV
21	NRC 197	2272	3457	1333	1185	1630	1383	2716	1160	306	1284	2025	2296	1956	VI
22	NRC 130 (C)	321	2049	864	1407	1185	1012	2296	346	167	914	1951	1852	1279	XXIII
23	NRC 196	2321	3654	1901	2049	1778	2667	2963	2395	528	1753	2395	2148	2398	I
24	AMS 77-3-6	1975	1728	864	914	1481	815	2914	1012	83	938	1728	1802	1526	XV/III
25	AMS 83	1753	3309	1481	1383	1309	691	2148	1037	306	370	1877	1432	1541	XVII
26	MACS 1724	1457	3679	1901	1457	815	1728	2593	1704	444	222	2420	2049	1857	X
27	NRC 138 (C)	1531	2938	1086	593	790	1654	2321	1309	194	1358	1383	1235	1561	XVI
	Mean	1429.37	2909.9	1324.07	1160.46	1329.54	1527.19	2546.04	1197.58	371.48	1007.25	1859.19	1824.44		
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6	4.05	4.05	4.05		
	DOS	26-06-21	12-07-24	24-06-21	30-06-21	01-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	22-06-21	01-07-21		
	CD	172.84	518.52	197.53	543.21	296.3	246.91	469.14	172.84	361.11	123.46	370.37	320.99		
	CV		10.7	8.99	29.76	14.14	10.1	10.99	9.54	57.83	9.07	12.29	10.89		
	Zonal CD (10%)													258	
	Zonal CD (50%)													106	

· Data from Indore and Morena centres was rejected due to high CV and low mean yield.

**Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : Days to Flower**

Table 1.5.9

S.No	Varieties	Amravai	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand - saur	Morena	Nagpur	Parbhani	Sehore	Mean	Rank
1	MAUS 819	36	37	44	42	41	40	41	43	49	41	33	43	41	XV
2	MAUS 795	34	33	35	41	39	36	39	38	50	39	37	39	38	IX
3	KDS 1201	35	41	43	42	41	40	41	52	48	41	42	44	43	XIX
4	KDS 1173	39	39	43	40	41	39	41	53	50	41	40	44	43	XIX
5	KDS 1172	37	39	44	40	45	39	42	52	53	41	41	43	43	XXII
6	KDS 1169	31	26	26	38	36	28	28	40	42	32	29	32	32	I
7	KDS 1194	34	37	39	41	40	38	41	40	46	41	40	43	40	XII
8	RVS 13-7	39	39	44	42	43	38	41	51	49	41	39	43	42	XVIII
9	JS 23-09	36	33	35	38	38	34	39	38	45	40	37	39	38	VIII
10	JS 20-34 (C)	33	29	32	38	34	32	34	36	43	32	31	36	34	II
11	JS 23-03	34	32	35	40	38	34	39	40	43	38	34	40	37	VI
12	PS 1569	34	34	36	39	38	36	40	35	46	37	37	39	38	VII
13	PS 1660	41	44	45	39	47	42	45	53	49	49	44	45	45	XXV
14	PS 1675	39	37	43	42	46	41	42	50	47	42	40	44	43	XXI
15	JS 95-60 (C)	34	27	30	37	36	32	29	40	49	35	33	39	35	III
16	RSC 11-60	40	39	41	41	41	43	41	50	48	42	43	43	43	XX
17	NRC 186	40	41	43	40	42	43	44	52	44	42	43	44	43	XXIII
18	NRC 202	39	39	41	41	42	40	41	46	47	41	42	43	42	XVII
19	NRC 201	35	35	37	40	39	38	39	44	43	37	37	43	39	X
20	NRC 198	36	37	39	38	43	39	40	40	49	41	41	42	40	XIV
21	NRC 197	35	36	38	40	41	39	41	43	47	42	40	40	40	XIII
22	NRC 130 (C)	30	32	34	38	38	34	39	37	46	37	37	39	37	V
23	NRC 196	37	37	34	39	41	38	42	42	46	41	39	41	40	XI
24	AMS 77-3-6	39	43	44	40	43	43	40	51	47	43	46	42	43	XXIV
25	AMS 83	39	37	39	42	41	39	42	50	46	42	41	41	42	XVI
26	MACS 1724	36	35	34	43	42	38	42	49	47	41	33	42	40	XIII
27	NRC 138 (C)	33	29	30	37	38	36	32	43	48	36	32	38	36	IV
	N.P.S.(Sgm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	01-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	22-06-21	01-07-21		

Table 1.5.10

Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mand - saur	Morena	Nagpur	Parbhani	Schore	Mean	Rank
1	MAUS 819	97	101	108	103	110	100	107	114	110	122	94	106	106.00	XXV
2	MAUS 795	95	94	91	104	97	95	104	103	96	90	97	104	97.50	X
3	KDS 1201	95	101	106	101	104	101	104	104	100	94	101	103	101.17	XV
4	KDS 1173	98	105	111	105	109	103	107	110	107	-	99	104	105.27	XXIII
5	KDS 1172	95	106	108	105	110	104	108	105	112	-	100	104	105.18	XXII
6	KDS 1169	94	85	87	97	86	88	89	100	95	94	87	94	91.33	IV
7	KDS 1194	98	103	101	-	-	101	107	106	96	-	99	103	101.56	XX
8	RVS 13-7	95	96	106	99	101	95	105	106	97	118	98	102	101.50	XIX
9	JS 23-09	85	87	96	97	87	92	89	-	97	95	97	99	92.82	V
10	JS 20-34 (C)	96	85	87	98	85	90	87	88	96	88	90	93	90.25	II
11	JS 23-03	93	89	93	102	88	94	96	91	98	95	94	97	94.17	VIII
12	PS 1569	83	85	90	96	83	88	87	84	103	88	97	92	89.67	I
13	PS 1660	100	104	107	105	105	101	108	110	97	121	103	103	105.33	XXIV
14	PS 1675	99	103	104	106	107	100	107	111	103	122	99	103	105.33	XXIV
15	JS 95-60 (C)	83	83	86	100	83	88	85	85	94	112	92	96	90.58	III
16	RSC 11-60	94	100	103	105	93	98	103	105	96	114	102	102	101.25	XVI
17	NRC 186	97	99	106	103	99	99	101	108	97	103	102	103	101.42	XVIII
18	NRC 202	96	93	104	105	100	101	103	105	101	115	101	101	102.08	XXI
19	NRC 201	92	93	95	104	95	98	100	98	95	106	98	99	97.75	XI
20	NRC 198	93	93	100	97	95	92	97	101	97	103	99	99	97.17	IX
21	NRC 197	94	100	101	104	99	95	103	98	98	117	100	100	100.75	XIV
22	NRC 130 (C)	94	85	89	97	89	88	90	85	95	109	96	99	93.00	VI
23	NRC 196	94	95	95	102	100	91	103	107	102	110	99	101	99.92	XIII
24	AMS 77-3-6	92	95	100	99	100	90	88	101	106	101	105	100	98.08	XII
25	AMS 83	95	101	107	106	105	92	106	105	101	104	100	103	102.08	XXI
26	MACS 1724	93	101	105	105	103	92	106	108	96	113	93	101	101.33	XXVII
27	NRC 138 (C)	91	97	93	101	88	89	96	99	92	87	91	98	93.50	VII
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	01-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	22-06-21	01-07-21		
Zonal CD (50%)														0.70	

**Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : Plant Height (cm)**

Table 1.5.1.1

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Morena	Nagpur	Parbhani	Shore	Mean	Rank
1	MAUS 819	59	36	43	38	43	34	43	69	28	53	42	64	46.00	XIV
2	MAUS 795	47	23	35	35	38	33	47	58	28	46	52	60	41.83	XVII
3	KDS 1201	78	50	34	53	36	51	64	67	38	62	57	64	54.50	VI
4	KDS 1173	83	76	52	63	54	72	80	61	50	-	91	65	67.91	II
5	KDS 1172	90	78	75	76	47	57	65	83	48	-	93	65	70.64	I
6	KDS 1169	57	27	29	49	44	33	33	45	28	49	42	55	40.92	XX
7	KDS 1194	71	55	49	62	-	55	47	55	29	-	52	61	53.60	VII
8	RVS 13-7	54	28	30	47	45	31	49	45	25	45	39	58	41.33	XIX
9	JS 23-09	46	28	27	51	37	29	35	54	30	49	36	48	39.17	XXII
10	JS 20-34 (C)	32	22	30	49	34	30	21	50	24	39	29	47	33.92	XXV
11	JS 23-03	41	23	28	54	38	34	39	50	23	42	38	70	40.00	XXI
12	PS 1569	44	33	31	40	34	29	30	45	26	36	39	52	36.58	XXIII
13	PS 1660	80	41	40	49	40	34	53	68	23	57	52	80	51.42	VIII
14	PS 1675	58	45	53	61	51	32	47	83	24	57	48	53	51.00	IX
15	JS 95-60 (C)	41	24	28	38	31	26	26	33	30	45	33	41	33.00	XXVI
16	RSC 11-60	48	36	41	54	48	30	45	65	35	55	60	63	48.33	XI
17	NRC 186	61	44	41	63	52	42	48	67	35	42	49	66	50.83	X
18	NRC 202	67	54	47	78	51	49	57	71	30	74	52	72	58.50	IV
19	NRC 201	51	35	32	56	43	35	43	45	26	47	50	60	43.58	XV
20	NRC 198	71	54	48	51	49	50	63	57	26	48	74	72	55.25	V
21	NRC 197	84	66	58	74	55	53	76	80	31	66	70	71	65.33	III
22	NRC 130 (C)	39	27	28	61	39	30	34	71	28	46	36	58	41.42	XVIII
23	NRC 196	56	35	43	62	46	42	47	69	28	53	44	48	47.75	XII
24	AMS 77-3-6	70	34	30	52	57	40	54	72	29	63	46	70	51.42	VIII
25	AMS 83	62	42	50	44	43	26	37	66	28	52	44	61	46.25	XIII
26	MACS 1724	50	32	43	54	34	31	34	57	25	60	47	51	43.17	XVI
27	NRC 138 (C)	50	27	44	39	34	30	31	41	24	36	35	35	35.50	XXIV
	N.P.S.(5gm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05		
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	01-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	22-06-21	01-07-21		

Table 1.5.12

Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Morena	Nagpur	Parbhani	Sehore	Mean	Rank	
1	MAUS 819	18.58	17.23	18.04	10.23	13.57	12.73	12.33	16.03	15.66	9.80	18.95	16.50	14.97	I	
2	MAUS 795	14.76	14.40	12.95	10.30	12.70	11.87	13.33	11.98	12.82	12.47	15.15	15.50	13.19	II	
3	KDS 1201	9.80	9.54	9.84	6.93	9.93	10.37	8.17	8.92	11.10	8.63	10.91	9.50	9.47	XX	
4	KDS 1173	6.39	10.04	9.86	6.43	7.93	7.20	8.33	7.98	12.33	-	11.80	7.67	8.72	XXV	
5	KDS 1172	6.33	9.90	10.14	7.07	6.83	7.47	8.50	8.86	11.95	-	11.88	7.17	8.74	XXIV	
6	KDS 1169	8.08	13.98	12.33	11.17	10.87	11.70	11.67	10.83	11.06	10.90	15.25	13.33	11.76	VI	
7	KDS 1194	7.02	10.02	10.68	-	-	9.20	9.83	9.55	9.18	-	10.94	9.50	9.55	XIX	
8	RVS 13-7	10.94	11.72	10.42	9.40	10.47	10.10	8.67	9.83	10.29	9.77	12.82	10.50	10.41	XVI	
9	JS 23-09	11.13	12.05	11.00	11.43	10.20	12.40	9.67	-	11.42	10.40	11.55	10.50	11.07	XI	
10	JS 20-34 (C)	8.12	12.25	11.89	12.90	11.40	12.23	11.17	11.15	11.93	9.30	13.86	11.50	11.48	IX	
11	JS 23-03	12.91	13.21	10.93	13.23	11.80	12.27	11.33	9.83	11.24	11.97	13.19	12.50	12.03	V	
12	PS 1569	10.94	11.08	10.60	11.13	10.83	11.07	11.83	9.21	7.97	9.17	12.17	10.50	10.54	XIV	
13	PS 1660	10.91	10.18	10.98	7.83	9.77	9.53	7.17	8.16	9.74	10.67	13.07	10.50	9.88	XVII	
14	PS 1675	12.70	12.86	13.20	8.10	12.77	11.70	11.33	10.59	11.02	10.00	14.31	12.17	11.73	VII	
15	JS 95-60 (C)	9.61	13.19	11.51	8.13	10.93	12.80	13.50	9.57	9.58	9.83	15.84	11.50	11.33	X	
16	RSC 11-60	9.22	9.15	9.93	8.00	9.33	10.10	8.00	8.41	9.75	8.17	10.87	9.50	9.20	XXII	
17	NRC 186	8.92	9.00	8.81	8.37	8.80	9.87	9.33	8.97	7.65	8.70	10.74	9.50	9.06	XXIII	
18	NRC 202	9.01	9.55	9.64	9.50	10.10	10.87	7.00	9.20	11.49	9.93	9.91	10.50	9.73	XVIII	
19	NRC 201	14.08	13.44	12.71	12.00	13.50	12.20	13.50	12.29	12.23	12.73	14.57	13.50	13.06	III	
20	NRC 198	10.38	12.69	11.07	10.03	11.13	12.03	10.50	10.52	10.80	11.27	11.57	10.50	11.04	XIII	
21	NRC 197	12.47	10.57	11.47	10.90	11.00	10.80	9.17	8.83	10.98	11.63	12.98	11.83	11.05	XII	
22	NRC 130 (C)	12.17	13.02	13.30	13.37	12.73	9.80	13.67	10.69	10.59	11.17	14.17	14.17	12.40	IV	
23	NRC 196	11.05	11.01	10.60	11.17	9.97	10.70	10.50	9.75	9.99	9.47	10.83	10.00	10.42	XV	
24	AMS 77-3-6	11.36	13.16	11.21	9.17	12.97	13.00	11.50	10.69	11.18	9.57	14.34	11.50	11.64	VIII	
25	AMS 83	9.67	10.83	10.59	9.07	9.63	9.20	9.83	10.01	9.95	7.73	12.52	9.50	9.88	XVII	
26	MACS 1724	10.48	13.35	12.68	10.17	10.00	10.40	12.50	9.75	10.70	8.23	14.02	10.50	11.07	XI	
27	NRC 138 (C)	9.85	10.71	10.22	6.53	9.10	9.37	10.67	8.91	8.42	9.77	9.65	9.50	9.39	XXI	
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	3.6		4.05	4.05			
	DOS	26-06-21	12-07-21	24-06-21	30-06-21	01-07-21	20-07-21	02-07-21	23-06-21	06-07-21	28-06-21	22-06-21	01-07-21			

Table 1.5.13

Trial : Initial Varietal Trial : Early
Zone : CENTRAL ZONE
Character : Oil Content (%)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Nagpur	Parbhani	Sehore	Mean	Rank
1	MAUS 819	18.99	21.78	18.80	18.61	20.46	18.69	19.71	20.07	20.72	18.62	22.01	19.86	XXIII
2	MAUS 795	20.83	22.24	19.76	20.12	23	19.94	19.16	18.76	21.52	18.84	18.72	20.26	XVII
3	KDS 1201	19.45	21.20	20.17	18.42	23.33	20.99	19.50	17.83	22.12	19.03	18.01	20.00	XX
4	KDS 1173	20.61	22.14	19.13	19.95	25.21	19.15	19.58	16.71		19.93	18.39	20.08	XIX
5	KDS 1172	21.81	19.00	19.06	21.20	24.12	22.68	19.40	17.82		18.62	22.45	20.61	XI
6	KDS 1169	20.61	21.56	20.45	20.88	21.67	21.06	22.41	20.82	21.86	20.90	22.22	21.31	III
7	KDS 1194	22.10	22.14	18.87			19.51	21.54	18.20		18.93	18.68	19.99	XXI
8	RVS 13-7	21.98	21.08	21.31	19.02	23.68	21.73	22.61	22.08		18.69	23.41	21.56	II
9	JS 23-09	20.41	19.95	22.53	20.10	23.49	20.59	23.14		20.82	17.93	21.13	21.01	IV
10	JS 20-34 (C)	21.52	22.13	21.27	17.90	20.98	21.31	20.59		23.40	17.94	18.45	20.55	XIII
11	JS 23-03	22.25	18.31	21.30	19.91	21.5	18.82	21.50	21.04	22.38	17.44		20.44	XV
12	PS 1569	22.17	22.11	21.82	20.10	22.65	23.11	18.43	17.93	22.72	20.75	18.37	20.92	VI
13	PS 1660	19.45	20.71	19.69	17.13	18.73	20.36	18.63	17.53	20.92	20.81	15.94	19.08	XXVII
14	PS 1675	22.34	22.77	19.38	19.72	21.11	22.43	18.95	17.65	21.52	20.96	19.05	20.53	XIV
15	JS 95-60 (C)	21.35	21.52	19.96	19.99	24.45	20.25	19.67	18.28	21.58	18.98	22.69	20.79	VII
16	RSC 11-60	20.43	20.79	20.19	20.15	21.87	20.18	21.16		21.00	19.91		20.63	X
17	NRC 186		21.72	19.28	18.63	21.45	21.39	22.32	19.52	20.99	17.48	19.25	20.20	XVIII
18	NRC 202	19.44	18.01	20.86	18.29	21.23	20.86	18.84	17.55	26.61	18.11		19.98	XXII
19	NRC 201	19.75	21.69	20.64	20.91	23.54	20.34	21.50	21.21	22.07	20.43	18.98	21.00	V
20	NRC 198	22.30	23.32	22.40	20.21	23.25	20.21	21.21	20.68	23.18	21.13	22.05	21.81	I
21	NRC 197	21.52	23.59	20.74	19.18	20.61	19.81	18.46	17.20	21.86	16.35	17.73	19.73	XXV
22	NRC 130 (C)	18.19	22.22	21.22	17.87	23.93	21.60	19.32	19.20	21.92	18.77	22.15	20.58	XII
23	NRC 196	21.02	22.44	19.69	18.16	22.77	20.28	20.16	19.46	21.67	20.34	21.21	20.65	VIII
24	AMS 77-3-6	19.91	21.19	19.69	16.18	23.36	20.11	20.00	18.69	21.81	17.52	19.32	19.80	XXIV
25	AMS 83	21.03	18.13	18.96	18.82	18.46	21.81	17.59	18.19	21.98	18.39	20.96	19.48	XXVI
26	MACS 1724	23.05	22.90	19.77	18.25	26.31	20.92	19.20	19.16	21.76	18.30	17.48	20.64	IX
27	NRC 138 (C)	21.62	17.90	21.53		25.65	20.53	20.51	18.61	21.65	16.66	19.78	20.44	XVI
	Mean	20.93	21.20	20.31	19.19	22.57	20.69	20.19	18.92	22.00	18.95	19.93		
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05		
	DOS	26-06-21	07-12-21	24-06-21	30-06-21	07-01-21	20-07-21	07-02-21	23-06-21	28-06-21	22-06-21	07-01-21		

Table 1.5.14

Trial: Initial Varietal Trial: Early
Zone: CENTRAL ZONE
Character: Oil Yield (kg/ha)

S.No	Varieties	Anravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Nagpur	Parbhani	Sehore	Mean	Rank
1	MAUS 819	257.9	806.7	278.4	202.1	166.7	249.1	554.8	441.0	122.9	482.8	543.4	390.4	IX
2	MAUS 795	334.3	741.3	273.3	263.3	198.7	438.3	600.7	305.7	324.1	316.3	415.8	394.9	VII
3	KDS 1201	341.0	774.5	363.5	127.2	472.4	295.4	563.4	198.1	234.9	545.0	409.1	419.7	V
4	KDS 1173	106.9	820.1	311.7	49.3	136.9	132.3	599.5	119.6		329.6	145.2	300.2	XIX
5	KDS 1172	96.8	647.3	287.0	68.1	77.4	128.8	526.9	158.4		358.5	260.4	282.4	XXII
6	KDS 1169	107.0	377.9	156.4	72.3	149.7	296.3	359.6	56.6	43.3	237.4	367.5	215.2	XXV
7	KDS 1194	120.0	262.3	265.4			163.9	15.9	179.8		378.6	198.3	198.0	XXVII
8	RVS 13-7	531.9	572.4	294.6	258.3	362.5	354.2	653.2	136.2		364.5	508.6	419.8	IV
9	JS 23-09	236.7	467.9	239.3	282.8	469.8	396.5	651.4		334.2	274.4	360.0	381.1	XI
10	JS 20-34 (C)	106.3	409.8	199.5	340.2	253.9	426.3	493.0		202.1	270.1	287.1	294.2	XX
11	JS 23-03	126.4	429.4	199.8	363.8	414.1	413.7	743.3	311.6	359.1	353.1		372.3	XV
12	PS 1569	246.3	551.3	177.8	153.8	178.9	336.7	477.9	39.8	134.7	302.3	240.5	268.6	XXIII
13	PS 1660	485.0	685.1	277.0	152.3	346.9	366.9	685.4	346.2	325.5	395.5	413.3	432.7	III
14	PS 1675	485.3	837.5	258.3	180.2	464.0	265.8	458.5	331.3	286.8	284.6	399.9	407.2	V1
15	JS 95-60 (C)	89.6	473.0	157.7	133.4	84.6	289.9	213.6	180.6	128.0	253.0	235.3	210.5	XXVI
16	RSC 11-60	327.8	646.8	378.9	268.6	226.8	353.7	579.9		186.6	285.0		373.2	XIV
17	NRC 186		788.3	361.9	299.0	476.6	512.3	611.8	376.0	129.5	332.2	484.8	452.6	II
18	NRC 202	412.7	640.3	144.1	275.5	471.7	355.4	372.0	186.4	236.6	442.6		362.4	XVI
19	NRC 201	331.5	706.9	351.7	382.0	348.6	366.6	626.4	209.5	212.5	337.9	313.9	380.6	XII
20	NRC 198	385.3	587.4	342.9	239.5	350.1	314.5	591.8	306.2	297.6	438.1	288.6	390.3	X
21	NRC 197	488.8	815.5	276.5	227.3	335.9	273.9	501.2	199.5	280.6	331.0	407.0	391.0	VIII
22	NRC 130 (C)	58.4	455.2	183.3	251.4	283.6	218.6	443.5	66.4	200.3	366.1	410.1	268.6	XXIV
23	NRC 196	487.9	819.8	374.2	372.1	404.9	540.7	597.2	465.9	379.8	487.0	455.6	501.3	I
24	AMS 77-3-6	393.2	366.2	170.1	147.9	346.0	163.9	582.8	189.1	204.5	302.7	348.1	306.7	XVIII
25	AMS 83	368.6	599.8	280.7	260.3	241.6	150.7	377.8	188.6	81.3	345.1	300.1	293.4	XXI
26	MACS 1724	335.8	842.5	375.8	265.9	214.4	361.5	497.9	326.5	48.3	442.7	358.2	380.4	XIII
27	NRC 138 (C)	330.9	525.9	233.8		202.6	339.5	476.0	243.5	294.0	230.4	244.2	312.1	XVII
	Mean	292.0	616.7	267.2	225.5	295.4	315.0	513.2	231.8	219.4	351.4	349.8		
	N.P.S.(Sqm)	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05		
	DOS	26-06-21	07-12-21	24-06-21	30-06-21	07-01-21	20-07-21	07-02-21	23-06-21	28-06-21	22-06-21	07-01-21		

Trial: Advanced Varietal Trial I
Zone: CENTRAL ZONE
Character: Yield (Kg/ha)

Table 1.5.15

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Setore	Mean	Rank
1	RVS 2011-10	2515	2994	2022	2037	2222	2160	5100	2000	1454	2092	2460	II
2	DLsb 1	1582	3542	1713	304	-	988	5100	661	1856	1167	1879	V
3	MACS 1520(C)	2276	3310	1852	911	1481	1829	4691	972	1213	1500	2004	IV
4	NRC 86(C)	2361	3171	2106	1593	1798	1813	4491	1889	1412	1792	2243	III
5	JS 20-116(C)	2894	3441	2330	1933	2415	2122	4691	2261	1139	1892	2512	I
	Mean	2325.6	3291.6	2004.6	1355.6	1979	1782.4	4814.6	1556.6	1414.8	1688.6		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	21.6	12		
	DOS	26-06-21	01-07-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21	29-06-21		
	CD	300.93	370.37	316.36	192.59	177.47	270.06	354.94	383.33	245.37	366.67		
	CV	8.32	7.26	10.18	9.51	7.12	9.92	4.81	16.05	11.18	13.97		

• Data received from all the Centres except Nagpur and Morena

Table 1.5.16

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : Days to Flower

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Setore	Mean	Rank
1	RVS 2011-10	44	39	41	44	39	37	42	43	38	43	41	I
2	DLsb 1	41	44	41	49	41	47	43	54	41	49	45	III
3	MACS 1520(C)	46	47	45	48	43	48	43	53	41	45	46	V
4	NRC 86(C)	42	45	44	47	38	47	43	52	41	44	44	II
5	JS 20-116(C)	42	45	45	48	41	47	43	52	42	46	45	IV
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	21.6	12		
	DOS	26-06-21	01-07-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21	29-06-21		

Table 1.5.17

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Sehore	Mean	Rank
1	RVS 2011-10	95	101	97	102	98	93	104	103	97	103	99	I
2	DLSb 1	97	108	100	105	-	97	108	102	100	109	103	IV
3	MACS 1520(C)	99	109	105	104	98	95	109	100	100	102	102	III
4	NRC 86(C)	101	106	104	104	100	96	108	107	100	104	103	V
5	JS 20-116(C)	96	98	101	103	98	95	103	106	101	103	100	II
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	21.6	12		
	DOS	26-06-21	01-07-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21	29-06-21		

Table 1.5.18

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : Plant Height (cm)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Sehore	Mean	Rank
1	RVS 2011-10	47	41	43	64	53	35	80	57	26	55	50.10	V
2	DLSb 1	69	49	50	67	-	46	90	61	36	56	58.22	III
3	MACS 1520(C)	72	67	67	63	59	42	95	55	34	63	61.70	II
4	NRC 86(C)	53	60	58	61	57	46	77	60	38	55	56.50	IV
5	JS 20-116(C)	66	63	63	81	66	48	88	69	34	64	64.20	I
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	21.6	12		
	DOS	26-06-21	01-07-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21	29-06-21		

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

Table 1.5.19

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Setore	Mean	Rank
1	RVS 2011-10	9.80	9.95	9.60	9.70	9.57	9.55	9.50	12.04	12.41	10.63	10.28	I
2	DL Sb 1	9.00	11.22	10.28	5.47	-	8.63	10.38	9.97	15.30	9.13	9.93	IV
3	MACS 1520(C)	9.57	9.95	9.58	8.10	8.95	8.53	10.25	11.10	15.66	9.13	10.08	III
4	NRC 86(C)	9.73	9.74	9.98	9.10	12.05	8.15	8.25	12.06	12.90	9.63	10.16	II
5	JS 20-116(C)	9.17	8.71	8.90	7.70	9.52	7.73	8.75	11.48	12.94	9.63	9.45	V
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	21.6	12		
	DOS	26-06-21	01-07-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21	29-06-21		

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : Oil Content (%)

Table 1.5.20

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Setore	Mean	Rank
1	RVS 2011-10	21.41	18.88	18.61	17.367	22.47	19.95	19.63	19.305	20.09	19.74	III
2	DL Sb 1	21.04	16.795	18.34			21.45	20.20	19.97	20.04	19.69	IV
3	MACS 1520(C)	21.86	22.03	18.89	17.085	23.06	21.12	20.33	18.665	20.03	20.34	I
4	NRC 86(C)	21.66	19.195	18.69	17.38	22.42	20.80	18.56	19.025	21.10	19.87	II
5	JS 20-116(C)	18.96	20.775	19.07	17.048	21.84	20.53	20.10	18.785	18.23	19.48	V
	Mean	20.99	19.54	18.72	17.22	22.44	20.77	19.76	19.15	19.90		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12		
	DOS	26-06-21	07-01-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21		

Table 1.5.21

Trial : Advanced Varietal Trial I
Zone : CENTRAL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Amravati	Anreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Sehore	Mean	Rank
1	RVS 2011-10	538.5	565.3	376.3	353.8	499.2	430.9	1000.9	386.1	420.3	507.9	II
2	DLSb 1	332.9	594.9	314.1			212.0	1030.1	132.0	233.9	407.1	V
3	MACS 1520(C)	497.5	729.2	349.8	155.6	341.4	386.3	953.4	181.4	300.5	432.8	IV
4	NRC 86(C)	511.4	608.7	393.5	276.9	403.0	377.2	833.3	359.4	378.1	460.2	III
5	JS 20-116(C)	548.7	714.9	444.2	329.5	527.4	435.7	942.7	424.7	344.8	523.6	I
	Mean	485.8	642.6	375.6	279.0	442.8	368.4	952.1	296.7	335.5		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12		
	DOS	26-06-21	07-01-21	27-06-21	28-06-21	30-06-21	20-07-21	30-06-21	23-06-21	29-06-21		

Table 1.5.22

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Amravati	Anreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Sehore	Mean	Rank
1	PS 1569	1667	2299	1628	1541	1312	2207	3086	1639	1844	1343	1857	V
2	JS 22-12	1775	2577	1906	1422	2261	2299	3619	1628	1998	1605	2109	III
3	JS 22-18	1821	2623	2076	1622	3056	2269	3819	1850	1806	1427	2237	I
4	JS 22-16	1466	2554	2454	1615	2384	2276	4259	1961	1736	1335	2204	II
5	RVSM 2012-4	1497	2407	2284	1763	1520	2106	3449	1844	1705	1790	2037	IV
6	NRC 181	1983	2492	1860	1230	1898	2431	1883	1844	1327	949	1790	VII
7	NRC 150	1721	2238	1674	1022	1929	1960	3711	1283	1312	1505	1836	VI
8	JS 95-60(C)	1265	2022	1489	770	617	1782	957	1372	1852	340	1247	IX
9	JS 20-34(C)	1296	2184	1829	1363	1049	1975	4244	1417	1289	347	1699	VIII
	Mean	1610.11	2377.33	1911.11	1372	1780.67	2145	3225.22	1648.67	1652.11	1182.33		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12.96	12.96		
	DOS	27-06-21	11-07-21	27-06-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	29-06-21	26-06-21		
	CD	262.35	324.07	246.91	340.74	138.89	300.93	655.86	344.44	347.22	185.19		
	CV	11.09	9.34	8.78	17.14	5.38	9.57	13.99	14.24	14.52	10.62		
Zonal CD (50%)												113	

· Data received from all the Centres except Nagpur and Morena

Table 1.5.23

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Days to Flower

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Mandsaur	Parbhani	Sehore	Mean	Rank
1	PS 1569	38	33	34	40	34	37	42	29	41	36	V
2	JS 22-12	35	35	36	40	35	38	45	36	40	38	VIII
3	JS 22-18	39	33	35	41	35	36	43	34	41	37	VII
4	JS 22-16	37	33	33	40	34	36	43	33	42	37	VI
5	RVSM 2012-4	37	36	33	40	38	38	46	35	39	38	IX
6	NRC 181	35	31	31	38	34	35	39	34	40	35	IV
7	NRC 150	35	30	32	40	33	31	37	37	40	35	III
8	JS 95-60(C)	33	29	32	39	31	33	36	30	37	33	II
9	JS 20-34(C)	33	29	33	38	32	32	35	28	36	33	I
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	18	12.96	2.4		
	DOS	27-06-21	11-07-21	27-06-21	29-06-21	30-06-21	20-07-21	23-06-21	29-06-21	26-06-21		

Table 1.5.24

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Mandsaur	Parbhani	Sehore	Mean	Rank
1	PS 1569	88	82	87	93	82	89	92	89	94	88	II
2	JS 22-12	90	89	87	98	84	94	91	94	98	92	IV
3	JS 22-18	95	92	89	98	85	95	95	95	97	93	VIII
4	JS 22-16	94	92	90	96	85	89	95	94	98	93	VI
5	RVSM 2012-4	96	91	91	98	88	91	96	94	97	94	IX
6	NRC 181	91	92	92	96	86	90	96	95	99	93	VII
7	NRC 150	92	88	89	99	87	88	94	96	99	92	V
8	JS 95-60(C)	91	83	86	97	82	89	87	90	90	88	I
9	JS 20-34(C)	91	86	88	96	85	88	89	88	90	89	III
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	18	12.96	2.4		
	DOS	27-06-21	11-07-21	27-06-21	29-06-21	30-06-21	20-07-21	23-06-21	29-06-21	26-06-21		
	Zonal CD (50%)										0.54	

Table 1.5.25

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Plant Height (cm)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Sehore	Mean	Rank
1	PS 1569	33	33	39	49	47	30	37	53	33	49	40.30	VII
2	JS 22-12	47	28	34	52	61	33	26	54	26	56	41.70	VI
3	JS 22-18	40	34	32	48	60	36	34	61	26	51	42.20	IV
4	JS 22-16	32	29	46	56	54	31	31	59	28	55	42.10	V
5	RVSM 2012-4	42	31	48	55	55	31	36	65	28	55	44.60	III
6	NRC 181	74	57	61	64	62	57	46	84	38	54	59.70	I
7	NRC 150	63	58	57	58	57	55	52	72	38	66	57.60	II
8	JS 95-60(C)	39	26	40	35	48	33	47	48	28	32	37.60	VIII
9	JS 20-34(C)	38	22	33	39	40	28	42	40	26	27	33.50	IX
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12.96	2.4		
	DOS	27-06-21	11-07-21	27-06-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	29-06-21	26-06-21		

Table 1.5.26

rial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Sehore	Mean	Rank
1	PS 1569	10.64	11.78	11.59	10.75	11.70	12.22	11.75	14.91	12.69	11.38	11.94	IV
2	JS 22-12	10.21	11.46	11.13	10.28	12.88	12.43	10.50	11.98	11.48	10.63	11.30	VI
3	JS 22-18	12.45	13.23	12.41	12.00	12.50	13.72	11.38	12.58	13.07	10.75	12.41	II
4	JS 22-16	10.22	11.02	10.87	9.40	11.50	11.45	9.63	14.80	11.70	11.38	11.20	VII
5	RVSM 2012-4	10.93	11.72	11.57	9.80	10.05	10.61	8.50	13.55	11.96	11.13	10.98	VIII
6	NRC 181	13.76	11.13	11.40	11.08	13.47	12.50	11.13	14.17	12.81	12.38	12.38	III
7	NRC 150	12.11	11.03	11.04	6.45	12.00	12.15	10.00	13.20	13.41	11.63	11.30	VI
8	JS 95-60(C)	13.29	13.11	12.15	9.17	12.82	12.33	12.75	15.90	12.64	11.75	12.59	I
9	JS 20-34(C)	11.92	12.06	11.57	11.45	11.50	12.30	11.00	13.90	11.57	10.00	11.73	V
	N.P.S.(Sqm)	12.96	12.96	12.96	13.50	12.96	12.96	12.96	18.00	12.96	2.40		
	DOS	27-06-21	11-07-21	27-06-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	29-06-21	26-06-21		

Table 1.5.27

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Oil Content (%)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Setore	Mean	Rank
1	PS 1569	18.18	17.98	20.10	16.87	24.58	20.69	20.30	19.26	17.53	16.77	19.22	VIII
2	JS 22-12	22.37	19.32	21.19	16.22	24.56	21.69	19.69	19.36	19.37	21.23	20.50	III
3	JS 22-18	23.62	22.67	21.02	18.83	24.92	22.43	18.40	20.63	18.89	23.91	21.53	I
4	JS 22-16	21.49	18.30	16.89	16.62	22.60	22.04	18.47	17.37	19.16	21.30	19.42	VII
5	RVSM 2012-4	22.33	17.17	20.55	17.31	23.33	21.32	18.62	19.38	20.40	20.43	20.08	VI
6	NRC 181	20.40	18.87	20.71	17.73	23.69	22.17	20.43	19.12	18.64	21.56	20.33	IV
7	NRC 150	23.19	19.76	20.94	18.01	23.87	23.85	20.64	18.60	18.43	23.20	21.05	II
8	JS 95-60(C)	21.42	16.97	19.66	16.41	22.69	21.14	19.23	18.45	17.12	17.73	19.08	IX
9	JS 20-34(C)	21.41	20.62	18.47	17.94	22.35	22.50	19.55	19.14	18.78	20.38	20.11	V
	Mean	21.60	19.07	19.95	17.33	23.62	21.98	19.48	19.03	18.70	20.72		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12.96	12.96		
	DOS	27-06-21	07-11-21	27-06-21	29-06-21	30-06-21	20-07-21	07-01-21	23-06-21	29-06-21	26-06-21		

Table 1.5.28

Trial : Advanced Varietal Trial I : Early
Zone : CENTRAL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Setore	Mean	Rank
1	PS 1569	303.0	413.4	327.1	260.0	322.5	456.6	626.5	315.6	323.3	225.2	357.3	VII
2	JS 22-12	397.0	497.9	403.8	230.7	555.2	498.7	712.4	315.1	386.9	340.7	433.8	II
3	JS 22-18	430.0	594.6	436.4	305.4	761.4	509.0	702.7	381.7	341.1	341.2	480.3	I
4	JS 22-16	315.0	467.3	414.5	268.4	538.7	501.6	786.6	340.6	332.6	284.3	425.0	III
5	RVSM 2012-4	334.3	413.2	469.4	305.2	354.6	449.0	642.0	357.3	347.7	365.6	403.8	IV
6	NRC 181	404.4	470.2	385.1	218.1	449.5	539.0	384.7	352.6	247.4	204.6	365.6	VI
7	NRC 150	399.0	442.1	350.5	184.1	460.4	467.5	765.8	238.6	241.7	349.1	389.9	V
8	JS 95-60(C)	271.0	343.1	292.7	126.4	140.0	376.7	184.0	253.1	317.1	60.3	236.4	IX
9	JS 20-34(C)	277.4	450.3	337.8	244.5	234.4	444.4	829.5	271.2	242.0	70.7	340.2	VIII
	Mean	347.9	454.7	379.7	238.1	424.1	471.4	626.0	314.0	308.9	249.1		
	N.P.S.(Sqm)	12.96	12.96	12.96	13.5	12.96	12.96	12.96	18	12.96	12.96		
	DOS	27-06-21	07-11-21	27-06-21	29-06-21	30-06-21	20-07-21	07-01-21	23-06-21	29-06-21	26-06-21		

Table 1.5.29

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	2014	3333	1560	1360	991	2356	4009	1875	1898	2155	V
2	JS 21-72	2597	3236	1856	1444	2796	1653	4810	1792	1875	2451	I
3	NRC 86(C)	2060	3421	1815	1591	2019	1875	4528	1412	2005	2303	IV
4	JS 20-98(C)	1995	3588	2181	1520	2310	1954	4435	1306	1949	2360	II
5	RSC 10-46(C)	2532	3745	1986	778	1343	1935	4718	1880	2083	2333	III
	Mean	2239.6	3464.6	1879.6	1338.6	1891.8	1954.6	4500	1653	1962		
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	01-07-21	12-07-21	29-06-21	02-07-21	20-07-21	30-06-21	29-06-21	29-06-21		
	CD	250	333.33	263.89	200	171.3	282.41	361.11	189.81	185.19		
	CV	7.26	6.2	9.03	9.65	5.88	9.38	5.18	7.49	6.14		
	Zonal CD										240	

Table 1.5.30

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Days to Flower

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	43	45	51	45	43	42	43	43	42	44	IV
2	JS 21-72	40	41	45	44	42	40	42	40	42	42	II
3	NRC 86(C)	41	44	48	43	41	41	44	41	42	43	III
4	JS 20-98(C)	43	41	45	43	41	38	42	39	42	42	I
5	RSC 10-46(C)	44	47	48	44	46	47	44	41	45	45	V
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	01-07-21	12-07-21	29-06-21	02-07-21	20-07-21	30-06-21	29-06-21	29-06-21		

Table 1.5.31

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	99	100	114	103	102	94	104	102	106	103	III
2	JS 21-72	99	96	99	102	98	92	97	99	102	98	I
3	NRC 86(C)	101	109	108	101	102	98	108	100	104	103	IV
4	JS 20-98(C)	103	106	98	104	101	94	105	99	102	101	II
5	RSC 10-46(C)	105	114	114	103	108	102	109	101	108	107	V
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	01-07-21	12-07-21	29-06-21	02-07-21	20-07-21	30-06-21	29-06-21	29-06-21	29-06-21	

Table 1.5.32

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Plant Height (cm)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	35	50	51	64	50	72	51	33	54	51.11	V
2	JS 21-72	53	69	62	62	61	63	61	29	64	58.22	III
3	NRC 86(C)	56	64	54	66	62	65	62	38	60	58.56	II
4	JS 20-98(C)	43	58	60	56	63	56	61	36	66	55.44	IV
5	RSC 10-46(C)	61	76	67	60	66	68	69	33	64	62.67	I
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	01-07-21	12-07-21	29-06-21	02-07-21	20-07-21	30-06-21	29-06-21	29-06-21		

Table 1.5.33

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	9.97	9.63	10.08	9.50	10.35	10.07	10.00	12.58	10.38	10.28	III
2	JS 21-72	11.66	12.83	12.61	13.32	13.58	12.63	13.75	13.40	12.50	12.92	I
3	NRC 86(C)	9.92	9.70	9.88	9.45	12.30	9.32	9.13	12.90	9.63	10.25	IV
4	JS 20-98(C)	10.76	10.47	10.87	10.25	10.95	10.88	10.38	13.75	10.38	10.97	II
5	RSC 10-46(C)	11.31	10.10	10.31	7.17	10.65	10.07	9.50	12.39	10.75	10.25	IV
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	01-07-21	12-07-21	29-06-21	02-07-21	20-07-21	30-06-21	29-06-21	29-06-21		

Table 1.5.34

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Oil Content (%)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	21.68	21.26	23.94	19.06	23.26	20.39	18.92	18.34	15.48	20.26	V
2	JS 21-72	18.78	20.99	24.47	18.52	22.30	22.07	19.65	17.37	22.76	20.76	II
3	NRC 86(C)	21.08	20.33	22.38	16.98	23.24	21.34	18.82	17.31	16.83	19.81	VI
4	JS 20-98(C)	21.58	20.865	25.31	19.19	21.90	19.66	19.88	18.73	17.49	20.51	III
5	RSC 10-46(C)	20.00	21.15	25.10	19.95	23.44	22.03	18.84	17.49	19.03	20.78	I
	Mean	20.62	20.92	24.24	18.74	22.83	21.10	19.22	17.85	18.32	20.42	IV
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	07-01-21	07-12-21	29-06-21	07-02-21	20-07-21	30-06-21	29-06-21	29-06-21		

Table 1.5.35

Trial : Advanced Varietal Trial II
Zone : CENTRAL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Parbhani	Sehore	Mean	Rank
1	HIMSO 1689	436.6	708.6	373.4	259.3	230.5	480.5	758.5	343.8	293.7	431.6	V
2	JS 21-72	487.7	679.1	454.1	267.4	623.4	364.8	944.9	311.2	426.8	506.6	I
3	NRC 86(C)	434.2	695.3	406.1	270.1	469.2	400.1	852.2	244.3	337.4	456.6	IV
4	JS 20-98(C)	430.4	748.6	552.0	291.7	505.9	384.1	881.7	244.6	340.9	486.7	II
5	RSC 10-46(C)	506.4	792.1	498.5	155.2	314.8	426.3	888.9	328.8	396.4	478.6	III
	Mean	459.1	724.7	456.8	248.7	428.7	411.1	865.2	294.5	359.0		
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	21.6	21.6		
	DOS	27-06-21	07-01-21	07-12-21	29-06-21	07-02-21	20-07-21	30-06-21	29-06-21	29-06-21		

Table 1.5.36

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	1778	-	-	1476	-	1907	2995	1725	1745	1938	I
2	NRC 152	1366	2389	2130	1591	1181	1519	3532	900	1315	1843	II
3	JS 20-34(C)	1190	1986	1657	1271	852	1764	3968	1107	1227	1771	III
4	JS 95-60(C)	903	2106	1838	391	296	1880	1981	1321	1556	1497	IV
	Mean	1309.25	2160.33	1875	1182.25	776.33	1767.5	3119	1263.25	1460.75		
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	28	21.6		
	DOS	27-06-21	11-07-21	09-08-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	26-06-21		
	CD	78.7	226.85	175.93	222.22	101.85	263.89	652.78	378.57	236.11		
	CV	3.73	8.7	7.85	11.75	11.16	9.34	13.06	18.8	10.03		
	Zonal CD (10%)										237	
	Zonal CD (50%)										97	

. Data of Jabalpur not included due to low <1000kg/ha mean yield

Table 1.5.37

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Days to Flower

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	32	-	-	42	-	36	31	35	31	35	IV
2	NRC 152	31	27	37	40	33	28	30	36	30	32	I
3	JS 20-34(C)	32	29	32	39	33	31	38	35	28	33	III
4	JS 95-60(C)	33	29	35	39	31	33	30	35	30	33	II
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	28	21.6		
	DOS	27-06-21	11-07-21	09-08-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	26-06-21		

Table 1.5.38

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Days to Maturity

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	88	-	-	101	-	88	86	97	91	92	IV
2	NRC 152	90	86	89	94	85	87	93	94	90	90	III
3	JS 20-34(C)	91	85	83	94	83	88	105	90	88	90	II
4	JS 95-60(C)	92	82	87	97	81	89	80	90	90	88	I
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	28	21.6		
	DOS	27-06-21	11-07-21	09-08-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	26-06-21		
	Zonal CD (5%)										1.5	
	Zonal CD (50%)										1.3	

Table 1.5.39

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Plant Height (cm)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	41	-	-	52	-	49	47	58	34	47	II
2	NRC 152	49	46	45	69	51	40	50	59	34	49	I
3	JS 20-34(C)	26	25	34	32	46	34	44	33	25	33	IV
4	JS 95-60(C)	41	30	41	43	49	37	39	40	24	38	III
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	28	21.6		
	DOS	27-06-21	11-07-21	09-08-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	26-06-21		

Table 1.5.40

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Kota	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	8.87	-	-	9.45	-	11.45	9.63	12.57	9.90	10.31	IV
2	NRC 152	12.23	12.66	12.09	10.75	12.63	12.95	14.38	13.59	12.80	12.68	I
3	JS 20-34(C)	10.79	11.90	11.13	12.20	10.27	12.82	9.88	13.45	11.63	11.56	III
4	JS 95-60(C)	13.97	13.10	12.17	8.50	12.10	12.35	12.75	15.61	12.77	12.59	II
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	21.6	28	21.6		
	DOS	27-06-21	11-07-21	09-08-21	29-06-21	30-06-21	20-07-21	01-07-21	23-06-21	26-06-21		

Table 1.5.41

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Oil Content (%)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	Sanosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	20.62		25.15	18.0		19.14	17.64	18.43	19.8300	IV
2	NRC 152	21.55	22.385	25.16	18.7	23.81	19.34	20.79	17.61	21.1725	II
3	JS 20-34(C)	23.15	22.165	24.82	20.4	23.97	19.18	20.05	18.21	21.4901	I
4	JS 95-60(C)	19.37	21.545	22.75	19.9		18.49	19.00	17.97	19.8596	III
	Mean	23.67	22.03	24.47	19.3	23.89	19.04	19.37	18.05		
	N.P.S.(Sqm)	21.60	21.60	21.60	22.5	21.60	21.60	28.00	21.60		
	DOS	27-06-21	07-11-21	08-09-21	29-06-21	30-06-21	07-01-21	23-06-21	26-06-21		

Table 1.5.42

Trial : Advanced Varietal Trial II : Early
Zone : CENTRAL ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Amravati	Amreli	Anand	Indore	Jabalpur	anosara	Mandsaur	Parbhani	Mean	Rank
1	NRC 165	544.5			265.5		573.1	304.3	321.5	435.9	I
2	NRC 152	294.4	534.8	535.8	298.2	281.2	683.1	187.1	231.5	392.6	II
3	JS 20-34(C)	275.4	440.2	411.2	259.2	204.2	761.1	221.9	223.4	362.5	III
4	JS 95-60(C)	174.9	453.7	418.1	77.8		366.3	250.9	279.6	323.9	IV
	Mean	322.3	476.2	455.0	225.2	242.7	595.9	241.1	264.0		
	N.P.S.(Sqm)	21.6	21.6	21.6	22.5	21.6	21.6	28	21.6		
	DOS	27-06-21	07-11-21	08-09-21	29-06-21	30-06-21	07-01-21	23-06-21	26-06-21		

Table 1.5.43

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	341	1265	1844	1555	V
2	Hara Soya(C)	207	1312	2245	1779	III
3	JS 95-60(C)	800	1806	2238	2022	I
4	Karune(C)	148	2083	1644	1864	II
5	JS 20-34*(C)	1383	1960	1265	1613	IV
	Mean	575.8	1685.2	1847.2		
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		
	CD	291.36	308.64	239.2		
	CV	33.07	12	8.35		

Table 1.5.44

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Green Pod Yield (Kg/ha) at Picking**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	1807	1600	5758	3055	III
2	Hara Soya(C)	1346	2189	4379	2638	IV
3	JS 95-60(C)	1293	3233	8553	4360	II
4	Karune(C)	448	-	3607	2028	V
5	JS 20-34*(C)	4933	3673	4591	4399	I
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		

Table 1.5.45

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Days to Flower**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	41	35	34	37	III
2	Hara Soya(C)	43	38	38	40	V
3	JS 95-60(C)	44	33	30	36	II
4	Karune(C)	42	38	33	38	IV
5	JS 20-34*(C)	42	33	28	34	I
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		

Table 1.5.46a

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Days to Picking at R6**

S.No	Varieties	Kota	Parbhani	Mean	Rank
1	NRC 188	75.3	76.5	75.9	IV
2	Hara Soya(C)	77.0	75.8	76.4	V
3	JS 95-60(C)	67.5	70.5	69.0	I
4	Karune(C)	73.0	77.5	75.3	III
5	JS 20-34*(C)	67.0	72.5	69.8	II
	N.P.S.(Sqm)	12.96	12.96		
	DOS	20-07-21	26-06-21		

Table 1.5.46b

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Days to Maturity**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	102	98	96	99	IV
2	Hara Soya(C)	100	100	98	99	V
3	JS 95-60(C)	95	89	90	91	II
4	Karune(C)	97	91	92	93	III
5	JS 20-34*(C)	97	89	87	91	I
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		

Table 1.5.47

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Plant Height (cm)**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	38	21	36	32	IV
2	Hara Soya(C)	47	39	33	40	II
3	JS 95-60(C)	37	38	30	35	III
4	Karune(C)	39	53	34	42	I
5	JS 20-34*(C)	38	31	26	32	IV
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		

Table 1.5.48

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Indore	Kota	Parbhani	Mean	Rank
1	NRC 188	13.25	17.72	20.12	17.03	I
2	Hara Soya(C)	7.50	10.82	14.96	11.09	V
3	JS 95-60(C)	8.20	12.35	12.99	11.18	IV
4	Karune(C)	12.82	12.28	21.85	15.65	II
5	JS 20-34*(C)	11.50	12.50	11.64	11.88	III
	N.P.S.(Sqm)	20.25	12.96	12.96		
	DOS	29-06-21	20-07-21	26-06-21		

Table 1.5.49

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Oil Content (%)**

S.No	Varieties	Indore	Parbhani	Mean	Rank
1	NRC 188	22.29	21.21	21.75	I
2	Hara Soya(C)	20.89	21.55	21.22	II
3	JS 95-60(C)	20.27	17.67	18.97	V
4	Karune(C)	21.79	18.28	20.03	III
5	JS 20-34*(C)	21.02	17.42	19.22	IV
	Mean	21.25	19.22		
	N.P.S.(Sqm)	20.25	12.96		
	DOS	29-06-21	26-06-21		

Table 1.5.50

Trial : Advanced Varietal Trial I : Vegetable Soybean**Zone : CENTRAL ZONE****Character : Oil Yield (kg/ha)**

S.No	Varieties	Indore	Parbhani	Mean	Rank
1	NRC 188	76.0	391.0	233.5	IV
2	Hara Soya(C)	43.2	483.8	263.5	II
3	JS 95-60(C)	162.2	395.5	278.8	I
4	Karune(C)	32.3	300.4	166.3	V
5	JS 20-34*(C)	290.7	220.3	255.5	III
	Mean	120.9	358.2		
	N.P.S.(Sqm)	20.25	12.96		
	DOS	29-06-21	26-06-21		

Table 1.6.1

Trial : Initial Varietal Trial**Zone : SOUTHERN ZONE****Character : Yield(Kg/ha)**

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	1975	1458	1210	741	914	2099	1400	LIV
2	KBS 21-1	2395	1488	2272	1772	3556	3309	2465	XVIII
3	MAUS 818	2938	2679	2148	1481	2938	2642	2471	XVI
4	MAUS 791	3358	1190	2395	1481	3111	3160	2449	XIX
5	AMS 115	3284	744	1704	1376	2000	2469	1930	LII
6	AMS 19-01	3235	1607	1802	1296	3136	2000	2179	XLV
7	RVS 13-20	2988	1071	2370	1720	2889	2815	2309	XXXVI
8	RVS 13-15	2642	2321	2222	1614	2642	2420	2310	XXXV
9	DLSb 3	3185	1964	2321	2116	3235	3136	2660	IX
10	DLSb 4	2889	2262	2123	2196	3259	3160	2648	X
11	DSb 39	2420	2351	3086	2381	3802	3111	2859	II
12	DSb 34 (C)	2395	714	2963	2302	3753	3284	2569	XIII
13	AS 40	1654	1607	2815	2116	3062	2444	2283	XXXIX
14	AS 24	3457	1577	3037	1958	3383	2667	2680	VII
15	JS 23-08	2815	744	1531	1508	2222	2173	1832	LIII
16	JS 23-05	3654	1012	2346	1481	2543	2642	2280	XL
17	DS 1312	3185	1101	2494	1905	2617	2988	2382	XXVI
18	DS 3163	3160	833	2519	1614	3259	2494	2313	XXXIII
19	DS 3168	2148	1458	2444	1693	2543	2444	2122	XLVIII
20	DS 3124	3556	1310	2346	1799	3284	2370	2444	XXI
21	SL 1282	2790	2083	1630	1878	2667	2173	2204	XLIII
22	SL 1230	3284	1190	2469	1852	3309	2519	2437	XXII
23	HIMSO-1694	3481	833	2444	1746	2716	2642	2310	XXXIV
24	HIMSO-1693	3086	774	2296	1878	2346	2642	2170	XLVI
25	VLS 103	3333	1101	2568	2143	2444	2790	2397	XXV
26	VLS 102	3284	1488	2617	1958	2543	2914	2467	XVII
27	DSb 23 (C)	3481	2589	3333	2566	3383	3333	3114	I
28	PS 1605	3506	774	2444	1534	2963	2617	2306	XXXVII
29	PS 1689	3630	804	1556	1455	2395	1901	1957	LI
30	PS 1682	3556	744	1877	1402	3160	2346	2181	XLIV
31	RSC 11-48	3210	893	2370	1772	3235	2494	2329	XXX
32	RSC 11-42	3531	1458	2815	1984	3160	3160	2685	VI
33	BAUS(M)-3	3531	1220	2148	1772	2840	2395	2318	XXXII
34	BAUS-116	3531	1250	1877	1852	2914	2494	2320	XXXI
35	CAUMS 2	3309	1518	3111	1984	2840	2395	2526	XV
36	NRC 195	3679	1012	2395	2037	2370	2296	2298	XXXVIII
37	NRC 203	3506	1042	1877	1138	2593	2494	2108	XLIX
38	NRC 193	3580	1310	2370	1878	2716	2617	2412	XXIV
39	NRC 192	3457	1161	2321	1614	3037	2988	2430	XXIII
40	NRC 191	3630	774	1556	1376	2765	2790	2149	XLVII
41	NRC 190	3481	1607	3012	1825	3111	2667	2617	XII

42	KDS 753 (C)	3358	1964	2864	2037	3531	3136	2815	IV
43	NRC 189	3012	1429	2568	1508	3111	2568	2366	XXVIII
44	RVSM 16-20	2691	1339	2469	1243	2840	2667	2208	XLII
45	KDS 1175	3383	2024	2765	2063	3975	2864	2846	III
46	KDS 1187	3481	1548	2222	2116	3284	3383	2672	VIII
47	KDS 1149	3185	1518	3358	1481	3259	3037	2640	XI
48	MACS 1672	3383	1131	1951	794	1556	3160	1996	L
49	ACS 1735	3605	2232	2642	2090	2963	3062	2766	V
50	ASb 15	3531	1845	2420	1905	2568	3062	2555	XIV
51	TS 21-2	2790	1756	1926	2196	2765	2765	2366	XXVII
52	TS 21-1	3284	1667	2370	2063	2049	2741	2362	XXIX
53	LOKSOY-1	2988	1042	2420	2037	2543	2568	2266	XLI
54	KSS 204	3062	1369	2765	1720	3259	2519	2449	XX
	Mean	3165.96	1407.04	2369.89	1767.54	2877	2704.19		
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	15-07-21	10-07-21		
	CD	543.21	416.67	419.75	343.92	493.83	271.6		
	CV	10.68	18.84	10.72	12.38	10.69	6.47		

- Trial failed at Ugarkhurd due to severe rains.

Table 1.6.2

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : Days to Flower

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	27	38	32	43	36	32	35	II
2	KBS 21-1	39	43	40	41	40	37	40	XIX
3	MAUS 818	43	39	42	39	39	34	39	XVI
4	MAUS 791	40	42	36	41	40	33	39	XII
5	AMS 115	41	39	38	40	37	33	38	X
6	AMS 19-01	43	45	43	42	41	39	42	XXV
7	RVS 13-20	40	42	38	41	40	33	39	XIV
8	RVS 13-15	41	46	41	41	39	34	40	XXI
9	DLSb 3	41	39	40	42	40	37	40	XVIII
10	DLSb 4	41	44	43	44	42	40	42	XXVI
11	DSb 39	45	48	43	45	44	40	44	XXX
12	DSb 34 (C)	39	44	40	41	39	35	40	XVII
13	AS 40	46	53	45	46	45	42	46	XXXIII
14	AS 24	40	42	40	42	38	37	40	XVIII
15	JS 23-08	41	41	38	43	38	33	39	XIV
16	JS 23-05	39	40	38	37	36	33	37	V
17	DS 1312	40	40	36	39	38	33	38	VIII
18	DS 3163	40	39	38	40	38	33	38	X
19	DS 3168	41	42	38	39	40	35	39	XV
20	DS 3124	45	41	41	42	40	37	41	XXIII
21	SL 1282	42	52	41	46	38	34	42	XXV
22	SL 1230	40	39	38	38	36	33	37	VI
23	HIMSO-1694	39	38	38	39	35	33	37	IV
24	HIMSO-1693	40	39	38	40	35	33	38	VII
25	VLS 103	40	40	37	39	35	33	37	VI
26	VLS 102	39	39	38	40	38	34	38	X
27	DSb 23 (C)	45	47	42	44	41	40	43	XXVII
28	PS 1605	41	39	36	38	38	34	38	VIII
29	PS 1689	47	48	46	45	45	42	46	XXXII
30	PS 1682	42	42	38	40	40	37	40	XVIII
31	RSC 11-48	46	46	43	45	42	40	44	XXIX
32	RSC 11-42	45	41	41	42	39	35	41	XXII
33	BAUS(M)-3	48	43	43	45	42	38	43	XXVII
34	BAUS-116	44	45	42	45	41	37	42	XXVI
35	CAUMS 2	42	50	43	45	41	39	43	XXVIII
36	NRC 195	41	40	40	39	38	35	39	XIII
37	NRC 203	41	42	36	38	36	34	38	IX
38	NRC 193	40	45	43	43	41	39	42	XXIV
39	NRC 192	38	37	38	38	38	32	37	III
40	NRC 191	29	41	32	37	35	32	34	I

41	NRC 190	45	42	42	43	41	38	42	XXIV
42	KDS 753 (C)	46	47	44	47	41	41	44	XXXI
43	NRC 189	42	41	42	43	41	37	41	XXIII
44	RVSM 16-20	41	37	35	37	38	33	37	III
45	KDS 1175	40	40	37	39	37	34	38	IX
46	KDS 1187	41	39	37	37	37	33	37	VI
47	KDS 1149	42	39	38	38	38	35	38	XI
48	MACS 1672	40	39	37	43	37	32	38	X
49	ACS 1735	42	43	40	43	40	34	40	XXI
50	ASb 15	39	39	38	39	37	34	38	VIII
51	TS 21-2	45	50	43	43	41	37	43	XXVII
52	TS 21-1	45	48	44	47	41	41	44	XXXI
53	LOKSOY-1	44	39	41	42	38	35	40	XVIII
54	KSS 204	45	39	43	42	37	35	40	XX
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	15-07-21	10-07-21		

Table 1.6.3

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : Days to Maturity

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	89	110	98	83	85	87	92	VII
2	KBS 21-1	104	98	102	85	89	85	94	XIII
3	MAUS 818	107	97	109	87	94	91	98	XXVIII
4	MAUS 791	105	92	102	88	81	85	92	VIII
5	AMS 115	107	97	102	80	94	89	95	XVIII
6	AMS 19-01	111	95	106	92	91	89	97	XXVII
7	RVS 13-20	107	92	68	84	82	85	86	II
8	RVS 13-15	106	84	96	86	81	86	90	III
9	DLSb 3	108	92	107	92	93	92	97	XXVII
10	DLSb 4	107	101	110	94	99	92	101	XXXV
11	DSb 39	112	104	110	94	97	92	102	XXXVII
12	DSb 34 (C)	104	94	100	91	87	87	94	XIII
13	AS 40	112	123	111	108	98	94	108	XL
14	AS 24	105	89	98	82	83	86	91	V
15	JS 23-08	107	95	96	94	84	86	94	XII
16	JS 23-05	104	87	69	79	85	86	85	I
17	DS 1312	105	85	102	82	89	86	92	VI
18	DS 3163	104	83	101	84	89	88	92	VI
19	DS 3168	107	107	111	83	93	92	99	XXXI
20	DS 3124	111	99	109	90	97	92	100	XXXII
21	SL 1282	109	114	112	94	99	97	104	XXXIX
22	SL 1230	105	93	109	85	93	89	96	XX
23	HIMSO-1694	103	90	109	79	92	90	94	XIII

24	HIMSO-1693	105	88	112	81	90	89	94	XV
25	VLS 103	106	87	104	80	90	88	93	IX
26	VLS 102	104	86	103	93	90	86	94	XII
27	DSb 23 (C)	113	92	115	94	97	92	101	XXXV
28	PS 1605	106	101	98	80	90	87	94	XII
29	PS 1689	113	131	119	94	100	94	109	XLI
30	PS 1682	108	109	109	90	93	89	100	XXXII
31	RSC 11-48	115	117	108	95	91	88	102	XXXVIII
32	RSC 11-42	110	94	103	92	89	89	96	XXII
33	BAUS(M)-3	116	90	117	92	92	92	100	XXXIII
34	BAUS-116	110	85	102	93	90	87	95	XVII
35	CAUMS 2	108	104	102	94	84	89	97	XXV
36	NRC 195	105	99	107	80	84	87	94	XII
37	NRC 203	105	98	109	80	84	87	94	XIII
38	NRC 193	105	104	115	93	97	88	100	XXXIV
39	NRC 192	103	94	119	84	89	89	96	XXIII
40	NRC 191	90	92	102	81	90	86	90	IV
41	NRC 190	110	88	102	84	86	86	93	X
42	KDS 753 (C)	112	92	102	109	96	92	101	XXXV
43	NRC 189	105	95	104	84	91	87	94	XVI
44	RVSM 16-20	103	99	104	78	84	89	93	XI
45	KDS 1175	107	99	107	88	91	88	97	XXIV
46	KDS 1187	104	96	107	88	92	89	96	XXI
47	KDS 1149	105	94	115	89	90	90	97	XXVI
48	MACS 1672	104	90	102	91	91	86	94	XIV
49	ACS 1735	106	95	104	92	90	86	96	XIX
50	ASb 15	103	87	104	86	91	86	93	XI
51	TS 21-2	110	93	111	93	92	88	98	XXIX
52	TS 21-1	112	103	111	95	93	92	101	XXXVI
53	LOKSOY-1	109	97	115	91	90	89	99	XXX
54	KSS 204	112	95	104	85	90	90	96	XXI
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	15-07-21	10-07-21		

Table 1.6.4

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : Plant Height (cm)

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	54	31	30	31	33	35	35.67	LI
2	KBS 21-1	104	59	61	55	74	81	72.33	III
3	MAUS 818	77	43	32	48	63	62	54.17	XXVI
4	MAUS 791	87	42	41	46	59	60	55.83	XXII
5	AMS 115	65	29	37	25	40	42	39.67	XLVII
6	AMS 19-01	87	36	50	36	54	44	51.17	XXXII
7	RVS 13-20	68	44	43	51	47	56	51.50	XXXI
8	RVS 13-15	71	34	43	39	38	44	44.83	XXXVIII
9	DLSb 3	117	45	61	60	59	76	69.67	V
10	DLSb 4	71	49	58	49	63	83	62.17	XIII
11	DSb 39	77	48	54	54	41	69	57.17	XX
12	DSb 34 (C)	88	47	39	43	57	71	57.50	XIX
13	AS 40	102	51	68	62	75	81	73.17	II
14	AS 24	62	37	46	43	55	69	52.00	XXX
15	JS 23-08	72	31	44	39	43	39	44.67	XXXIX
16	JS 23-05	61	33	40	38	46	50	44.67	XXXIX
17	DS 1312	68	28	29	26	40	48	39.83	XLVI
18	DS 3163	70	28	31	25	39	48	40.17	XLV
19	DS 3168	63	35	40	30	42	52	43.67	XLI
20	DS 3124	68	35	37	31	52	49	45.33	XXXVII
21	SL 1282	91	51	44	53	65	76	63.33	XII
22	SL 1230	65	35	36	33	44	44	42.83	XLII
23	HIMSO-1694	62	29	41	32	41	49	42.33	XLIII
24	HIMSO-1693	58	30	37	36	40	45	41.00	XLIV
25	VLS 103	56	30	33	28	35	38	36.67	L
26	VLS 102	60	50	42	53	61	55	53.50	XXVII
27	DSb 23 (C)	85	55	56	54	64	70	64.00	X
28	PS 1605	81	29	36	38	38	42	44.00	XL
29	PS 1689	103	50	61	42	62	79	66.17	VII
30	PS 1682	89	37	41	32	54	43	49.33	XXXIII
31	RSC 11-48	90	43	60	46	59	59	59.50	XVI
32	RSC 11-42	68	41	56	52	55	56	54.67	XXIV
33	BAUS(M)-3	82	54	54	54	72	72	64.67	VIII
34	BAUS-116	96	45	40	47	60	58	57.67	XVIII
35	CAUMS 2	83	51	56	48	59	68	60.83	XIV
36	NRC 195	97	42	50	43	54	53	56.50	XXI
37	NRC 203	73	26	43	34	41	47	44.00	XL
38	NRC 193	92	54	57	50	46	65	60.67	XV
39	NRC 192	74	37	48	36	46	53	49.00	XXXIV
40	NRC 191	58	27	36	39	34	37	38.50	XLVIII

41	NRC 190	85	39	49	36	56	55	53.33	XXVIII
42	KDS 753 (C)	100	59	72	49	69	71	70.00	IV
43	NRC 189	90	38	47	32	56	58	53.50	XXVII
44	RVSM 16-20	68	30	43	29	52	51	45.50	XXXVI
45	KDS 1175	89	41	57	63	64	67	63.50	XI
46	KDS 1187	109	46	57	62	62	79	69.17	VI
47	KDS 1149	71	34	52	37	43	54	48.50	XXXV
48	MACS 1672	55	34	39	30	33	39	38.33	XLIX
49	ACS 1735	63	56	50	52	44	65	55.00	XXIII
50	ASb 15	76	49	56	52	55	67	59.17	XVII
51	TS 21-2	85	63	58	61	52	67	64.33	IX
52	TS 21-1	91	55	77	65	91	97	79.33	I
53	LOKSOY-1	72	39	49	53	57	57	54.50	XXV
54	KSS 204	72	36	48	43	57	58	52.33	XXIX
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	15-07-21	10-07-21		

Table 1.6.5

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : 100 Seed Weight (g)

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	29.80	11.00	34.97	28.34	28.70	33.90	27.79	I
2	KBS 21-1	14.47	11.67	19.57	14.55	14.64	13.73	14.77	XI
3	MAUS 818	14.90	13.67	18.07	18.02	15.42	13.47	15.59	VI
4	MAUS 791	14.33	11.67	16.77	12.99	15.03	11.93	13.79	XVII
5	AMS 115	14.33	8.67	19.13	13.56	13.84	11.60	13.52	XX
6	AMS 19-01	13.40	10.33	12.47	13.45	11.72	9.17	11.76	XXXV
7	RVS 13-20	12.87	10.00	13.83	12.50	11.84	11.77	12.14	XXXI
8	RVS 13-15	13.73	12.00	13.73	10.74	11.94	10.53	12.11	XXXII
9	DLSb 3	15.93	13.00	14.90	14.74	12.37	12.93	13.98	XV
10	DLSb 4	15.23	12.00	16.00	15.47	13.68	12.73	14.19	XIV
11	DSb 39	12.83	11.33	12.83	13.84	12.97	12.80	12.77	XXVII
12	DSb 34 (C)	13.57	11.00	13.70	13.66	12.98	12.13	12.84	XXVI
13	AS 40	10.87	8.33	11.20	9.74	10.20	7.87	9.70	XLIX
14	AS 24	12.77	10.00	11.63	11.87	11.31	9.80	11.23	XLIII
15	JS 23-08	12.33	9.00	12.93	12.43	11.66	11.83	11.70	XXXVII
16	JS 23-05	13.20	10.67	17.13	13.07	14.91	13.73	13.79	XVII
17	DS 1312	12.83	8.33	12.97	13.17	12.61	10.00	11.65	XXXVIII
18	DS 3163	13.87	8.33	12.93	12.56	12.66	10.17	11.75	XXXVI
19	DS 3168	12.53	8.67	11.97	13.19	11.81	9.03	11.20	XLIV
20	DS 3124	15.27	11.33	13.50	14.06	14.63	10.63	13.24	XXIII
21	SL 1282	14.63	14.00	12.50	13.83	11.96	10.10	12.84	XXVI
22	SL 1230	16.00	12.67	16.57	16.56	15.16	12.40	14.89	X
23	HIMSO-1694	12.43	9.33	13.43	12.82	13.29	10.83	12.02	XXXIV
24	HIMSO-1693	12.37	8.67	14.13	14.17	15.30	11.30	12.66	XXVIII
25	VLS 103	15.50	11.67	16.73	18.02	16.70	14.67	15.55	VII
26	VLS 102	15.83	14.33	14.63	16.11	16.20	12.77	14.98	IX
27	DSb 23 (C)	13.60	12.33	13.33	13.86	14.52	12.37	13.34	XXII
28	PS 1605	14.57	8.33	15.10	15.00	14.18	12.83	13.34	XXII
29	PS 1689	11.50	9.00	11.83	13.74	11.73	8.77	11.10	XLV
30	PS 1682	13.30	8.00	12.37	12.75	12.93	9.60	11.49	XL
31	RSC 11-48	11.67	9.00	11.57	11.28	10.50	10.47	10.75	XLVII
32	RSC 11-42	10.67	11.33	11.10	11.95	10.16	9.30	10.75	XLVII
33	BAUS(M)-3	14.00	12.33	14.40	14.30	13.04	10.47	13.09	XXIV
34	BAUS-116	12.43	8.00	12.50	12.26	14.64	9.97	11.63	XXXIX
35	CAUMS 2	11.40	9.00	13.03	13.04	11.80	10.47	11.46	XLI
36	NRC 195	14.30	9.33	16.63	15.71	12.83	12.43	13.54	XIX
37	NRC 203	15.10	14.00	20.10	17.17	17.67	15.63	16.61	III
38	NRC 193	11.43	8.67	12.73	12.99	11.49	10.13	11.24	XLII
39	NRC 192	12.80	10.67	14.37	12.63	11.50	11.67	12.27	XXIX
40	NRC 191	17.33	10.33	21.83	17.99	19.64	18.30	17.57	II
41	NRC 190	11.70	10.33	10.90	11.04	10.82	9.40	10.70	XLVIII

42	KDS 753 (C)	15.83	13.33	18.60	16.93	16.90	15.90	16.25	IV
43	NRC 189	11.77	8.67	12.10	11.47	13.12	8.70	10.97	XLVI
44	RVSM 16-20	13.97	8.67	13.67	12.53	11.71	11.77	12.05	XXXIII
45	KDS 1175	14.30	10.67	14.20	13.75	16.00	11.97	13.48	XXI
46	KDS 1187	15.47	11.67	17.93	16.25	14.85	14.80	15.16	VIII
47	KDS 1149	13.77	9.67	12.97	12.94	13.35	10.73	12.24	XXX
48	MACS 1672	14.53	12.67	16.40	17.69	14.69	12.53	14.75	XIII
49	ACS 1735	14.33	10.67	15.27	14.29	15.28	12.10	13.66	XVIII
50	ASb 15	13.83	12.33	17.37	15.19	15.56	14.30	14.76	XII
51	TS 21-2	14.27	10.00	16.43	13.99	11.50	12.07	13.04	XXV
52	TS 21-1	14.73	11.33	15.30	15.27	13.66	12.90	13.87	XVI
53	LOKSOY-1	15.27	12.00	19.93	16.98	15.32	15.37	15.81	V
54	KSS 204	15.33	9.00	16.83	13.21	15.50	13.37	13.87	XVI
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	15-07-21	10-07-21		

Table 1.6.6

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : Oil Content (%)

S.No	Varieties	Bangalore	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	22.73	19.08	21.46	20.47	20.935	XLII
2	KBS 21-1	22.6	19.91	20.87	20.89	21.068	XXXVII
3	MAUS 818	22.29	20.05	22.37	20.97	21.420	XXVIII
4	MAUS 791	22.85	19.29	22.47	21.80	21.604	XXI
5	AMS 115	22.73	18.98	20.72	21.35	20.944	XLI
6	AMS 19-01	20.69	22.04	21.71	20.83	21.319	XXXI
7	RVS 13-20	19.57	19.88	20.55	20.43	20.107	LII
8	RVS 13-15	20.61	20.98	21.9	20.38	20.967	XL
9	DLSb 3	20.53	20.78	20.75	20.97	20.756	XLIV
10	DLSb 4	22.72	22.08	20.78	22.01	21.899	XII
11	DSb 39	20.74	20.91	20.8	22.69	21.284	XXXIV
12	DSb 34 (C)	20.77	21.71	19.71	19.65	20.459	XLVIII
13	AS 40	22.84	20.51	20.6	21.22	21.292	XXXIII
14	AS 24	18.3	20.44	20.73	20.26	19.931	LIII
15	JS 23-08		23.11	21.47	20.29	21.625	XVIII
16	JS 23-05	25.46	20.57	19.11	21.05	21.547	XXIII
17	DS 1312	23.11	23.52	21.06	22.26	22.487	V
18	DS 3163	23.06	20.17	22.67	20.59	21.623	XIX
19	DS 3168	24.05	21.81	20.6	21.73	22.047	XI
20	DS 3124		22.82	21.31	21.28	21.802	XIV
21	SL 1282	24.27	23.76	21.69	21.11	22.706	II
22	SL 1230	22.54	22.02	22.92	21.88	22.340	VI
23	HIMSO-1694	22.76	19.87	21.38	22.41	21.605	XX
24	HIMSO-1693	22.66	21.22	21.29	21.00	21.542	XXIV
25	VLS 103	23.17	22.17	22.73	20.99	22.265	VII

26	VLS 102	25.46	21.67	22.23	21.72	22.768	I
27	DSb 23 (C)	23.67	21.21	21.86	21.99	22.181	IX
28	PS 1605	20.32	22.97	22.52	20.04	21.462	XXV
29	PS 1689	20.34	21.93	21.15	20.56	20.994	XXXIX
30	PS 1682	24.93	21.76	21.48	20.54	22.176	X
31	RSC 11-48	27.68	22.47	20.48	19.86	22.621	III
32	RSC 11-42	22.31	22.03	22.4	22.01	22.188	VIII
33	BAUS(M)-3	21.49	20.71	20.1	21.07	20.841	XLIII
34	BAUS-116	20.65	23.39	20.06	22.66	21.689	XVI
35	CAUMS 2	21.64	22.80	21.68	20.75	21.718	XV
36	NRC 195	17.64	21.05	21.73	21.32	20.434	XLIX
37	NRC 203	20.61	19.45	18.67	20.43	19.789	LIV
38	NRC 193	21.15	21.95	19.27	20.34	20.677	XLV
39	NRC 192	23.99	21.85	19.33	20.56	21.432	XXVII
40	NRC 191	22.34	18.82	19.77	19.92	20.211	LI
41	NRC 190	21.24	20.64	20.76	21.43	21.019	XXXVIII
42	KDS 753 (C)	19.54	20.91	19.54	21.54	20.381	L
43	NRC 189	20.3	21.33	20.68	20.29	20.651	XLVI
44	RVSM 16-20	21.79	21.99	21.39	20.04	21.302	XXXII
45	KDS 1175	21.88	23.03	20.41	20.44	21.439	XXVI
46	KDS 1187	22.97	21.47	21.29	19.66	21.347	XXX
47	KDS 1149	21.4	22.06	21.94	22.19	21.899	XIII
48	MACS 1672	22.89	22.02	22.71	22.87	22.620	IV
49	ACS 1735	21.18	21.58	21.49	20.61	21.213	XXXV
50	ASb 15	21.23	21.30	21.65	20.37	21.135	XXXVI
51	TS 21-2	22.8	22.11	21.41	19.98	21.574	XXII
52	TS 21-1	21.25	22.97		20.83	21.684	XVII
53	LOKSOY-1	20.91	20.13	20.21	21.10	20.586	XLVII
54	KSS 204	22.53	21.71	21.32	20.01	21.392	XXIX
	Mean	22.06	21.39	21.12	20.99		
	N.P.S.(Sqm)	3.36	3.78	4.05	4.05		
	DOS	16-07-21	14-07-21	15-07-21	10/7/2021		

Table 1.6.7

Trial : Initial Varietal Trial
Zone : SOUTHERN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Bangalore	Dharwad	K. Digraj	Pune	Mean	Rank
1	SKAU-WSB-101	331.4	141.4	196.1	429.7	274.7	LIV
2	KBS 21-1	336.3	352.8	742.1	691.3	530.6	XI
3	MAUS 818	597.1	296.9	657.2	554.0	526.3	XII
4	MAUS 791	271.9	285.7	699.0	689.0	486.4	XXI
5	AMS 115	169.1	261.2	414.4	527.0	342.9	LIII
6	AMS 19-01	332.5	285.6	680.8	416.7	428.9	XXXVII
7	RVS 13-20	209.6	341.9	593.7	575.1	430.1	XXXVI
8	RVS 13-15	478.4	338.6	578.6	493.2	472.2	XXVI
9	DLSb 3	403.2	439.6	671.3	657.6	542.9	VIII
10	DLSb 4	513.9	484.9	677.2	695.7	592.9	III
11	DSb 39	487.6	497.9	790.8	705.8	620.5	II
12	DSb 34 (C)	148.3	499.6	739.7	645.4	508.3	XIV
13	AS 40	367.0	433.9	630.8	518.7	487.6	XX
14	AS 24	288.6	400.1	701.3	540.3	482.6	XXIII
15	JS 23-08		348.5	477.1	441.0	422.2	XLII
16	JS 23-05	257.7	304.6	486.0	556.1	401.1	XLVII
17	DS 1312	254.4	448.0	551.1	665.2	479.7	XXIV
18	DS 3163	192.1	325.5	738.8	513.6	442.5	XXXIV
19	DS 3168	350.6	369.2	523.9	531.0	443.7	XXXIII
20	DS 3124		410.5	699.8	504.2	538.2	X
21	SL 1282	505.5	446.1	578.5	458.7	497.2	XVII
22	SL 1230	268.2	407.8	758.4	551.2	496.4	XVIII
23	HIMSO-1694	189.6	346.9	580.7	592.1	427.3	XXXVIII
24	HIMSO-1693	175.4	398.5	499.5	554.7	407.0	XLV
25	VLS 103	255.1	475.1	555.5	585.7	467.8	XXVIII
26	VLS 102	378.8	424.2	565.3	632.9	500.3	XVI
27	DSb 23 (C)	612.8	544.1	739.5	732.9	657.3	I
28	PS 1605	157.3	352.3	667.3	524.5	425.3	XLI
29	PS 1689	163.5	319.0	506.5	390.8	345.0	LII
30	PS 1682	185.5	305.0	678.8	481.9	412.8	XLIV
31	RSC 11-48	247.2	398.2	662.5	495.2	450.8	XXXI
32	RSC 11-42	325.3	437.1	707.8	695.5	541.4	IX
33	BAUS(M)-3	262.2	367.0	570.8	504.5	426.1	XL
34	BAUS-116	258.1	433.2	584.5	565.0	460.2	XXIX
35	CAUMS 2	328.5	452.4	615.7	497.0	473.4	XXV
36	NRC 195	178.5	428.7	515.0	489.5	402.9	XLVI
37	NRC 203	214.8	221.3	484.1	509.4	357.4	L
38	NRC 193	277.1	412.1	523.4	532.4	436.2	XXXV
39	NRC 192	278.5	352.7	587.1	614.3	458.1	XXX
40	NRC 191	172.9	258.9	546.6	555.7	383.5	XLVIII
41	NRC 190	341.3	376.7	645.8	571.6	483.9	XXII

42	KDS 753 (C)	383.8	425.8	690.0	675.5	543.8	VI
43	NRC 189	290.1	321.7	643.4	521.1	444.1	XXXII
44	RVSM 16-20	291.8	273.3	607.5	534.6	426.8	XXXIX
45	KDS 1175	442.9	475.0	811.3	585.5	578.7	IV
46	KDS 1187	355.6	454.2	699.2	665.2	543.5	VII
47	KDS 1149	324.9	326.7	715.0	674.0	510.2	XIII
48	MACS 1672	258.9	174.8	353.4	722.6	377.4	XLIX
49	ACS 1735	472.7	450.9	636.7	631.0	547.8	V
50	ASb 15	391.7	405.7	556.0	623.6	494.2	XIX
51	TS 21-2	400.4	485.4	592.0	552.5	507.6	XV
52	TS 21-1	354.2	473.9	0.0	571.0	349.8	LI
53	LOKSOY-1	217.9	409.9	513.9	541.8	420.9	XLIII
54	KSS 204	308.4	373.3	694.8	504.1	470.2	XXVII
	Mean	312.7	379.2	598.8	568.3		
	N.P.S.(Sqm)	3.36	3.78	4.05	4.05		
	DOS	16-07-21	14-07-21	15-07-21	10/7/2021		

Table 1.6.8

Trial : Initial Varietal Trial : Early
Zone : SOUTHERN ZONE
Character : Yield(Kg/ha)

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	3481	1310	2247	1243	3481	2914	2446	X
2	MAUS 795	3407	1548	2272	820	1926	2642	2103	XXI
3	KDS 1201	3235	2113	2346	2090	3852	2716	2725	IV
4	KDS 1173	2568	893	1407	1481	2988	2765	2017	XXV
5	KDS 1172	2173	1280	1704	1614	3333	3111	2203	XVIII
6	KDS 1169	2173	1458	1975	1296	2765	2543	2035	XXIV
7	KDS 1194	3383	1399	2914	1958	3951	2889	2749	III
8	RVS 13-7	3556	1577	2815	847	2593	2568	2326	XIII
9	JS 23-09	3556	952	2494	1349	2914	2593	2310	XIV
10	MACS 1460 (C)	3605	1042	3111	2090	3457	3284	2765	II
11	JS 23-03	3580	744	2395	1138	1975	2444	2046	XXII
12	PS 1569	3062	1429	2519	1349	2123	2543	2171	XIX
13	PS 1660	3136	1042	2099	1270	3802	2420	2295	XV
14	PS 1675	3407	1161	2173	979	2889	2642	2209	XVII
15	JS 93-05 (C)	3605	1369	1309	-	716	2222	1844	XXVI
16	RSC 11-60	3481	1399	2889	1296	2988	2667	2453	IX
17	NRC 186	3457	1488	2840	1534	3358	2790	2578	VI
18	NRC 202	3630	982	1827	1878	3062	2272	2275	XVI
19	NRC 201	3160	1042	1901	1296	3185	2420	2167	XX
20	NRC 198	3358	1935	2296	1455	3086	2593	2454	VIII
21	NRC 197	3235	1964	2741	2063	3333	2568	2651	V
22	DSb 34 (C)	3580	1607	3185	2275	3407	3136	2865	I
23	NRC 196	3432	952	2494	1667	2988	2469	2334	XII
24	AMS 77-3-6	3037	1042	1852	1667	-	2593	2038	XXIII
25	AMS 83	3556	2202	1975	1349	3136	2716	2489	VII
26	MACS 1724	3407	1042	2938	1270	2790	3062	2418	XI
	Mean	3279.23	1345.08	2335.31	1490.96	2963.92	2676.23		
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	01-01-00	14-07-21		
	CD	444.44	386.9	419.75	291.01	641.98	271.6		
	CV	8.36	17.8	11.5	12.31	14.5	6.58		
	Zonal CD (50%)							143	

Table 1.6.9

Trial : Initial Varietal Trial : Early**Zone : SOUTHERN ZONE****Character : Days to Flower**

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digranj	Pune	Mean	Rank
1	MAUS 819	39	39	39	39	38	37	39	X
2	MAUS 795	35	41	34	37	36	30	36	V
3	KDS 1201	41	41	36	41	38	36	39	XII
4	KDS 1173	42	39	38	40	38	38	39	XIII
5	KDS 1172	42	39	38	37	37	37	38	IX
6	KDS 1169	27	39	31	33	31	27	31	II
7	KDS 1194	41	39	36	36	37	35	37	VIII
8	RVS 13-7	43	41	41	40	38	38	40	XVI
9	JS 23-09	37	40	34	36	32	33	35	IV
10	MACS 1460 (C)	40	40	39	35	32	37	37	VII
11	JS 23-03	34	40	34	36	35	30	35	III
12	PS 1569	36	43	35	37	32	36	37	VI
13	PS 1660	47	51	44	45	42	41	45	XXII
14	PS 1675	40	41	40	43	40	38	40	XVII
15	JS 93-05 (C)	40	42	38	-	40	38	40	XIV
16	RSC 11-60	42	49	42	44	41	40	43	XXI
17	NRC 186	43	42	42	45	41	39	42	XX
18	NRC 202	42	45	35	44	41	38	41	XVIII
19	NRC 201	31	42	38	38	35	35	37	VI
20	NRC 198	41	45	38	41	39	38	40	XVII
21	NRC 197	42	41	38	42	39	37	40	XV
22	DSb 34 (C)	41	43	41	43	40	38	41	XIX
23	NRC 196	40	41	38	39	38	36	39	XI
24	AMS 77-3-6	44	53	44	48	-	39	46	XXIII
25	AMS 83	40	40	39	44	39	37	40	XV
26	MACS 1724	42	39	38	39	38	36	39	XI
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	01-01-00	14-07-21		

Table 1.6.10

Trial : Initial Varietal Trial : Early
Zone : SOUTHERN ZONE
Character : Days to Maturity

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	104	99	106	80	93	88	95	XVII
2	MAUS 795	99	97	104	78	87	80	91	VIII
3	KDS 1201	105	97	102	82	90	86	94	XIV
4	KDS 1173	106	111	119	84	95	93	101	XXV
5	KDS 1172	106	109	119	78	94	94	100	XXIV
6	KDS 1169	89	97	116	76	82	80	90	VI
7	KDS 1194	105	97	106	77	90	88	94	XV
8	RVS 13-7	108	97	97	82	84	82	92	IX
9	JS 23-09	98	97	84	78	81	80	86	III
10	MACS 1460 (C)	106	97	101	76	81	83	91	VII
11	JS 23-03	93	97	87	78	80	80	86	II
12	PS 1569	100	97	87	79	81	81	88	IV
13	PS 1660	114	104	120	88	94	90	102	XXVI
14	PS 1675	104	98	120	87	93	92	99	XXII
15	JS 93-05 (C)	103	99	89	-	90	82	93	XI
16	RSC 11-60	103	109	99	87	94	88	97	XIX
17	NRC 186	107	97	97	84	84	84	92	X
18	NRC 202	108	108	117	85	91	86	99	XXIII
19	NRC 201	85	98	117	86	91	84	94	XIII
20	NRC 198	105	104	80	85	90	86	92	IX
21	NRC 197	112	109	99	86	91	85	97	XX
22	DSb 34 (C)	105	97	97	89	90	86	94	XVI
23	NRC 196	105	97	80	80	86	84	89	V
24	AMS 77-3-6	110	106	99	90	-	89	99	XXI
25	AMS 83	105	105	99	86	90	89	96	XVIII
26	MACS 1724	107	97	101	84	83	84	93	XII
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	01-01-00	14-07-21		
	Zonal CD (50%)							0.68	

Table 1.6.11

Trial : Initial Varietal Trial : Early**Zone : SOUTHERN ZONE****Character : Plant Height (cm)**

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	83	35	49	39	35	56	50	XVIII
2	MAUS 795	57	33	43	28	36	53	42	XXI
3	KDS 1201	94	46	58	54	46	75	62	V
4	KDS 1173	83	49	85	49	65	102	72	II
5	KDS 1172	92	81	80	53	74	113	82	I
6	KDS 1169	68	36	35	31	37	37	41	XXII
7	KDS 1194	84	46	59	35	50	67	57	VIII
8	RVS 13-7	55	37	41	22	33	47	39	XXIV
9	JS 23-09	48	30	40	36	34	42	38	XXV
10	MACS 1460 (C)	67	46	54	39	46	60	52	XIV
11	JS 23-03	59	29	35	25	28	43	37	XXVI
12	PS 1569	61	48	36	36	31	48	43	XX
13	PS 1660	65	50	44	47	53	59	53	XII
14	PS 1675	69	49	41	42	42	59	50	XV
15	JS 93-05 (C)	68	33	36	-	30	31	40	XXIII
16	RSC 11-60	84	44	54	36	53	62	56	IX
17	NRC 186	57	45	61	43	51	58	53	XIII
18	NRC 202	93	54	67	62	64	70	68	III
19	NRC 201	61	51	48	45	39	54	50	XVII
20	NRC 198	76	57	46	56	53	74	60	VI
21	NRC 197	97	54	54	57	56	85	67	IV
22	DSb 34 (C)	74	54	49	52	64	64	60	VII
23	NRC 196	63	39	47	39	59	52	50	XVI
24	AMS 77-3-6	80	55	46	35	-	59	55	X
25	AMS 83	64	61	47	54	40	60	54	XI
26	MACS 1724	53	32	49	37	41	49	44	XIX
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	01-01-00	14-07-21		

Table 1.6.12

Trial : Initial Varietal Trial : Early**Zone : SOUTHERN ZONE****Character : 100 Seed Weight (g)**

S.No	Varieties	Adilabad	Bangalore	Bidar	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	20.07	14.00	22.00	19.86	16.19	17.73	18.31	I
2	MAUS 795	17.70	13.33	18.17	15.05	15.43	15.90	15.93	II
3	KDS 1201	11.83	8.67	12.73	13.11	12.40	12.37	11.85	XXII
4	KDS 1173	11.97	11.00	12.73	14.87	12.18	13.37	12.69	XIV
5	KDS 1172	12.63	9.67	12.53	15.04	10.89	13.03	12.30	XIX
6	KDS 1169	15.80	11.67	14.40	13.08	13.29	14.47	13.79	VIII
7	KDS 1194	12.03	9.00	13.10	12.22	10.46	11.70	11.42	XXIV
8	RVS 13-7	13.73	13.00	16.03	14.95	13.27	12.93	13.99	VI
9	JS 23-09	12.23	11.67	12.97	11.74	12.30	13.17	12.35	XVIII
10	MACS 1460 (C)	12.97	8.67	15.87	13.26	12.15	12.93	12.64	XVII
11	JS 23-03	13.60	11.00	15.57	12.65	13.02	14.40	13.37	XI
12	PS 1569	13.37	9.67	14.83	13.01	11.68	13.37	12.66	XVI
13	PS 1660	11.70	9.33	12.47	14.01	11.37	11.53	11.74	XXIII
14	PS 1675	13.20	10.33	15.90	16.00	13.88	13.63	13.82	VII
15	JS 93-05 (C)	12.53	10.67	13.93	-	13.81	12.47	12.68	XV
16	RSC 11-60	12.43	9.00	13.00	13.01	13.32	12.03	12.13	XXI
17	NRC 186	11.37	9.00	11.57	12.06	10.41	10.80	10.87	XXVI
18	NRC 202	11.30	10.00	12.77	11.32	11.99	10.13	11.25	XXV
19	NRC 201	13.10	11.00	17.10	15.01	14.70	14.87	14.30	III
20	NRC 198	14.13	13.33	13.43	13.97	13.27	13.77	13.65	IX
21	NRC 197	13.13	13.00	14.00	14.10	12.21	12.63	13.18	XII
22	DSb 34 (C)	12.93	14.00	13.83	13.36	13.88	13.43	13.57	X
23	NRC 196	12.93	10.00	13.07	12.82	12.72	11.77	12.22	XX
24	AMS 77-3-6	14.50	11.00	16.17	15.21	-	13.20	14.02	V
25	AMS 83	12.43	10.00	14.03	15.16	12.77	12.83	12.87	XIII
26	MACS 1724	14.20	12.00	16.30	14.44	15.14	13.33	14.24	IV
	N.P.S.(Sqm)	4.05	3.36	4.05	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	25-06-21	14-07-21	01-01-00	14-07-21		

Table 1.6.13

Trial : Initial Varietal Trial : Early
Zone : SOUTHERN ZONE
Character : Oil Content (%)

S.No	Varieties	Adilabad	Bangalore	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	19.71	19.02		20.12	21.86	20.175	XXVI
2	MAUS 795	20.86	21.50	20.07	20.83	22.42	21.134	XIX
3	KDS 1201	21.38	24.35	20.95	21.76	22.25	22.137	VI
4	KDS 1173	21.40	24.43	20.33	21.46	21.60	21.843	VIII
5	KDS 1172	21.88	23.23	20.71	21.53	21.59	21.785	X
6	KDS 1169	23.37	21.64	20.33	19.58	21.48	21.278	XVII
7	KDS 1194	21.11	22.86	20.67	19.53	21.27	21.086	XX
8	RVS 13-7	22.74	19.37	21.16	21.43	22.70	21.478	XIV
9	JS 23-09	22.08	19.60	19.80	21.35	22.54	21.072	XXI
10	MACS 1460 (C)	21.88	20.97	20.75	20.94	21.97	21.301	XVI
11	JS 23-03	22.81	24.59	21.36	20.79	22.43	22.393	III
12	PS 1569	21.23	24.74	20.41	21.29	21.93	21.920	VII
13	PS 1660	21.47		20.49	20.85	21.47	21.067	XXII
14	PS 1675	21.55	25.99	22.78	21.04	22.47	22.764	I
15	JS 93-05 (C)	21.67	25.09		20.23	22.24	22.306	V
16	RSC 11-60	20.52	24.53	22.38	21.93	22.22	22.312	IV
17	NRC 186	19.49	24.39	18.31	21.12	21.74	21.007	XXIV
18	NRC 202	20.37		21.77	22.47	21.86	21.614	XI
19	NRC 201	20.97	23.72	21.13	21.56	21.83	21.841	IX
20	NRC 198	22.78	23.40	23.06	22.07	22.23	22.708	II
21	NRC 197	20.22	23.21	20.76	21.62	21.84	21.529	XIII
22	DSb 34 (C)	20.72	22.94	20.94	20.98	21.26	21.367	XV
23	NRC 196	20.61		20.59	21.49	21.56	21.061	XXIII
24	AMS 77-3-6	21.94		19.98		20.81	20.907	XXV
25	AMS 83	20.90		21.77	21.88	21.92	21.614	XII
26	MACS 1724	21.37		20.19	21.33	22.01	21.222	XVIII
	Mean	21.34	22.98	20.86	21.16	21.90		
	N.P.S.(Sqm)	4.05	3.36	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	14-07-21	1/1/2000	14-07-21		

Table 1.6.13

Trial : Initial Varietal Trial : Early
Zone : SOUTHERN ZONE
Character : Oil Yield (kg/ha)

S.No	Varieties	Adilabad	Bangalore	Dharwad	K. Digraj	Pune	Mean	Rank
1	MAUS 819	686.1	249.2		700.2	636.9	568.1	VI
2	MAUS 795	710.5	332.8	164.6	401.1	592.3	440.3	XXIV
3	KDS 1201	691.6	514.5	437.9	838.0	604.3	617.3	I
4	KDS 1173	549.4	218.2	301.1	641.2	597.2	461.4	XXI
5	KDS 1172	475.3	297.3	334.2	717.6	671.6	499.2	XVI
6	KDS 1169	507.7	315.5	263.5	541.4	546.2	434.8	XXVI
7	KDS 1194	714.0	319.8	404.7	771.4	614.5	564.9	VII
8	RVS 13-7	808.6	305.5	179.2	555.7	582.9	486.4	XIX
9	JS 23-09	785.0	186.6	267.0	622.1	584.4	489.0	XVIII
10	MACS 1460 (C)	788.8	218.5	433.7	723.9	721.3	577.2	V
11	JS 23-03	816.4	182.9	243.0	410.5	548.2	440.2	XXV
12	PS 1569	649.9	353.5	275.3	452.0	557.8	457.7	XXII
13	PS 1660	673.3		260.2	792.5	519.5	561.4	XI
14	PS 1675	734.2	301.7	223.0	607.7	593.7	492.1	XVII
15	JS 93-05 (C)	781.0	343.5		144.8	494.2	440.9	XXIII
16	RSC 11-60	714.1	343.2	290.0	655.1	592.5	519.0	XIV
17	NRC 186	673.6	362.9	280.8	709.0	606.6	526.6	XIII
18	NRC 202	739.2		408.7	687.9	496.7	583.1	III
19	NRC 201	662.7	247.2	273.8	686.7	528.3	479.7	XX
20	NRC 198	765.0	452.8	335.5	681.1	576.4	562.2	X
21	NRC 197	654.1	455.8	428.3	720.4	560.9	563.9	VIII
22	DSb 34 (C)	741.8	368.6	476.3	714.8	666.7	593.6	II
23	NRC 196	707.3		343.2	642.0	532.3	556.2	XII
24	AMS 77-3-6	666.2		333.0		539.6	512.9	XV
25	AMS 83	743.2		293.6	686.0	595.2	579.5	IV
26	MACS 1724	727.9		256.3	595.0	674.1	563.3	IX
	Mean	698.7	318.5	312.8	627.9	585.9		
	N.P.S.(Sqm)	4.05	3.36	3.78	4.05	4.05		
	DOS	16-06-21	16-07-21	14-07-21	1/1/2000	14-07-21		

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Table 2.1.1.

AGRON. - 1/21. Evaluation of AVT II entries under different row spacing

Zone: North Hill Zone;

Centre: Almora;

Character: Seed yield (kg/ha)

Treatment	Seed yield (kg/ha)		
	Row Spacing (cm)		
Entry	30 cm	45 cm	Mean
VLS 63 (check)	2705	2786	2745
VLS 89 (check)	2723	2692	2707
PS 1556 (check)	2052	2096	2074
VLS 99	3001	3037	3019
Mean	2620	2653	
CD (P=0.05)			
Row spacing	NS		
Entry	620		
Interaction	NS		

Table 2.1.2

AGRON. 1/21. Evaluation of AVT II entries under different row spacing

Zone: North Hill; Centre: Almora; Character: Pods/plant, seed index, straw yield, harvest index and oil yield

Treatment	No. of Branches/ plant		No. of Pods/ plant	(100- seed weight(g))	Straw yield (kg/ha)	HI (%)	Grain production efficiency (kg/ha/day)	RUE (kg/ha/mm)
	Seco ndar y	Terti ary						
Row Spacing								
30 cm	2.8	4.5	42.7	13.3	4019	39.5	22.5	3.46
45 cm	2.7	4.4	41.2	13.6	4334	37.9	22.8	3.50
Mean	2.8	4.4	42.0	13.5	4177	38.7	22.6	3.48
SEm±	0.1	0.1	2.9	0.5	176	1.0	0.6	-
CD(P=0.05)	NS	NS	NS	NS	NS	NS	NS	-
Entry								
VLS 63(c)	3.0	4.7	44.8	15.1	4642	37.0	22.9	3.62
VLS 89(c)	2.9	4.8	37.1	13.9	3974	40.9	23.3	3.57
PS 1556(c)	2.5	3.8	38.0	10.2	3796	35.7	18.7	2.74
VLS 99	2.7	4.4	48.0	14.7	4295	41.3	25.6	3.98
Mean	2.8	4.4	42.0	13.5	4177	38.7	22.6	3.48
SEm±	0.1	0.2	5.1	0.4	259	0.6	1.0	-
CD (P=0.05)	NS	NS	NS	1.4	NS	NS	3.2	-

Table 2.1.3**ASP-1/15. Evaluation of AVT II entries under different row spacing****Zone:** North plain Zone**Design:** Split plot**Replications:** Three**Character:** Seed yield (kg/ha)

Treatment	Pantnagar			Ludhiana			Zonal mean		
	Row spacing								
Entry	30cm	45cm	Mean	30cm	45cm	Mean	30cm	45cm	Mean
NRC-149	1652	1849	1751	1451	1533	1492	1552	1691	1622
SL 955(c)	1669	1837	1753	1765	1833	1799	1717	1835	1776
PS 1347(c)	1570	1647	1609	1724	1728	1726	1647	1688	1668
SL 1074(c)	1116	1197	1157	1403	1469	1436	1260	1333	1297
SL958 (c)				1298	1393	1346	1298	1393	1346
Mean	1633	1502		1528	1591		1581	1546	
Row spacing			NS			NS			
Entries			118.8			211			
Interaction			NS			NS			

Table 2.1.4**ASP-1/15. Evaluation of AVT II entries under different row spacing****Zone:** North Eastern Zone**Design:** Split plot**Replications:** Three**Character:** Seed yield (kg/ha)

Treatment	Imphal			Medziphema			Zonal mean		
	Row spacing								
Entry	30cm	45cm	Mean	30cm	45cm	Mean	30cm	45cm	Mean
DS-3108	2890	2929	2909	1719	1571	1645	2304	2250	2277
JS-335(c)	2301	2452	2377	1441	1181	1311	1871	1817	1844
RKS-18(c)	2183	2202	2193	1584	1453	1519	1883	1828	1856
JS 97-52(c)	2210	2256	2233	1563	1661	1612	1886	1959	1923
Mean	2396	2460		1577	1467		1986	1963	
Row spacing			NS			NS			-
Entries			368.9			NS			-
Interaction			NS			NS			-

Table 2.1.5

ASP-1/15. Evaluation of AVT II entries under different row spacing (Zonal mean)

Zone: North plain Zone Design: Split plot Replications: Three

Characters: Dry matter, CGR, RGR, Plant height, No. of pods/plant, 100-seed weight, Straw yield, Harvest Index, Grain production efficiency and RUE

Treatment				Dry matter (g/plant)			Mean CGR (g/m ² /day)		Mean RGR (g/g/day)		Straw yield (kg/ha)	Harvest index (%)	Grain production efficiency (kg/ha/day)	RUE (kg/ha/mm)
	No. of branches /plant	No. of pods/ plant	100-seed weight (g)	30 DAS	45 DAS	60 DAS	30-45 DAS	45-60 DAS	30-45 DAS	45-60 DAS				
Row spacing														
30cm	3.81	83.55	8.75	2.94	7.49	17.59	7.66	17.00	0.043	0.039	4671	26.36	11.48	1.70
45cm	3.94	80.55	8.75	3.18	7.93	16.96	7.95	15.26	0.345	0.034	4862	24.66	11.23	1.67
Entry														
NRC-149	4.61	93.45	9.33	3.36	8.14	17.86	7.91	16.44	0.039	0.276	5390	23.98	11.68	1.73
SL 955 (c)	3.83	93.65	8.25	3.30	7.66	18.15	7.44	17.37	0.039	0.038	4919	27.17	12.82	1.92
PS 1347 (c)	3.59	80.45	9.69	2.87	8.31	18.12	9.17	16.37	0.049	0.035	4269	28.80	12.27	1.81
SL 1074 (c)	3.56	62.85	7.99	2.73	6.82	14.81	6.91	13.61	0.042	0.036	4675	22.90	9.46	1.42
SL958 (c)	1.73	35.60	7.69	1.34	2.15	4.69	2.40	7.52	0.014	0.023	5339	20.21	9.61	1.66

ASP-1/15. Evaluation of AVT II entries under different row spacing (Zonal mean)

Replications: Three

Characters: Dry matter, CGR, RGR, Plant height, No. of pods/plant, 100-seed weight, Harvest Index, Grain production efficiency and RUE

Treatment	Dry matter (g/plant)			Mean CGR (g/m ² /day)		Mean RGR (g/g/day)		Straw yield (kg/ha)	Harvest index (%)	Grain production efficiency (kg/ha/day)	RUE (kg/ha/m ²)			
	No. of branches /plant	No. of pods/plant	100 seed weight (g)	30 DAS	45 DAS	60 DAS	30-45 DAS	45-60 DAS						
Row spacing														
30cm	4.87	66.21	12.19	0.71	2.93	7.55	5.52	10.88	0.101	0.064	3540	35.92	19.44	3.88
45cm	4.64	68.46	12.71	0.72	2.93	8.56	4.26	10.26	0.100	0.073	3533	35.51	19.12	3.77
Entry														
DS-3108	4.47	70.81	13.87	0.71	2.81	7.93	4.50	10.79	0.104	0.065	3605	38.15	22.10	4.36
JS-335(c)	4.74	67.50	13.28	0.76	3.16	9.00	5.45	11.98	0.094	0.073	3413	34.90	17.77	3.47
RKS-18(c)	4.81	63.34	11.60	0.67	2.74	7.69	4.43	10.55	0.112	0.062	3533	34.82	18.43	3.70
JS 97-52(c)	5.00	67.20	11.06	0.72	3.01	7.60	5.23	8.96	0.093	0.074	3594	34.99	18.81	3.82

Table 2.1.7

ASP-1/15. Evaluation of AVT II entries under different row spacing

Zone: Central Design: Split plot Replications: Three Character: Seed yield (kg/ha)

Treatment	Sehore			Amravati			Kota			Zonal mean		
	Row spacing											
Entry	30cm	45c m	Mean	30c m	45c m	Mean	30c m	45c m	Mean	30c m	45c m	Mea n
NRC 152 (early)	1770	1626	1698	1785	1946	1866	1760	1685	1723	1772	1752	1762
NRC 165(early)	-	-	-	1818	1915	1867	-	-	-	1818	1915	1867
HIMSO 1689 (M-to-L)	1846	2290	2068	2074	2441	2258	1636	1605	1621	1852	2112	1982
JS 21-72 (M-to-L)	1638	2150	1894	2444	2671	2558	1895	1751	1823	1992	2191	2092
JS 20-34 (c)	1574	1471	1523	2088	2457	2273	1491	1352	1421	1718	1760	1739
NRC 86 (c)	1702	1944	1823	1710	1951	1831	1620	1378	1499	1677	1758	1718
Mean	1706	1896		1703	1912		1400	1295		1603	1701	
Row spacing			NS			259.0			100.5			-
Entries			263.2			292.8			188.0			-
Interaction			NS			NS			NS			-

Table 2.1.8

ASP-1/15. Evaluation of AVT II entries under different row spacing (Zonal mean)

Zone: Central **Design:** Split plot **Replications:** Three

Characters: Dry matter, CGR, RGR, Plant height, No. of pods/plant, 100-seed weight, Straw yield, Harvest Index, Grain production efficiency and RUE

Treatment	No. of branches/plant	No. of pods/plant	100 seed weight (g)	Dry matter (g/plant)			Mean CGR (g/m ² /day)		Mean RGR (g/g/day)		Straw yield (kg/ha)	Harvest index (%)	Grain production efficiency (kg/ha/day)	RUE (kg/ha/mm)
				30 DAS	45 DAS	60 DAS	30-45 DAS	45-60 DAS	30-45 DAS	45-60 DAS				
Row spacing														
30cm	2.68	40.31	10.58	2.33	8.34	13.22	17.39	13.64	0.08	0.03	2511	41.48	18.15	1.94
45cm	3.18	43.65	11.52	2.70	9.41	15.21	18.69	15.79	0.07	0.03	2276	45.51	19.11	2.08
Entry														
NRC 152 (early)	2.41	32.97	11.78	2.33	9.85	13.35	21.49	9.08	0.09	0.01	2387	42.48	18.87	1.94
NRC 165(early)	3.16	45.87	11.07	2.52	8.76	14.55	17.63	16.06	0.08	0.03	2504	44.50	19.11	2.15
HIMSO 1689 (M-to-L)	3.60	51.24	11.50	2.97	9.54	19.25	18.56	27.71	0.07	0.04	2602	45.36	20.78	2.31
JS 21-72 (M-to-L)	2.35	36.74	11.24	2.54	7.98	13.36	15.33	15.07	0.07	0.03	2339	42.17	17.97	1.95
JS 20-34 (c)	3.10	48.41	9.64	2.45	8.77	12.41	17.92	9.71	0.08	0.02	2274	43.10	17.10	1.84
NRC 86 (c)	3.30	48.40	11.52	1.73	6.10	10.77	9.69	10.36	0.04	0.02	2269	39.44	16.79	1.27

Table 2.2.1

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern plain; **Design:** Strip plot; **Replications:** Four; **Character:** Seed yield (kg/ha);

Min^m = Minimum, **Con^l** = Conventional

Crop rotation	Ludhiana			Pantnagar			Zonal mean		
	Tillage system								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	2503	2468	2486	1727	1789	1758	2115	2129	2122
Soy-Soy-Maize-Soy	5039	4999	5019	4361	4389	4375	4700	4694	4697
Soy-Maize-Soy-Maize	2497	2460	2478	1773	1758	1766	2135	2109	2122
Soy-Soy-Soy-Maize	2487	2421	2454	1845	1863	1854	2166	2142	2154
Mean	3132	3087		2426	2450	-	2779	2769	
CD (P=0.05)									
Tillage			NS			531			-
Crop Rotation			209			505			-
Interaction			NS			-			-

Table 2.2.2

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern plain; **Design:** Strip plot; **Replications:** Four; **Character:** Rabi Seed yield (kg/ha)

Crop rotation	Ludhiana			Pantnagar			Zonal mean		
	Tillage system								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	4284	4245	4265	4225	4720	4472	4255	4483	4369
Soy-Soy-Maize-Soy	4186	4180	4183	4082	4439	4260	4134	4310	4222
Soy-Maize-Soy-Maize	4232	4186	4209	4111	4467	4289	4172	4327	4249
Soy-Soy-Soy-Maize	4245	4173	4209	4276	4742	4509	4261	4458	4359
Mean	4237	4196		4173	4592	-	4205	4394	
CD (P=0.05)									
Tillage			NS			767			-
Crop Rotation			NS			762			-
Interaction			NS			-			-

Table 2.2.3.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern plain

Design: Strip plot

Replications: Four

Character: Soybean Equivalent yield (kg/ha)

Crop rotation	Ludhiana			Pantnagar			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	4535	4481	4549	1727	1789	1758	3131	3135	3154
Soy-Soy-Maize-Soy	4388	4365	4439	2079	2093	2086	3234	3229	3263
Soy-Maize-Soy-Maize	4504	4445	4474	1773	1758	1766	3139	3102	3120
Soy-Soy-Soy-Maize	4500	4400	4469	1845	1863	1854	3173	3132	3162
Mean	4511	4454		1856	1876		4511	4454	
CD (P=0.05)									
Tillage			NS			512			-
Crop Rotation			NS			420			-

Table 2.2.4

AGRON.2/15: Sustainable soybean production through diversification and tillage systems

Zone: Northern plain

Character: Yield and economical parameters

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	HI (%)	SEY (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Tillage system								
Minimum tillage	2543	5361	31.2	2996	43985	125538	81553	2.80
Conventional tillage	2584	5212	32.4	3005	47790	126901	79111	2.63
Crop rotations								
Soy-Soy-Soy-Soy	1995	4807	29.3	3027	45970	117160	71190	2.40
Soy-Soy-Maize-Soy	3196	5744	34.0	2906	45641	112023	66382	2.29
Soy-Maize-Soy-Maize	3135	6204	33.3	3135	45970	122249	76279	2.58
Soy-Soy-Soy-Maize	1929	4394	30.7	2936	45970	114040	68070	2.32

Table 2.2.5.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern Eastern

Design: Strip plot; Replications: Four

Character: Seed yield (kg/ha)

Crop rotation	Ranchi			Raipur			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	2211	2199	2205	1810	1939	1875	2205	2069	2040
Soy-Soy-Maize-Soy	3241	3287	3264	5412	6125	5769	3264	4706	4517
Soy-Maize-Soy-Maize	2326	2269	2297	1811	1974	1893	2298	2122	2095
Soy-Soy-Soy-Maize	2257	2234	2245	1647	1742	1695	2246	1988	1970
Mean	2509	2497		2670	2945		2503	2721	
CD (P=0.05)									
Tillage			NS			191			
Crop Rotation			271.5			155			
Interaction			NS			290			

Table 2.2.6.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern Eastern Design: Strip plot

Replications: Four

Character: RabiSeed yield (kg/ha)

Crop rotation	Ranchi			Raipur			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	2014	2269	2141	1102	1169	1136	1558	1719	1639
Soy-Soy-Maize-Soy	2130	2373	2251	1058	1077	1068	1594	1725	1660
Soy-Maize-Soy-Maize	2321	2269	2295	1021	1064	1043	1671	1667	1669
Soy-Soy-Soy-Maize	2014	2326	2170	1207	1241	1224	1611	1784	1697
Mean	2119	2309		1097	1138		1608	1724	
CD (P=0.05)									
Tillage			118.71			NS			-
Crop Rotation			294.72			NS			-
Interaction			NS			NS			-

Table 2.2.7.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Northern Eastern

Design: Strip plot; Replications: Four

Character: Soybean Equivalent Yield (kg/ha)

Crop rotation	Ranchi		Raipur				Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	3218	3333	3275	1810	1939	1875	2514	2636	2575
Soy-Soy-Maize-Soy	3391	3455	3423	2706	3063	2885	3049	3259	3154
Soy-Maize-Soy-Maize	2695	2690	2692	1811	1974	1893	2253	2332	2293
Soy-Soy-Soy-Maize	3264	3397	3330	1647	1742	1695	2456	2570	2513
Mean	3142	3219		1994	2180		2568	2700	
CD (P=0.05)									
Tillage			NS			116.62			-
Crop Rotation			254.9			NS			-
Interaction			NS			NS			-

Table 2.2.8.

AGRON.2/15: Sustainable soybean production through diversification and tillage systems

Zone: Northern Eastern

Design: Strip plot;

Replications: Four;

Character: Yield and economical parameters

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	HI (%)	SEY (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Tillage system								
Minimum	2589	4671	36.1	2038	39163	93700	54538	1.96
Conventional	2496	4397	36.9	2122	43175	97925	54750	1.84
Crop rotation								
Soy-Soy-Soy-Soy	2040	3618	36.3	2050	41019	102747	61728	2.07
Soy-Soy-Maize-Soy	4033	6931	37.9	2591	41019	103312	62294	2.11
Soy-Maize-Soy-Maize	2578	3882	46.1	1719	41619	96976	55357	1.76
Soy-Soy-Soy-Maize	1970	3490	36.0	1970	41019	97844	56826	1.99

Table 2.2.9

AGRON.2/15: Sustainable soybean production through diversification and tillage systems

(2020-21)

Zone: Northern Eastern

Centre: Raipur

Character: Soil parameters

Treatment	Bulk density	WHC	Porosity	Initial values (Soil)				Organic carbon at harvest (%)
				Organic carbon (%)	N (kg/ha)	P (kg/ha)	K (kg/ha)	
Tillage system								
Minimum	1.33	47	58	0.58	226.4	13.99	368.2	0.49
Conventional	1.32	46	57	0.58	228.7	12.65	359.9	0.52
Crop rotation								
Soy-Soy-Soy-Soy	1.32	44	57	0.58	229.6	13.96	366.4	0.48
Soy-Soy-Maize-Soy	1.31	46	56	0.58	221.3	11.14	353.5	0.48
Soy-Maize-Soy-Maize	1.31	44	57	0.58	229.8	14.48	362.8	0.49
Soy-Soy-Soy-Maize	1.31	44	56	0.58	227.9	14.10	362.1	0.50

Table 2.2.10

AGRON.2/15: Sustainable soybean production through diversification and tillage systems (2020-21)
Zone: Northern Eastern Centre: Ranchi Character: Soil parameters and nutrient uptake

Treatment	Bulk density	WHC	Porosity	Initial values (Soil)			Organic carbon at harvest (%)	Nutrient uptake			
				Organic carbon (%)	N (kg/ha)	P (kg/ha)		K (kg/ha)	N (kg/ha)	P (kg/ha)	K (kg/ha)
Tillage system											
Minimum tillage	1.49	22.04	40.63	0.466	243.11	14.48	183.89	0.476	164.11	20.28	111.47
Conventional tillage	1.54	21.68	39.81	0.461	242.05	14.40	181.69	0.470	161.44	20.13	108.74
SEm±	0.02	0.24	0.17	0.002	0.90	0.02	0.32	0.002	2.99	0.33	2.36
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Crop rotations											
Soy-Soy-Soy-Soy	1.53	21.84	39.75	0.464	242.39	14.45	182.55	0.474	174.36	20.95	109.49
Soy-Soy-Maize-Soy	1.54	21.74	40.38	0.467	243.38	14.45	183.22	0.477	185.20	22.43	117.26
Soy-Maize-Soy-Maize	1.51	21.80	40.38	0.460	242.17	14.43	182.83	0.468	113.86	16.01	96.67
Soy-Soy-Soy-Maize	1.50	22.07	40.38	0.464	242.38	14.42	182.56	0.473	177.66	21.42	117.00
SEm±	0.02	0.34	0.36	0.003	1.30	0.03	0.31	0.004	4.10	0.46	2.27
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	13.12	1.47	7.28

Table 2.2.11.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Central

Design: Strip plot; Replications: Four

Character: Seed yield (kg/ha)

Crop rotation	Kota			Amravati			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	1053	998	1025	2024	1761	1892	1539	1380	1459
Soy-Soy-Maize-Soy	2763	2675	2719	2382	2137	2404	2573	2406	2562
Soy-Maize-Soy-Maize	1060	992	1026	2035	1793	1914	1548	1393	1470
Soy-Soy-Soy-Maize	1007	1069	1038	1920	1750	1835	1464	1410	1437
Mean	1471	1433		2128	1894		1800	1664	
CD (P=0.05)									
Tillage			NS			121.60			
Crop Rotation			85.09			85.98			
Interaction			NS			NS			

Table 2.2.12.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Central

Design: Strip plot

Replications: Four

Character: Rabi Seed yield (kg/ha)

Crop rotation	Kota			Amravati			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	2454	2523	2488	1989	1815	1902	2222	2169	2195
Soy-Soy-Maize-Soy	2584	2249	2416	1441	1426	1433	2013	1838	1925
Soy-Maize-Soy-Maize	2435	2416	2425	1722	1665	1693	2079	2041	2059
Soy-Soy-Soy-Maize	2585	2494	2540	1622	1594	1608	2104	2044	2074
Mean	2514	2420		1693	1625		2104	2023	
CD (P=0.05)									
Tillage			NS			175.54			
Crop Rotation			NS			124.13			
Interaction			NS			NS			

Table 2.2.13.

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Central

Design: Strip plot

Replications: Four

Character: Soybean Equivalent Yield (kg/ha)

Crop rotation	Kota		Amravati			Zonal mean			
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	4221	4255	4238	4638	4147	4392	4430	4201	4315
Soy-Soy-Maize-Soy	4629	4156	4393	4276	4011	4143	4453	4084	4268
Soy-Maize-Soy-Maize	4204	4111	4157	4365	3981	4173	4285	4046	4165
Soy-Soy-Soy-Maize	4345	4289	4317	4053	3846	3949	4199	4068	4133
Mean	4350	4203		4333	3996		4342	4100	
CD (P=0.05)									
Tillage			NS			269.27			
Crop Rotation			NS			190.40			
Interaction			NS			NS			

Table 2.2.14

AGRON.2/15: Sustainable soybean production through diversification and tillage systems (2020-21)

Zone: Central

Design: Strip plot

Replications: Four

Character: Yield and economical parameters

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	HI (%)	SEY (Kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Tillage system								
Minimum	2108	3617	40.5	3220	40670	131764	91094	2.69
Conventional	1940	3446	40.4	3032	43360	124160	80800	2.28
Crop rotations								
Soy-Soy-Soy-Soy	1459	1840	43.4	3065	40897	122022	81125	2.41
Soy-Soy-Maize-Soy	3729	8515	32.7	3326	45404	146385	100981	2.72
Soy-Maize-Soy-Maize	1470	1888	43.0	3035	40919	120919	80001	2.40
Soy-Soy-Soy-Maize	1437	1884	42.7	3076	40840	122520	81680	2.41

Table 2.2.15

AGRON.2/15: Sustainable soybean production through diversification and tillage systems (2020-21)

Zone: Central

Design: Strip plot

Replications: Four

Centre: ARS,Kota

Character: Soil physical and chemical parameters; nutrient uptake

Treatment	Bulk density	WH C	Porosity	Initial values (Soil)				Organic carbon at harvest (%)	Nutrient uptake		
				Organic carbon (%)	N (kg/ha)	P (kg/ha)	K (kg/ha)		N (kg/ha)	P (kg/ha)	K (kg/ha)
Tillage system											
Minimum tillage	1.481	49.48	44.44	0.64	312.3	21.35	300.8	0.683	137.2	13.01	85.88
Conventional tillage	1.474	49.27	44.26	0.64	309.6	21.26	296.8	0.679	130.8	12.24	81.47
SEm±	0.004	0.13	0.16	0.00	2.83	0.31	3.49	0.003	2.67	0.23	1.9
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.71	NS
Crop rotations											
Soy-Soy-Soy-Soy	1.489	49.4	44.45	0.64	312.0	21.29	298.1	0.681	93.57	8.87	57.15
Soy-Soy-Maize-Soy	1.484	49.5	44.49	0.64	312.4	21.41	300.4	0.682	256.8	24.29	163.6
Soy-Maize-Soy-Maize	1.472	49.2	44.18	0.63	308.8	21.21	297.4	0.681	91.63	8.57	55.80
Soy-Soy-Soy-Maize	1.486	49.4	44.28	0.64	310.5	21.31	299.3	0.680	94.06	8.78	58.14
SEm±	0.004	0.13	0.16	0.00	2.83	0.31	3.49	0.003	2.67	0.23	1.90
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	8.10	0.71	5.76

Table 2.2.16

AGRON.2/15: Sustainable soybean production through diversification and tillage systems (2020-21)
(After Harvesting of Gram)
Centre: CZ. RRC, Amravati (MS) Character: Soil parameters

Treatment	Organic carbon	Available Nitrogen	Available Phosphorus	Available Potassium	Bulk Density
Tillage system					
Minimum tillage	0.485	225	21.05	346	1.48
Conventional tillage	0.478	209	18.77	340	1.49
SEm±	0.001	0.70	0.116	0.98	0.004
CD (P=0.05)	0.005	3.15	0.523	4.42	NS
Crop rotations					
Soy-Soy-Soy-Soy	0.485	224	20.30	348	1.48
Soy-Soy-Maize-Soy	0.476	211	19.87	338	1.49
Soy-Maize-Soy-Maize	0.483	217	19.90	343	1.49
Soy-Soy-Soy-Maize	0.481	215	19.56	341	1.49
SEm±	0.001	0.84	0.17	1.26	0.01
CD (P=0.05)	0.003	2.51	0.50	3.76	NS
Interaction					
SEm±	0.001	1.19	0.23	1.79	0.01
CD (P=0.05)	NS	NS	NS	NS	NS

Table 2.2.17

AGRON.2/15: Sustainable soybean production through diversification and tillage systems (2020-21)
(After Harvesting of Gram)
Centre: CZ. RRC, Amravati (MS)
Character: Nutrient uptake

Treatment	Total N uptake	Total P uptake	Total K uptake
Tillage system			
Minimum tillage	65.69	9.62	18.53
Conventional tillage	62.46	9.14	17.54
SEm±	0.52	0.11	0.20
CD (P=0.05)	2.35	0.48	0.89
Crop rotations			
Soy-Soy-Soy-Soy	73.49	11.10	20.50
Soy-Soy-Maize-Soy	54.77	7.66	15.52
Soy-Maize-Soy-Maize	65.98	9.63	18.18
Soy-Soy-Soy-Maize	62.05	9.13	17.93
SEm±	1.59	0.28	0.48
CD (P=0.05)	4.72	0.83	1.42
Interaction			
SEm±	2.24	0.39	0.68
CD (P=0.05)	NS	NS	NS

Table 2.2.18

ASP-2/ 15. Sustainable soybean production through crop diversification and tillage systems (2020-21)

Zone: Southern Design: Split plot

Replications: Three Character: Seed yield (kg/ha)

Crop rotation	Dharwad			Adilabad			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	2085	2111	2098	1959	2563	2261	2022	2337	2180
Soy-Soy-Maize-Soy	6236	6386	6311	2807	3215	3011	4522	4801	4661
Soy-Maize-Soy-Maize	1995	2240	2117	2137	2752	2445	2066	2496	2281
Soy-Soy-Soy-Maize	2033	2363	2198	2323	2517	2420	2178	2440	2309
Mean	3087	3289		2306	2762		2697	3026	
CD (P=0.05)									
Tillage			170			283.1			
Crop Rotation			209			288.7			
Interaction			275			NS			

Table 2.2.19

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Southern

Design: Strip plot

Replications: Four

Character: RabiSeed yield (kg/ha)

Crop rotation	Dharwad			Adilabad			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	688	730	709	1586	2198	1892	1137	1464	1301
Soy-Soy-Maize-Soy	665	687	676	1846	1986	1916	1256	1337	1296
Soy-Maize-Soy-Maize	715	703	709	1670	2242	1956	1193	1473	1333
Soy-Soy-Soy-Maize	696	726	711	1472	2389	1930	1084	1558	1321
Mean	691	712		1643	2204		1167	1458	
CD (P=0.05)									
Tillage			NS			319.6			
Crop Rotation			NS			NS			
Interaction			NS			NS			

Table 2.2.20

ASP-2/15. Sustainable soybean production through crop diversification and tillage systems(2020-21)

Zone: Southern Design: Strip plot; Replications: Four; Character: Soybean Equivalent Yield (kg/ha)

Crop rotation	Dharwad			Adilabad			Zonal mean		
	Tillage								
	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean	Min ^m	Con ^l	Mean
Soy-Soy-Soy-Soy	3022	3279	3151	4043	5453	4748	3533	4366	3950
Soy-Soy-Maize-Soy	9658	10139	9899	5233	5825	5529	7446	7982	7714
Soy-Maize-Soy-Maize	3034	3389	3211	4334	5700	5017	3684	4545	4114
Soy-Soy-Soy-Maize	3052	3544	3298	4258	5658	4958	3655	4601	4128
Mean	4692	5088		4467	5659		4580	5374	
CD (P=0.05)									
Tillage			274			211.5			
Crop Rotation			251			361.6			
Interaction			NS			NS			

Table 2.2.21

Sustainable soybean production through diversification and tillage systems (2020-21)

Zone: Southern

Design: Strip plot

Replications: Four

Character: Yield and economical parameters

Treatments	Seed yield (kg/ha)	Straw yield (kg/ha)	HI (%)	SEY (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Tillage system								
Minimum tillage	2697	7703	11.22	4580	65508	168777	103269	3.10
Conventional tillage	3026	7829	12.73	5374	71805	198833	127028	3.25
Crop rotations								
Soy-Soy-Soy-Soy	2180	4182	16.37	3950	67606	147261	79655	2.35
Soy-Soy-Maize-Soy	4661	17788	0.23	7714	71524	280509	208985	5.42
Soy-Maize-Soy-Maize	2281	4539	15.67	4114	68063	153539	85476	2.45
Soy-Soy-Soy-Maize	2309	4558	15.68	4128	67434	153911	86477	2.46

Table 2.2.22

2/15: Sustainable soybean production through diversification and tillage systems (2020-21)
Center: ARS, Adilabad Character: Initial soil parameters (before soybean crop *Kharif*, 2020)

Treatment	Bulk density	WHC	Porosity	Initial values (Soil)				Organic carbon at harvest (%)	Nutrient uptake			
				Organic Carbon (%)	N (kg/ha)	P (kg/ha)	K (kg/ha)		N (kg/ha)	P (kg/ha)	K (kg/ha)	
Tillage system												
Minimum	1.56	36.8	37.4	0.62	208.5	20.0	288.7	0.61	171.6	30.9	71.2	
Conventional	1.54	36.7	36.1	0.57	221.1	21.3	290.1	0.60	163.1	30.1	68.1	
SEm±	0.02	0.72	0.53	0.03	3.10	0.23	15.3	0.02	1.87	1.30	2.83	
CD (P=0.05)	NS	NS	NS	NS	NS	1.08	NS	NS	8.7	NS	NS	
Crop rotations												
Soy-Soy-Soy-Soy	1.53	36.8	36.5	0.63	206.2	20.5	291.7	0.65	177.8	28.8	73.1	
Soy-Soy-Maize-Soy	1.50	35.4	37.5	0.59	220.3	22.3	282.8	0.57	170.2	31.0	73.7	
Soy-Maize-Soy-Maize	1.57	37.6	36.2	0.59	216.3	19.1	292.7	0.61	162.0	29.6	67.3	
Soy-Soy-Soy-Maize	1.61	37.4	36.7	0.56	216.5	20.6	290.5	0.56	159.6	32.7	64.5	
SEm±	0.02	0.71	0.45	0.04	7.4	1.40	11.1	0.03	5.99	1.65	3.72	
CD (P=0.05)	0.07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Interaction	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

Table 2.2.23

Table. Final soil parameters (After soybean crop harvest *Kharif*, 2020)

Center: ARS, Adilabad

Treatments	Bulk density	WHC	Porosity	Initial values (Soil)			Organic carbon at harvest (%)	Nutrient uptake		
				Organic carbon (%)	N (kg/ha)	P (kg/ha)		K (kg/ha)	N (kg/ha)	P (kg/ha)
Tillage system										
Minimum tillage	1.53	35.4	38.9	0.54	210.6	24.5	296.4	175.9	28.6	75.6
Conventional tillage	1.55	36.2	38.0	0.55	219.6	26.3	274.0	160.5	29.4	65.9
Sem+	0.01	0.74	0.63	0.01	2.99	0.25	14.7	1.85	1.30	2.80
CD (at 5%)	NS	NS	NS	NS	NS	1.08	NS	9.2	NS	NS
Crop rotations										
Soy-Soy-Soy-Soy	1.48	35.2	33.4	0.69	221.4	31.2	278.9	166.3	32.1	70.1
Soy-Soy-Maize-Soy	1.52	36.0	40.1	0.68	218.0	28.5	296.3	169.9	33.6	75.6
Soy-Maize-Soy-Maize	1.49	33.9	39.5	0.63	234.7	24.7	301.5	175.2	35.7	70.1
Soy-Soy-Soy-Maize	1.53	39.5	35.5	0.69	225.3	23.0	288.4	168.3	34.0	68.5
Sem+	0.03	0.88	0.44	0.08	9.0	1.40	9.9	6.11	1.90	2.99
CD (at 5%)	0.06	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 2.3.1

ASP3/18/21. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: SouthernCharacter: Yield

Treatment	Seed yield (kg/ha)			Mean
	Dharwad	Adilabad	Pune	
Control	2197	1331	2052	1860
RDF only	2702	2514	2499	2572
75 % RDF	2361	1582	2146	2030
75 % RDF + Bio Zn	2479	1865	2375	2240
75 % RDF + Bio NPK	2497	1979	2489	2322
75 % RDF + Bio Zn + Bio NPK	2534	2215	2616	2455
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High solubilizing)	2563	2534	2658	2585
SEm+	83	133	61.24	
CD (P=0.05)	257	414	188.69	

Table 2.3.2

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: CentralCharacter: Yield

Treatment	Seed yield (kg/ha)				Mean
	Sehore	Kota	Amravati	Devgarh Baria	
Control	943	1095	1477	1431	1237
RDF only	1466	1597	1670	1665	1600
75 % RDF	1221	1350	1598	1489	1415
75 % RDF + Bio Zn	1293	1534	1859	1545	1558
75 % RDF + Bio NPK	1369	1537	2220	1566	1673
75 % RDF + Bio Zn + Bio NPK	1380	1549	2307	1628	1716
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	1329	1566	2546	1842	1821
SEm+	84	59.01	154.48	60.16	
CD (P=0.05)	220	181.89	475.97	178.75	

Table 2.3.3

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: North Plain Zone Character: Yield

Treatment	Seed yield(kg/ha)			
	Delhi	Pantnagar	Ludhiana	Mean
Control	1134	1207	1346	1229
RDF only	2014	1937	1642	1864
75 % RDF	1597	1621	1451	1556
75 % RDF + Bio Zn	1806	1684	1486	1659
75 % RDF + Bio NPK	1898	1773	1708	1793
75 % RDF + Bio Zn + Bio NPK	2176	1803	1531	1837
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	2130	1574	1553	1752
SEm±	93.4	79.96	66	-
CD (P=0.05)	287.9	246.3	205	-

Table 2.3.4.

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Eastern Zone Character: Yield

Treatment	Seed yield(kg/ha)			Mean
	Bhawanipatna	Ranchi	Raipur	
Control	1240	1080	1073	1131
RDF only	1998	2514	1805	2106
75 % RDF	1632	2177	1668	1826
75 % RDF + Bio Zn	1738	2176	1707	1874
75 % RDF + Bio NPK	1743	2238	1797	1926
75 % RDF + Bio Zn + Bio NPK	2285	2394	2029	2236
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	1943	2421	1908	2091
SEm±	112	91.01	62	-
CD (P=0.05)	345	280.45	191	-

Table 2.3.5.

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean
Zone: Southern Character: Yield, yield attributes and economical parameters

Treatment	Branches/ plant	Pods/ plant	Seed index	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Control	3.78	39.08	11.66	1860	3188	5049	25.21	36340	84841	48501	2.44
RDF only	5.29	52.38	12.18	2572	3854	6409	29.10	42161	115555	73394	3.03
75 % RDF	4.39	39.84	12.01	2030	3539	5585	25.39	37653	92375	54723	2.98
75 % RDF + Bio Zn	4.46	42.68	12.33	2240	3694	5933	26.43	37335	101278	63243	3.20
75 % RDF + Bio NPK	4.83	50.78	12.34	2322	3566	5888	28.70	37481	104611	67130	3.26
75 % RDF + Bio Zn + Bio NPK	4.97	52.23	12.34	2455	3580	6034	29.93	37836	110066	72229	3.37
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	5.46	59.12	12.00	2585	3724	6342	30.67	38015	115351	77336	3.52

Table 2.3.6

AGRON 3/21.Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Southern(Zonal mean) **Variety:**Character: Plant dry weight (g), CGR, RGR, Nodule parameters at R2, Nodule parameters at R5

Treatment	Plant dry weight (g)			CGR		RGR		Nodule parameters at R2			Nodule parameters at R5		
	30 DAS	45 DAS	60 DAS	45-30 DAS	60-45 DAS	45-30 DAS	60-45 DAS	Numbers	Fresh weight (g)	Dry weight (g)	Numbers	Fresh weight (g)	Dry weight (g)
Control	3.97	15.20	29.72	3.204	4.748	0.103	0.042	19.07	0.67	0.22	33.18	1.23	0.316
RDF only	5.16	17.72	36.07	4.098	4.729	0.117	0.046	23.71	1.19	0.260	39.80	1.79	0.378
75 % RDF	4.44	15.73	31.27	3.744	4.721	0.096	0.041	19.99	0.81	0.240	34.51	1.52	0.338
75 % RDF + Bio Zn	4.96	16.19	34.12	3.493	4.854	0.099	0.046	22.40	1.13	0.243	37.30	1.58	0.346
75 % RDF + Bio NPK	5.10	16.70	35.54	3.552	5.325	0.105	0.048	26.99	1.08	0.251	40.77	1.79	0.363
75 % RDF+BioZn+Bio NPK	5.36	17.42	36.71	3.778	5.813	0.107	0.047	27.29	1.30	0.225	42.92	1.90	0.369
75 % RDF + Rhizobium+MDSR14 + 12c (12c= <i>Burkholderia arboris</i> - High P solubilizing)	5.59	18.73	37.31	4.213	6.542	0.117	0.046	33.19	1.36	0.275	47.29	2.08	0.355

Table 2.3.7

AGRON 3/21. Evaluation of novel bio formulation for yield enhancement in soybean
Zone: Southern **Centre:** Dharwad **Variety:** DSb 21 **Character:** Soil: Initial – Composite soil sample
N (225 kg/ha), P (19.5 kg/ha), K (293 kg/ha), Zn (0.64 mg/kg), and Fe (8.23 mg/kg)

Treatment	Soil at harvest				
	Available N (kg/ha)	Available P (kg/ha)	Available K (kg/ha)	Available Zn (mg/kg)	Available Fe (mg/kg)
Control	198	12.40	272	0.23	7.72
RDF only	288	21.30	353	1.04	10.40
75 % RDF	213	15.60	307	0.51	8.92
75 % RDF + Bio Zn	218	16.10	311	0.61	9.31
75 % RDF + Bio NPK	224	16.70	337	0.71	9.42
75 % RDF + Bio Zn + Bio NPK	248	18.20	323	0.73	9.43
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	268	19.80	342	0.96	9.77
SEm±	14	0.96	14	0.03	0.43
CD (P=0.05)	44	2.97	44	0.09	1.32

Table 2.3.8

AGRON 3/21. Evaluation of novel bio formulation for yield enhancement in soybean
Zone: Southern **Centre:** Dharwad **Variety:** DSb 21 **Character:** Crop uptake at harvest: N, P, K, Zn and Fe

Treatment	N uptake (kg/ha)	P uptake (kg/ha)	K uptake (kg/ha)	Zn uptake (g/ha)	Fe uptake (g/ha)
Control	79.98	12.0	68.6	878	1761
RDF only	101.88	16.9	87.1	1575	3798
75 % RDF	85.95	12.9	73.7	1099	2893
75 % RDF + Bio Zn	90.24	13.5	77.4	1227	3085
75 % RDF + Bio NPK	90.89	13.6	77.9	1317	3175
75 % RDF + Bio Zn + Bio NPK	92.23	13.8	79.1	1428	3442
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	95.29	15.3	81.3	1499	3622
SEm±	3.11	0.5	2.7	58	121
CD (P=0.05)	9.58	1.5	8.2	178	373

Table 2.3.9

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean**Zone:** Eastern Zone, **Character:** Yield, yield attributes and economical parameters

Treatment	Branches/ plant	Pods/ plant	Seed index	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Control	3.26	42.83	10.15	1131	2248	3379	34	26963	44388	17426	1.47
RDF only	4.61	61.25	12.45	2106	3519	5625	38	33985	82710	48725	2.26
75 % RDF	3.70	52.00	11.61	1826	3025	4850	38	32217	71735	39518	2.09
75 % RDF + Bio Zn	3.65	53.61	11.67	1874	3108	4982	38	32459	73607	41149	2.12
75 % RDF + Bio NPK	4.00	55.50	12.12	1926	3194	5120	38	32492	75670	43178	2.19
75 % RDF + Bio Zn + Bio NPK	4.67	64.36	12.92	2236	3628	5864	39	32734	87782	55049	2.52
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	4.55	60.72	12.44	2091	3492	5583	38	32632	82136	49504	2.40

Table 2.3.10

AGRON 3/21.Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Eastern Zone, **Variety:**Character: Plant dry weight (g), CGR, RGR, Nodule parameters at R2, Nodule parameters at R5

Treatment	Plant dry weight (g)			CGR		RGR		Nodule parameters at R2			Nodule parameters at R5		
	30 DAS	45 DAS	60 DAS	45-30 DAS	60-45 DAS	45-30 DAS	60-45 DAS	Numbers	Fresh weight (g)	Dry weight (g)	Numbers	Fresh weight (g)	Dry weight (g)
Control	0.97	5.78	8.61	1.94	1.11	0.087	0.018	18.99	1.00	0.08	22.72	0.90	0.11
RDF only	1.51	7.54	11.47	2.66	1.53	0.074	0.018	31.97	1.80	0.16	41.94	1.65	0.21
75 % RDF	1.20	6.40	9.76	2.08	1.34	0.071	0.019	28.67	1.50	0.13	35.90	1.30	0.17
75 % RDF + Bio Zn	1.18	6.37	9.81	2.04	1.34	0.071	0.018	33.08	1.58	0.15	38.70	1.55	0.20
75 % RDF + Bio NPK	1.34	6.71	10.06	2.05	1.29	0.073	0.018	35.94	2.02	0.19	40.63	1.76	0.23
75 % RDF+BioZn+Bio NPK	1.52	8.07	13.06	2.96	1.90	0.079	0.018	40.20	2.06	0.21	50.76	2.24	0.31
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	1.46	7.80	12.44	2.70	1.53	0.079	0.018	38.14	2.06	0.18	49.11	23.66	0.28

Table 2.3.11

AGRON 3/21. Evaluation of novel bio formulation for yield enhancement in soybean**Zone:** Southern**Center:** ARS, Adilabad**Variety:** JS-335 (instead of DSB-21)**Character:** Soil; **data:** Initial N, P, K, Zn, and Fe; and **at****Harvest:** N, P, K, Zn and Fe

Treatments	At Initial					At Harvest				
	N (kg/ha)	P(kg/ha)	K(kg/ha)	Zn (g/ha)	Fe(g/ha)	N(kg/ha)	P(kg/ha)	K(kg/ha)	Zn(g/ha)	Fe(g/ha)
Control	214.2	20.4	275.2	260.0	672.2	220.8	20.1	291.2	270.8	672.9
RDF only	216.7	17.5	295.7	270.4	698.8	223.2	22.5	283.5	266.2	742.6
75 % RDF	217.6	17.1	288.7	263.0	686.7	217.9	20.6	282.9	272.6	800.7
75 % RDF + Bio Zn	218.4	16.1	292.4	258.6	646.4	225.8	17.9	273.9	282.2	707.1
75 % RDF + Bio NPK	222.1	18.6	299.1	265.4	663.4	219.4	19.5	281.3	269.7	749.8
75 % RDF + Bio Zn + Bio NPK	209.0	18.8	287.1	256.7	733.8	208.5	19.1	283.1	261.2	821.3
75 % RDF + Rhizobium + MDSR14 + 12c	222.5	17.9	280.6	253.0	775.9	226.4	18.5	272.0	262.1	778.7
SEm±	5.55	1.53	4.38	6.66	47.8	7.10	1.04	9.94	5.84	39.9
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 2.3.12

AGRON 3/21. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Southern zone Centre: MACS Agharkar Research Institute, Pune Variety: DSb 21

Character: Soil; data: Initial N, P, K, Zn, and Fe; and at Harvest: N, P, K, Zn and Fe

Treatment	Initial nutritional content (kg/ha)					Nutritional content after harvest (kg/ha)				
	N	P	K	Zn	Fe	N	P	K	Zn	Fe
Control	171.85	15.13	474.22	1.54	0.70	144.26	18.42	398.17	1.83	0.74
RDF only	149.27	38.82	303.12	2.23	0.66	129.69	12.94	271.43	1.54	0.88
75 % RDF	115.40	25.22	462.6	1.29	0.69	134.22	17.76	346.42	1.87	0.81
75 % RDF + Bio Zn	143.00	26.1	407.61	1.16	0.67	101.61	34.87	575.5	1.19	0.70
75 % RDF + Bio NPK	104.12	14.91	355.93	1.31	0.71	144.26	8.99	311.14	1.54	0.76
75 % RDF + Bio Zn + Bio NPK	124.19	16.23	303.12	1.32	0.69	149.27	27.63	445.38	1.58	0.69
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	125.44	17.32	339.03	1.19	0.68	222.03	25.00	478.44	1.46	0.78
SEm+	16.21	6.21	50.43	0.26	0.01	26.10	6.32	74.29	0.16	0.05
CD (P=0.05)	9.69	3.71	30.16	0.16	0.01	15.61	3.78	44.43	0.10	0.03

Table 2.3.13

AGRON 3/21. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Southern zone Centre: MACS Agharkar Research Institute, Pune, Variety: DSb 21 Character: Crop

uptake: at Harvest: N, P, K, Zn and Fe

Treatment	Nutrient uptake				
	N (kg/ha)	P (kg/ha)	K (kg/ha)	Zn (g/ha)	Fe (g/ha)
Control	64.84	6.98	22.16	75.92	42.03
RDF only	92.96	8.50	25.74	94.96	182.33
75 % RDF	73.18	6.22	15.67	64.38	59.54
75 % RDF + Bio Zn	73.63	7.84	22.09	85.50	107.58
75 % RDF + Bio NPK	108.02	7.72	33.60	94.58	155.24
75 % RDF + Bio Zn + Bio NPK	95.75	8.37	26.94	86.33	149.77
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	100.47	7.97	22.59	87.71	117.65
SEm+	11.54	0.57	3.90	7.66	36.31
CD (P=0.05)	6.90	0.34	2.33	4.58	21.71

Table 2.3.14

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean
 Zone: Central
 Character: Yield, yield attributes and economical parameters

Treatment	Branches/ plant	Pods/ plant	Seed index	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Control	2.41	25.40	11.02	1237	1533	2769	45.40	27965	54067	26102	1.39
RDF only	3.13	39.41	11.65	1600	1931	3530	46.13	30514	66606	36092	1.62
75 % RDF	2.70	30.04	11.43	1415	1697	3112	46.28	28959	59906	30946	1.50
75 % RDF + Bio Zn	2.86	33.03	11.39	1558	1825	3383	47.07	29681	66680	36999	1.65
75 % RDF + Bio NPK	2.95	34.72	11.60	1673	1978	3651	46.80	29945	72009	42064	1.79
75 % RDF + Bio Zn + Bio NPK	3.20	38.43	11.63	1716	2060	3776	46.33	30210	74212	43663	1.81
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderiaarboris</i> -High P solubilizing)	3.21	42.84	11.67	1821	2199	4020	46.69	30129	80593	50464	2.08

Table 2.3.15

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: North Plain
 Character: Yield, yield attributes and economical parameters

Treatment	Branches/ plant	Pods/ plant	Seed index	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Control	3.68	56.73	8.75	1229	4302	5531	14.92	31147	64185	26784	1.51
RDF only	4.83	77.60	9.78	1864	5191	7056	16.56	34478	99199	58351	2.31
75 % RDF	4.37	69.77	9.27	1556	4762	6318	16.04	33712	82636	42549	1.89
75 % RDF + Bio Zn	4.36	71.47	9.36	1659	4906	6564	16.01	34210	88768	48178	2.03
75 % RDF + Bio NPK	4.52	77.43	9.39	1793	4938	6731	16.95	34218	94989	54388	2.21
75 % RDF + Bio Zn + Bio NPK	4.87	79.53	9.71	1837	5186	7023	16.06	33995	99759	59509	2.35
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderiaarboris</i> -High P solubilizing)	4.57	72.43	9.40	1752	4993	6745	16.05	34183	95924	61741	2.61

Table 2.3.16

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean

Zone: Central Character: yield attributes

Treatment	Plant dry weight (g)			CGR		RGR	
	30 DAS	45 DAS	60 DAS	30-45 DAS	45-60 DAS	30-45 DAS	45-60 DAS
Control	1.78	6.20	12.68	11.53	17.40	0.067	0.044
RDF only	2.50	7.95	15.17	14.33	19.16	0.062	0.037
75 % RDF	2.04	6.90	13.71	12.80	18.29	0.066	0.041
75 % RDF + Bio Zn	2.19	7.18	13.96	13.16	18.16	0.064	0.039
75 % RDF + Bio NPK	2.28	7.59	14.64	14.10	18.89	0.066	0.038
75 % RDF + Bio Zn + Bio NPK	2.49	7.79	15.22	14.01	19.99	0.061	0.039
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderiaarboris</i> -High P solubilizing)	2.47	7.81	15.21	14.09	19.81	0.062	0.039

Table 2.3.17

ASP3/18. Evaluation of novel bio formulation for yield enhancement in soybean; Zone: North Plain Zone Character: yield attributes

Treatment	Plant dry weight (g)			CGR		RGR	
	30 DAS	45 DAS	60 DAS	45-30 DAS	60-45 DAS	45-30 DAS	60-45 DAS
Control	2.43	5.84	12.05	6.07	12.64	0.044	0.042
RDF only	3.05	8.24	18.44	8.18	20.35	0.050	0.046
75 % RDF	2.81	6.94	16.52	6.51	18.96	0.045	0.050
75 % RDF + Bio Zn	2.78	7.11	15.95	6.94	17.72	0.049	0.046
75 % RDF + Bio NPK	3.13	7.74	18.46	7.48	21.01	0.047	0.049
75 % RDF + Bio Zn + Bio NPK	3.17	7.78	17.34	7.16	19.20	0.045	0.047
75 % RDF + Rhizobium + MDSR14 + 12c (12c= <i>Burkholderia arboris</i> -High P solubilizing)	2.94	7.61	16.89	7.36	18.99	0.050	0.047

Table 2.4.1.

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: North Plain Zone Variety:SL-958Characters: Yield and economics of soybean

Treatment	Ludhiana Yield (kg/ha)	Pantnagar Yield (kg/ha)	Mean Yield (kg/ha)	Differential yield (kg/ha)	Value of differential yield (Rs/ha)	Cost of treatment (Rs/ha)	Differential cost (Rs/ha)	Ratio of differential value to differential cost	Gross Returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net returns (Rs/ha)	B:C ratio
FP (ST, SI, RDF, WM, PA, RF)	1578	1869	1724			32931			67522	32931	34591	2.05
FP – ST	1365	1764	1565	159	6204	32734	199	32.84	61317	32734	28583	1.87
FP – SI	1380	1774	1577	147	5719	32714	218	47.53	61802	32714	29088	1.89
FP – RDF	1193	1518	1356	368	14403	28618	4313	3.61	53117	28618	24499	1.87
FP – WM	644	631	638	1086	42555	28859	4073	14.30	24965	28859	-3895	0.87
FP – PA	1490	1744	1617	107	4174	31080	1851	2.55	63347	31080	32267	2.04
FP – R&F	1437	1661	1549	175	6836	31514	1417	4.90	60684	31514	29170	1.93
Sem+	49	155.5	-									
CD (at 5%)	151	479.2	-									

FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow

Table 2.4.2

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's)

Zone: North Plain Zone **Variety:** SL-958**Characters:** Yield attributes and yield of soybean

Treatment	Pods/ plant	Seed index	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)
Full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge&furrow)	92.25	8.98	5480	7204	24.59
Full package – seed treatment	84.10	8.57	5430	6994	23.10
Full package – seed inoculation	84.90	8.69	5454	7031	23.21
Full package – RDF	78.20	8.58	4601	5957	23.50
Full package – weed management	44.40	7.80	3902	4540	15.51
Full package – insecticide application	82.20	8.61	5664	7281	22.68
Full package – Ridge furrow	83.05	8.81	5454	7004	22.58

Table 2.4.3

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's)

Zone: Central Zone**Variety:** Characters: Yield and economics of soybean

Treatment	Sehore Yield (kg/ha)	Amravati Yield (kg/ha)	Kota Yield (kg/ha)	Devgarh baria Yield (kg/ha)	Mean Yield (kg/ha)	Differential yield (kg/ha)	Value of differential yield (Rs/ha)	Cost of treatment (Rs/ha)	Differential cost (Rs/ha)	Ratio of differential value to differential cost	Gross Returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net returns (Rs/ha)	B:C ratio
FP (ST, SL, RDF, WM, PA, R&F	2566	2400	1368	1932	2067			22188			68260	41567	57416	2.89
FP – ST	2200	2105	1341	1723	1842	229	8876	354	14841	3.92	61947	38124	48911	2.59
FP – SI	2290	1932	1150	1760	1783	321	12532	391	15120	4.28	61160	36065	46820	2.58
FP – RDF	2155	1071	1142	1584	1488	656	25693	2858	14612	3.40	56821	25831	37010	2.46
FP – WM	1055	1250	646	1526	1119	1128	43789	3817	15767	2.21	40077	28184	23230	1.60
FP – PA	2088	1471	1040	1661	1565	578	22599	1699	14052	5.09	56847	30774	38776	2.32
FP – R&F	2267	1637	1142	1640	1672	430	16822	833	14160	5.48	59464	32851	42526	2.41
Sem+	137	150.83	42.76	61.13										
CD (at 5%)	422	464.72	131.80	181.63										

FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow

Table 2.4.4

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Central Zone				Characters: Yield attributes and yield of soybean			
Treatment		Pods/ plant	Seed index	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)	
Full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge&furrow)		53.86	10.73	2481	4743	45.14	
Full package – seed treatment		47.31	10.65	2317	4340	44.09	
Full package – seed inoculation		47.16	10.52	2075	3935	45.59	
Full package – RDF		37.99	10.12	1708	3168	46.18	
Full package – weed management		32.23	10.06	1583	2537	41.24	
Full package – insecticide application		40.47	10.14	1806	3341	46.08	
Full package – Ridge furrow		42.15	10.25	2269	4119	42.67	

Table 2.4.5

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Northern Eastern Zone, Characters: Yield and economics of soybean												
Treatment	Medziphe ma Yield (kg/ha)	Imphal Yield (kg/ha)	Mean Yield (kg/ha)	Differential I yield (kg/ha)	Value of differential yield (Rs/ha)	Cost of treatment (Rs/ha)	Different ial cost (Rs/ha)	Ratio of differential value to differential cost	Gross Returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net returns (Rs/ha)	B:C ratio
FP (ST, SI,, RDF, WM, PA, R&F	1175	2735	1955			33109			122272	41878	80394	1.76
FP – ST	1133	2513	1823	153	9735	40785	109	12.37	112537	40785	71752	1.61
FP – SI	1064	2558	1811	127	8046	41655	223	35.99	114226	41655	72571	1.60
FP – RDF	354	2094	1224	615	38478	33930	7948	4.84	83794	33930	49864	1.22
FP – WM	103	1260	682	1268	79748	35718	6160	13.28	42524	35718	6806	0.02
FP – PA	779	1965	1372	594	37583	39894	1984	18.45	84689	39894	44795	0.99
FP – R&F	1132	2254	1693	291	18638	38938	2940	5.62	103634	38938	64696	1.54
Sem+	31.02	114.12										
CD (at 5%)	95.59	351.64										
FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow												

FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow

Table 2.4.6

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Northern/Eastern Zone, Characters: Yield attributes and yield of soybean

Treatment	Pods/ plant	Seed index	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)
Full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge&furrow)	96.42	12.05	3361	5185	36.95
Full package – seed treatment	82.25	12.20	3375	5046	34.55
Full package – seed inoculation	82.75	12.19	3191	4888	36.90
Full package – RDF	60.00	11.80	2418	3628	33.55
Full package – weed management	38.00	9.25	1157	1713	32.08
Full package – insecticide application	54.84	11.90	2624	3853	33.62
Full package – Ridge furrow	74.84	11.77	3263	4796	34.72

Table 2.4.7

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Southern Zone, Characters: Yield and economics of soybean

Treatment	Adilabad Yield (kg/ha)	Pune Yield (kg/ha)	Dharwad Yield (kg/ha)	Mean Yield (kg/ha)	Differential yield (kg/ha)	Value of differential yield (Rs/ha)	Cost of treatment (Rs/ha)	Differential cost (Rs/ha)	Ratio of differential value to differential cost	Gross Returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net returns (Rs/ha)	B:C ratio
FP (ST, SI,, RDF, WM, PA, R&F	2479	3040	2371	2630	0	43468	29959		2	116145	44722	71424	2.55
FP – ST	2301	2884	2303	2496	134	5639	29572	387	49	110493	42874	67618	2.55
FP – SI	2391	2677	2256	2441	189	8041	29671	288	60	108090	42552	65538	2.61
FP – RDF	2122	2158	2211	2164	466	19250	23470	6489	3	96891	37199	59692	2.72
FP – WM	1585	2594	1873	2017	613	26777	23232	6727	6	89355	34776	54580	2.59
FP – PA	1818	2671	1993	2161	469	20486	25924	4035	6	95653	39705	55949	2.32
FP – R&F	1951	2664	2278	2298	332	13611	26557	3402	4	102534	41244	61291	2.50
Sem+	220.7	85.28	98										
CD (at 5%)	480.8	262.74	302										

FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow

Table 2.4.8

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Southern Zone, Characters: Yield attributes and yield of soybean

Treatment	Pods/ plant	Seed index	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)
Full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge&furrow)	62.81	13.38	4497	7127	43.91
Full package – seed treatment	59.40	12.88	4275	6672	43.66
Full package – seed inoculation	57.14	13.47	4273	6714	42.42
Full package – RDF	52.12	13.13	4210	6374	39.26
Full package – weed management	47.11	13.30	3479	5496	42.62
Full package – insecticide application	53.23	12.68	3960	6121	41.26
Full package – Ridge furrow	56.24	13.04	4158	6452	41.02

Table 2.4.9

AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centre's); Zone: Eastern Zone, Characters: Yield and economics of soybean

Treatment	Bhawa nipatn a Yield (kg/ha)	Ranchi Yield (kg/ha)	Raipur Yield (kg/ha)	Mean Yield (kg/ha)	Differential yield (kg/ha)	Value of differential yield (Rs/ha)	Cost of treatment (Rs/ha)	Differential cost (Rs/ha)	Ratio of differential value to differential cost	Gross Returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	B:C ratio
FP (ST, SI, RDF, WM, PA, R&F)	2057	2454	1876	2129			32634		8.53	83617	32634	50983	2.49
FP – ST	1826	2389	1493	1902	227	8899	32201	434	40.61	74718	32201	42517	2.19
FP – SI	1659	2333	1427	1806	323	12654	32365	269	26.04	70963	32365	38598	2.05
FP – RDF	1120	1352	610	1027	1102	42776	25818	6816	10.10	40314	25818	14496	1.29
FP – WM	1040	1361	352	918	1211	47610	27986	4648	13.53	36007	27986	8021	0.91
FP – PA	1733	2019	517	1423	706	27816	30216	2418	9.80	55801	30216	25585	1.46
FP – R&F	1966	2185	1649	1933	196	7703	30146	2488	4.80	75914	30146	45768	2.37
Sem+	81	120.65	28.6										
CD (at 5%)	249	371.79	86.3										

FP-Full package, ST-Seed treatment, SI- Seed inoculation, WM- Weed management, PA- Pesticide application, RF- Ridge & Furrow

Table 2.4.10**AGRON-4/19: Evaluation of partial factor productivity for soybean (All Centres)****Zone:** EasternZone, **Characters:** Yield attributes and yield of soybean

Treatment	Pods/ plant	Seed index	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)
Full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge and furrow)	54.54	10.88	3155	5284	40.56
Full package – seed treatment	47.97	10.55	2862	4765	39.93
Full package – seed inoculation	45.67	10.06	2779	4585	39.44
Full package – RDF	34.06	9.91	1598	2625	38.94
Full package – weed management	27.24	9.23	1389	2307	39.58
Full package – insecticide application	39.95	9.84	2118	3541	39.55
Full package – Ridge furrow	49.65	10.67	2953	4887	39.75

Table 2.5.1

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: North Plain, Variety:PS 1347 and SL 958Character: Growth and yield attributing

Treatment	Plant dry weight (g/plant)								CGR				RGR			Plant height (cm)	Branches/ plant	Pods/ plant	Seed index (g)
	30 DAS		45 DAS		60 DAS		75 DAS		45-30 DAS		60-45 DAS		75-60 DAS						
Variety																			
PS 1347	4.36	9.59	17.71	25.90	9.63	15.95	15.06	0.050	0.044	0.025	64.36	4.59	91.4	10.75					
SL 958	4.91	10.4	19.62	26.67	10.35	17.25	13.77	0.050	0.041	0.021	91.56	3.62	92.3	9.49					
Thiourea (Spray at 20-25 & 50-55 DAS)																			
Control	3.17	6.34	13.69	18.18	6.33	15.75	8.78	0.037	0.044	0.015	73.52	3.12	59.0	9.24					
Water spray	3.38	6.91	13.77	18.81	6.91	14.99	9.67	0.036	0.041	0.016	77.22	3.21	63.6	9.36					
Thiourea @ 250 ppm	3.53	7.74	14.72	20.76	8.10	15.29	10.85	0.040	0.037	0.017	81.31	3.37	76.9	9.50					
Thiourea @ 500 ppm	3.92	8.02	15.15	21.23	7.98	15.59	11.58	0.037	0.036	0.017	83.80	3.42	85.5	9.81					
Thiourea @ 750 ppm	3.99	8.24	15.79	22.34	8.29	16.36	12.57	0.038	0.037	0.017	86.52	3.73	87.8	9.97					

Table 2.5.2

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: North Plain, Variety: PS 1347 and SL 958; Character: Seed yield (kg/ha)

Treatment	Ludhiana	Pantnagar	Delhi	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Variety											
PS 1347	1564	1694	1906	1721	4417	6143	28.16	35060	76442	41381	1.82
SL 958	1216	1605	2119	1647	4851	6501	25.73	35120	74229	39108	1.75
Sem $\pm$	38	59.17	56.6								
CD	111	NS	168								
Thiourea(Spray at 20-25 & 50-55 DAS)											
Control	1238	1407	1778	1474	4204	5678	26.40	34173	65886	31713	1.57
Water spray	1304	1438	1815	1519	4335	5854	26.35	35081	67942	32861	1.58
Thiourea @ 250 ppm	1381	1706	1963	1683	4665	6368	27.01	35247	75275	40028	1.78
Thiourea @ 500 ppm	1559	1798	2235	1864	4842	6706	27.82	35414	83137	47723	1.98
Thiourea @ 750 ppm	1470	1899	2272	1880	5124	7005	27.06	35581	84443	48862	2.01
Sem $\pm$	61	93.57	89.5	-							
CD (at 5%)	175	271.5	266	-							

Table 2.5.3

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: Eastern, Variety: JS 95-60 and RSC 10-46, Character: Growth and yield attributing

Treatment	Plant dry weight (g/plant)						CGR			RGR				Plant height (cm)	Branches/ plant	Pods/ plant	Seed index (g)
	30 DAS	45 DAS	60 DAS	75 DAS	45-30 DAS	60-45 DAS	75-60 DAS	45-30 DAS	60-45 DAS	75-60 DAS	60-45 DAS	75-60 DAS	75-60 DAS				
Variety																	
JS 95 60	1.74	6.75	17.40	27.62	0.336	0.740	0.520	0.040	0.013	0.006	0.013	0.006	0.006	60.74	3.58	45.89	10.92
RSC 10-46	1.84	7.61	21.60	30.33	0.390	0.865	0.586	0.042	0.015	0.007	0.015	0.007	0.007	70.82	4.13	60.27	10.87
Thiourea (Spray at 20-25 & 50-55 DAS)																	
Control	1.68	6.48	17.10	24.58	0.321	0.702	0.514	0.041	0.014	0.007	0.014	0.007	0.007	62.29	3.40	48.78	10.37
Water spray	1.76	6.77	17.91	25.86	0.335	0.757	0.509	0.040	0.014	0.007	0.014	0.007	0.007	62.80	3.61	50.95	10.60
Thiourea @ 250 ppm	1.79	7.29	20.37	27.19	0.368	0.835	0.485	0.041	0.015	0.006	0.015	0.006	0.006	64.50	4.07	55.17	11.09
Thiourea @ 500 ppm	1.85	7.88	20.96	29.91	0.400	0.841	0.584	0.041	0.015	0.006	0.015	0.006	0.006	67.46	4.29	55.36	11.18
Thiourea @ 750 ppm	1.88	8.03	21.44	31.38	0.414	0.872	0.652	0.041	0.015	0.006	0.015	0.006	0.006	69.61	4.39	57.67	11.38

Table 2.5.4

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: Eastern; Variety: JS 95-60 and RSC 10-46; Character: Seed yield (kg/ha)

Treatment		Ranchi	Raipur	Seed yield (kg/ha)	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Variety											
JS 95 60		1662	1486	1574	3333	2115	10290	45714	51900	32913	1.93
RSC 10-46		1929	1667	1798	3718	2380	10290	49285	60745	43461	2.27
Sem+		41.31	2.03								
CD (at 5%)		119.87	6.10								
Thiourea (Spray at 20-25 & 50-55 DAS)											
Control		1679	1407	1543	3204	2106	9925	43529	51028	34809	1.96
Water spray		1718	1469	1593	3310	2141	10325	45101	52630	35670	1.97
Thiourea @ 250 ppm		1789	1583	1686	3538	2249	10375	47630	56230	37911	2.09
Thiourea @ 500 ppm		1886	1661	1774	3696	2356	10400	49468	59676	41176	2.20
Thiourea @ 750 ppm		1906	1763	1834	3878	2385	10425	51770	62049	41369	2.29
Sem+		65.32	4.51								
CD (at 5%)		189.53	14.62								

Table 2.5.5

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: Central															Character: Growth and yield attributing		
Treatment	Plant dry weight (g/plant)				CGR			RGR			Plant height (cm)	Branches/plant	Pods/plant	Seed index (g)			
	30 DAS	45 DAS	60 DAS	75 DAS	45-30 DAS	60-45 DAS	75-60 DAS	45-30 DAS	60-45 DAS	75-60 DAS							
Variety																	
NRC 86	2.45	10.59	16.95	22.74	23.23	17.64	15.46	0.102	0.031	0.018	64.40	3.60	55.95	11.36			
RVS 24	2.37	11.08	17.27	22.47	24.90	17.00	14.36	0.108	0.029	0.016	64.84	3.98	60.79	12.05			
Thiourea (Spray at 20-25 & 50-55 DAS)																	
Control	2.15	9.98	16.24	21.28	22.33	17.37	13.26	0.108	0.032	0.016	61.44	3.54	51.81	11.29			
Water spray	2.29	10.36	16.65	22.42	23.04	17.41	15.40	0.106	0.031	0.018	62.98	3.64	54.27	11.52			
Thiourea @ 250 ppm	2.43	10.94	17.03	22.82	24.35	16.76	15.90	0.105	0.029	0.018	64.44	3.79	56.27	11.76			
Thiourea @ 500 ppm	2.60	11.60	18.18	23.23	25.78	18.19	13.82	0.104	0.029	0.015	67.62	3.97	64.95	11.98			
Thiourea @ 750 ppm	2.60	11.30	17.45	23.52	24.83	16.87	16.17	0.103	0.028	0.018	66.63	4.03	64.55	11.99			

Table 2.5.6

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: Central, Character: Seed yield (kg/ha)															
Treatment	Sehore	Kota	Amravati	Devgarh Baria	Seed yield (kg/ha) (mean)	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)	Cost of cultivation n (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio			
Variety															
JS 20 29	1857	JS 20 34	1390	NRC 86	2263	NRC 86	1721	1808	2409	4361	46.50	27854	69692	41838	2.42
JS 20 69	2202	JS 95 60	1563	RVS 24	2700	RVS 24	1632	2024	2554	4903	47.89	28061	77746	49684	2.71
Sem+	3.23		35.91		29.68		-								
CD (at 5%)	19.64		86.08		86.12		93.1								
Thiourea(Spray at 20-25 & 50-55 DAS)															
Control	1741		1416		2292		1351	1700	2241	4262	46.85	27427	65302	37875	2.26
Water spray	1886		1450		2338		1486	1790	2352	4423	46.99	28061	68858	40797	2.34
Thiourea @ 250 ppm	2074		1467		2513		1716	1943	2507	4680	47.20	28322	74718	46396	2.56
Thiourea @ 500 ppm	2185		1511		2718		1883	2074	2653	4922	47.52	28582	79806	51224	2.73
Thiourea @ 750 ppm	2260		1539		2545		1947	2074	2654	4873	47.39	28662	79916	51254	2.74
Sem+	71.84		41.25		46.93		-								
CD (at 5%)	215.38		NS		136.17		147.20								

Table 2.5.7

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: Southern Character: Growth and yield attributing

Treatment	Plant dry weight (g/plant)						CGR						RGR				Plant height (cm)	Branches/ plant	Pods/ plant	Seed index (g)
	30 DAS		45 DAS		60 DAS		75 DAS		45-30 DAS		60-45 DAS		75-60 DAS							
Variety																				
JS 93 05	5.12	21.33	34.30	52.91	5.68	6.77	12.72	0.156	0.077	0.130	59.85	5.05	46.95	12.95						
MACS 1188	6.61	28.52	40.97	56.06	5.11	5.59	10.77	0.242	0.076	0.077	75.25	6.30	54.65	14.40						
Thiourea (Spray at 20-25 & 50-55 DAS)																				
Control	5.70	22.55	34.50	49.29	5.41	4.05	10.02	0.164	0.073	0.065	61.60	5.40	45.70	12.70						
Water spray	5.65	24.60	36.90	53.80	5.59	5.20	11.23	0.195	0.074	0.109	65.75	5.65	47.55	13.20						
Thiourea @ 250 ppm	5.99	25.10	38.19	54.71	5.04	6.60	11.41	0.196	0.081	0.105	68.35	5.75	49.80	13.95						
Thiourea @ 500 ppm	5.89	26.05	38.39	56.47	6.16	6.38	12.43	0.207	0.070	0.129	69.75	5.90	53.75	14.15						
Thiourea @ 750 ppm	6.10	26.34	40.24	58.10	4.78	8.66	13.64	0.233	0.084	0.113	72.35	5.90	55.15	14.50						

Table 2.5.8

AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea; Zone: SouthernCharacter: Seed yield (kg/ha)

Treatment	Dharwad	Adilabad	Seed yield (kg/ha)(mean)	Straw yield (kg/ha)	Biological yield (kg/ha)	HI (%)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Variety										
JS 93 05	2163	2059	2111	3918	6029	15.5	43453	100139	56686	2.40
MACS 1188	2677	2234	2456	4367	6822	16.45	43233	117738	74506	2.86
Sem±	52	34.6	-							
CD (at 5%)	154	101.1	-							
Thiourea(Spray at 20-25 & 50-55 DAS)										
Control	2181	1873	2027	3957	5984	14.50	40733	96978	56239	2.48
Water spray	2284	1991	2138	4012	6150	15.30	41892	102144	60252	2.54
Thiourea @ 250 ppm	2404	2176	2290	4224	6514	15.70	42913	109082	66169	2.65
Thiourea @ 500 ppm	2565	2315	2440	4249	6689	16.86	44512	116271	71534	2.73
Thiourea @ 750 ppm	2664	2377	2521	4271	6792	17.56	46440	120223	73782	2.74
Sem±	82	54.8	-							
CD (at 5%)	244	159.9	-							

Table 2.6.1

AGRON- 6/21. Bio efficacy testing of Cytozyme bio stimulant product Crop Max (Crop 100) on Soybean (*Glycine max*); Character: Yield and economics

Treatment	Kota	Sehore	Amravati	Seed Yield (kg/ha) (mean)	Number of pods per plant	Weight of 100 seeds	Biological yield
Crop Max, 500 ml/ha	1587	1934	1788	1770	31.91	11.23	4081
CropMax 625 ml/ha	1629	1953	1840	1807	32.98	11.44	4148
CropMax 750 ml/ha	1654	1975	2146	1925	36.77	11.62	4468
Biozyme (Liquid) – Standard check, 500 ml/ha	1674	1885	1958	1839	35.11	11.32	4255
Untreated control	1389	1739	1528	1552	27.62	11.07	3520
Sem±	55.61	61	101.12	-			
CD (at 5%)	171.42	NS	311.57	-			

Table 2.6.2

AGRON- 6/21. Bio efficacy testing of Cytozyme bio stimulant product Crop Max (Crop 100) on Soybean (*Glycine max*); Character: Yield and economics

Treatment	Dharwad	Adilabad	Seed Yield (kg/ha)
Crop Max, 500 ml/ha	2302	2007	2155
CropMax 625 ml/ha	2374	2141	2258
CropMax 750 ml/ha	2469	2336	2403
Biozyme (Liquid) – Standard check, 500 ml/ha	2447	2178	2313
Untreated control	2097	1847	1972
Sem±	102	137.1	
CD (at 5%)	316	417.3	

Table 2.6.3

AGRON. 6/21. Bio-efficacy testing of Cytozymebio stimulant product Crop Max (Crop 100) on soybean (*Glycine max*)

Zone: Southern **Centre:** Dharwad **Variety:** MACS 1188

Treatments	Plant Vigor	No. of primary branches per plant (mean)	Chlorophyll content (SPAD)		Leaf Area Index		Dry matter accumulation per plant (Biomass yield) (mean)		
			30 DAS	60 DAS	30 DAS	60 DAS	30	45	60
Crop Max, 500 ml/ha	150	4.40	36.21	46.95	1.46	3.42	6.22	19.12	41.98
Crop Max 625 ml/ha	150	4.95	36.51	48.86	1.63	3.49	6.82	19.66	42.87
Crop Max 750 ml/ha	200	5.30	36.53	48.55	1.93	4.23	7.24	20.37	43.52
Biozyme (Liquid) - Standard check, 500 ml/ha	150	5.05	36.13	47.33	1.77	3.83	6.70	19.58	43.32
Untreated control	100	4.00	35.58	46.57	1.32	3.03	6.44	17.95	40.12
Sem±	10		1.24	1.37	0.07	0.14			
CD (P=0.05)	30		NS	NS	0.21	0.42			

Table 2.6.4

AGRON. 6/21. Bio-efficacy testing of Cytozymebio stimulant product Crop Max (Crop 100) on soybean (*Glycine max*)

Zone: Southern, **Centre:** Dharwad, **Variety:** MACS 1188

Treatments	Number of pods per plant (mean)	Weight of 100 seeds (mean)	Biological yield (kg/ha) (mean)	Number of seeds/pods	Cost of cultivation (Rs. /ha)	Gross returns (Rs. /ha)	Net returns (Rs. /ha)	B:C Ratio
Crop Max, 500 ml/ha	45.75	13.47	6182	2.6	35063	126610	91547	3.61
CropMax 625 ml/ha	49.35	13.85	6331	2.9	36045	130570	94525	3.62
CropMax 750 ml/ha	51.45	14.50	6653	3.0	37563	135796	98233	3.62
Biozyme (Liquid) – Standard check, 500 ml/ha	48.35	14.15	6423	2.7	34585	134567	99982	3.89
Untreated control	41.40	13.27	6018	2.6	32663	115353	82690	3.53
Sem±				0.2		5634	5634	0.15
CD (P=0.05)				NS		17362	NS	NS

Table 2.6.5

AGRON. 6/21. Bio-efficacy testing of Cytozyme bio stimulant product Crop Max (Crop 100) on soybean(*Glycine max*)

Zone: Southern, **Centre:** Dharwad, **Variety:** MACS 1188

Phyto-toxicity of Cytozyme bio stimulant product Crop Max is given below: At 0, 1, 3, 5, 7 and 10 days after each application for all treatment

Treat ments	Leaf tip injury							Wilting/ Stunting							Vein Clearing							Necrosis/Chlorosis							Epinasty and Hyponasty						
	0	1	3	5	7	10	15	0	1	3	5	7	10	15	0	1	3	5	7	10	15	0	1	3	5	7	10	15	1	3	5	7	10	15	
Crop Max, 500 ml/ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Crop Max 625 ml/ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Crop Max 750 ml/ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Crop Max 1250 ml/ha *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Biozy me (Liqui d) – Stand ard check , 500 ml/ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Table 2.6.6

AGRON. 6/21. Bio-efficacy testing of Cytozymebio stimulant product Crop Max (Crop 100) on soybean
Zone: Southern, **Centre:** Adilabad

Phyto-toxicity of Cytozyme bio stimulant product Crop Max for Adilabad centre is given below:

Table. Leaf injury should be considered on visual rating from 1-10 as follows:

% Injury	Rating	% Injury	Rating
0-10	1	11-20	2
21 - 30	3	31-40	4
41-50	5	51-60	6
61-70	7	71-80	8
81-90	9	91-100	10

1	Phytotoxicity symptoms - Leaf injury on tips and leaf surface at						
S. No.	Treatments	0 DAS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
1	Crop Max (Crop 100) @ 500 ml/ha	1	1	1	1	1	1
2	Crop Max (Crop 100) @ 625 ml/ha	1	1	1	1	1	1
3	Crop Max (Crop 100) @ 750 ml/ha	1	1	1	1	1	1
4	Crop Max (Crop 100) @ 1250 ml/ha	1	1	1	1	1	1
5	Biozyme (Liquid) @ 500 ml/ha - Standard check	1	1	1	1	1	1
6	Untreated control	0	0	0	0	0	0

2	Phytotoxicity symptoms - Wilting at						
S. No.	Treatments	0 DAS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
1	Crop Max (Crop 100) @ 500 ml/ha	1	1	1	1	1	1
2	Crop Max (Crop 100) @ 625 ml/ha	1	1	1	1	1	1
3	Crop Max (Crop 100) @ 750 ml/ha	1	1	1	1	1	1
4	Crop Max (Crop 100) @ 1250 ml/ha	1	1	1	1	1	1
5	Biozyme (Liquid) @ 500 ml/ha - Standard check	1	1	1	1	1	1
6	Untreated control	0	0	0	0	0	0

3	Phytotoxicity symptoms - Vein clearing at						
S. No.	Treatments	0 DAS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
1	Crop Max (Crop 100) @ 500 ml/ha	1	1	1	1	1	1
2	Crop Max (Crop 100) @ 625 ml/ha	1	1	1	1	1	1
3	Crop Max (Crop 100) @ 750 ml/ha	1	1	1	1	1	1
4	Crop Max (Crop 100) @ 1250 ml/ha	1	1	1	1	2	2
5	Biozyme (Liquid) @ 500 ml/ha - Standard check	1	1	1	1	1	1
6	Untreated control	0	0	0	0	0	0

4	Phytotoxicity symptoms -Necrosis at						
S. No.	Treatments	0 DAS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
1	Crop Max (Crop 100) @ 500 ml/ha	1	1	1	1	1	1
2	Crop Max (Crop 100) @ 625 ml/ha	1	1	1	1	1	1
3	Crop Max (Crop 100) @ 750 ml/ha	1	1	1	1	1	1
4	Crop Max (Crop 100) @ 1250 ml/ha	1	1	1	1	1	1
5	Biozyme (Liquid) @ 500 ml/ha - Standard check	1	1	1	1	1	1
6	Untreated control	0	0	0	0	0	0

5	Phytotoxicity symptoms - Epinasty and hyponasty at						
S. No.	Treatments	0 DAS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
1	Crop Max (Crop 100) @ 500 ml/ha	1	1	1	1	1	1
2	Crop Max (Crop 100) @ 625 ml/ha	1	1	1	1	1	1
3	Crop Max (Crop 100) @ 750 ml/ha	1	1	1	1	1	1
4	Crop Max (Crop 100) @ 1250 ml/ha	1	1	1	1	2	2
5	Biozyme (Liquid) @ 500 ml/ha - Standard check	1	1	1	1	1	1
6	Untreated control	0	0	0	0	0	0

Table 2.6.7

AGRON. 6/21. Bio-efficacy testing of Cytozymebio stimulant product Crop Max (Crop 100) on soybean
Zone: Centre: Kota

Table. Phyto-toxicity: Observations on phytotoxicity symptoms.

Treatments	Leaf injury on tips and leaf surface						Wilting						Vein clearing						Necrosis						Epinasty and hyponasty					
	DAS						DAS						DAS						DAS						DAS					
	0	1	3	5	7	10	0	1	3	5	7	10	0	1	3	5	7	10	0	1	3	5	7	10	0	1	3	5	7	10
Crop Max, 500 ml/ha	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CropMax 625 ml/ha	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CropMax 750 ml/ha	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CropMax 1250 ml/ha*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Biozyme (Liquid) – Standard check, 500 ml/ha	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Untreated control	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

dhV foKku Entomology

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Table 3.1: Ent. 1 a. Seasonal incidence of soybean insect-pests

SMW	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
PANTNAGAR (Var. Bragg)																
White fly / 3 leaf	--	--	--	--		0.77	1.33	2.45	2.70	3.21	3.80	2.32	1.60	1.01	0.94	
Stem fly % Stem tunneling	--	--	--					11.12	12.11	15.85	23.54	24.65	23.44	25.32		
Aphids / 3 leaf	--	--	--			0.22	0.40	0.82	1.00	2.15	2.83	1.88				
Semilooper/m									0.70	1.21	2.11	1.76	0.98	0.66		
Spodoptera litura Fb (l/ml)								0.32	1.22	1.88	3.44	4.89	1.34	0.48		
Spilosoma obliqua (W.) (l/ml)								0.87	2.14	2.78	1.20	0.40	0.30			
% Defoliation																
21.53% at peak incidence																
SEHORE (Var. JS 335)																
G. gemma			0.00	0.50	2.5	2.66	2.99	5.33	2.1	0.66	0.00					
C. acuta	-	-	0.00	1.33	3.0	3.66	3.33	7.66	3.9	0.66	0.00	-	-	-		
Helicoverpa	-	-	0.30	0.50	3.3	2.66	0.9	0.6	1.0	0.33	-	-				
Tobacco	-	-	0.00	0.20	1.3	1.33	1.8	4.66	2.50	0.50	-	-	-			
Stem fly % infest.	-	-	-	20.0	20.0	30.0	40.0	40.0	50.0	50.0	50.0	50.0	.	-		
Stem fly (%) ST	-	-	-	0.50	2.3	15.0	24.0	19.8	22.40	15.5	10.4	-	-	-		
Girdle beetle%	-	-	-	0.40	0.9	1.22	2.0	3.5	5.5	8.2	10.0	10.5		-		
Minor insect pests	Minor insect pests: Gray weevil (Mylocerus sp.), Field crickets and white fly and Mocis undata was observed at negligible level.															
PARBHANI (Var. MAUS 2)																
O. brevis % Infestation		0.00	0.00	0.00	1.67	3.33	5.00	10.00	11.67	13.33	13.33	13.33				
Green semilooper larvae/ml		0.00	0.00	0.00	0.00	0.33	3.33	9.33	13.33	4.00	1.67	0.67				
M. sojae	Stem tunneling at physiological maturity : 36.10 %															
Minor insect pests	H. armigera, Condica illecta, Spodoptera litura, Jassids, White fly, Grey Weevil															
AMARAWATI (Var. JS 335)																
Girdle beetle %	--	--	0	0	0.2	0.4	0.2	0	0	0.2	0	0	0	0		
Stem fly % Infest.	--	--	0	0	30	30	60	70	70	70	80	80	0	0		
Semilooper			0	0	0.06	0.2	0.26	0.33	0.06	0	0	0	0	0		
Spodoptera litura			0	0	0.33	0.67	0.33	0.46	0.53	0.2	0					

SMW	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
KOTA (Var. JS 335)																
Girdle beetle (%)	-	-			-	-	3.33	6.67	10.00	13.33	16.33	16.67	20.00	23.00	-	-
Semi loopers/m	-	-	-		-	0.33	0.33	0.67	1.00	1.00	1.33	1.00	0.67	0.33	-	-
S. litura / m	-	-	-		-	0.00	0.00	0.00	0.33	0.33	0.33	0.67	0.33	0.33	-	-
H. armigera/m					-	0.33	0.33	0.33	0.00	0.33	0.67	-	0.33	0.33	-	-
White fly/plant	-	-	-		-	1.00	1.33	3.33	4.00	5.33	6.67	5.67	4.00	2.67	1.33	-
Jassids/plant	-	-	-	-	-	1.67	2.00	2.67	3.67	4.67	6.00	5.00	3.67	2.00	1.00	-
Defoliation (%)	3.5 at flowering and 18.5 at peak larval incidence at 37-38 (SMW)															
Minor insects	Stem fly, grass hoppers, field cricket, hairy caterpillars & grey weevil															
DHARWAD (Var. JS 335)																
Spodoptera litura Fb (l/mrl)					-	-	0.75	1.43	3.07	4.58	5.08	4.72	3.59	2.43	1.39	
Thysanoplusia orichalcea Fab (l/mrl)					-	-	0.12	0.29	0.93	1.57	2.34	2.16	1.67	0.89	0.56	
Spilosoma obliqua (W.) (l/mrl)					-	-	-	0.95	1.98	2.76	4.21	5.64	5.16	4.23	2.54	
O. brevis Infestation (%)							2.39	5.83	8.93	10.78	12.38	9.68	7.92	5.23		
M. sojae Stem tunneling (%)							1.32	3.48	6.39	9.26	10.26	8.17	3.29	-		
C. pychora Pod damage (%)												30.69	33.26	39.41	42.19	47.16
Minor insect pests																
Helicoverpa armigera (l/mrl)							0.77	1.23	2.31	2.95	2.43	1.92	1.29	0.78		
D. Myllocerus beetles/plant.					-		0.65	0.85	1.10	1.25	1.40	0.90	-			
Green stinkbugs Nezara viridula (number/plant)					-	0.70	1.35	1.60	1.75	1.30	0.65	0.95				
% Defoliation	17.34% at Flowering and 35.82% at peak incidence of larvae															
IMPHAL (Var. JS 335)																
S. obliqua/m	61.33		59.00		55.67	81.33	43.33	10.67	8.00	0.00	0.00	0.00				
Leaf Weber /m	5.33		8.33		5.67	6.33	5.33	4.33	4.67	4.00	1.33	0.00				
S. litura/m	0.00		0.00		4.00	5.33	5.67	6.00	3.33	2.00	1.67	0.00				
Aphids / plant	0.00		4.40		14.80	13.50	31.20	11.60	8.40	8.00	0.00	0.00				

Seedling mortality at 7-10 DAG	6.00 % due to stem fly attack at seedling stage
Stem fly	12.24 %
% Defoliation	At peak incidence 31.84 %
Minor insect pests	Gram pod borer, bean bug, soybean thrips
	DELHI (Var. JS 335)
YMV	YMV rating 9.00 on a scale of 1 – 9
White fly	Infestation started right from its seedling stage and The highest number of whitefly count was observed in 37 th standard meteorological week (SMW) with a value 21.6.
Stem fly	mean stem tunneling 40.63 percent
<i>Spodoptera litura</i>	The highest number of <i>Spodoptera</i> adults were obtained in 36 th SMW (3.5) followed by 30 th SMW (3.25).

Table 3.2 : Ent. 1 b. Seasonal incidence of bio- control agents

SMW	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
SEHORE																
Spiders and coccinellids	Negligible level															
B. bassiana infec.	14.20 % with maximum mortality during August last week															
PARBHANI																
Lady bird beetle/m	--	0.00	0.00	0.33	0.67	1.00	1.00	0.67	1.67	1.00	1.33	0.67				
Spider/m		0.00	0.00	0.00	1.00	1.00	1.33	3.33	4.33	2.33	3.67	1.67				
PANTNAGAR																
Coccinellid beetle/mrl						0.18	0.42	0.56	0.67	1.05	1.30	0.90	0.60	0.60	0.40	
Bugs/plant								0.24	0.45	1.55	1.67	1.99	2.21	0.89	1.23	
Bacterial infection	45.5%															
Virus infection	17.5%															
Fungal infection	8%															
AMRAVATI																
Lady bird beetle			0	0	0	3	2	1	1	0	0	0	0			
KOTA																
Coccinellid beetle/mrl					-	0.33	0.33	0.67	1.00	1.00	1.67	1.33	1.00	0.67	0.33	-
Cotesia parasitization (%)					-	1.00	2.0	2.75	2.5	3.00	1.8	1.00	1.00	-	-	-
Spiders/plant					-	0.3	0.5	0.8	1.0	0.9	0.7	0.5	0.5	0.3	0.1	-
DHARWAD																
Coccinellid beetle/mrl								0.75	1.15	1.80	2.05	2.20	1.85	1.40		
C. carnea /mrl								0.60	0.95	1.35	1.90	2.00	1.70	1.25		
Spiders/plant								0.30	0.45	0.70	0.95	0.55	0.40	0.30		
Apanteles sp. Parasitization (%)								4.31	6.53	7.49	8.35	7.97	6.17			
N. rileyi Infection (%)								5.59	8.41	13.25	17.33	18.17	14.3 9	10.2 8	9.33	
IMPHAL																
Spiders/plant	0.4	0.0	0.4	0.1	0.4	0.2	0.0	0.3	0.2	0.4	0.0					
Coccinellids/plant	0.4	0.6	0.9	0.5	0.3	0.3	0.7	0.4	0.3	0.1	0.0					
Larval mortality %	5 to 20%															

Table 3.3 : Ent. 2 a. Field screening of AVT entries (Central Zone) for resistance to major insect-pests (Defoliators)

Table 3.3 : Line 2 a. Field screening of 14 Y1 entries (Central Zone) for resistance to major insect pests (Defoliators)													
S. No.	Entry	Defoliators (larvae / m)			Reaction to Insect-Pest complex				% Defoliation	No. of <i>H. armigera</i> larvae/ m	Semilooper	<i>S. litura</i> (larvae/m)	
		Amravati	Kota	Sehore	Amravati	Kota	Sehore	Prabhani					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
1.	DLSb 1		1.50 (1.41)*- R	1.99 (1.56) LR		RLY	S-HY	S-LY	25.05 MS	0.25 (0.85)*	4.00 (2.11)* HR	0.25 (0.85)*MR	
2.	HIMSO 1689	0.03	1.84 (1.53) - MR	1.99 (1.85) MR	S-LY	RLY	R-LY	S-LY	14.05 LS	0.25 (0.85)	6.50 (2.64) MR	0.75 (1.11) LR	
3.	JS 21-72	0.30	2.33 (1.68) - LR	0.83 (1.15) R	S-LY	RHY	R-HY	S-HY(T)	6.76 LS	0.00 (0.70)	9.50 (3.16) LR	1.00 (1.20) LR	
4.	JS 22-12	0.47	2.00 (1.58)*-LR	1.83 (1.52) LR	S-LY	RHY	S-LY	S-LY	7.62 LS	0.00 (0.70)	6.00 (2.54) R	0.50 (1.00) MR	
5.	JS 22-16	0.07	1.67 (1.47) - MR	0.83 (1.14) R	S-LY	RHY	R-HY	S-LY	10.00 LS	0.00 (0.70)	5.50 (2.44) HR	0.25 (0.85) MR	
6.	JS 22-18	0.45	2.34 (1.68) - LR	1.33 (1.34) MR	S-LY	SLY	R-HY	S-LY	12.47 LS	0.50 (1.00)	8.75 (3.04) LR	1.25 (1.31) LR	
7.	KDS 1096		2.33 (1.68) - LR	1.33 (1.34) MR		SHY	S-LY	S-HY(T)	25.48 MS	0.00 (0.70)	6.25 (2.59) MR	0.00 (0.70) MR	
8.	NRC 149			0.66 (1.07) HR			R LY						
9.	NRC 150	0.60	1.33 (1.35) - MR	1.66 (1.47) MR	S-LY	RHY	S-LY	S-LY	6.09 LS	0.25 (0.85)	10.50 (3.31) HS	1.75 (1.49) S	
10.	NRC 152		1.17 (1.29) - R	0.83 (1.15) R		SLY	R-HY	S-LY	12.99 LS	0.00 (0.70)	5.50 (2.44) HR	0.25 (0.85) MR	
11.	NRC 165		1.50 (1.41) - MR	2.33 (1.68) LR		RHY	S-LY	S-LY	7.58 LS	0.25 (0.85)	6.50 (2.64) MR	0.00 (0.70) MR	
12.	NRC 181	0.43	1.34 (1.35) - MR	0.83 (1.15) R	S-LY	RHY	R-HY	S-LY	14.64 LS	0.25 (0.85)	8.50 (2.99) LR	1.00 (1.22) LR	
13.	NRC 188							S-LY	7.11 LS	0.25 (0.85)	6.00 (2.54) R	0.00 (0.70) MR	
14.	PS 1569	0.30	2.34 (1.68) - LR	2.66 (1.78) S	S- HY(T)	SLY	S-LY	S-LY		0.00 (0.70)	8.00 (2.91) LR	1.25 (1.31) LR	

15.	RVS 2011-10		2.00 (1.58) - MR	0.66 (1.07) HR		RHY	R-HY	R-LY	25.93MS	0.00 (0.70)	10.00 (3.23) S	1.25 (1.31) LR
16.	RVSM 2012-4	0.43	2.17 (1.63) - LR		S- HY(T)	SLY		R-LY		0.50 (1.00)	10.00 (3.23) S	1.25 (1.31) LR
17.	RVS 2012-4			0.83 (1.15) R			S-LY		15.58 LS			
18.	Hara Soya (ZC)							S-LY		0.25 (0.85)	9.00 (3.08) LR	1.25 (1.31) LR
19.	JS 20-116 (ZC)		1.50 (1.41) - R	1.66 (1.47) MR		R- HY	R-HY	R-LY	16.74 LS	0.00 (0.70)	8.25 (2.95) LR	0.50 (1.00) MR
20.	JS 20-34 (ZC)		2.00 (1.58) - LR	1.16 (1.29)MR		SLY	R-LY	S-LY	14.92LS	0.00 (0.70)	4.25 (2.17) HR	0.00 (0.70) MR
21.	JS 20-98 (ZC)	0.13	1.67 (1.47) - MR	2.66 (1.78) S	R-LY	SHY	S-LY	S-LY	13.36 LS	0.50 (1.00)	8.75 (3.04) LR	1.25 (1.31) LR
22.	JS 95-60 (ZC)		2.34 (1.68) - LR			SLY		S-LY		0.00 (0.70)	5.25 (2.39) HR	0.00 (0.70) MR
23.	Karune (ZC)							S-LY		0.00 (0.70)	5.25 (2.39) HR	0.00 (0.70) MR
24.	MACS 1520 (ZC)		1.84 (1.53) - MR			RLY		S-LY		0.50 (1.00)	9.50 (3.16) LR	1.50 (1.41) S
25.	NRC 86 (ZC)	0.30	2.50 (1.73) - LR	2.33 (1.63)LR	S- HY(T)	RHY	S -HY	R-LY	17.00 LS	0.25 (0.85)	8.00 (2.91) LR	0.50 (1.00) MR
26.	RSC 10-46 (ZC)	0.17	2.34 (1.68) - LR		R-HY	SLY		S-LY		0.00 (0.70)	4.75 (2.29) HR	0.00 (0.70) MR
27.	AMS 100-39							S-HY(T)		0.25 (0.85)	8.50 (2.99) LR	1.25 (1.29) LR
28.	AMS 2014-1							R-HY		0.25 (0.85)	5.75 (2.49) R	0.00 (0.70) MR
29.	AMS-MB-5- 18							R-LY		0.00 (0.70)	4.25 (2.17) HR	0.00 (0.70) MR
30.	BAUS 102							S-LY		0.25 (0.85)	10.00 (3.23) S	0.50 (0.96) MR
31.	CSB 10112							R-LY		0.25 (0.85)	12.25 (3.56) HS	2.00 (1.58) HS
32.	DS 3108							S-LY		0.00 (0.70)	6.50 (2.63) MR	0.25 (0.85) MR

33.	DS 3110									S-LY		0.25 (0.85)	6.50 (2.64) MR	0.00 (0.70) MR
34.	DSb 21									S-LY		0.50 (1.00)	11.50 (3.46) HS	1.50 (1.40) LR
35.	DSb 33									R-LY		0.00 (0.70)	6.50 (2.63) MR	0.50 (0.96) MR
36.	DSb 34									S-LY		0.25 (0.85)	10.00 (3.23) S	0.75 (1.11) LR
37.	DSb 38					1.66 (1.47) MR			R-LY		9.33 LS			
38.	Himso 1690									R-LY		0.00 (0.70)	11.00 (3.38) HS	1.00 (1.20) LR
39.	JS 20-89									S-LY		0.50 (1.00)	10.50 (3.31) HS	1.50 (1.40) LR
40.	JS 20-96									R-LY		0.00 (0.70)	5.75 (2.49) R	0.25 (0.85) MR
41.	JS 21-71									R-LY		0.25 (0.85)	11.75 (3.49) HS	1.00 (1.22) LR
42.	JS 93-05			2.50 (1.73) – LR				SHY		R-HY		0.00 (0.70)	6.25 (2.59) MR	0.50 (0.96) MR
43.	JS 97-52									S-LY		0.00 (0.70)	5.50 (2.44) HR	0.00 (0.70) MR
44.	JS 335	0.30		2.84 (1.83) – S		2.90 (1.86) S	S-LY	SLY	S-LY		27.52 MS			
45.	KDS 726									R-HY		0.25 (0.85)	7.50 (2.82) MR	0.00 (0.70) MR
46.	KDS 753									R-HY		0.00 (0.70)	6.75 (2.69) MR	0.25 (0.85) MR
47.	KDS 980									R-HY		0.25 (0.85)	10.75 (3.35) HS	1.75 (1.49) S
48.	KDS 992									S-LY		0.25 (0.85)	9.00 (3.08) LR	0.75 (1.11) LR
49.	MACS 1460									S-LY		0.25 (0.85)	5.00 (2.34) HR	0.00 (0.70) MR
50.	MACS 1493									S-LY		0.00 (0.70)	12.00 (3.53) HS	1.50 (1.41)S

51.	MACS 1566						S-LY		0.25 (0.85)	10.00 (3.23) S	1.00 (1.20) LR
52.	MACS 450						S-LY		0.25 (0.85)	7.75 (2.86) LR	0.75 (1.06) LR
53.	MACSNRC 1575						S-LY		0.00 (0.70)	6.25 (2.59) MR	0.75 (1.11) LR
54.	MACSNRC 1667						S-HY(T)		0.25 (0.85)	6.50 (2.64) MR	0.25 (0.85) MR
55.	MACS 1407 (check)		0.99 (1.17) R			R-LY		10.94 LS			
56.	NRC 117						S-LY		0.25 (0.85)	10.25 (3.27) HS	1.75 (1.49) S
57.	NRC 128						S-HY(T)		0.25 (0.85)	9.25 (3.12) LR	0.50 (0.96) MR
58.	NRC 130						R-LY		0.00 (0.70)	5.00 (2.34) HR	0.25 (0.85) MR
59.	NRC 136						R-HY		0.50 (0.96)	9.00 (3.08) LR	0.50 (0.96) MR
60.	NRC 142						R-LY		0.25 (0.85)	11.75 (3.49) HS	1.75 (1.49) S
61.	NRC 146						R-LY		0.00 (0.70)	8.25 (2.95) LR	0.50 (1.00) MR
62.	NRC 147						S-LY		0.00 (0.70)	9.50 (3.15) LR	0.00 (0.70) MR
63.	NRC 148						S-LY		0.25 (0.85)	9.75 (3.19) S	0.75 (1.11) LR
64.	NRC 157						R-LY		0.00 (0.70)	6.00 (2.54) R	0.25 (0.85) MR
65.	NRC 164						R-LY		0.25 (0.85)	8.00 (2.91) LR	1.25 (1.31) LR
66.	NRC SL 2						S-LY		0.00 (0.70)	7.50 (2.82) MR	0.00 (0.70) MR
67.	PS 1611						S-LY		0.25 (0.85)	5.00 (2.34) HR	0.00 (0.70) MR
68.	PS 1613						R-LY		0.25 (0.85)	9.75 (3.19) S	1.00 (1.20) LR

69.	PS 1637									S-LY		0.50 (1.00)	9.75 (3.19) S	1.00 (1.20) LR
70.	RSC 10-70									S-LY		0.00 (0.70)	5.00 (2.34) HR	0.00 (0.70) MR
71.	RSC 11-03									R-LY		0.00 (0.70)	11.50 (3.46) HS	1.25 (1.31) LR
72.	RSC 11-07									S-HY(T)		0.25 (0.85)	8.50 (3.00) LR	0.75 (1.11) LR
73.	RSC 11-15									R-HY		0.25 (0.85)	8.25 (2.95) LR	0.75 (1.06) LR
74.	RVS 2001-18									S-LY		0.00 (0.70)	5.00 (2.34) HR	0.00 (0.70) MR
75.	RVS 2007-6									S-LY		0.25 (0.85)	11.75 (3.49) HS	1.75 (1.49) S
76.	RVS 2001-4								R-HY		13.22 LS			
77.	RVS 2009-9									R-HY		0.00 (0.70)	7.50 (2.82) MR	0.50 (0.96) MR
78.	RVS 2010-1									R-HY		0.25 (0.85)	9.25 (3.12) LR	0.25 (0.85) MR
79.	RVS-18 (Check)							2.33 (1.68)LR	S-HY		15.42 LS			
80.	RVS-24 (Check)							2.50 (1.73) LR	S-HY		17.01 LS			
81.	RVSM 2011-35							2.66 (1.78) LR		S-LY		0.25 (0.85)	12.00 (3.53) HS	2.00 (1.58) HS
82.	RVSM 2011-35(Check)							1.66 (1.47)MR	R-HY		18.57 MS			
83.	SL 958									S-LY		0.00 (0.70)	5.75 (2.49) R	0.00 (0.70) MR
84.	SL 1068									R-LY		0.25 (0.85)	9.25 (3.12) LR	0.25 (0.85) MR
85.	SL 1213									S-LY		0.25 (0.85)	11.25 (3.42) HS	1.00 (1.20) LR
86.	VLS 95									S-LY		0.25 (0.85)	5.25 (2.39) HR	0.00 (0.70) MR

87.	VLS 99			2.33 (1.68) LR			S-LY		16.36 LS			
88.	DSb 32							S-HY(T)		0.00 (0.70)	5.75 (2.49) R	0.50 (1.00) MR
89.	KDS 869							R-LY		0.25 (0.85)	9.00 (3.08) LR	1.50 (1.41) LR
90.	MAUS 61							R-HY		0.00 (0.70)	5.75 (2.49) R	0.00 (0.70) MR
91.	NRC 149							R-LY		0.25 (0.85)	5.75 (2.49) R	0.25 (0.85) MR
92.	NRC 94							R-LY		0.25 (0.85)	7.75 (2.87) LR	0.75 (1.06) LR
93.	PS 1556							R-LY		0.25 (0.85)	7.50 (2.82) MR	1.50 (1.41) LR
94.	RSC 10-52 (Check)			2.16 (1.83) S			S-HY	S-LY	18.57 MS	0.00 (0.70)	4.25 (2.17) HR	0.00 (0.70) MR
95.	RSC 11-17							R-HY		0.00 (0.70)	5.75 (2.89) LR	0.25 (0.85) MR
96.	RSC 11-35			2.66 (1.78) LR			S-HY (T)		15.26 LS			
97.	SKF-SPS-11							S-LY		0.00 (0.70)	7.75 (2.86) LR	0.75 (1.11) LR
98.	VLS 59 (Check)			3.99 (2.11) HS			S-LY		12.32 LS			0.50 (0.96) MR
99.	VLS 63 (Check)			2.66 (1.77) LR			S-LY	S-LY	18.99 MS	0.00 (0.70)	6.50 (2.63) MR	
100.	NRC 131							S-LY		0.00 (0.70)	5.50 (2.44) HR	0.00 (0.70) MR
101.	DSb 23							R-LY		0.25 (0.85)	5.75 (2.49) R	0.00 (0.70) MR
102.	NRC 132							S-LY		0.00 (0.70)	8.75 (3.04) LR	0.75 (1.11) LR
103.	MAUS 2 (LC)							S-LY		0.50 (1.00)	10.00 (3.23) S	1.75 (1.49) S
104.	MAUS 158 (LC)							S-LY		0.00 (0.70)	6.00 (2.54) R	0.25 (0.85) MR
105.	PS 1670			3.33 (3.03) S			S-LY		28.39 MS			

106.	RKS 18 (check)	2.50 (1.73) - LR				SLY						
107.	RKS 24 (check)	2.33 (1.68) - LR				SLY						
108.	RKS 113 (check)	2.50 (1.73) - LR				SHY						
109.	SE ±	0.06	(0.10)						0.10	0.11	0.13	
110.	CD at 5 %	0.18	(0.30)						NS/0.28	0.31	0.38	
111.	CD at 1 %	0.26							0.30	0.40	0.47	
112.	CV %								18.14	5.60	19.06	

Table 3.4 : Ent. 2 b. Field screening of AVT entries (Central Zone) for resistance to major insect-pests (STEM BORERS)

S. No.	Entry	Girdle beetle damage (%)						% Stem tunnelling due to stem fly			
		Amrawati (3)	Sehore (4)	Prabhani (5)	Kota (6)	Prabhani (7)	Amravati (8)	Sehore (9)			
1.	DLSb 1		10.00 (17.84)LR	8.81 (17.24)*LR	13.33 (21.41)*- R	54.36 (47.49)* HS		15.91 (22.58)MR			
2.	HIMSO 1689	0.00	6.50 (14.87)MR	5.72 (13.84) MR	16.67 (24.10)-MR	54.14 (47.37) HS	46.00	8.17 (16.58) R			
3.	JS 21-72	0.50	12.50 (20.60) L R	7.87 (16.28) LR	16.67 (24.10)-MR	37.09 (37.51) MR	47.50	21.14 (27.34) S			
4.	JS 22-12	0.50	2.50 (6.45) HR	1.89 (7.89) HR	25.00 (29.99)**- LR	49.01 (44.42) S	54.50	12.98 (20.98)MR			
5.	JS 22-16	1.00	7.50 (15.67)MR	5.63 (13.69) MR	16.67 (23.99) - MR	53.44 (46.97) HS	77.00	12.50 (20.60) MR			
6.	JS 22-18	1.50	9.31 (17.28)MR	2.04 (8.21) HR	21.84 (27.84) - LR	56.28 (48.59) HS	78.00	13.75 (21.73)LR			
7.	KDS 1096		2.50 (6.45)HR	7.83 (16.22) LR	16.67 (24.10) - MR	15.59 (23.25) HR		17.38 (24.60)LR			
8.	NRC 149		4.77 (12.60) R					8.89 (15.30) R			

9.	NRC 150	1.50	15.00 (22.49) LR	5.16 (13.12) MR	16.67 (24.10) - MR	43.87 (41.45) LR	53.50	24.02 (29.33) HS
10.	NRC 152		9.31 (17.28) MR	5.49 (13.54) MR	11.67 (19.92) - HR	34.34 (35.84) MR		12.98 (20.98) MR
11.	NRC 165		4.88 (12.75) R	5.65 (13.72) MR	16.67 (24.10) - MR	40.70 (39.59) LR		2.50 (6.45) HR
12.	NRC 181	2.00	5.00 (12.91) R	6.96 (15.28) LR	18.34 (25.33) - MR	44.88 (42.05) LR	15.00	11.56 (19.86) MR
13.	NRC 188			4.49 (12.23) MR		23.29 (28.85) HR		
14.	PS 1569	2.50	5.00 (12.91) R	6.85 (15.17) LR	23.34 (28.83) - LR	53.65 (47.09) HS	56.00	10.36 (18.66) MR
15.	RVS 2011-10		7.50 (15.67)MR	3.08 (10.11) HR	16.67 (24.10) - MR	31.83 (34.33) R		12.50 (20.60) MR
16.	RVSM 2012-4	1.00		5.21 (13.18) MR	21.84 (27.84) - LR	41.60 (40.15) LR	85.00	
17.	RVS 2012-4		2.90 (6.95) HR					10.24 (18.59)MR
18.	Hara Soya (ZC)			10.02 (18.45) S		46.06 (42.73) LR		
19.	JS 20-116 (ZC)		10.00 (17.84) LR	7.50 (15.88) LR	16.67 (24.10) - MR	36.41 (37.06) MR		21.36 (27.50) S
20.	JS 20-34 (ZC)		15.00 (22.49) LR	2.44 (8.98) HR	18.34 (25.33) - MR	34.96 (36.23) MR		8.53 (16.69) R
21.	JS 20-98 (ZC)	0.00	17.50 (24.67) S	7.74 (16.15) LR	18.34 (25.33) - LR	49.02 (44.43) S	57.00	15.93 (23.47) LR
22.	JS 95-60 (ZC)			23.89 (29.04) HS	26.67 (31.09) – S	44.64 (41.92) LR		
23.	JS 335 (C)	0.50	22.50 (28.60) S		25.00 (29.99) - HS		24.50	24.96 (29.96) HS
24.	Karune (ZC)			10.27 (18.65) HS		42.62 (40.73) LR		
25.	MACS 1520 (ZC)			12.11 (20.33) HS	23.33 (28.88) - S	22.25 (28.13) HR		
26.	NRC 86 (ZC)	0.00	7.73 (15.96) MR	7.51 (15.89) LR	14.84 (22.62) - MR	42.91 (40.91) LR	40.00	15.61 (23.25) LR
27.	RSC 10-46 (ZC)	0.50		3.47 (10.63) HR	20.00 (26.57) - LR	37.21 (37.58) MR	17.50	

28.	AMS 100-39				3.94 (11.30) R		52.04 (46.16) HS		
29.	AMS 2014-1				9.28 (17.73) S		42.47 (40.65) LR		
30.	AMS-MB-5-18				7.94 (16.35) LR		41.69 (40.18) LR		
31.	BAUS 102				10.56 (18.91) HS		46.10 (42.75) LR		
32.	CSB 10112				11.79 (20.07) HS		48.43 (44.09) S		
33.	DS 3108				11.26 (19.59) HS		56.17 (48.55) HS		
34.	DS 3110				6.48 (14.74) LR		42.30 (40.56) LR		
35.	DSb 21				8.51 (16.94) LR		37.07 (37.50) MR		
36.	DSb 33				1.85 (7.78) HR		41.58 (40.14) LR		
37.	DSb 34				2.21 (8.50) HR		47.78 (43.69) S		
38.	Himso 1690				12.18 (20.41) HS		30.13 (33.26) HR		
39.	JS 20-89				6.88 (15.15) LR		43.23 (41.10) LR		
40.	JS 20-96				3.17 (10.08) HR		53.35 (46.91) HS		
41.	JS 21-71				5.37 (13.39) MR		26.76 (31.11) HR		
42.	JS 93-05				8.09 (16.52) LR	25.00 (29.99) - LR	25.17 (30.10) HR		
43.	JS 97-52				4.17 (11.77) R		56.95 (49.02) HS		
44.	KDS 726				4.37 (11.86) MR		23.87 (29.21) HR		
45.	KDS 753				7.85 (16.25) LR		22.70 (28.45) HR		
46.	KDS 980				5.91 (13.96) MR		37.27 (37.61) MR		
47.	KDS 992				8.34		34.81		

				(16.78) LR		(36.15) MR		
48.	MACS 1460			8.25 (16.68) LR		37.55 (37.77) MR		
49.	MACS 1407 (Check)		5.00 (12.91) R				7.50 (15.67) MR	
50.	MACS 1493			6.35 (14.59) MR		49.11 (44.48) S		
51.	MACS 1566			8.93 (17.38) LR		46.30 (42.87) LR		
52.	MACS 450			9.24 (17.68) S		49.86 (44.91) S		
53.	MACSNRC 1575			3.26 (10.38) HR		30.99 (33.73) MR		
54.	MACSNRC 1667			9.53 (17.97) S		43.74 (41.39)LR		
55.	NRC 117			5.27 (13.27) MR		44.72 (41.96) LR		
56.	NRC 128			4.58 (12.31) MR		39.23 (38.73) MR		
57.	NRC 130			6.31 (14.48) MR		29.62 (32.88) HR		
58.	NRC 136			11.13 (19.48) HS		24.79 (29.86) HR		
59.	NRC 142			6.14 (14.34) MR		52.64 (46.51) HS		
60.	NRC 146			2.04 (8.21) HR		39.65 (39.01) MR		
61.	NRC 147			7.42 (15.64) LR		42.33 (40.58) LR		
62.	NRC 148			8.53 (16.89) LR		30.77 (33.68) MR		
63.	NRC 157			5.39 (13.38) MR		32.92 (34.96) MR		
64.	NRC 164			2.23 (8.43) HR		23.53 (28.93) HR		
65.	NRC SL 2			6.51 (14.63) MR		40.43 (39.47) LR		
66.	PS 1611			5.26 (13.14) MR		52.40 (46.37) HS		

67.	PS 1613				11.60 (19.87) HS		52.73 (46.56) HS		
68.	PS 1637				10.74 (19.12) HS		47.77 (43.71) S		
69.	RSC 10-70				5.42 (13.45) MR		33.25 (35.19) MR		
70.	RSC 11-03				8.59 (17.03) LR		46.08 (42.73) LR		
71.	RSC 11-07				5.56 (13.64) MR		29.45 (32.86) HR		
72.	RSC 11-15				4.35 (11.95) MR		20.54 (26.94) HR		
73.	RVS 2001-18				1.86 (7.83) HR		46.65 (43.06) LR		
74.	RVS 2001-4(Check)			7.50 (15.67) MR					32.95 (34.99) HS
75.	RVS 2007-6				5.87 (13.98) MR		22.27 (28.14) HR		
76.	RVS 2009-9				3.48 (10.72) HR		26.26 (30.81) HR		
77.	RVS 2010-1				8.44 (16.88) LR		23.42 (28.93) HR		
78.	RVSM 2011-35			7.73 (15.96) MR	8.28 (16.70) LR		48.64 (44.20) S		13.14 (21.01) LR
79.	RVS-18 (Check)			12.50 (20.60) LR					14.55 (22.38) LR
80.	RVS-24 (Check)			4.88 (12.75) R					27.75 (31.74) HS
81.	SL 958				11.01 (19.34) HS		30.81 (33.70) MR		
82.	SL 1068				5.56 (13.63) MR		49.66 (44.79) S		
83.	SL 1213				7.16 (15.47) LR		65.13 (53.80) HS		
84.	VLS 95				13.25 (21.33) HS		34.87 (36.18) MR		
85.	VLS 99			32.50 (34.77) HS					23.11 (28.56) HS
86.	DSb 32				10.27		28.24		

				(18.68) HS		(32.08) HR		
87.	KDS 869			6.64 (14.93) LR		34.70 (36.08) MR		
88.	MAUS 61			5.09 (13.03) MR		30.52 (33.53) R		
89.	NRC 149			2.34 (8.78) HR		41.63 (40.17) LR		
90.	NRC 94			8.79 (17.23) LR		50.84 (45.47) HS		
91.	PS 1556			4.55 (12.29) MR		33.17 (35.15) MR		
92.	PS 1670		21.35 (27.49) S				17.33 (24.59) LR	
93.	RSC 10-52		12.50 (20.60) LR	3.71 (10.67) HR		16.90 (24.20) HR	10.83 (19.19) MR	
94.	RSC 11-17			7.00 (15.23) LR		44.42 (41.78) LR		
95.	RSC 11-35		15.00 (22.77) LR				27.57 (31.63) HS	
96.	SKF-SPS-11			7.19 (15.53) LR		36.84 (37.36) MR		
97.	VLS 63		10.00 (18.42) LR	9.18 (17.64) S		50.68 (45.38) HS	11.24 (19.41) MR	
98.	VLS 59		7.50 (15.67) MR				16.25 (23.74) LR	
99.	NRC 131			2.94 (9.87) HR		62.06 (51.99) HS		
100.	DSb 23			5.37 (13.40) MR		21.81 (27.84) HR		
101.	DSb 38		2.50 (6.45) HR				6.90 (14.89) R	
102.	NRC 132			4.38 (12.03) MR		41.41 (39.97) LR		
103.	MAUS 2 (LC)			10.71 (19.10) HS		62.35 (52.17) HS		
104.	MAUS 158 (LC)			3.26 (10.26) HR		45.79 (42.55) LR		
105.	RKS 18 (Check)				21.84 (27.84) - LR			

106.	RKS 24 (Check)				18.34 (25.33) - LR			
107.	RKS1 13 (Check)				20.00 (26.49) - LR			
	SE +		(2.22)	1.04	1.00	1.60	(1.69)	
	CD at 5 %		(6.46)	2.89	3.10	4.43	(4.92)	
	CD at 1 %			3.78	4.35	5.82		
	CV %			10.07		5.79		

Table 3.5 : Ent. 2 c. Field screening of AVT entries (Northern Plain Zone) for resistance to major insect-pests

S.No.	Entry	Stem tunneling due to Stem fly (%)	(Delhi)	Defoliators larvae (TC) / m	White fly 3 leaf/ Plant*	Aphid 3 leaf/ plant*	Bug/ mrl*	White fly	YMV incidence (mean number of white flies tra. values)	Reaction to Pest Complex	
										Pantnagar	(Delhi)
(1)	(2)	Pantnagar (3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(Delhi) (12)
1.	DLSb 1	37.28 (37.63) LR		2 (1.57) MR	6 (2.51) LR	2 (1.58) LR	3 (1.85) LR			R-Ly	
2.	DS 3108	18.58 (42.66) LR		4 (2.10) LR	4 (2.10) MR	1.5 (1.40) LR	2 (1.54) MR			S-Ly	
3.	DS 9421	41.63 (40.17) LR	15.82 (23.14)	5 (2.33) LR	7 (2.71) LR	1.5 (1.40) LR	2 (1.57) MR	4.67	1 (4.8)	R-Ly	SLY
4.	DS 9422	54.94 (47.83) S	35.26 (36.11)	4.25 (2.17) LR	10 (3.23) S	1 (1.14) MR	1.5 (1.40) MR	3.99	1 (5.6)	R-Ly	SLY
5.	DS9431		31.80 (34.30)						0 (5.6)		RLY
6.	Himso 1689	39.08 (38.68) LR		6 (2.54) S	5 (2.33) MR	2 (1.57) LR	1 (1.22) MR			S-HY (T)	
7.	JS 21-72	32.03 (34.46) MR		6.25 (2.59) S	7.5 (2.79) LR	3 (1.85) LR	1 (1.14) MR			R-Hy	
8.	JS 22-12	28.60 (32.32) MR		2 (1.57) MR	3.5 (1.99) MR	0.5 (0.96) MR	3 (1.85) LR			R-Ly	
9.	JS 22-16	28.15 (32.02) MR		4.5 (2.21) LR	2 (1.58) R	1 (1.14) MR	2 (1.54) MR			R-Ly	
10.	JS 22-18	38.85 (38.55) LR		5 (2.33) LR	6.5 (2.63) LR	2 (1.54) LR	2 (1.58) MR			R-Ly	

11.	KDS 1096	65.95 (49.08) HS		4 (2.10) LR	8 (2.89) LR	0 (0.70) MR	1.5 (1.40)MR	3.67		S-Ly	
12.	KDS1076		28.94 (32.49)						0 (6.5)		SLY
13.	NRC 149	15.28 (22.97) HR	40.78 (39.66)	1 (1.22) HR	7 (2.71) LR	0.5 (0.96) MR	3.5 (1.99) LR	1.50	1 (6.6)	R-Hy	SLY
14.	NRC 150	42.75 (40.82) LR		4.5 (2.23) LR	5 (2.33) LR	4 (2.10) LR	2 (1.58)MR			S-Ly	
15.	NRC 152	24.65 (29.76) MR		1.5 (1.40) R	3.5 (1.99) MR	1.5 (1.40) LR	4 (2.06) LR			S-Ly	
16.	PS 1569	48.65 (44.22) LR		1.5 (1.40) R	3 (1.85) MR	1 (1.14) MR	3 (1.85) LR			S-Ly	
17.	PS 1670	53.69 (47.11) S	16.06 (21.51)	1 (1.20) HR	4.5 (2.23) MR	1 (1.14) MR	2.5 (1.72) LR	4.16	2 (6.9)	S-HY (T)	RLY
18.	RSC 11-35	18.28 (25.28)HR		2 (1.58) MR	6 (2.54) LR	2.5 (1.72) LR	2 (1.58)MR			R-Hy	
19.	RVS 2011-10	22.2 (28.09) R		2.25 (1.65) MR	6 (2.54) LR	3 (1.85) LR	2.5 (1.72) LR			S-HY (T)	
20.	VLS 99	44.75 (41.98) LR		3 (1.86) MR	5 (2.30) MR	0.5 (0.96) MR	4 (2.10) LR			S-Ly	
21.	DS 9712 (C)	27.57 (31.67)MR	9.16 (15.89)	3 (1.85) MR	3 (1.85) MR	1.5 (1.40) LR	2.5 (1.72) LR	4.33	1 (5.9)	R-Ly	SLY
22.	JS 335 (C)	18.17 (25.20) HR		6 (2.51) LR	4 (2.10) MR	2 (1.54) LR	2 (1.57)MR			R-Hy	
23.	JS 20-34 (C)	34.23 (35.79) MR		5 (2.33) LR	7 (2.73) LR	4.5 (2.23) S	1.75 (1.49)MR			S-Ly	
24.	JS 20-98 (C)	14.3 (22.18) HR		5.2 (2.38) LR	4 (2.10) MR	1.5 (1.40) LR	2.5 (1.72) LR			R-Hy	
25.	JS 95-60 (C)	33.45 (35.31) MR		3 (1.87) MR	3 (1.87) MR	1 (1.22) MR	2.5 (1.72) LR			S-HY (T)	
26.	JS 97-52 (C)	39.51 (38.93) LR		6.5 (2.63) S	6 (2.51) LR	0 (0.70) MR	2 (1.54)MR			R-Hy	

27.	Karune (C)	33.06 (35.08) MR		2 (1.58) MR	4 (2.10) MR	1.5 (1.40) LR	3 (1.85) LR			R-Ly	
28.	MACS 1460 (C)	38.32 (38.24) LR		4.5 (2.21) LR	6.5 (2.64) LR	2 (1.57) LR	2.5 (1.63)MR			S-Ly	
29.	NRC 86 (C)	57.78 (48.32) HS		4 (2.10) LR	8.5 (2.98) LR	2 (1.54) LR	1.5 (1.40) MR			S-Ly	
30.	PS 1347 (C)	39.76 (39.09) LR	31.68 (34.00)	3.5 (1.99) MR	6 (2.51) LR	1 (1.14) MR	2.5 (1.72) LR	4.67	7 (4.6)	S-Ly	RLY
31.	PS 1556 (C)	45.04 (42.15) LR		1.5 (1.40) R	2.5 (1.72) MR	0 (0.70) R	4 (2.10) LR			S-Ly	
32.	SL 955 (C)	60.55 (51.09) HS	27.53 (30.44)	3.25 (1.92) MR	6 (2.51) LR	2 (1.54) LR	2.25 (1.64)MR	2.67	3 (6.1)	R-Hy	RLY
33.	SL 958 (C)	37.46 (37.73) LR	16.84 (24.22)	4 (2.10) LR	4 (2.10) MR	1 (1.14) MR	2.5 (1.72) LR	3.83	1 (5.7)	R-Ly	SLY
34.	SL 1074 (C)	39.64 (39.01) LR	38.08 (38.05)	4.5 (2.23) LR	7 (2.73) LR	1.5 (1.40) LR	4 (2.10) LR	2.83	1 (4.8)	S-HY (T)	SLY
35.	VLS 89 (C)	38.41 (38.11) LR		4 (2.11) LR	9.5 (3.16) S	1.5 (1.40) LR	4 (2.10) LR			S-Ly	
36.	AMS 100-39	22.95 (28.60) R		6.5 (2.64) S	4.5 (2.23) MR	2 (1.54) LR	2 (1.58)MR			R-Hy	
37.	MACS 1493	31.87 (34.36) MR		3 (1.85) MR	7 (2.68) LR	3 (1.85) LR	3.5 (1.96) LR			S-Hy (T)	
38.	JS 20-87	24.45 (29.63) MR		3.5 (1.99) MR	3 (1.85) MR	3.5 (1.99) LR	3 (1.85) LR			R-Hy	
39.	RVSM 2011-35	22.75 (28.48) R		4 (2.11) LR	2.5 (1.72) MR	0.5 (0.96) MR	1.5 (1.40)MR			R-Hy	
40.	VLS 63	79.45 (63.06) HS		3.5 (1.99) MR	4.5 (2.23) MR	1.5 (1.40) LR	2.5 (1.72) LR			S-Ly	
	CD at 5 %	8.52		0.54	0.74	0.75	0.68				
	CV 5%	11.28		13.54	15.57	26.83	19.84				
	SEM±	2.97		0.19	0.26	0.26	0.23				

Table 3.6 : Ent. 2d. Field screening of AVT entries for resistance to major insect-pests (Imphal)

Sl. No.	Entries	No. of Bihar Hairy Caterpillar/ml	No. of leaf webber larvae/ml	No. of tobacco caterpillar larvae/ml	Percent defoliation at peak incidence /plant	No. of Aphids /plant	Stem tunnelling at physiological maturity (%)	Reaction to insect-pests
1.	DLSb 1	10.40 (3.29)* MR	1.50 (1.41)* R	1.30 (1.34)* MR	22.12 LS	8.00 (2.89)* MR	6.02 (14.79)# MR	SHY (T)
2.	DS 3108	13.00 (3.63) MR	2.30 (1.67) MR	1.20 (1.30) MR	23.59 LS	6.40 (2.60) MR	6.84 (15.71) LR	SHY (T)
3.	DSb 38	19.40 (4.46) LR	2.80 (1.82) LR	2.00 (1.58) LR	24.44 LS	12.20 (3.52) MR	6.69 (15.52) LR	SHY (T)
4.	KDS 1096	11.60 (3.48) MR	2.80 (1.82) LR	1.30 (1.34) MR	24.14 LS	10.60 (3.33) MR	4.99 (13.55) MR	SHY (T)
5.	MACS 1460 (C)	9.60 (3.17) MR	1.50 (1.40) R	1.70 (1.48) MR	22.09 LS	5.60 (2.47) MR	5.44 (14.10) MR	SHY (T)
6.	JS 20-116 (C)	21.40 (4.68) LR	2.90 (1.84) LR	2.20 (1.64) LR	23.61 LS	15.60 (3.97) LR	5.73 (14.45) MR	SLY
7	JS 335 (C)	21.30 (4.59) LR	2.50 (1.73) LR	2.60 (1.76) LR	25.67 MS	30.20 (5.53) LR	5.89 (14.56) MR	SLY
8	JS 97-52 (C)	22.80 (4.82) LR	3.20 (1.92) LR	1.90 (1.55) LR	26.11 MS	17.40 (4.21) LR	6.04 (14.79) MR	SLY
9	RKS 18 (C)	19.00 (4.40) LR	2.70 (1.78) LR	2.60 (1.76) LR	26.09 MS	30.80 (5.57) S	6.89 (15.70) LR	SLY
10	RKS 113 (C)	27.30 (5.27) LR	3.40 (1.97) LR	2.30 (1.67) LR	26.09 MS	22.40 (4.59) LR	6.91 (15.76) LR	SLY
SE $\pm$		0.46	0.14	0.11	0.92	0.87	0.87	
CD at 5 %		1.04	0.31	0.26	2.07	1.96	1.98	

Table 3.7: ENT 3a: Status of AVT-II entries for antixenosis against *S. litura*

Sr. no.	Genotype	AD (Approximate Digestibility)			ECI (Efficiency of Conversion of Ingested food)			ECD (Efficiency of Conversion of Digested food)		
		Pantnagar	Indore	Dharwad	Pantnagar	Indore	Dharwad	Pantnagar	Indore	Dharwad
1.	VLS 99	92.60 (74.67)	83.11 (65.73)	73.80 (59.19)	25.71 (30.01)	70.02 (56.80)	57.43 (49.25)	25.71 (30.01)	84.10 (66.50)	77.82 (61.88)
2.	JS 21-72	90.57 (72.42)	79.69 (63.21)	68.29 (55.71)	33.00 (33.69)	66.07 (54.38)	36.43 (37.11)	36.73 (36.18)	83.21 (65.81)	53.35 (46.90)
3.	Himso 1689	92.4 (74.21)	80.32 (63.66)	70.56 (57.12)	18.28 (25.30)	73.84 (59.24)	51.34 (45.75)	19.76 (26.39)	92.01 (73.58)	72.76 (58.52)
4.	NRC 149	90.19 (71.79)	80.37 (63.70)	67.14 (55.00)	34.30 (35.73)	66.94 (54.90)	38.75 (38.48)	38.16 (38.03)	83.90 (66.34)	57.72 (49.42)
5.	NRC 152	88.20 (70.20)	82.87 (65.55)		5.44 (12.88)	54.06 (47.33)		6.39 (13.87)	65.36 (53.94)	
6.	JS 335	86.86 (68.88)	83.49 (66.03)	76.43 (60.93)	25.02 (30.00)	71.66 (57.84)	58.44 (49.84)	28.79 (32.45)	85.93 (67.97)	76.47 (60.96)
7	DS 3108	87.13 (68.96)		73.48 (58.98)	17.34 (23.99)		56.60 (48.77)	20.01 (25.90)		77.02 (61.33)
8	DS 9421	92.51 (74.22)			13.44 (21.32)			14.58 (22.23)		
	SE_{me}±	2.00	(1.97)		4.84	(5.29)		5.46	(9.38)	
	CD at 5%	6.07	(4.12)		14.68	(11.03)		16.55	(19.57)	

* Figures in the parenthesis are Transformed angular values

Table 3.8: ENT 3b - Status of AVT-II entries for antibiosis against *S. litura*

Sr. No.	Genotypes	“C” Value			Antixenosis response			
		Pantnagar	Indore	Dharwad	Pantnagar	Indore	Dharwad	Dharwad
1	VLS 99	1.28	1.07	1.21	Preferred host	Preferred host	Preferred host	Preferred host
2	JS 21-72	1.12	0.78	0.83	Preferred host	Slight antixenosis	Slight antixenosis	Slight antixenosis
3	Himso 1689	0.93	0.79	1.09	Slight antixenotic	Slight antixenosis	Preferred host	Preferred host
4	NRC 149	1.33	0.69	0.92	Preferred host	Moderate antixenosis	Slight antixenosis	Slight antixenosis
5	NRC 152	0.57	0.86	-	Moderate Antixenotic	Slight antixenosis	-	-
6	JS 335	Check	1.00	1.19	Check	Preferred host	Preferred host	Preferred host
7	DS 3108	1.01		1.16	Preferred host			Preferred host
8	DS 9421	0.87		-	Slight antixenotic			-

Table 3.9 : ENT.4 a. Field screening of IVT (Normal) entries for resistance to major insect-pests (Stem fly- % Stem tunneling)

Code No.	Entries	Pantnagar	Sehore	Parthani	Amravati	Imphal	Dharwad	Delhi
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	RCS 1-10		Not germinated					46.8 (43.12) S
2	SKUA-WSB.101	⁴⁴ (41.55) S	8.59 (17.06)MR	^{50.95} (45.53)* LR	55.50 LR	3.93 (12.14)* MR	25.97 (30.63)S	28.6 (32.22) S
3	SKAU-S-4		Not germinated		36.50 MR			17.7 (24.36) MR
4	KBS 21-1	^{76.6} (61.07) HS	^{15.53} (23.17) LR	^{20.20} (26.55) HR	83.40 HS	^{5.65} (14.35) LR	^{20.73} (27.07)LR	40.4 (39.22) S
5	MAUS 818	^{37.36} (37.66) MR	^{5.28} (13.28) HR	^{45.82} (42.59) LR	86.50 HS	^{3.34} (11.13) MR	^{13.84} (21.83)MR	45.0 (42.07) S

6	MAUS 791	48.25 (43.99) HS	14.25 (22.13)MR	32.78 (34.85) HR	33.00 MR	2.43 (9.76) MR	15.57 (23.23)MR	37.9 (35.26) S
7	AUKS 224		Not germinated		77.50 HS			14.5 (22.19) MR
8	AMS 115	29.82 (33.09) HR	14.91 (22.61) LR	48.74 (44.27) LR	76.50 HS	2.68 (10.26) MR	26.28 (30.83)S	50.1 (45.06) S
9	AMS1901	35.48 (36.54) MR	8.33 (16.76) R	51.78 (46.03) LR	76.50 HS	3.94 (12.16) MR	17.92 (25.03)MR	50.3 (45.17) S
10	RVS 1320	57.25 (49.16) HS	25.36 (30.19) S	28.53 (32.26) HR	75.00 HS	9.29 (18.18) LR	18.89 (25.75)MR	41.3 (39.94) S
11	RVS 1315	43.85 (41.46) S	19.79 (26.29) LR	33.38 (35.26) R	30.50 R	4.54 (12.82) MR	19.21 (25.98)MR	33.1 (34.97) S
12	DLSb 3	26.09 (30.70) HR	5.40 (12.38)HR	22.18 (28.08) HR	76.50 HS	7.78 (16.64) LR	21.59 (27.68)LR	31.8 (34.18) S
13	DLSb 4	44.59 (41.89) S	8.33 (16.76)R	31.82 (34.33) HR	46.50 LR	8.32 (17.22) LR	15.78 (23.39)MR	28.9 (32.46) S
14	DSb39	59.32 (50.37) HS	9.78 (18.21)MR	36.21 (36.97) MR	52.00 LR	0.00 (4.05) R	23.15 (28.75)LR	49.2 (44.51) S

15	RVSM 2011-35		36.87 (37.37) HS	50.66 (45.37) LR	40.50 MR	4.38 (12.69) MR	11.13 (19.48)R	64.9 (22.63) MR
16	AS 40	40.37 (39.44) LR	29.11 (32.63)S	53.13 (46.78) LR	52.50 LR	2.94 (9.34) MR	24.71 (29.79)LR	30.5 (33.52) S
17	AS24	25.1 (30.06) HR	11.17 (19.50)MR	29.08 HR (32.63)	78.00 HS	1.69 (7.71) R	28.50 (32.35)HS	46.3 (42.54) S
18	JS 23-08	30.8 (33.70) HR	21.20 (27.23)LR	32.57 (34.79) HR	63.50 HS	4.97 (13.50) MR	26.28 (30.83)S	25.5 (30.30) S
19	JS 23-05	29.3 (32.76) HR	22.61 (28.35) LR	76.91 (61.31) HS	9.00 HR	6.81 (15.68) LR	18.65 (25.58)MR	16.2 (22.03) MR
20	DS 1312	33.07 (35.10) HR	6.21 (14.02)R	76.38 (60.96) HS	42.00 MR	11.71 (20.38) S	24.77 (29.84)LR	17.2 (23.73) MR
21	DS3163	34.69 (36.07) R	5.40 (12.38)HR	52.29 (46.30) LR	48.00 LR	6.16 (14.95) LR	17.84 (24.97)MR	25.5 (30.32) S
22	DS3168	30.88 (33.75) HR	15.96 (23.52) LR	75.11 (60.06) HS	59.50 S	7.41 (16.17) LR	15.38 (23.08)MR	6.0 (13.84) R
23	DS3124	17.85 (24.98) HR	8.33 (16.66)R	57.18 (49.15) S	24.50 HR	3.55 (11.60) MR	24.08 (29.38)LR	26.1 (30.47) S

24	SL 1282	29.82 (33.09) HR	9.78 (18.21)MR	70.39 (57.03) HS	75.00 HS	3.78 (11.90) MR	14.23 (22.15)MR	30.5 (33.44) S
25	SL 1230	55.85 (48.36) HS	23.55 (28.77)LR	68.14 (55.67) HS	35.50 MR	9.01 (17.89) LR	16.57 (24.01)MR	24.8 (29.86) S
26	HIMSO -1694	26.23 (30.79) HR	11.02 (19.37) MR	47.87 (43.77) LR		5.04 (13.61) MR	12.35 (20.57)MR	35.4 (36.50) S
27	HIMSO -1693	34.2 (35.78) R	5.66 (12.53)HR	56.76 (48.87) S	21.00 HR	7.56 (16.45) LR	24.37 (29.57)LR	28.4 (31.74) S
28	VLS - 103	38.2 (62.22) HS	14.44 (22.30)MR	29.56 (32.92) HR	39.50 MR	11.06 (19.87) LR	19.35 (26.09)MR	18.1 (24.73) MR
29	VLS -102	46.92 (43.23) HS	11.64 (19.94)MR	72.97 (58.68) HS	20.50 HR	6.53 (15.37) LR	29.03 (32.59)HS	43.0 (40.94) S
30	AMS 100-39	57.73 (49.44) HS	23.66 (29.08)LR	54.50 (47.57) LR	33.00 MR	3.13 (9.56) MR	16.29 (23.79)MR	22.4 (27.84) MR
31	PS 1605	23.57 (29.03) HR	13.55 (20.37)MR	40.95 (38.77) MR	52.00 LR	4.83 (13.34) MR	25.96 (30.62)LR	42.1 (40.42) S
32	PS 1689	33.74 (35.50) R	24.35 (29.46)LR	63.14 (52.70) HS	27.00 HR	6.98 (15.87) LR	22.04 (27.99)LR	31.0 (33.76) S

33	PS 1682	42.78 (40.84) LR	9.25 (17.68)MR	69.96 (57.11) HS		4.52 (12.94) MR	26.77 (31.15)S	36.8 (37.26) S
34	RSC 11-48	22.15 (28.07) HR	6.17 (14.37) R	35.01 (36.24) R	22.50 HR	5.39 (13.92) MR	18.25 (25.28)MR	49.1 (44.45) S
35	RSC 11-42	17.27 (24.54) HR	8.94 (17.14) MR	37.33 (37.63) MR	26.50 HR	5.31 (13.80) MR	25.89 (30.57)S	15.3 (22.09) MR
36	BAUS(M) -3	44.91 (42.07) HS	12.92 (21.05) MR	27.29 (31.47) HR	19.50 HR	10.10 (18.96) LR	31.37 (34.05)HS	Germinated but died
37	BAUS 116	39.8 (39.11) LR	17.70 (23.85) LR	59.67 (50.58) HS	32.00 M	6.26 (15.07) LR	18.35 (25.35)MR	Germinated but died
38	CAUMS 2	35.65 (36.65) MR	5.94 (14.05) HR	59.85 (50.67) HS	4.50 HR	8.49 (17.42) LR	31.13 (33.90)HS	22.5 (27.75) MR
39	NRC 195	40.99 (39.80) LR	19.63 (26.28) LR	57.23 (49.14) S	44.00 LR	7.89 (16.78) LR	28.26 (32.10)S	4.5 (12.64) R
40	NRC 203	41.28 (39.97) LR	9.63 (17.74) MR	54.96 (47.84) LR	31.00 R	9.55 (18.46) LR	23.69 (29.11)LR	28.3 (32.10) S
41	NRC 193	37.87 (37.97) MR	14.30 (22.14) MR	36.93 (37.40) MR	37.50 MR	3.33 (11.28) MR	25.92 (30.59)LR	23.4 (28.88) MR
42	NRC 192	14.6 (22.41) HR	17.58 (24.72) LR	27.91 (31.88) HR	68.00 HS	6.27 (15.08) LR	21.57 (27.66)LR	4.5 (12.64) R

43	NRC 191	28.45 (32.21) HR	12.95 (21.07) MR	60.06 (50.79) HS	29.00 R	5.27 (13.86) MR	28.35 (32.16)S	34.7 (32.32) S
44	NRC 190	50 (44.99) HS	9.01 (17.41) HR	36.35 (37.06) MR	17.50 HR	7.94 (16.84) LR	26.90 (31.23)S	27.1 (32.98) S
45	RSC 10-52	42.84 (40.89) LR	13.38 (21.40) R	24.90 (29.87) HR	35.50 MR		24.66 (29.76)LR	23.1 (27.35) MR
46	NRC 189	30.38 (33.44) HR	27.14 (31.38) S	31.02 (33.83) HR	28.50 R	6.25 (14.59) LR	22.55 (28.34)LR	23.2 (27.34) MR
47	RVSM 16-20	39.45 (38.90) LR	20.14 (26.65) LR	28.23 (32.04) HR	35.00 MR	1.75 (7.80) R	31.41 (34.07)HS	18.8 (32.02) MR
48	KDS 1175	73.35 (58.93) HS	30.54 (33.51) HS	38.80 (38.51) MR	44.50 MR	6.19 (14.56) LR	18.07 (25.15)MR	28.8 (33.88) S
49	KDS 1187	45.94 (42.67) HS	12.56 (20.74) MR	20.64 (27.01) HR	55.00 LR	7.64 (16.52) LR	18.14 (25.20)MR	60.0 (44.31) S
50	KDS 1149	42.85 (40.88) LR	5.94 (14.05) HR	51.83 (46.04) LR	46.50 LR	2.13 (8.33) MR	22.68 (28.43)LR	Germinated but died
51	MACS 1672	32.53 (34.77) HR	22.35 (28.18)S	73.82 (59.37) HS	77.50 HS	11.41 (20.17) S	24.36 (29.56)LR	Germinated but died
52	MACS 1735	63.05 (52.57) HS	18.91 (25.76) LR	19.54 (26.21) HR	42.00 MR	6.16 (14.95) LR	22.27 (28.15)LR	Germinated but died

53	Asb 15	24.95 (29.96) HR	13.89 (21.84) MR		27.00 HS	5.53 (14.19) LR	26.56 (31.01)S	
54	ASB 11		Not germinated	38.00 (38.05) MR	33.00 MR			
55	TS 21-2	43.85 (41.46) R	18.99 (25.78) LR	57.39 (49.25) S		8.03 (16.85) LR	17.85 (24.98)MR	
56	TS 21-1	23.2 (28.79) HR	9.23 (17.66) MR	49.98 (44.98) LR		4.90 (13.44) MR	24.36 (29.56)LR	
57	LOKSOV -1	35.93 (36.82) MR	22.50 (28.28)S	46.91 (43.22) LR		7.94 (16.88) LR	19.56 (26.24)MR	
58	RVS 2011-10	41.01 (39.81) LR	14.92 (22.49)MR	21.44 (27.43) HR		3.13 (9.56) MR	17.76 (24.91)MR	
SE $\pm$		0.88	(2.45)	2.06	3.85	2.93	1.06	-
CD at 5 %		2.52	(7.02)	5.70	11.45	5.89	3.20	15.97

Table 3.10: ENT. 4 b. Field screening of IVT (Normal) entries for resistance to major insect-pests (Girdle beetle - % Plant infestation)

Code No.	Entries	Sehore	Amravati	Dharwad	Kota	Prabhani
(1)	(2)	(3)	(4)	(5)	(6)	7)
1	RCS 1-10	Not germinated			25.00 (29.99)**- LR	
2	SKUA-WSB.101	7.45 (15.83) MR	2.50 (1.73) HS	18.57 (25.52)LR	21.67 (27.72) - LR	9.00 (17.37)* HS
3	SKAU- S-4	Not germinated	0.00 (0.71) MR		23.33 (28.88) - LR	
4	KBS 21-1	7.48 (15.85) LR	0.00 (0.71) MR	14.63 (22.48)MR	13.33 (21.41) - R	3.98 (11.50) MR
5	MAUS 818	1.73 (4.14) R	0.00 (0.71) MR	17.15 (24.45)LR	23.34 (28.83) - LR	9.05 (17.49) HS
6	MAUS 791	3.58 (9.88) MR	2.50 (1.73) HS	13.26 (21.35)MR	20.00 (26.49) - LR	6.37 (14.58) LR
7	AUKS 224	Not germinated	0.00 (0.71) MR		18.34 (25.33) - MR	
8	AMS 115	9.34 (17.70) LR	0.00 (0.71) MR	18.21 (25.25)LR	18.50 (25.45) - MR	9.83 (17.58) HS
9	AMS1901	0.00 (0.00) HR	2.50 (1.73) HS	13.27 (21.35)MR	20.00 (26.49) - LR	17.47 (24.65) HS
10	RVS 1320	13.00 (21.11) LR	0.00 (0.71) MR	10.79 (19.17)R	18.34 (25.33) - MR	2.18 (8.45) R
11	RVS 1315	9.02 (17.45) LR	0.00 (0.71) MR	14.90 (22.70)MR	20.00 (26.57) - LR	2.52 (9.12) MR
12	DLsb 3	0.00 (0.00) HR	2.50 (1.73) HS	16.63 (24.06)LR	16.67 (24.10) - MR	5.84 (13.94) LR

13	DLSb 4	3.27 (10.31)MR	0.00 (0.71) R	17.94 (25.05)LR	21.67 (27.72) - LR	5.32 (13.32) LR
14	DSb39	1.44 (4.37) R	1.00 (1.22) LR	12.62 (20.80)MR	10.00 (18.19) - HR	6.78 (15.06) LR
15	RVSM 2011-35	9.76 (18.19)LR	0.00 (0.71) R	14.07 (22.03)MR	26.67 (31.05) - S	1.51 (6.92) HR
16	AS 40	3.51 (10.78)MR	3.50 (2.00) HS	13.49 (21.54)MR	16.67 (23.99) - MR	3.52 (10.71) MR
17	AS24	11.01 (19.27) LR	1.50 (1.40) S	21.95 (27.93)S	18.34 (25.33) - MR	3.95 (11.40) MR
18	JS 23-08	4.55 (8.77) MR	1.50 (1.40) S	17.19 (24.48)LR	20.00 (26.49) - LR	4.46 (11.87) MR
19	JS 23-05	5.01 (12.54) MR	0.00 (0.71) R	10.53 (18.92)R	18.34 (25.33) - MR	7.98 (16.31) S
20	DS 1312	0.00 (0.00)HR	0.00 (0.71) R	11.20 (19.54)MR	20.00 (26.49) - LR	2.52 (8.72) R
21	DS3163	0.00 (0.00)HR	0.00 (0.71) R	16.31 (23.81)MR	26.67 (31.09) - S	4.93 (12.76) LR
22	DS3168	6.82 (14.88) MR	1.00 (1.22) LR	10.77 (19.15)R	23.33 (28.88) - LR	4.98 (12.71) LR
23	DS3124	1.19 (4.43) R	0.00 (0.71) R	17.75 (24.90)LR	24.83 (29.88) - LR	1.29 (6.39) HR
24	SL 1282	4.55 (12.37) MR	2.50 (1.73) HS	11.05 (19.40)MR	20.00 (26.49) - LR	3.94 (11.39) MR
25	SL 1230	6.38 (13.69) M R	2.50 (1.73) HS	15.61 (23.26)LR	25.00 (29.99) - LR	3.95 (11.45) MR

26	HIMSO -1694	5.24 (13.00) MR			11.34 (19.67)MR	23.33 (28.88) - LR	4.76 (12.58) LR
27	HIMSO -1693	2.31 (7.69) R	2.50 (1.73) HS		15.80 (23.41)LR	20.00 (26.57) - LR	5.44 (13.47) LR
28	VLS - 103	9.13 (17.45) LR	2.00 (1.58) HS		15.35 (23.05)LR	15.00 (22.76) - MR	6.63 (14.89) LR
29	VLS -102	2.94 (11.08) R	2.50 (1.73) HS		20.85 (27.16)LR	18.34 (25.33) - MR	5.77 (13.89) LR
30	AMS 100-39	3.70 (11.05) MR	1.50 (1.40) S		11.00 (19.36)MR	16.67 (23.99) - MR	5.02 (12.93) LR
31	PS 1605	3.56 (10.85) MR	1.50 (1.40) S		23.79 (29.18)S	16.67 (24.10) - MR	6.52 (14.73) LR
32	PS 1689	6.10 (14.21) LR	0.00 (0.71) R		14.88 (22.68)MR	13.34 (21.27) - R	4.40 (12.10) MR
33	PS 1682	6.83 (14.94) MR			23.35 (28.88)S	21.67 (27.72) - LR	5.07 (12.98) LR
34	RSC 11-48	1.19 (4.43) R	1.50 (1.40) S		13.08 (21.19)MR	18.34 (25.33) - MR	2.26 (8.62) R
35	RSC 11-42	6.91 (15.18) LR	0.00 (0.71) R		15.27 (22.99)LR	18.34 (25.33) - MR	2.41 (8.92) MR
36	BAUS(M) -3	2.14 (7.78) R	0.00 (0.71) R		26.53 (30.99)S	13.33 (21.41) - R	5.62 (13.70) LR
37	BAUS 116	13.73 (21.82) S	0.00 (0.71) R		26.54 (31.00)S	21.67 (27.72) - LR	5.09 (13.00) LR
38	CAUMS 2	3.56 (10.85) MR	1.50 (1.40) S		23.61 (29.06)S	20.00 (26.57) - LR	4.97 (12.87) LR

39	NRC 195	4.78 (12.59) MR	0.00 (0.71) R	21.64 (27.71) LR	20.00 (26.49) - LR	3.09 (10.05) MR
40	NRC 203	6.74 (14.94) LR	0.00 (0.71) R	27.89 (31.87) HS	15.00 (22.76) - MR	2.50 (8.78) HR
41	NRC 193	9.57 (17.97) LR	0.00 (0.71) R	26.32 (30.85) S	11.67 (19.92) - R	2.98 (9.93) MR
42	NRC 192	6.13 (14.28) LR	0.00 (0.71) R	25.45 (30.28) S	21.67 (27.72) - LR	3.35 (10.32) MR
43	NRC 191	9.68 (16.76) LR	1.00 (1.22) LR	26.32 (30.85) S	15.00 (22.50) - MR	5.49 (13.46) LR
44	NRC 190	3.82 (11.12) MR	0.00 (0.71) R	27.96 (31.91) HS	13.34 (21.27) - R	5.37 (13.16) LR
45	RSC 10-52	5.19 (13.13) MR	0.00 (0.71) R	18.28 (25.31) LR	18.33 (25.15) - MR	3.26 (10.39) MR
46	NRC 189	14.75 (23.73) S	0.00 (0.71) R	24.74 (29.82) LR	20.00 (26.57) - LR	4.10 (11.29) MR
47	RVSM 16-20	18.00 (25.04) S	1.00 (1.22) LR	18.90 (25.76) LR	23.33 (28.88) - LR	1.51 (6.94) HR
48	KDS 1175	4.98 (12.68) MR	0.00 (0.71) R	13.57 (21.61) MR	21.67 (27.72) - LR	2.42 (8.93) MR
49	KDS 1187	5.02 (12.88) MR	1.50 (1.40) S	15.76 (23.38) LR	21.67 (27.72) - LR	1.35 (6.41) HR
50	KDS 1149	1.66 (7.27) R	1.50 (1.40) S	15.52 (23.19) LR	21.67 (27.72) - LR	3.91 (11.33) MR
51	MACS 1672	3.44 (10.63) MR	0.00 (0.71) R	16.64 (24.07) LR	23.33 (28.88) - LR	2.78 (9.27) MR

52	MACS 1735	5.82 (13.61) MR	0.00 (0.71) R	12.99 (21.12)MR	23.33 (28.88) - LR	3.61 (10.94) MR
53	Asb 15	10.60 (18.85) S	0.00 (0.71) R	27.84 (31.83)HS	25.00 (29.99) - LR	2.31 (8.74) R
54	ASB 11	Not germinated	0.00 (0.71) R		21.67 (27.72) - LR	
55	TS 21-2	18.99 (25.78) LR		19.56 (26.24)LR		6.78 (15.09) LR
56	TS 21-1	9.23 (17.66) MR		18.37 (25.37)LR		9.50 (17.89) HS
57	LOKSOY -1	22.50 (28.28)S		24.56 (29.70)S		5.85 (13.97) LR
58	RVS 2011-10	14.92 (22.49)MR		15.23 (22.96)MR		8.85 (17.30) HS
SEm±		(2.45)	0.09	1.52	(1.66)	1.27
CD at 1%		-		-	(6.28)	4.62
CD at 5 %		(7.02)	0.27	4.57	(4.71)	3.54

Table 3.11: ENT. 4 c. Field screening of IVT (Normal) entries for resistance to major insect pests (Defoliators)

Code No.	Entries	Defoliators (Number of larvae / m)							Leaf damage (% defoliation)	No. of semilooper/ m ²	No. of <i>S. litura</i> larvae/m ²
		Sehore (3)	Amravati (4)	Pantnagar (5)	Kota (6)	Dharwad (7)	Imphal (8)	Bidar (9)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1	RCS 1-10	Not germinated			2.67 (1.78)*-LR			3.29 (10.42)LS			
2	SKUA-WSB.101	1.16 (1.19) MR	0.00 (0.71) MR	4 (2.10) S	2.00 (1.58) -LR	4.54 (2.25)HS	12.20 (3.22)* LR	2.71 (9.40) LS	4.83 (2.30)* HR	0.17 (0.80)* MR	
3	SKAU-S-4	Not germinated	0.10 (0.77) LR		2.67 (1.78) -LR			7.49 (15.65) LS			
4	KBS 21-1	1.66 (1.42) MR	0.00 (0.71) MR	1 (1.20) MR	0.84 (1.15) -R	2.16 (1.63)R	4.20 (2.17) MR	3.92 (11.31) LS	9.67 (3.18) LR	0.83 (1.15) LR	
5	MAUS 818	0.50 (0.96) R	0.47 (0.98) HS	1.5 (1.40) MR	2.50 (1.73) -LR	2.82 (1.82)MR	3.60 (2.00) MR	6.00 (14.13) LS	9.00 (3.08) LR	0.83 (1.15) LR	
6	MAUS 791	0.50 (0.96) R	0.00 (0.71) MR	0.5 (0.96) R	2.00 (1.58) -LR	3.14 (1.91)LR	4.20 (2.13) MR	4.42 (11.88) LS	6.83 (2.70) MR	0.67 (1.02) LR	
7	AUKS 224	Not germinated	0.00 (0.71) MR		2.17 (1.63) -LR			3.52 (10.72) LS			
8	AMS 115	3.00 (1.85) LR	0.00 (0.71) MR	0 (0.70) HR	2.00 (1.58) -LR	3.85 (2.09)LR	4.20 (2.13) MR	4.12 (11.71) LS	7.33 (2.79) MR	0.67 (1.08) LR	
9	AMS1901	0.33 (0.89) HR	0.00 (0.71) MR	1 (1.20) MR	2.00 (1.58) -LR	2.53 (1.74)MR	7.90 (2.85) LR	4.81 (12.65) LS	4.33 (2.19) HR	0.17 (0.80) MR	

10	RVS 1320	1.49 (1.41) MR	0.37 (0.92) S	1.5 (1.40) MR	1.84 (1.53) - MR	2.74 (1.80)MR	5.50 (2.45) MR	4.66 (12.46) LS	9.83 (3.21) S	1.00 (1.21) LR
11	RVS 1315	1.33 (1.30) MR	0.00 (0.71) MR	0 (0.70) HR	2.00 (1.58) - LR	3.81 (2.08)LR	7.20 (2.62) MR	4.83 (12.53) LS	10.83 (3.36) HS	0.50 (0.99) MR
12	DLSb 3	0.49 (0.99) R	0.00 (0.71) MR	1 (1.22) MR	1.67 (1.47) - MR	4.24 (2.18)S	4.20 (2.13) MR	4.53 (12.29) LS	10.00 (3.24) S	0.67 (1.06) LR
13	DLSb 4	1.66 (1.47) MR	0.43 (0.96) HS	1.5 (1.40) MR	1.84 (1.53) - MR	3.77 (2.07)LR	8.20 (2.76) MR	5.47 (13.52) LS	8.17 (2.94) LR	1.00 (1.21) LR
14	DSb39	0.33 (0.89) HR	0.00 (0.71) MR	2 (1.57) LR	0.84 (1.15) - R	3.54 (2.01)LR	4.20 (2.13) MR	4.11 (11.53) LS	4.50 (2.23)HR	0.17 (0.80) MR
15	RVSM 2011-35	2.66 (1.75)LR	0.00 (0.71) MR		2.67 (1.78) - LR	2.19 (1.64)R	9.00 (3.00) LR	2.04 (8.20) LS	8.17 (2.94) LR	0.83 (1.15) LR
16	AS 40	2.66 (1.78) LR	0.00 (0.71) MR	3 (1.85) LR	1.67 (1.47) - MR	3.05 (1.88)LR	16.00 (4.06) LR	2.91 (9.82) LS	11.50 (3.46) HS	1.17 (1.28) LR
17	AS24	3.33 (1.95) LR	0.33 (0.90) LR	3.5 (1.72) LR	1.84 (1.50) - MR	4.89 (2.32)HS	4.60 (2.20) MR	3.91 (11.40) LS	7.17 (2.76) MR	0.00 (0.70) R
18	JS 23-08	3.66 (2.04) S	0.00 (0.71) MR	1.5 (1.40) MR	1.83 (1.52) - MR	3.66 (2.04)LR	4.40 (2.16) MR	2.64 (9.35) LS	10.00 (3.24) S	1.00 (1.22) LR
19	JS 23-05	1.50 (1.40) MR	0.30 (0.88) LR	1 (1.22) MR	2.17 (1.63) - LR	2.48 (1.73)MR	16.20 (3.61) LR	4.64 (12.35) LS	6.83 (2.70) MR	0.33 (0.91) MR
20	DS 1312	0.50 (0.96)R	0.27 (0.87) LR	2 (1.54) LR	1.17 (1.29) - MR	2.85 (1.83)MR	23.40 (4.82) S	4.33 (11.99) LS	9.67 (3.18) LR	0.50 (0.99) MR
21	DS3163	0.50 (0.96)R	0.00 (0.71) MR	1 (1.20) MR	2.50 (1.73) - LR	3.01 (1.87)LR	26.20 (5.15) S	3.72 (11.10) LS	10.83 (3.36) HS	0.33 (0.91) MR

22	DS3168	1.00 (1.14) MR	0.00 (0.71) MR	2.5 (1.72) LR	2.17 (1.61) - LR	2.38 (1.70)MR	6.40 (2.63) MR	2.31 (8.72) LS	10.17 (3.26) S	0.50 (0.99) MR
23	DS3124	0.16 (0.83) HR	0.00 (0.71) MR	2 (1.57) LR	2.33 (1.68) - LR	3.02 (1.88)LR	7.80 (2.83) LR	2.68 (9.37) LS	6.67 (2.67) MR	0.00 (0.70) R
24	SL 1282	2.39 (1.73) LR	0.00 (0.71) MR	1.5 (1.40) MR	2.33 (1.65) - LR	2.04 (1.59)R	19.40 (4.09) LR	2.60 (9.27) LS	9.33 (3.13) LR	1.33 (1.35) S
25	SL 1230	0.83 (1.08) R	0.10 (0.77) LR	1 (1.22) MR	2.17 (1.63) - LR	3.12 (1.90)LR	21.40 (4.25) LR	3.38 (10.59) LS	5.83 (2.51) HR	0.83 (1.15) LR
26	HIMSO - 1694	4.66 (2.24) HS			2.34 (1.68) - LR	2.90 (1.84)MR	17.80 (3.95) LR	3.79 (11.22) LS	11.67 (3.48) HS	0.83 (1.15) LR
27	HIMSO - 1693	0.83 (1.08) R	0.00 (0.71) MR	2 (1.57) LR	1.84 (1.53) - MR	3.46 (1.99)LR	11.00 (3.25) LR	3.32 (10.42) LS	8.67 (3.02) LR	0.67 (1.06) LR
28	VLS - 103	0.33 (0.89) HR	0.00 (0.71) MR	1.5 (1.40) MR	1.84 (1.53) - MR	3.25 (1.94)LR	16.60 (4.02) LR	2.81 (9.65) LS	5.00 (2.34) HR	0.50 (0.99) MR
29	VLS -102	0.83 (1.08) R	0.00 (0.71) MR	2.5 (1.72) LR	1.83 (1.52) - MR	4.08 (2.14)S	13.60 (3.57) LR	2.91 (9.82) LS	9.67 (3.18) LR	0.50 (0.96) MR
30	AMS 100-39	1.33 (1.34) MR	0.00 (0.71) MR	1 (1.22) MR	1.67 (1.47) - MR	2.97 (1.86)MR	17.00 (3.68) LR	2.08 (8.26) LS	4.50 (2.23) HR	0.17 (0.80) MR
31	PS 1605	0.66 (1.01) R	0.00 (0.71) MR	0.5 (0.96) R	1.50 (1.40) - MR	4.83 (2.31)HS	3.60 (1.93) MR	3.42 (10.66) LS	5.83 (2.51) HR	0.17 (0.80) MR
32	PS 1689	2.66 (1.74) LR	0.00 (0.71) MR	2 (1.57) LR	1.50 (1.41) - MR	2.67 (1.78)MR	5.40 (2.43) MR	3.41 (10.63) LS	9.17 (3.10)LR	0.50 (0.99) MR
33	PS 1682	0.66 (1.03) R			1.84 (1.53) - MR	5.03 (2.35)HS	4.60 (2.26) MR	3.47 (10.72) LS	7.33 (2.79)MR	0.33 (0.91) MR

34	RSC 11-48	3.33 (1.94) LR	0.00 (0.71) MR	3.5 (1.99) LR	1.67 (1.47) - MR	3.66 (2.04)LR	1.80 (1.50) MR	2.83 (9.66) LS	9.00 (3.08) LR	0.50 (0.99) MR
35	RSC 11-42	2.16 (1.59) LR	0.00 (0.71) MR	3.5 (1.99) LR	1.67 (1.47) - MR	3.58 (2.02)LR	14.40 (3.81) LR	3.59 (10.91) LS	11.33 (3.43) HS	0.83 (1.13) LR
36	BAUS(M) -3	1.33 (1.34) MR	0.00 (0.71) MR	2.5 (1.72) LR	1.33 (1.35) - MR	4.23 (2.17)S	7.80 (2.70) MR	3.70 (11.08) LS	11.00 (3.38) HS	1.33 (1.34) S
37	BAUS 116	2.00 (1.58) LR	0.00 (0.71) MR	2 (1.54) LR	2.67 (1.78) - LR	3.97 (2.11)S	6.80 (2.66) MR	3.09 (10.12) LS	4.00 (2.11) HR	0.33 (0.91) MR
38	CAUMS 2	1.99 (1.40) MR	0.33 (0.90) LR	3 (1.86) LR	1.84 (1.53) - MR	4.05 (2.13)S	8.00 (2.91) LR	2.73 (9.48) LS	9.17 (3.10) LR	0.50 (0.99) MR
39	NRC 195	4.33 (2.18) HS	0.00 (0.71) MR	4.5 (2.22) S	2.17 (1.63) - LR	3.89 (2.10)LR	10.00 (3.20) LR	2.98 (9.90) LS	6.00 (2.54) HR	0.17 (0.80) MR
40	NRC 203	2.39 (1.73) LR	0.13 (0.79) LR	3 (1.86) LR	1.00 (1.22) - R	5.09 (2.36)HS	11.20 (3.36) LR	3.09 (10.12) LS	10.33 (3.29) HS	0.67 (1.06) LR
41	NRC 193	2.00 (1.58) LR	0.00 (0.71) MR	3.5 (1.99) LR	1.00 (1.22) - R	4.02 (2.13)S	1.20 (1.21) R	3.62 (10.96) LS	10.67 (3.33) HS	0.83 (1.15) LR
42	NRC 192	0.99 (1.19) MR	0.00 (0.71) MR	2 (1.57) LR	1.33 (1.35) - MR	3.76 (2.06)LR	7.00 (2.74) MR	3.44 (10.63) LS	6.00 (2.54) HR	0.50 (0.99) MR
43	NRC 191	3.83 (2.05) S	0.00 (0.71) MR	3 (1.85) LR	1.67 (1.47) - MR	4.52 (2.24)HS	2.60 (1.55) R	3.78 (11.15) LS	4.17 (2.15) HR	0.17 (0.80) MR
44	NRC 190	0.83 (1.08) R	0.37 (0.93) S	1 (1.20) MR	1.17 (1.29) - MR	4.23 (2.17)S	13.60 (3.75) LR	2.92 (9.77) LS	7.83 (2.87) MR	0.17 (0.80) MR
45	RSC 10-52	0.66 (1.07) R	0.00 (0.71) MR	1 (1.20) MR	2.00 (1.58) - LR	3.25 (1.94)LR		3.06 (10.06) LS	8.50 (2.99) LR	0.67 (1.08) LR

46	NRC 189	3.83 (2.07) S	0.30 (0.88) LR	1.5 (1.40) MR	2.17 (1.63) - LR	3.29 (1.95)LR	9.80 (3.17) LR	4.33 (12.00) LS	12.17 (3.55) HS	0.83 (1.15) LR
47	RVSM 16- 20	0.99 (1.19) MR	0.00 (0.71) MR	0.5 (0.96) R	1.84 (1.53) - MR	3.73 (2.06)LR	1.20 (1.21) R	3.74 (11.14) LS	8.17 (2.94) LR	0.50 (0.99) MR
48	KDS 1175	2.16 (1.59) LR	0.00 (0.71) MR	2 (1.57) LR	1.84 (1.53) - MR	3.11 (1.90)LR	12.40 (3.51) LR	3.36 (10.53) LS	11.17 (3.41) HS	0.67 (1.06) LR
49	KDS 1187	3.66 (2.04) S	0.00 (0.71) MR	4.5 (2.21) S	2.17 (1.63) - LR	3.47 (1.99)LR	6.60 (2.66) MR	3.71 (11.05) LS	6.33 (2.61) R	0.17 (0.80) MR
50	KDS 1149	0.50 (0.96) R	0.00 (0.71) MR	3 (1.85) LR	2.17 (1.63) - LR	2.68 (1.78)MR	0.60 (1.01) R	4.07 (11.63) LS	4.67 (2.27) HR	0.50 (0.96) MR
51	MACS 1672	3.66 (2.03) S	0.00 (0.71) MR	2.5 (1.72) LR	2.33 (1.68) - LR	2.86 (1.83)MR	6.80 (2.70) MR	3.28 (10.42) LS	9.83 (3.21) S	1.17 (1.28) LR
52	MACS 1735	5.99 (2.70) HS	0.43 (0.96) HS	4 (2.10) S	1.84 (1.53) - MR	3.05 (1.88)LR	4.80 (2.24) MR	4.50 (12.24) LS	5.33 (2.40) HR	0.00 (0.70) R
53	Asb 15	1.33 (1.34) MR	0.33 (0.90) LR	1.5 (1.40) MR	2.50 (1.73) - LR	4.00 (2.12)LR	5.60 (2.46) MR	3.60 (10.91) LS	9.17 (3.10) LR	0.67 (1.06) LR
54	ASB 11	Not germinated	0.00 (0.71) MR	2 (1.57) LR	2.17 (1.63) - LR			3.53 (10.82) LS		
55	TS 21-2	2.66 (1.78) LR		1 (1.22) MR	0.10	4.23 (2.17)S	7.70 (2.79) LR		5.33 (2.41) HR	0.33 (0.89) MR
56	TS 21-1	3.00 (1.85) LR		2 (1.54) LR	0.38	3.89 (2.10)LR	2.10 (1.44) R		9.83 (3.20) S	0.50 (0.99) MR
57	LOKSOY -1	3.33 (1.95) LR		2.5 (1.72) LR	0.29	4.74 (2.29)HS	8.80 (3.03) MR		8.00 (2.91) LR	0.33 (0.91) MR

58	RVS 2011-10	3.66 (2.03) S		1.5 (1.40) MR		3.18 (1.92)LR	2.40 (1.70) R		6.00 (2.54) HR	0.33 (0.89) MR
	SE ±	0.92	0.05			0.25		0.68	0.10	0.11
	CD at 5 %	1.85	0.15			0.76		1.93	0.29	0.31
	CD at 1 %	-	-					2.57	0.36	0.40

Table 3.12: ENT. 4 d. Field screening of IVT (Normal) entries for resistance to major insect pests (Pod borer, Aphids, White fly, Leaf webber and YMV Rating)

Code No.	Entries	Pod Borer				Aphid (3leaf/plant)					White fly/leaf					Mean YMV disease incidence (Scale: 1-9)	No. of jassids/ plant	Leaf webber larvae/m
		Dharwad	Bidar	Imphal	Pantnagar	Pantnagar	Parbhani	Ludhiana	(Delhi)	(Delhi)	Parbhani	Imphal						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(11)						
1	RCS 1-10		1.82 (7.74)R						16.2 (4.0) MR	5								
2	SKUA-WSB.101	33.15 (35.14)MR	6.19 (14.23)LR	6.80 (2.66) * MR	2.5 (1.72) LR	4.5 (2.21) MR	1.50 (1.40)* MR	1.66 (1.62)	13.8 (3.7) HR	0	1.10 (1.25)*	3.90 (2.09)* LR						
3	SKAU-S-4		4.19 (11.80)MR						18 (4.2) LR	1								
4	KBS 21-1	37.22 (37.58)LR	6.22 (14.43)LR	9.20 (3.09) MR	3 (1.86) LR	6 (2.54) LR	1.50 (1.41) MR	2.99 (1.99)	15.2 (3.9) HR	5	1.20 (1.29)	2.50 (1.73) MR						
5	MAUS 818	35.43 (36.51)LR	3.04 (9.78)MR	15.50 (3.99) LR	2 (1.54) LR	4 (2.10) MR	1.60 (1.44) LR	3.16 (2.03)	11 (3.3) R	0	1.10 (1.25)	2.50 (1.73) MR						
6	MAUS 791	31.43 (34.08)MR	1.80 (7.61)R	13.80 (3.71) LR	2 (1.57) LR	5 (2.33) MR	1.70 (1.47) LR	2.66 (1.91)	11 (3.3) R	0	1.10 (1.25)	2.30 (1.67) MR						
7	AUKS 224		5.81 (13.80)LR						21 (4.6) LR	3								
8	AMS 115	41.47 (40.07)S	8.76 (17.19)S	18.20 (4.32) LR	1.5 (1.40) MR	9 (3.07) LR	1.00 (1.22) MR	2.66 (1.88)	17.6 (4.2) LR	3	1.20 (1.30)	3.20 (1.91) LR						

9	AMS1901	39.05 (38.66)LR	3.82 (10.46)MR	14.20 (3.81) LR	0 (0.70) R	4.5 (2.23) MR	1.60 (1.44) LR	3.00 (2.00)	17.6 (4.2) LR	3	1.20 (1.30)	2.60 (1.75) MR
10	RVS 1320	40.59 (39.56)LR	7.51 (15.91)LR	9.20 (3.03) MR	2 (1.54) LR	7.5 (2.79) LR	1.30 (1.34) MR	2.33(1.81)	13.6 (3.9) HR	0	0.90 (1.18)	2.50 (1.73) MR
11	RVS 1315	38.14 (38.13)LR	7.19 (15.54)LR	19.70 (4.43) LR	0 (0.70) R	6.5 (2.63) LR	1.70 (1.48) LR	3.83(2.19)	25.6 (5.1) LR	5	1.20 (1.30)	3.40 (1.96) LR
12	DLSb 3	44.34 (41.73)S	5.34 (12.88)LR	13.40 (3.70) LR	2.5 (1.72) LR	8 (2.91) LR	1.70 (1.48) LR	1.66(1.63)	17.4 (4.2) LR	5	1.30 (1.33)	1.70 (1.48) R
13	DLSb 4	38.42 (38.29)LR	2.28 (8.68)MR	20.20 (4.55) LR	2 (1.54) LR	11 (3.38) HS	1.60 (1.44) LR	2.33(1.82)	22 (4.7) LR	5	1.10 (1.25)	2.60 (1.76) MR
14	DSb39	30.81 (33.70)MR	1.92 (7.97)R	4.80 (2.30) MR	2 (1.57) LR	6 (2.54) LR	1.80 (1.51) LR	3.83(2.19)	25.6 (5.1) LR	5	1.20 (1.30)	1.90 (1.54) MR
15	RVSM 2011-35	40.68 (39.61)LR	8.20 (16.13)LR	11.60 (3.48) LR			1.10 (1.26) MR	2.16(1.77)	15.4 (3.9) MR	7	1.40 (1.37)	3.50 (2.00) LR
16	AS40	46.40 (42.92)HS	5.30 (12.72)LR	10.90 (3.37) MR	2 (1.54) LR	4 (2.10) MR	1.70 (1.48) LR	1.49(1.58)	20.4 (4.5) LR	5	1.30 (1.34)	4.00 (2.12) LR
17	AS24	41.76 (40.24)LR	5.90 (13.96)LR	11.20 (3.38) MR	1 (1.14) MR	4.5 (2.23) MR	0.90 (1.18) R	3.33(2.07)	25.4 (5.0) LR	3	1.20 (1.30)	1.50 (1.40) R
18	JS 23-08	34.77 (36.12)MR	4.03 (10.95)MR	14.20 (3.81) LR	1.5 (1.40) MR	5.5 (2.44) LR	1.10 (1.25) MR	1.83(1.68)	32.4 (5.7) S	7	0.80 (1.14)	3.30 (1.95) LR
19	JS 23-05	37.11 (37.51)LR	3.10 (10.11)MR	15.40 (3.99) LR	1.5 (1.40) MR	3.5 (1.99) MR	1.30 (1.34) MR	2.99(1.95)	19 (4.4) LR	6	1.40 (1.37)	4.00 (2.12) LR

20	DS 1312	39.47 (38.90)LR	2.97 (9.59)MR	22.10 (4.75) LR	2 (1.57) LR	3.5 (2.00) MR	1.40 (1.37) MR	3.50(2.12)	23.6 (4.9) LR	3	1.40 (1.37)	3.10 (1.89) LR
21	DS3163	45.35 (42.31)S	3.51 (10.12)MR	13.30 (3.70) LR	3 (1.85) LR	5 (2.30) MR	1.20 (1.30) MR	2.33(1.81)	17.6 (4.2) LR	5	1.20 (1.30)	4.20 (2.17) LR
22	DS3168	35.94 (36.82)LR	0.00 (0.00)HR	11.20 (3.36) MR	1 (1.14) MR	6 (2.51) LR	1.60 (1.44) LR	1.99(1.72)	23.4 (4.8) LR	3	1.10 (1.26)	3.30 (1.95) LR
23	DS3124	40.87 (39.72)LR	4.25 (11.89)MR	12.40 (3.50) LR	1.5 (1.40) MR	6 (2.54) LR	1.60 (1.44) LR	2.66(1.90)	31.6 (5.6) S	7	1.30 (1.34)	2.70 (1.79) MR
24	SL 1282	34.13 (35.73)MR	2.64 (9.04)MR	14.90 (3.92) LR	2.5 (1.72) LR	5 (2.30) MR	1.60 (1.44) LR	3.66(2.15)	19.4 (4.4) LR	3	1.30 (1.34)	3.40 (1.97) LR
25	SL 1230	43.22 (41.09)S	5.21 (9.42)MR	14.50 (3.84) LR	0 (0.70) R	2 (1.54) R	1.00 (1.21) MR	2.49(1.84)	22.4 (4.7) LR	7	0.90 (1.18)	4.80 (2.30) S
26	HIMSO -1694	39.26 (38.78)LR	4.11 (11.65)MR	10.10 (3.13) MR	1.5 (1.40) MR	3 (1.85) MR	1.70 (1.48) LR	1.99(1.72)	22.6 (4.8) LR	7	0.70 (1.09)	3.30 (1.95) LR
27	HIMSO -1693	45.17 (42.21)S	4.17 (11.74)MR	8.10 (2.88) MR	0.5 (0.96) MR	5 (2.33) MR	1.70 (1.47) LR	5.49(2.52)	15.8 (4.0) MR	1	1.10 (1.25)	2.20 (1.64) MR
28	VLS - 103	42.39 (40.60)S	12.97 (20.63)HS	11.00 (3.32) MR	3 (1.85) LR	4.5 (2.23) MR	1.40 (1.37) MR	3.83(2.19)	17.2 (4.1) LR	7	1.20 (1.30)	3.10 (1.90) LR
29	VLS -102	40.83 (39.70)LR	1.83 (5.51)R	9.50 (3.15) MR	1.5 (1.40) MR	7 (2.71) LR	1.80 (1.51) LR	3.00(1.98)	20.4 (4.5) LR	3	1.30 (1.34)	4.20 (2.16) LR
30	AMS 100-39	36.35 (37.06)LR	2.44 (8.99)MR	16.50 (4.12) LR	1.5 (1.40) MR	4 (2.10) MR	1.50 (1.40) MR	3.99(2.33)	18.6 (4.3) LR	0	1.40 (1.37)	3.00 (1.87) LR

31	PS 1605	43.19 (41.07)S	8.23 (16.55)LR	10.20 (3.25)MR	1 (1.14) MR	5 (2.33) MR	1.60 (1.44) LR	3.49(2.10)	22 (4.7) LR	1	1.20 (1.30)	1.60 (1.45) R
32	PS 1689	34.77 (36.12)MR	6.58 (14.58)LR	15.10 (3.94) LR	3.5 (1.99) LR	3 (1.87) MR	1.60 (1.44) LR	3.66(2.12)	23.4 (4.8) LR	7	0.80 (1.12)	3.90 (2.09) LR
33	PS 1682	33.30 (35.23)MR	5.52 (12.66)LR	13.50 (3.63) LR	3 (1.85) LR	6 (2.54) LR	1.60 (1.44) LR	3.50(2.55)	20.4 (4.5) LR	5	1.00 (1.22)	3.20 (1.92) LR
34	RSC 11-48	41.28 (39.96)LR	1.63 (7.23)R	10.00 (2.98)MR	0.5 (0.96) MR	4 (2.11) MR	0.90 (1.17) R	3.66(2.16)	21.6 (4.6) LR	5	1.40 (1.37)	1.90 (1.53) MR
35	RSC 11-42	35.86 (36.77)LR	2.38 (8.49)MR	21.20 (4.66) LR	2 (1.54) LR	6 (2.54) LR	1.90 (1.54) LR	2.66(1.91)	26.4 (5.1) LR	3	1.20 (1.30)	2.60 (1.76) MR
36	BAUS(M) -3	40.12 (39.29)LR	6.14 (14.23)LR	10.20 (3.23)MR	4 (2.10) S	8 (2.89) LR	2.10 (1.61) LR	3.16(2.03)		-	1.20 (1.30)	3.20 (1.92) LR
37	BAUS 116	43.19 (41.07)S	10.34 (18.70)HS	6.80 (2.70)MR	2 (1.57) LR	6.5 (2.64) LR	1.50 (1.41) LR	3.66(2.15)		-	0.90 (1.18)	4.30 (2.16) LR
38	CAUMS 2	48.23 (43.97)HS	4.99 (12.13)MR	8.60 (3.02)MR	3 (1.85) LR	4.5 (2.23) MR	1.20 (1.30) MR	4.33(2.29)	26 (5.1) LR	1	0.90 (1.18)	4.00 (2.12) LR
39	NRC 195	39.43 (38.88)LR	7.56 (15.76)LR	10.50 (3.22)MR	1 (1.20) MR	8 (2.89) LR	1.30 (1.31) MR	2.66(1.91)	27 (5.3) LR	1	1.30 (1.34)	4.40 (2.21) S
40	NRC 203	38.62 (38.40)LR	10.81 (18.73)HS	16.50 (4.12) LR	0 (0.70) R	8 (2.91) LR	1.60 (1.44) LR	3.33(2.07)	29 (5.4) S	1	1.00 (1.2)	2.90 (1.84) LR
41	NRC 193	38.52 (38.35)LR	9.70 (18.14)HS	6.20 (2.54)MR	1.5 (1.40) MR	6.5 (2.64) LR	1.40 (1.37) MR	3.66(2.15)	15.8 (4.0) MR	0	0.60 (1.04)	2.20 (1.64) MR

42	NRC 192	38.71 (38.46)LR	5.45 (13.39)LR	14.50 (3.78) LR	0 (0.70) R	4 (2.10) MR	1.50 (1.41) MR	3.33(2.08)	21.6 (4.6) LR	0	1.10 (1.26)	2.40 (1.70) MR
43	NRC 191	37.74 (37.89)LR	4.97 (12.84)MR	10.30 (3.08) MR	¹ (1.20) MR	4 (2.11) MR	2.10 (1.61) LR	5.66(2.58)	16.2 (4.9) MR	7	1.30 (1.34)	2.20 (1.64) MR
44	NRC 190	42.51 (40.67)LR	5.43 (13.47)LR	14.90 (3.91) LR	0.5 (0.96) MR	8 (2.91) LR	1.70 (1.48) LR	4.00(2.23)	13.8 (4.2) MR	2	1.10 (1.25)	3.00 (1.87) LR
45	RSC 10-52	36.88 (37.38)LR	5.89 (14.05)LR		¹ (1.22) MR	5 (2.33) MR	1.80 (1.51) LR	1.83(1.68)	18 (4.8) LR	1	1.30 (1.34)	
46	NRC 189	41.50 (40.09)LR	4.20 (11.80)MR	18.40 (4.34) LR	2 (1.54)LR	10.5 (3.31) S	1.70 (.148) LR	2.49(1.85)	33 (5.6) S	1	1.40 (1.37)	2.30 (1.67) MR
47	RVSM 16-20	39.68 (39.03)LR	3.92 (11.36)MR	6.70 (2.66) MR	2.5 (1.72) LR	8 (2.90) LR	1.90 (1.54) LR	2.99(1.99)	23.6 (4.4) LR	1	1.30 (1.34)	1.60 (1.44) R
48	KDS 1175	38.02 (38.05)LR	3.61 (10.90)MR	8.80 (3.03) MR	4 (2.10) S	5 (2.33) MR	1.80 (1.51) LR	2.49(1.87)	17.6 (4.7) LR	2	1.10 (1.26)	2.50 (1.73) MR
49	KDS 1187	37.25 (37.60)LR	5.69 (13.32)LR	9.00 (3.06) MR	5 (2.33) HS	6.5 (2.63) LR	1.60 (1.44) LR	3.16(2.03)	23.4 (4.8) LR	3	1.20 (1.296)	2.90 (1.83) MR
50	KDS 1149	38.33 (38.24)LR	7.19 (14.01)LR	3.20 (1.91) R	2 (1.54) LR	4.5 (2.21) MR	1.60 (1.44) LR	2.66(1.91)		-	1.30 (1.34)	2.50 (1.73) MR
51	MACS 1672	30.72 (33.65)MR	1.00 (4.07)R	8.40 (2.98) MR	3 (1.85) LR	6 (2.54) LR	1.80 (1.51) LR	2.66(1.89)		-	1.10 (1.26)	2.70 (1.78) MR
52	MACS 1735	40.59 (39.56)LR	5.30 (13.31)LR	1.60 (1.32) R	3.5 (1.99) LR	7 (2.71) LR	1.70 (1.47) LR	3.16(2.03)		-	0.90 (1.18)	1.50 (1.41) R
53	Asb 15	46.31 (42.87)HS	7.23 (15.60)LR	11.80 (3.49) LR	3 (1.87) LR	6 (2.54) LR	1.60 (1.44) LR	1.00(1.41)			1.10 (1.25)	3.30 (1.95) LR
54	ASB 11		5.89 (14.05)LR									

55	TS 21-2	41.67 (40.19)LR		22.10 (4.75) LR	1.5 (1.40) MR	5 (2.33) MR	1.40 (1.37)MR	3.50(2.12)			1.20 (1.30)	3.80 (2.07) LR
56	TS 21-1	35.12 (36.33)LR		9.80 (3.09) MR	1.5 (1.40) MR	3 (1.86)MR	1.60 (1.44) LR	3.99(2.23)			1.20 (1.30)	2.00 (1.58) MR
57	LOKSOY -1	39.13 (38.70)LR		10.00 (3.16) MR	2 (1.58) LR	3 (1.85) MR	1.80 (1.51) LR	3.49(2.12)			1.30 (1.34)	3.40 (1.96) LR
58	RVS 2011-10	35.49 (36.55)MR		11.90 (3.42) MR	1 (1.20)MR	4 (2.06) MR	1.50 (1.41) MR	2.83(1.94)			1.30 (1.34)	1.80 (1.52) MR
SE ±		2.05	1.10	0.71	0.22	0.24	0.08				0.07	0.17
CD at 5 %		6.16	3.11	1.43	0.63	0.69	0.22				NS/0.20	0.35
CV at 5 %		-	4.15		21.68	14.24	8.18				7.82	

ENT. 3.13: ENT. 4 e. Field screening of IVT (early) entries for resistance to major insect pests (Central Region)

Code No	Entries	Leaf Defoliators/ mrl *				Girdle beetle infestation (%) *						Stem fly (% stem tunneling)				
		Amravati	Kota	Sohore	Prabhani	Amravati	Kota	Sohore	Indore	Prabhani	Prabhani	Amravati	Sohore	Indore		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)		
1	MAUS 819	0.00 (0.71) MR	2.17 (1.63)*- LR	0.83 (1.15) R	5.83 (2.51)* R	0.50 (0.97) LR	20.00 (26.49)** - LR	2.40 (6.25) HR	7.29 (15.66)LR	10.41 (18.82)* HS	38.91 (38.39)* MR	51.5 (45.88) LR	7.50 (15.79) R	21.85 (27.87) LR		
2	MAUS 795	0.10 (0.77) MR	2.00 (1.58) - LR	0.66 (1.05) H R	8.17 (2.94) LR	0.00 (0.71) MR	21.67 (27.72) - LR	0.00 (0.00) HR	7.89 (16.31) LR	5.33 (13.34) LR	34.08 (35.54) MR	36 (36.80) MR	8.55 (16.81) R	28.60 (32.33) LR		
3	KDS 1201	0.00 (0.71) MR	2.17 (1.63) - LR	1.33 (1.35) MR	9.83 (3.21) HS	0.50 (0.97) MR	25.00 (29.99) - LR	10.00 (17.84) LR	5.85 (13.99) LR	5.70 (13.75) LR	38.24 (38.19) MR	27 (31.12) MR	11.25 (19.53) MR	55.11 (47.93)H S		
4	KDS 1173		2.34 (1.68) - LR	2.66 (1.78)LR	11.17 (3.41) HS		19.83 (26.36) - LR	2.50 (6.45) HR	7.40 (15.79) LR	12.87 (20.98) HS	31.04 (33.83) MR		9.63 (17.93) MR	37.30 (37.64)		
5	KDS 1172		2.33 (1.68) - LR	1.83 (1.52) LR	9.67 (3.18) S		23.17 (28.72) - LR	7.50 (15.67) MR	9.37 (17.82) LR	7.97 (16.39) HS	27.03 (31.30) MR		32.20 (34.21) HS	54.30 (47.47) HS		
6	KDS 1169	0.07 (0.75) MR	2.00 (1.58) - LR	1.33 (1.34) MR	5.00 (2.34) HR	1.50 (1.40) S	18.33 (25.15) - MR	9.31 (17.28) MR	7.86 (16.28) LR	9.40 (17.85) HS	38.20 (38.05) MR	52.5 (46.44) LR	13.15 (20.80) MR	27.25 (31.47) LR		
7	KDS 1194	0.00 (0.71) MR	1.34 (1.35) - MR	2.33 (1.62)LR	4.33 (2.18) HR	0.00 (0.71) MR	15.00 (22.76) - MR	12.55 (20.68) L R	11.33 (19.67) LR	2.50 (9.10) HR	50.36 (45.20) LR	15 22.50 HR	20.41 (26.79) LR	40.06 (39.27)S		
8	RVS 13-7	0.17 (0.82)	1.67 (1.47) -	3.99 (3.11)	9.50 (3.16) S	0.00 (0.71)	16.67 (23.99) -	12.50 (20.60)	10.77 (19.16) LR	2.03 (8.12)	42.97 (40.91)	42 40.39	11.59 (19.52)	46.01 (42.71)		

		LR	MR	HS		MR	MR	LR		HR	LR	LR	MR	HS
9	JS 23-09	0.00 (0.71) MR	1.50 (1.41) - MR	0.83 (1.15) R	6.67 (2.67) MR	1.50 (1.40) S	16.67 (23.99) - MR	4.75 (12.60) R	3.90 (11.39) LR	2.03 (7.97) HR	47.00 (43.27) LR	69.5 56.75 HS	13.24 (21.30) MR	64.33 (53.33) HS
10	JS 2034	0.30 (0.88) LR	1.84 (1.53) - MR	2.49 (1.73) LR	5.00 (2.34) HR	0.00 (0.71) MR	19.83 (26.36) - LR	15.00 (22.49) LR	0.96 (5.62) MR	4.04 (11.58) MR	31.23 (33.94) MR	75.5 60.47 HS	10.20 (18.58) MR	35.03 (36.29) HS
11	JS 23-03	0.03 (0.73) MR	2.34 (1.68) - LR	0.83 (1.15) R	5.50 (2.44) HR	0.00 (0.71) MR	18.34 (25.33) - MR	0.00 (0.00) HR	4.69 (12.50) LR	1.54 (7.11) HR	39.33 (38.83) MR	85 67.50 HS	12.07 (20.27) MR	60.13 (50.84) HS
17	PS 1569	0.10 (0.77) MR	2.34 (1.68) - LR	1.66 (1.46) MR	9.00 (3.07) LR	1.00 (1.22) LR	23.34 (28.83) - LR	4.80 (12.70) R	3.21 (10.32) MR	3.06 (10.08) R	35.76 (36.71) MR	11.5 (19.78) HR	12.12 (20.21) MR	65.90 (54.27) HS
18	PS 1660	0.00 (0.71) MR	2.67 (1.77) - LR	0.33 (0.99) HR	11.33 (3.43) HS	0.00 (0.71) MR	25.00 (29.99) - LR	0.00 (0.00) HR	17.80 (24.95) HS	5.72 (13.81) LR	69.45 (56.88) HS	42.5 (40.68) LR	12.45 (20.43) MR	38.85 (38.56) HS
19	PS 1675	0.27 (0.87) LR	1.84 (1.53) - MR	3.33 (3.03) HS	6.83 (2.70) MR	2.00 (1.58) HS	21.67 (27.72) - LR	21.35 (27.46) S	12.38 (20.60) S	7.15 (15.49) S	49.40 (44.64) LR	60 (50.89) S	12.20 (19.96)M R	37.38 (37.69) HS
20	JS 95-60		2.00 (1.58) - LR	2.66 (1.78) S	9.00 (3.08) LR		15.17 (22.90) - MR	12.50 (20.60) LR	9.88 (18.32) LR	3.51 (10.76) MR	34.66 (36.02) MR		10.83 (19.09)M R	56.98 (49.01) HS
21	RSC11-60	0.23 (0.85) LR	2.17 (1.63) - LR	2.66 (1.77) S	4.67 (2.26) HR	0.00 (0.71) MR	21.67 (27.72) - LR	12.50 (20.60) LR	5.32 (13.33) LR	5.56 (13.51) LR	39.99 (39.21) MR	26.5 (30.93) MR	28.43 (27.53) S	40.03 (39.25) HS
22	NRC 186	0.00 (0.71) MR	1.17 (1.29) - LR	0.83 (1.15) R	7.17 (2.76) MR	1.00 (1.22) LR	10.00 (18.43) - LR	5.00	7.23 (15.60) LR	2.60 (9.24) HR	34.90 (36.20) MR	10 (18.43) HR	7.51 (15.69)	35.15 (36.36) HS

		(0.92) LR	(1.35) - MR	(1.63) LR	(2.47) HR	(1.40) S	(19.92) - MR	(15.96) MR	(9.10) MR	(11.35) MR	(45.80) LR	(41.26) LR	(20.75) MR	(44.60) HS
36				2.66 (1.78)S				12.50 (20.60) LR					31.70 (33.96) HS	
37	JS 22-12								5.64 (13.73) LR					80.97 (64.14) HS
38	JS 22-18								5.56 (13.63) LR					57.92 (49.55) HS
39	JS 22-16								2.84 (9.70) MR					70.07 (56.83) HS
40	RVSM 2012-4								4.89 (12.77) LR					53.13 (46.79) HS
41	NRC 181								6.58 (14.86) LR					50.58 (45.33) HS
42	NRC 165								9.11 (17.56) LR					64.64 (53.51) HS
43	NRC 152								12.17 (20.42)S					50.62 (45.36) HS
44	NRC 150								5.94 (14.10)LR					55.96 (48.42) HS
	SEm±	0.06	0.09		0.09	0.12	1.96		(4.22)	0.82	3.62	3.61	(2.38)	(5.07)
	CD at 1%		0.35		0.35		7.62		(11.37)	3.18	14.08		-	(13.66)
	CD at 5%	0.17	0.26		0.27	0.35	5.63		(8.51)	2.37	10.46	10.58	(7.08)	(10.23)

* Code number 12 to 16, 23, 26 and 27 seeds were not available

ENT. 3.14: ENT. 4 f. Field screening of IVT (early) entries for resistance to major insect pests

Code No.	Entries	Defoliators			Pod borer		Aphid 3leaf/plant	Whitefly / trifoliolate leaf	Stem fly (% stem tunneling)		Girdle beetle (Per cent infestation)
		Bidar (% defoliation)	Pantnagar	Dharwad	Bidar	Dharwad	Pantnagar	Ludhiana	Pantnagar	Dharwad	Dharwad
									(10)	(11)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	MAUS 819	4.07 (11.58)LS	² (1.54)MR	4.13 (2.15)S	14.95 (22.44)HS	34.35 (35.87)MR	³ (1.87)LR	1.83	27.93 (31.93)HR	23.35 (28.88)MR	14.34 (22.24)MR
2	MAUS 795	5.17 (13.14)LS	³ (1.85)LR	5.06 (2.36)HS	10.19 (18.49)S	41.23 (39.93)S	3.25 (1.93)LR	1.67	32.75 (34.89)MR	32.12 (34.51)S	21.85 (27.86)LR
3	KDS 1201	5.99 (14.11)LS	² (1.58)MR	3.32 (1.95)LR	7.33 (15.69)LR	37.39 (37.68)LR	² (1.57)MR	1.99	34.95 (36.24)MR	14.56 (22.42)MR	17.52 (24.73)MR
4	KDS 1173	4.96 (12.86)LS	2.5 (1.72)MR	3.45 (1.99)LR	3.63 (10.98)MR	39.27 (38.79)LR	2.5 (1.72)LR	3.00	15.38 (23.08)HR	23.03 (28.67)MR	18.26 (25.29)MR
5	KDS 1172	6.55 (14.82)LS	² (1.57)MR	4.02 (2.13)S	4.87 (12.68)MR	40.35 (39.42)S	1.75 (1.49)MR	2.67	26.47 (30.94)HR	25.74 (30.47)LR	21.23 (27.43)LR
6	KDS 1169	3.21 (10.27)LS	1.75 (1.49)MR	5.23 (2.39)HS	9.73 (18.03)LR	48.26 (43.99)HS	² (1.57)MR	3.49	36.65 (40.20)LR	33.02 (35.06)S	24.27 (29.50)S
7	KDS 1194	3.87 (11.27)LS	2.5 (1.72)MR	3.89 (2.10)LR	5.24 (13.22)MR	37.28 (37.62)LR	² (1.54)MR	2.00	89.5 (71.13)HS	27.35 (31.52)LR	15.85 (23.45)MR

8	RVS 13-7	3.12 (10.16) LS	4 (2.10) LR	4.05 (2.13)LR	6.35 (14.59) MR	36.23 (36.99)LR	3 (1.85) LR	2.83	18.07 (25.15) HR	26.35 (30.87)L R	16.23 (23.75)MR
9	JS 23- 09	4.50 (12.22) LS	2 (1.58) MR	5.19 (2.39)HS	16.76 (23.85) HS	45.21 (42.23)HS	1 (1.20) MR	3.66	48.9 (44.36) HS	30.69 (33.63)S	27.75 (31.78)HS
10	JS 2034	4.55 (12.31) LS	1.5 (1.40) MR	3.22 (1.93)M R	2.76 (9.29) R	42.28 (40.54)S	1 (1.22) MR	2.49	49.35 (44.62) HS	24.88 (29.91) MR	20.26 (26.74)LR
11	JS 23- 03	3.16 (10.19) LS	2 (1.54) MR	3.29 (1.95)M R	9.88 (18.27) LR	36.34 (37.06)LR	2 (1.54) MR	1.99	37.65 (37.87) MR	22.25 (28.14) MR	15.21 (22.95)MR
17	PS 1569	2.93 (9.86) LS	4.5 (2.23) LR	3.43 (1.98)LR	1.96 (7.98) R	35.21 (36.38)LR	3 (1.85) LR	2.99	47.45 (43.53) HS	18.39 (25.38) MR	13.02 (21.14)MR
18	PS 1660	1.98 (8.09) LS	2 (1.58) MR	2.63 (1.77)M R	2.83 (9.66) R	40.18 (39.32)LR	2 (1.58) MR	3.33	41.42 (40.05) LR	25.94 (30.61) MR	15.26 (22.99)MR
19	PS 1675	3.20 (10.30) LS	2.5 (1.72) MR	2.09 (1.61)R	6.85 (14.56) LR	32.20 (34.56)MR	2.5 (1.72) LR	1.66	39 (38.64) LR	29.74 (33.03)L R	22.32 (28.18)LR
20	JS 95- 60	4.38 (12.08) LS	3 (1.87) LR	3.67 (2.04)LR	3.18 (10.04) R	37.56 (37.78)LR	2.25 (1.65) MR	3.16	49.53 (44.73) HS	27.52 (31.63)L R	19.23 (26.00)LR
21	RSC11- 60	3.46 (10.70) LS	3.75 (2.05) LR	3.72 (2.05)LR	6.72 (14.86) MR	39.11 (38.69)LR	3 (1.87) LR	4.83	40 (39.22) LR	19.89 (26.47) MR	21.52 (27.63)LR
22	NRC 186	3.57 (10.88) LS	4.5 (2.23) LR	3.49 (2.00)LR	3.16 (10.24) R	40.25 (39.36)LR	3.75 (2.06) LR	3.83	47.75 (43.70) HS	26.01 (30.65) MR	23.24 (28.81)LR
24	NRC 202	2.51 (9.10) LS	1 (1.22)	3.87 (2.09)LR	3.69 (11.05)	41.21 (39.92)LR	2 (1.54)	3.33	23.75 (29.15)	19.07 (25.89)	21.25 (27.44)LR

			R		MR		MR		HR	MR	
25	NRC 201	6.01 (14.02) LS	² (1.54) MR	3.52 (2.00)LR	9.56 (17.95) LR	37.88 (37.97)LR	1.5 (1.40) MR	2.83	49.5 (44.71) HS	31.14 (33.91)S	18.25 (25.28)MR
28	NRC 198	3.97 (11.46) LS	³ (1.87) LR	3.13 (1.91)M R	10.80 (18.93) S	39.23 (38.76)LR	2.5 (1.72) LR	3.83	27.3 (31.49) HR	23.84 (29.22) MR	18.05 (25.13)MR
29	NRC 197	5.33 (13.25) LS	1.5 (1.40) MR	3.28 (1.94)M R	8.57 (16.97) LR	38.52 (38.35)LR	1.5 (1.40) MR	2.83	32.77 (34.92) MR	19.32 (26.06) MR	21.15 (27.37)LR
30	NRC 130	3.56 (10.87) LS		2.18 (1.64)R	9.64 (18.05) LR	34.21 (35.78)MR				16.33 (23.83) MR	25.61 (30.39)S
31	NRC 196	3.67 (11.04) LS	⁶ (2.51) S	4.02 (2.13)S	3.80 (10.97) MR	43.52 (41.26)S	⁴ (2.10) LR	4.49	30.32 (33.40) HR	32.11 (34.50)S	27.33 (31.51)HS
32	AMS 0542	4.21 (11.76) LS	5.5 (2.44) S	4.13 (2.15)S	3.28 (7.42) MR	42.21 (40.50)S	6.5 (2.64) HS	2.99	42.75 (40.82) LR	33.95 (35.62)S	26.75 (31.13)S
33	AMS 19-9	3.87 (11.34) LS	⁴ (2.10) LR	3.89 (2.10)LR	3.81 (11.25) MR	39.25 (38.78)S	³ (1.85) LR	2.33	28.7 (32.36) HR	28.93 (32.53)L R	25.62 (30.40)S
34	MACS 1724	3.53 (10.72) LS	3.5 (1.99) LR	3.78 (2.07)LR	7.79 (16.19) LR	36.28 (37.02)LR	1.75 (1.49) MR	2.49	27.05 (31.32) HR	28.61 (32.32)L R	23.28 (28.84)LR
SEm±		0.61			2.27		0.18		1.06	1.19	1.31
CD at 1%		2.39			4.90						
CD at 5%		1.77			3.62		0.54	NS	3.09	3.57	3.94

* Code number 12 to 16, 23, 26 and 27 seeds were not available

Table 3.15: ENT. 5a - Evaluation of germplasm lines at hot spots for resistance against major insect pests (Dharwad).

Sl. No.	IISR Germplasm	Defoliators (larvae/ml)*	Percent defoliation at peak incidence **	Pod borer damage** (%)	Yield (Kg/ha)
1	EC 251682	3.09(1.90)LR	42.70(40.79)MS	37.84(37.94)LR	970
2	EC 251827	2.08(1.61)MR	30.55(33.54)MS	37.39(37.68)LR	1065
3	EC 251865	2.47(1.72)MR	35.24(36.40)MS	39.30(38.80)LR	1123
4	EC 251861	3.82(2.08)S	45.12(42.18)MS	42.88(40.89)S	865
5	EC 251541	1.13(1.28)R	22.27(28.15)LS	33.41(35.29)LR	1428
6	EC 251876	3.04(1.88)LR	40.18(39.32)MS	37.39(37.68)LR	984
7	EC 274755	2.25(1.66)MR	32.57(34.79)MS	32.17(34.54)LR	1137
8	EC 280129	3.13(1.91)LR	43.69(41.36)MS	46.22(42.82)HS	796
9	EC 280148	1.79(1.51)MR	27.16(31.40)MS	32.41(34.69)MR	1315
10	EC 280149	1.16(1.29)R	20.34(26.80)LS	34.52(35.97)LR	1476
11	EC 281462	1.26(1.33)MR	23.75(29.15)LS	35.65(36.65)LR	1427
12	EC 287466	3.83(2.08)S	47.68(43.65)MS	35.79(36.73)LR	732
13	EC 287469	2.79(1.81)LR	36.47(37.14)MS	31.26(33.98)MR	1069
14	EC 289099	2.87(1.84)LR	37.12(37.52)MS	37.95(38.01)LR	1034
15	EC 291401	1.96(1.57)MR	26.43(30.92)MS	34.84(36.16)LR	1287
16	EC 308312	2.82(1.82)LR	35.64(36.64)MS	40.21(39.34)S	1053
17	EC 309512	2.16(1.63)MR	32.14(34.52)MS	34.80(36.13)LR	1196
18	EC 309537	1.50(1.42)MR	26.32(30.85)MS	33.83(35.55)LR	1339
19	EC 309538	2.09(1.61)MR	31.05(33.85)MS	33.60(35.41)LR	1105
20	EC 313915	1.97(1.57)MR	28.43(32.21)MS	32.97(35.03)LR	1273
21	EC 313976	2.96(1.86)LR	36.25(37.00)MS	37.59(37.80)LR	1036
22	EC 771199	1.81(1.52)MR	28.03(31.95)MS	38.83(38.53)LR	1278
23	EC 325098	3.20(1.92)LR	45.17(42.21)MS	40.77(39.66)S	740
24	EC 325103	2.26(1.66)MR	31.06(33.86)MS	40.24(39.35)S	1065
25	EC 333875	2.51(1.74)MR	33.29(35.22)MS	33.31(35.23)LR	1084

26	EC 333879	2.45(1.72)MR	33.08(35.10)MS	31.52(34.14)MR	1051
27	EC 333880	2.82(1.82)LR	35.98(36.84)MS	31.02(33.83)MR	983
28	EC 333876	2.93(1.85)LR	36.24(37.00)MS	44.47(41.81)HS	912
29	EC 333892	2.57(1.75)MR	34.06(35.69)MS	35.05(36.28)LR	1039
30	EC 333929	2.90(1.84)LR	36.12(36.93)MS	42.59(40.72)S	873
31	EC 340506 B	2.40(1.70)MR	32.97(35.03)MS	38.02(38.05)LR	1023
32	EC 343312	1.84(1.53)MR	29.73(33.03)MS	33.22(35.18)LR	1309
33	EC 350664	1.59(1.45)MR	27.14(31.38)MS	32.30(34.62)LR	1375
34	EC 357998	1.20(1.31)R	24.08(29.38)LS	31.69(34.24)MR	1423
35	EC 383165	2.00(1.58)MR	30.45(33.48)MS	42.28(40.54)S	1275
36	EC 389149	2.70(1.79)LR	35.77(36.72)MS	36.56(37.19)LR	952
37	EC 389148	1.39(1.38)MR	24.16(29.43)LS	38.76(38.49)LR	1253
38	EC 389153	2.82(1.82)LR	35.80(36.74)MS	36.28(37.02)LR	859
39	EC 389154	2.93(1.85)LR	36.04(36.88)MS	32.99(35.04)LR	906
40	EC 389160	2.57(1.75)MR	33.00(35.05)MS	35.35(36.47)LR	1022
41	EC 389170	1.05(1.25)R	23.17(28.76)LS	31.23(33.96)MR	1379
42	EC 389170	1.85(1.53)MR	28.75(32.41)MS	33.82(35.55)LR	1312
43	EC 389174	4.04(2.13)HS	50.34(45.18)S	41.01(39.81)S	685
44	EC 389179 B	4.37(2.21)HS	54.78(47.72)S	43.60(41.31)HS	678
45	EC 390981 A	1.96(1.57)MR	31.24(33.97)MS	35.95(36.82)LR	1237
46	EC 393228	2.36(1.69)MR	31.75(34.28)MS	34.99(36.25)LR	1079
47	EC 396059	2.02(1.59)MR	30.87(33.74)MS	34.17(35.76)LR	1153
48	EC 457216	1.67(1.47)MR	27.85(31.84)MS	44.01(41.54)HS	1329
49	EC 457366	3.18(1.92)LR	38.49(38.33)MS	38.19(38.15)LR	756
50	EC 458350	2.26(1.66)MR	30.48(33.50)MS	35.14(36.34)LR	1085
51	JS 335 (C)	2.92(1.85)LR	33.65(35.44)MS	39.03(38.65)LR	897
S.E _m ±		0.19	1.08	1.67	41.75
CD @ 5%		0.58	3.25	5.03	125.29
CD @ 1%		0.77	4.36	6.70	167.23
Mean		2.41	33.42	36.63	1093

Table 3.16: ENT. 5b. Screening of germplasm line at hot spots for resistance against major insect-pests (Central region)

S. No.	ACC. No.	Indore			Kota		Sehore			
		Defoliators (Larvae/mrl)	Stem fly (% stem tunneling)	Girdle beetle (% Infestation)	Defoliators (Larvae/mrl)	Girdle Beetle (% Infestation)	Semiloopers		Stem fly (% Stem tunneling)	Girdle beetle (% Plant Infestation)
							Larvae/ mrl+	Defoliation (%)		
1.	EC 251682	9.61 (3.18)LR	36.09 (36.92) LR	4.55 (12.31)MR	1.17 (1.29)*- MR	15.00 (22.76) -MR	1.33	14.5 LS	12.50	5.00
2.	EC 251827	12.28 (3.57) LR	64.49 (53.42) LR	-	1.00 (1.22) - R	13.34 (21.27) - R	2.66	25.5 MS	15.20	0.00
3.	EC 251865	7.00 (2.74) LR	68.33 (55.75) LR	4.35 (12.04) MR	1.50 (1.41) - MR	15.00 (22.76) -MR	4.33	8.50 LS	0.00	0.00
4.	EC 251861	-	36.68 (37.27) LR	-	2.00 (1.58) - LR	21.67 (27.72) - LR	2.33	16.0 LS	16.66	4.00
5.	EC 251541	4.00 (2.12) MR	51.92 (46.10) LR	12.18 (20.42) LR	2.50 (1.73) - LR	23.34 (28.83) - LR	1.66	-	0.00	0.00
6.	EC 251876	4.50 (2.24) MR	34.98 (36.26) S	-	1.50 (1.41) - MR	20.00 (26.57) -MR	333	25.5 MS	13.33	0.00
7.	EC 274755	4.00 (2.12) MR	40.53 (39.54) LR	2.78 (9.60) MR	2.33 (1.68) - LR	25.00 (29.99) - LR	2 33	26.5 MS	0.00	0.00
8.	EC 280129	-	47.19 (43.39) S	25.00 (30.00) LR	2.67 (1.78) - S	21.67 (27.72) - LR	1.33	24.5 MS	12.50	5.00
9.	EC 280148	-	46.66 (43.08) S	-	0	0	No germination			
10.	EC 280149	19.44 (4.47)HS	50.12 (45.07) LR	-	1.84 (1.53) - LR	26.67 (30.91) - LR	2.00	14.0 LS	22.10	4.00
11.	EC 281462	4.00 (2.12) MR	31.23 (33.98) S	23.81 (29.21) LR	2.00 (1.58) - LR	23.33 (28.88) - LR	No germination			
12.	EC 287466	1.50 (1.41) MR	45.15 (42.22) HS	19.84 (26.45) LR	1.17 (1.29) - MR	23.34 (28.83) - LR	3.33	23.5 LS	18.33	5.00

13.	EC 287469	-	28.31 (32.15) HS	-	1.84 (1.53) - LR	26.67 (31.09) -LR	2.00	25.5 MS	30.33	10.66
14.	EC 289099	6.50 (2.65) LR	26.97 (31.29) LR	15.63 (23.28) LR	1.50 (1.41) - MR	18.34 (25.33) -MR	4.00	15.0 LS	8.33	0.00
15.	EC 291401	4.00 (2.12) MR	46.87 (43.20) LR	14.71 (22.55) LR	1.00 (1.22) - R	15.00 (22.76) -MR	3.00	13.0 LS	0.00	5.00
16.	EC 308312	-	28.92 (32.53) LR	-	2.50 (1.73) - LR	26.67 (30.91) -LR	NO germination			
17.	EC 309512	2.00 (1.58) MR	44.46 (41.82) LR	5.56 (13.63) MR	2.17 (1.63) - LR	23.33 (28.88) -LR	3.00	15.5 LS	0.00	4.00
18.	EC 309537	-	37.91 (38.00) LR	-	2.50 (1.73) - LR	23.34 (28.83) -LR	2.33	10.5 LS	0.00	0.00
19.	EC 309538	-	58.80 (50.07) LR	-	0	0	4.33	10.0 LS	14.28	0.00
20.	EC 313915	-	37.12 (37.54) S	5.88 (14.03) MR	1.50 (1.41) - MR	20.00 (26.49) -MR	3.33	11.5 LS	16.66	0.00
21.	EC 313976	1.00 (1.22) MR	37.24 (37.61) S	-	1.84 (1.53) - LR	23.33 (28.88) -LR	2.00	16.0 LS	20.00	12.5
22.	EC 771199	-	49.78 (44.87) LR	-	2.00 (1.58) - LR	25.00 (29.99) -LR	NO germination			
23.	EC 325098	2.50 (1.73) MR	66.12 (54.40) LR	8.34 (16.78) MR	2.34 (1.68) - LR	26.67 (31.05) -LR	1.33	13.0 LS	13.33	5.00
24.	EC 325103	4.00 (2.12) MR	62.66 (52.33) S	15.71 (23.35) LR	1.67 (1.47) - MR	21.67 (27.72) -LR	4.66	25.6 MS	10.00	10.4
25.	EC 333875	-	53.67 (47.10) S	-	2.34 (1.68) - LR	25.00 (29.99) -LR	3.66	17.0 LS	18.46	6.25
26.	EC 333879	-	44.03 (41.57) LR	-	2.17 (1.63) - LR	21.67 (27.72) -LR	NO germination			
27.	EC 333880	-	43.64 (41.35) LR	-	0	0	4.00	27.5MS	10.00	6.66
28.	EC 333876	-	44.00 (41.55) LR	-	2.34 (1.68) - LR	23.33 (28.88) -LR	2.00	13.0 LS	21.66	6.00

29.	EC 333892	4.00 (2.12) MR	64.08 (53.18) LR		1.84 (1.53) - LR	20.00 (26.57) -MR	2.66	26.5MS	0.00	5.50
30.	EC 333929	7.50 (2.83) LR	30.55 (33.55) LR	12.41 (20.63) LR	1.67 (1.47) - MR	18.34 (25.33) -MR	3.00	16.0 LS	15.23	3.00
31.	EC 340506 B	8.50 (3.00) LR	37.44 (37.72) LR	-	1.84 (1.53) - LR	21.67 (27.72) - LR	1.33	15.0 LS	16.66	5.00
32.	EC 343312	-	-	-	2.17 (1.63) - LR	25.00 (29.99) - LR	3.00	19.5 LS	0.00	0.00
33.	EC 350664	5.50 (2.45) MR	51.10 (45.63) HS	-	1.50 (1.41) - MR	21.84 (27.84) - LR	2.33	16.5 LS	15.15	14.25
34.	EC 357998	9.00 (3.08) LR	40.07 (39.27) LR	24.05 (29.37) LR	1.67 (1.47) - MR	23.33 (28.88) - LR	4.33	18.6 LS	22.2	20.00
35.	EC 383165	-	48.92 (44.38) LR	20.00 (26.57) LR	0.84 (1.15) - HR	11.67 (19.92) - HR	3.33	13.0 LS	0.00	0.00
36.	EC 389149	9.00 (3.08) LR	38.30 (38.23) HS	9.22 (17.67) MR	1.00 (1.22) - R	13.33 (21.41) - R	4.00	27.0 MS	25.71	10.00
37.	EC 389148	9.00 (3.08) LR	53.41 (46.95) S	5.00 (12.92) MR	0	0	3.66	26.0MS	17.14	5.00
38.	EC 389153	5.00 (2.35) MR	53.18 (46.82) LR	15.44 (23.14) LR	2.67 (1.78) - S	21.67 (27.72) - LR	1.66	11.5 LS	20.00	15.00
39.	EC 389154	11.00 (3.39) LR	56.62 (48.80) LR	14.55 (22.42) LR	0	0	0.99	11.5 LS	7.15	0.00
40.	EC 389160	-	-	-	2.34 (1.68) - LR	23.33 (28.88) - LR	1.66	16.0 LS	15.38	20.00
41.	EC 389170	7.50 (2.83) LR	54.37 (47.50) S	1.57 (7.19) MR	2.67 (1.78) - S	25.00 (29.99) - LR	0.66	0.00	13.33	5.00
42.	EC 389170	6.50 (2.65) LR	57.20 (49.14) S	3.57 (10.89) MR	2.00 (1.58) - LR	18.34 (25.33) -MR	Seed was not received			
43.	EC 389174	6.00 (2.55) LR	31.84 (34.35) LR	23.11 (28.73) LR	1.00(1.22) - R	15.00 (22.76) -MR	2.66	26.5 MS	16.66	12.50
44.	EC 389179 B	6.50 (2.65) LR	37.13 (37.54) LR	1.14 (6.12) MR	0	0	1.33	15..5 LS	15.08	5.00

45.	EC 390981 A	7.00 (2.74) LR	42.37 (40.61) S		0	0	2.66	17.50 LS	12.50	15.75
46.	EC 393228	-	32.70 (34.88) LR	-	2.17 (1.63) - LR	21.67 (27.72) - LR	3.33	26.0 MS	0.00	15.00
47.	EC 396059	-	51.76 (46.01) S	30.56 (33.56) LR	2.50 (1.73) - LR	25.00 (29.99) - LR	3.33	18.6 LS	15.38	0.00
48.	EC 457216	-	50.31 (45.17) S	16.67 (24.09) LR	2.17 (1.63) - LR	18.34 (25.33) -MR	1.33	12.5 LS	11.00	5.00
49.	EC 457366	3.00 (1.87)MR	44.31 (41.73) S	25.00 (30.00) LR	1.00 (1.22) - R	13.33 (21.41) - R	3.33	16.5 LS	0.00	7.15
50.	EC 458350	6.00 (2.55) LR	60.41 (51.01) LR	16.67 (24.09) LR	1.00 (1.22) - R	13.34 (21.27) - R	4.00	22.5 MS	0.00	5.00
CD at 5%		(1.29)	(8.81)	(15.81)	0.08	1.64				
CD at 1%		(1.74)	(11.75)	(21.35)	0.32	6.25				
SEm±		(0.63)	(4.38)	(7.71)	0.24	4.68				

Table 3.17: ENT. 5c. Evaluation of germplasm lines at hot spots for resistance against major insect-pests (Imphal).

Code No.	Entries	No. of BHC larvae/mrl	No. of other defoliating larvae*/mrl (*tobacco caterpillar, leaf roller etc.)	Percent defoliation at peak incidence/plant	No. of aphids/plant	Yield per line (kg)
1	EC 251682	25.60	2.20	27.50 MS	19.00	0.34
2	EC 251827	2.40	2.80	19.23 LS	22.00	0.38
3	EC 251865	4.80	1.80	19.57 LS	22.67	0.35
4	EC 251861	24.00	2.60	26.36 MS	15.33	0.33
5	EC 251841	12.00	2.20	18.33 LS	6.67	0.45
6	EC 251876	9.20	2.80	16.00 LS	13.00	0.43
7	EC 274755	11.20	1.80	21.11 LS	20.00	0.32
8	EC 280129	7.20	1.20	12.22 LS	19.33	0.42
9		Did not germinate				
10	EC 280149	9.20	2.40	20.00 LS	35.33	0.33
11	EC 281462	11.20	1.80	21.67 LS	8.00	0.45
12	EC 287466	25.20	2.40	27.93 MS	2.33	0.27
13	EC 287469	7.60	2.80	21.67 LS	18.00	0.25
14	EC 289099	9.20	1.40	18.57 LS	5.00	0.43
15	EC 291401	5.60	3.00	19.60 LS	4.00	0.41

16	EC 308312	2.40	1.00	21.43 LS	27.00	0.50
17	EC 309512	2.80	3.00	18.00 LS	39.67	0.47
18		Did not germinate				
19		Did not germinate				
20	EC 313915	0.00	1.00	15.00 LS	5.33	0.53
21		Did not germinate				
22		Did not germinate				
23	EC 325098	2.40	1.00	14.44 LS	2.00	0.43
24	EC 325103	5.20	1.60	18.00 LS	16.00	0.41
25	EC 333875	10.80	4.00	20.00 LS	17.33	0.23
26	EC 333879	9.20	3.40	13.64 LS	13.33	0.38
27	EC 333880	0.00	1.40	10.00 LS	13.00	0.55
28		Did not germinate				
29	EC 333892	0.00	2.60	15.45 LS	15.33	0.30
30	EC 333929	0.00	3.00	14.00 LS	5.33	0.41
31	EC 340506B	0.00	1.60	12.86 LS	2.33	0.63
32		Did not germinate				
33	EC 350664	1.40	1.80	16.96 LS	7.00	0.45
34	EC 357998	0.00	1.40	13.33 LS	15.00	0.56

35		Did not germinate				
36	EC 389149	0.00	1.00	12.86 LS	8.33	0.57
37	EC 389148	3.40	2.60	21.20 LS	14.33	0.26
38	EC 389153	0.00	1.20	12.86 LS	4.00	0.49
39	EC 389154	1.20	1.40	21.76 LS	8.00	0.35
40		Did not germinate				
41	EC 389170	9.20	2.00	19.52 LS	28.67	0.29
42	EC 389170	13.00	3.40	16.67 LS	11.67	0.23
43	EC 389174	22.40	1.80	28.18 MS	17.33	0.32
44	EC 389179B	15.60	2.20	20.91 LS	14.67	0.28
45		Did not germinate				
46		Did not germinate				
47		Did not germinate				
48	EC 457216	32.80	2.20	28.95 MS	16.67	0.24
49	EC 457366	19.20	2.60	20.53 LS	13.33	0.26
50	EC 458350	20.00	3.00	25.24 MS	29.67	0.25
51	JS 335 (Mean of 10 lines)	22.80	2.80	26.67 MS	25.00	0.37

Table 3.18: ENT. 5d. Incidence of whitefly, *Bemisia tabaci* in soybean germplasm lines (PAU, Ludhiana)

S. No.	Entry	Mean Jassid nymphs/ trifoliolate leaf	Mean Jassid Grade	Mean whitefly adults / trifoliolate leaf	Yield (kg/ha)
1	EC 251682	0.66	1.5	2.50	448
2	EC 251827	1.16	2.5	2.99	216
3	EC 251865	0.33	1.0	1.99	370
4	EC 251861	0.83	2.0	3.33	235
5*	EC 251541	-	-	-	-
6*	EC 251876	-	-	-	-
7*	EC 274755	-	-	-	-
8*	EC 280129	-	-	-	-
9*	EC 280148	-	-	-	-
10*	EC 280149	-	-	-	-
11*	EC 281462	-	-	-	-
12*	EC 287466	-	-	-	-
13*	EC 287469	-	-	-	-
14*	EC 289099	-	-	-	-
15*	EC 291401	-	-	-	-
16*	EC 308312	-	-	-	-
17*	EC 309512	-	-	-	-
18*	EC 309537	-	-	-	-
19*	EC 309538	-	-	-	-
20	EC 313915	1.16	2.0	2.83	246
21	EC 313976	0.50	1.5	1.67	448
22	EC 771199	-	-	-	-
23	EC 325098	0.83	2.0	3.16	276
24*	EC 325103	-	-	-	-
25*	EC 333875	-	-	-	-
26*	EC 333879	-	-	-	-
27*	EC 333880	-	-	-	-

28	EC 333876	0.33		1.5	1.84	445
29*	EC 333892	-		-	-	-
30*	EC 333929	-		-	-	-
31	EC 340506 B	0.83		2.0	3.83	448
32*	EC 343312	-		-	-	-
33	EC 350664	0.99		2.0	3.33	370
34	EC 357998	-		-	-	-
35*	EC 383165	-		-	-	-
36*	EC 389149	-		-	-	-
37*	EC 389148	-		-	-	-
38*	EC 389153	-		-	-	-
39*	EC 389154	-		-	-	-
40*	EC 389160	-		-	-	-
41	EC 389170	0.66		1.5	1.49	445
42	EC 389170	0.83		2.0	2.99	235
43*	EC 389174	-		-	-	-
44*	EC 389179 B	-		-	-	-
45*	EC 390981 A	-		-	-	-
46*	EC 393228	-		-	-	-
47*	EC 396059	-		-	-	-
48*	EC 457216	-		-	-	-
49	EC 457366	1.16		2.0	2.33	445
50	EC 488350	0.50		1.5	1.67	614
51	SL 958	0.67		1.5	2.00	1875
CD at 5%		NS		-	NS	NS

* Entries get killed due to spurious/bad FYM and Bud Necrosis Virus disease

Table 3.19: ENT. 6a. Integrated management of root rot complex and stem borers of soybean (Dharwad)

Tr.	Treatment details	Formul a-tions	Dosage (g/ml/ kg seed)	% field stand*	% Root rot incidence*	% Stem tunneling*	% Girdling*	Plant ht (cm)	No. of branches per plant	No. of pods per plant	100 seed wt (g)	Seed yield (kg/ha)
T ₁	Seed treatment (ST) with Carboxin + Thiram	75% WP	3	94.33 (76.28)	7.33 (15.71)	19.23 (26.00)	27.83 (31.83)	46.95	5.55	64.20	13.25	1642.75
T ₂	ST with Trifloxystrobin + Penflufen	240 FS	1	98.33 (82.11)	1.66 (7.34)	16.75 (24.15)	25.38 (30.24)	48.64	5.88	66.90	13.85	1724.46
T ₃	ST with Thiophanate methyl + Pyroclostrobin	500 FS	2	95.66 (78.04)	2.66 (9.36)	16.32 (23.82)	24.52 (29.67)	48.20	5.95	66.50	13.72	1710.25
T ₄	ST with <i>Trichoderma harzianum</i>	-	10	88.33 (70.11)	10.66 (19.06)	22.37 (28.22)	31.78 (34.30)	46.25	5.33	62.40	13.10	1610.22
T ₅	ST with Thiamethoxam	600 FS	2	86.66 (68.64)	12.33 (20.57)	7.15 (15.50)	10.37 (18.78)	44.35	5.10	64.10	13.15	1630.25
T ₆	T1 + T5	-	3+2	95.66 (78.04)	6.33 (14.57)	10.13 (18.55)	12.78 (20.94)	47.24	5.95	64.80	14.20	1690.26
T ₇	T2 + T5	-	1+2	97.66 (81.30)	2.66 (9.36)	5.73 (13.84)	8.02 (16.44)	48.25	5.98	67.25	14.55	1745.35
T ₈	T3 + T5	-	2+2	98.66 (83.51)	1.33 (6.54)	4.87 (12.74)	7.15 (15.50)	48.58	6.01	66.85	14.62	1765.35
T ₉	T4 + T5	-	10+2	93.33 (75.08)	7.66 (16.08)	12.41 (20.62)	17.31 (24.58)	46.25	5.85	58.45	13.64	1640.22
T ₁₀	ST with biopolymer chitosan based <i>Trichoderma</i> formulation (IIOR)	SC	4	92.66 (74.33)	8.66 (17.12)	13.62 (21.65)	21.54 (27.64)	46.60	5.60	62.55	13.20	1641.25
T ₁₁	ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOR)	SC	10	93.50 (75.45)	7.33 (15.71)	11.46 (19.78)	20.25 (26.73)	46.80	5.62	62.75	13.28	1642.11
T ₁₂	ST with biopolymer chitosan based <i>Trichoderma</i> formulation (IIOR) + Thiamethoxam		2+10	94.00 (76.10)	6.33 (14.57)	8.84 (17.29)	15.11 (22.87)	46.25	5.60	64.55	13.28	1640.32
T ₁₃	Untreated control	-	-	78.66 (62.56)	23.33 (28.89)	30.38 (30.43)	42.74 (40.84)	43.35	5.25	53.70	12.60	890.25
	S.Em±	-	-	0.71	0.54	0.78	0.88	0.46	0.31	0.65	0.17	46.11
	CD @ 5%	-	-	2.82	1.57	2.37	2.65	1.52	1.09	1.85	0.55	189.02

Table 3.20: ENT 7a: Effect of microbial consortia on population of tobacco leaf eating caterpillar/mrl in soybean

			Imphal										Amravati							
	Treatments		1 st spray			2 nd spray			PT	3 rd spray			Yield (Kg/ha)	Treatments	1 st spray			2 nd spray		
			PT	3DAT	7DAT	PT	3DAT	7DAT		3DAT	7DAT	PT			3DAT	7DAT	PT	3DAT	7DAT	
T1	<i>Beauveriabassiana</i> (2 kg/ha) + <i>Metarhiziumanisopliae</i> (2 kg/ha)	0.00	0.11 (0.78)	1.22 (1.30)	0.78 (1.13)	1.00 (1.22)	0.56 (1.02)	0.67 (1.08)	0.33 (0.90)	3136	<i>Beauveria bassiana</i> @ 4g/l	2.50 (1.58)	2.17 (1.47)	1.83 (1.35)	2.67 (1.63)	2.58 (1.59)	2.25 (1.48)			
T2	<i>Nomuraearileyi</i> (2 kg/ha) + Bt(1 kg/ha)	0.00	0.00 (0.71)	0.89 (1.18)	0.56 (1.02)	0.78 (1.13)	0.56 (1.02)	0.56 (1.02)	0.11 (0.78)	3358	<i>Metarhizium anisopliae</i> @ 4g/l	2.17 (1.47)	2.34 (1.52)	2.42 (1.55)	3.25 (1.80)	2.92 (1.71)	2.50 (1.58)			
T3	<i>Nomuraearileyi</i> (2 kg/ha) + <i>Metarhiziumanisopliae</i> (2 kg/ha)	0.00	0.22 (0.83)	0.89 (1.18)	0.67 (1.07)	1.08 (1.08)	0.56 (1.02)	0.56 (1.02)	0.22 (0.84)	3144	<i>Nomuraea rileyi</i> @ 4g/l	2.59 (1.59)	1.50 (1.21)	1.17 (1.06)	2.92 (1.70)	2.08 (1.43)	1.75 (1.31)			
T4	<i>Beauveriabassiana</i> (2 kg/ha) + <i>Nomuraearileyi</i> (2 kg/ha)	0.00	0.11 (0.78)	1.22 (1.31)	0.89 (1.17)	1.00 (1.22)	0.56 (1.02)	0.67 (1.08)	0.33 (0.91)	3160	Bt Commercial @ 1g/l	2.67 (1.63)	1.75 (1.32)	1.42 (1.18)	2.42 (1.55)	2.17 (1.47)	1.83 (1.35)			
T5	<i>Beauveriabassiana</i> (2 kg/ha) + Bt(1 kg/ha)	0.00	0.11 (0.78)	0.70 (1.27)	0.44 (0.97)	0.78 (1.13)	0.33 (0.91)	0.33 (0.91)	0.00 (0.71)	3383	Untreated check	1.83 (1.35)	2.42 (1.55)	3.00 (1.73)	3.0 (1.73)	3.50 (1.86)	3.33 (1.81)			
T6	<i>Metarhiziumanisopliae</i> (2 kg/ha) + Bt(1 kg/ha)	0.00	0.48 (0.71)	1.00 (1.22)	0.67 (1.07)	0.89 (1.18)	0.56 (1.02)	0.56 (1.02)	0.11 (0.78)	3128	-									
T7	Untreated control	0.00	0.33 (0.90)	2.33 (1.68)	1.44 (1.39)	2.22 (1.65)	1.56 (1.43)	1.56 (1.43)	0.56 (1.02)	2008	-	-	-	-	-					
	CD at 5%	-	NS	0.20	0.17	0.22	0.23	0.11	0.18	NS	199.42	CD at 5%-	-	0.19	0.25	-	0.28	0.32		

Table 3.21: ENT 7b: Effect of microbial consortia on population of defoliators in soybean at Imphal.

Treatments		Bihar hairy caterpillar/m										Bean leaf webber/m								
		1 st spray			2 nd spray			3 rd spray				1 st spray			2 nd spray			3 rd spray		
		PT	3DAT	7DAT	PT	3DAT	7DAT	PT	3DA T	7DA T	PT	3DA T	7DAT	PT	3DAT	7DAT	PT	3DA T	7DAT	
T1	Beauveribassiana (2 kg/ha) + Metarhiziumanisopliae(2 kg/ha)		36.67 (6.08)	26.44 (5.13)	16.44 (3.59)	18.11 (4.31)	12.89 (3.65)	6.67 (2.66)	0.22 (0.83)	0.00	0.00	2.89 (1.83)	2.89 (1.84)	1.44 (1.39)	1.78 (1.51)	1.56 (1.43)	1.33 (1.35)	1.44 (1.38)	1.22 (1.30)	1.11 (1.26)
T2	Nomuraearleyei (2 kg/ha) + Bt(1 kg/ha)		22.67 (4.72)	20.44 (4.50)	8.00 (1.36)	11.11 (3.37)	6.89 (2.69)	3.33 (1.79)	0.00 (0.71)	0.00	0.00	2.78 (1.81)	2.44 (1.70)	1.67 (1.46)	2.00 (1.57)	1.44 (1.39)	1.44 (1.39)	1.33 (1.35)	1.11 (1.26)	0.78 (1.13)
T3	Nomuraearleyei (2 kg/ha) + Metarhiziumanisopliae(2 kg/ha)		19.33 (4.29)	16.89 (4.15)	13.11 (3.44)	12.44 (3.55)	9.78 (3.17)	3.33 (1.94)	0.33 (0.90)	0.00	0.00	3.00 (1.87)	2.67 (1.77)	2.11 (1.61)	2.44 (1.71)	1.89 (1.54)	1.78 (1.51)	1.67 (1.47)	1.33 (1.34)	1.22 (1.31)
T4	Beauveribassiana (2 kg/ha) + Nomuraearleyei (2 kg/ha)		14.00 (3.74)	13.56 (3.74)	11.56 (3.81)	14.44 (3.85)	11.78 (3.49)	6.67 (2.66)	1.00 (1.21)	0.00	0.00	3.11 (1.90)	2.56 (1.72)	1.89 (1.54)	2.44 (1.72)	1.78 (1.50)	1.67 (1.46)	1.56 (1.40)	1.22 (1.30)	0.89 (1.16)
T5	Beauveribassiana (2 kg/ha) + Bt(1 kg/ha)		14.78 (3.82)	12.89 (3.57)	5.22 (1.84)	11.00 (3.36)	7.44 (2.75)	2.89 (1.81)	0.22 (0.83)	0.00	0.00	3.33 (1.94)	2.67 (1.75)	1.33 (1.34)	1.78 (1.50)	1.33 (1.34)	1.11 (1.26)	0.78 (1.12)	0.67 (1.07)	0.56 (1.02)
T6	Metarhiziumanisopliae(2 kg/ha) + Bt(1 kg/ha)		23.56 (4.84)	15.33 (3.89)	14.22 (2.74)	12.67 (3.53)	10.00 (3.15)	4.89 (2.29)	0.44 (0.92)	0.00	0.00	3.67 (2.04)	2.78 (1.81)	2.44 (1.71)	3.00 (1.87)	2.00 (1.57)	1.78 (1.51)	1.44 (1.39)	0.89 (1.18)	0.78 (1.13)
T7	Untreated control		24.22 (4.91)	22.44 (4.74)	24.67 (6.65)	21.89 (4.72)	22.89 (4.83)	13.89 (3.79)	0.89 (1.06)	0.00	0.00	3.22 (1.92)	3.89 (2.07)	4.33 (2.20)	4.33 (2.18)	4.56 (2.24)	3.78 (2.06)	3.00 (1.86)	2.44 (1.71)	1.11 (1.27)
CD @ 5%		NS	NS	2.02	0.73	0.60	0.74	NS	-	-	NS	NS	0.37	0.36	0.31	0.30	NS	0.34	NS	

Figures in parentheses are square root (x + 0.5) values

Table 3.22: ENT 7c: Effect of microbial consortia on defoliators population on soybean at Prabhani.

T.N.	Treatment details	Semiloopers						Tobacco caterpillar						Yield kg/ha
		1 st Spray			2 nd Spray			1 st Spray			2 nd Spray			
		DBT	3 DAT	7 DAT	DBT	3 DAT	7 DAT	DBT	3 DAT	7 DAT	DBT	3 DAT	7 DAT	
1	<i>B.bassiana</i> + <i>M.anisoplia</i> _e	8.11 (2.93)	7.00 (2.73)	4.11 (2.14)	3.11 (1.89)	1.89 (1.53)	1.00 (1.21)	1.00 (1.21)	0.56 (1.00)	0.33 (0.91)	0.22 (0.84)	0.11 (0.77)	0.00 (0.70)	1177.24
2	<i>N.rileyi</i> + Bt.	7.89 (2.89)	7.56 (2.83)	4.44 (2.22)	3.33 (1.95)	2.11 (1.61)	1.33 (1.35)	0.89 (1.17)	0.78 (1.12)	0.44 (0.96)	0.33 (0.89)	0.11 (0.77)	0.00 (0.70)	1071.93
3	<i>N.rileyi</i> + <i>M.anisoplia</i> _e	8.22 (2.95)	7.33 (2.79)	4.33 (2.19)	3.22 (1.92)	2.00 (1.57)	1.22 (1.30)	0.78 (1.12)	0.67 (1.07)	0.22 (0.84)	0.11 (0.77)	0.00 (0.70)	0.00 (0.70)	1163.25
4	<i>B.bassiana</i> + <i>N.rileyi</i>	8.33 (2.97)	6.11 (2.57)	3.11 (1.86)	1.89 (1.53)	0.89 (1.17)	0.33 (0.89)	1.00 (1.22)	0.44 (0.96)	0.11 (0.77)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1240.58
5	<i>B.bassiana</i> + Bt.	8.56 (3.00)	7.67 (2.85)	4.67 (2.27)	3.56 (2.01)	2.33 (1.68)	1.56 (1.42)	1.00 (1.22)	0.89 (1.17)	0.56 (1.02)	0.44 (0.96)	0.22 (0.84)	0.11 (0.77)	1002.01
6	<i>M.anisoplia</i> _e + Bt.	9.00 (3.08)	7.67 (2.85)	4.89 (2.31)	3.67 (2.04)	2.89 (1.83)	1.89 (1.53)	1.11 (1.26)	1.00 (1.21)	0.67 (1.08)	0.56 (1.02)	0.33 (0.91)	0.22 (0.84)	988.02
7	Control	8.22 (2.95)	9.22 (3.11)	11.56 (3.47)	7.89 (2.89)	5.33 (2.41)	2.67 (1.77)	0.89 (1.17)	1.00 (1.21)	1.22 (1.30)	0.89 (1.17)	0.78 (1.12)	0.56 (1.02)	742.87
	S.E. ±	0.07	0.05	0.05	0.07	0.07	0.09	0.04	0.08	0.06	0.07	0.05	0.04	75.46
	C.D. at 5%	NS	0.15	0.16	0.21	0.23	0.29	NS	NS	0.18	0.21	0.15	0.13	232.18

Table 3.23: ENT 7d: Effect of microbial consortia on defoliators population on soybean at Dharwad

Tr.	Treatment details	Tobacco caterpillar - <i>Spodoptera litura</i> (No. of larvae/m ²)								
		1 st spray			2 nd spray			3 rd spray		
		1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT
T ₁	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	4.85 (2.31)	4.07 (2.14)	3.02 (1.88)	3.07 (1.89)	2.47 (1.72)	1.87 (1.54)	1.80 (1.52)	0.89 (1.18)	0.42 (0.96)
T ₂	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.79 (2.30)	3.95 (2.11)	2.77 (1.81)	2.81 (1.82)	2.25 (1.66)	1.62 (1.46)	1.59 (1.45)	0.73 (1.11)	0.29 (0.89)
T ₃	<i>Nomuraea rileyi</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	4.91 (2.33)	3.88 (2.09)	2.57 (1.75)	2.62 (1.77)	2.03 (1.59)	1.47 (1.40)	1.44 (1.39)	0.65 (1.07)	0.21 (0.84)
T ₄	<i>Beauveria bassiana</i> (2kg/ha) + <i>Nomuraea rileyi</i> (2kg/ha)	5.01 (2.35)	4.59 (2.26)	3.54 (2.01)	3.57 (2.02)	2.78 (1.81)	2.13 (1.62)	2.10 (1.61)	1.34 (1.36)	0.95 (1.20)
T ₅	<i>Beauveria bassiana</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.83 (2.31)	4.23 (2.17)	3.23 (1.93)	3.25 (1.94)	2.65 (1.77)	1.96 (1.57)	1.93 (1.56)	1.02 (1.23)	0.71 (1.10)
T ₆	<i>Metarhizium anisopliae</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.94 (2.33)	4.62 (2.26)	3.73 (2.06)	3.77 (2.07)	3.03 (1.88)	2.39 (1.70)	2.38 (1.70)	1.62 (1.46)	1.14 (1.28)
T ₇	Untreated control	4.86 (2.32)	6.13 (2.57)	8.39 (2.98)	7.15 (2.77)	8.07 (2.93)	9.34 (3.14)	6.54 (2.65)	6.15 (2.58)	5.92 (2.53)
	S.E_{mt}	0.39	0.31	0.27	0.28	0.20	0.16	0.15	0.12	0.10
	CD @ 5%	NS	0.93	0.82	NS	0.60	0.49	NS	0.36	0.31

* Figures in the parenthesis are transformed $\sqrt{x+0.5}$ values

DBT: Days before treatment; DAT: Days after treatment

Table 3.24: ENT 7e: Effect of microbial consortia on defoliators population on soybean at Dharwad

Tr.	Treatment details	Semilooper - <i>Thysanopplusia orichalcea</i> (No. of larvae/mrl)								
		1 st spray			2 nd spray			3 rd spray		
		1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT
T ₁	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	3.08 (1.89)	2.78 (1.81)	1.93 (1.56)	1.95 (1.57)	1.45 (1.40)	1.12 (1.27)	1.20 (1.30)	0.78 (1.13)	0.31 (0.90)
T ₂	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	3.12 (1.90)	2.68 (1.78)	1.78 (1.51)	1.80 (1.52)	1.29 (1.34)	0.96 (1.21)	1.02 (1.23)	0.63 (1.06)	0.24 (0.86)
T ₃	<i>Nomuraea rileyi</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	2.96 (1.86)	2.39 (1.70)	1.56 (1.44)	1.57 (1.44)	1.07 (1.25)	0.75 (1.12)	0.89 (1.18)	0.39 (0.94)	0.00 (0.71)
T ₄	<i>Beauveria bassiana</i> (2kg/ha) + <i>Nomuraea rileyi</i> (2kg/ha)	3.19 (1.92)	2.95 (1.86)	2.21 (1.65)	2.21 (1.65)	1.85 (1.53)	1.49 (1.41)	1.50 (1.41)	1.02 (1.23)	0.41 (0.95)
T ₅	<i>Beauveria bassiana</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	2.98 (1.87)	2.83 (1.82)	2.08 (1.61)	2.10 (1.61)	1.73 (1.49)	1.37 (1.37)	1.48 (1.41)	0.89 (1.18)	0.38 (0.94)
T ₆	<i>Metarhizium anisopliae</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	3.05 (1.88)	3.01 (1.87)	2.38 (1.70)	2.39 (1.70)	2.01 (1.58)	1.66 (1.47)	1.65 (1.47)	1.13 (1.28)	0.53 (1.01)
T ₇	Untreated control	3.02 (1.88)	3.78 (2.07)	5.03 (2.35)	5.05 (2.36)	5.78 (2.51)	6.15 (2.58)	5.39 (2.43)	4.86 (2.32)	3.65 (2.04)
	S.Em±	0.32	0.29	0.24	0.24	0.22	0.17	0.17	0.14	0.09
	CD @ 5%	NS	0.87	0.72	NS	0.66	0.52	NS	0.43	0.27

* Figures in the parenthesis are transformed $\sqrt{x+0.5}$ values

DBT: Days before treatment; DAT: Days after treatment

Table 3.25: ENT 7f: Effect of microbial consortia on defoliators population on soybean at Dharwad

Tr.	Treatment details	Bihar hairy caterpillar- <i>Spilosoma obliqua</i> (No. of larvae/ml)										Leaf damage (%) defoliation*	Seed Yield (kg/ha)
		1 st spray			2 nd spray			3 rd spray					
		1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT	1 DBT	3 DAT	7 DAT			
T ₁	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	12.53 (3.61)	10.23 (3.28)	8.56 (3.01)	8.61 (3.02)	5.94 (2.54)	4.22 (2.17)	4.30 (2.19)	2.79 (1.81)	0.54 (1.02)	21.31 (27.48)	1689	
T ₂	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	12.97 (3.67)	9.58 (3.17)	7.39 (2.81)	7.50 (2.83)	5.13 (2.37)	3.39 (1.97)	3.40 (1.97)	2.04 (1.59)	0.31 (0.90)	20.28 (26.75)	1741	
T ₃	<i>Nomuraea rileyi</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	12.19 (3.56)	8.13 (2.94)	6.24 (2.60)	6.35 (2.62)	4.29 (2.19)	2.16 (1.63)	2.18 (1.64)	1.13 (1.28)	0.19 (0.83)	17.14 (24.45)	1838	
T ₄	<i>Beauveria bassiana</i> (2kg/ha) + <i>Nomuraea rileyi</i> (2kg/ha)	12.84 (3.65)	12.02 (3.54)	10.14 (3.26)	10.23 (3.28)	7.17 (2.77)	5.46 (2.44)	5.50 (2.45)	4.05 (2.13)	1.23 (1.32)	27.26 (31.46)	1584	
T ₅	<i>Beauveria bassiana</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	13.01 (3.68)	11.43 (3.45)	9.35 (3.14)	9.51 (3.16)	6.57 (2.66)	5.05 (2.36)	5.10 (2.37)	3.37 (1.97)	1.12 (1.27)	24.17 (29.44)	1616	
T ₆	<i>Metarhizium anisopliae</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	12.46 (3.60)	12.23 (3.57)	10.67 (3.34)	10.70 (3.35)	7.56 (2.84)	6.02 (2.55)	6.08 (2.57)	4.66 (2.27)	1.47 (1.40)	29.33 (32.78)	1502	
T ₇	Untreated control	12.39 (3.59)	13.45 (3.73)	16.89 (4.17)	15.90 (4.05)	16.50 (4.12)	18.37 (4.34)	15.03 (3.94)	11.17 (3.42)	9.43 (3.15)	60.15 (50.84)	903	
	S.Em±	0.45	0.36	0.29	0.28	0.23	0.18	0.18	0.15	0.12	0.83	29.3	
	CD @ 5%	NS	1.08	0.87	NS	0.69	0.54	NS	0.45	0.36	2.50	87.9	

* Figures in the parenthesis are transformed $\sqrt{x+0.5}$ values

DBT: Days before treatment; DAT: Days after treatment

Table 3.26: ENT 7g: Effect of microbial consortia on defoliators population on soybean at Kota

S.No.	Treatments	Infestation of defoliators/m row length				Seed yield (kg/ha)
		1 st spray (40 DAG)		2 nd spray (55 DAG)		
		3 DAT	7 DAT	3 DAT	7 DAT	
1	<i>Beauveria bassiana</i> (2 kg/ha) + <i>Metarhizium anisopliae</i> (2 kg/ha)	1.89 (1.54)*	1.55 (1.43)	1.67 (1.46)	1.33 (1.35)	1654
2	<i>Nomuraea rileyi</i> (2 kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	1.67 (1.47)	1.33 (1.35)	1.33 (1.35)	1.11 (1.27)	1698
3	<i>Nomuraea rileyi</i> (2 kg/ha) + <i>Metarhizium anisopliae</i> (2 kg/ha)	2.33 (1.68)	1.89 (1.55)	2.00 (1.58)	1.89 (1.55)	1574
4	<i>Beauveria bassiana</i> (2 kg/ha) + <i>Nomuraea rileyi</i> (2 kg/ha)	2.11 (1.61)	1.56 (1.43)	1.89 (1.55)	1.67 (1.47)	1602
5	<i>Beauveria bassiana</i> (2 kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	1.56 (1.43)	1.22 (1.31)	1.11 (1.27)	0.89 (1.17)	1735
6	<i>Metarhizium anisopliae</i> (2 kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	1.11 (1.27)	0.89 (1.18)	1.00 (1.22)	0.67 (1.07)	1799
7	Untreated control	2.33 (1.68)	2.45 (1.71)	2.56 (1.75)	2.44 (1.71)	1432
	SEm±	0.05	0.05	0.06	0.07	27.98
	CD (P=0.05)	0.14	0.16	0.19	0.23	86.20

Table 3.27: ENT 7 h : Effect of microbial consortia on defoliators population on soybean at Sehore

S. N o.	Treatment	Population of grey semilooper , <i>Gesonia gemma</i> / mrl (I st Spray)				Population of grey semiloopers / mrl (II nd Spray)				Yield (Kg/ha)
		Before treatment	3 DAT	7 DAT	Mean	Before treatment	3 DAT	7 DAT	Mean	
1.	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	5.00 (2.34)	2.33 (1.63)	1.33 (1.32)	1.83 (1.47)	4.77 (2.21)	2.99 (1.87)	1.67 (1.46)	2.33 (1.66)	1865.15
2.	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillu thuringiensis</i> (Bt) (1 kg/ha)	4.77 (2.28)	1.00 (1.23)	0.83 (1.11)	0.91 (1.17)	3.88 (2.08)	1.88 (1.55)	0.99 (1.22)	1.43 (1.38)	1912.37
3.	<i>Nomuraea rileyi</i> (2kg/ha)+ <i>Metarhizium anisopliae</i> (2kg/ha)	5.33 (2.40)	1.33 (1.36)	1.08 (1.33)	1.20 (1.34)	4.22 (2.23)	0.66 (1.05)	0.41 (0.93)	0.53 (0.99)	1962.48
4.	<i>Beauveria bassiana</i> (2kg/ha)+ <i>Nomuraea rileyi</i> (2kg/ha.)	5.22 (2.38)	0.92 (1.18)	0.33 (0.91)	0.62 (1.04)	3.00 (1.88)	0.66 (1.05)	0.33 (0.89)	0.50 (0.97)	1981.93
5	<i>Beauveria bassiana</i> (2kg/ha)+ <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.66 (2.29)	0.74 (1.10)	0.33 (0.89)	0.53 (0.99)	4.77 (2.26)	0.55 (0.99)	0.33 (0.89)	0.44 (0.94)	2027.00
6	<i>Metarhizium anisopliae</i> (2kg/ha)+ <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.99 (2.33)	2.33 (1.70)	2.00 (1.58).	2.16 (1.64)	4.33 (2.12)	2.89 (1.83)	2.33 (1.68)	2.61 (1.75)	2020.00
7	Untreated check	5.66 (2.48)	6.33 (3.10)	5.33 (2.41)	5.83 (2.75)	4.99 (2.32)	6.55 (2.65)	7.33 (2.79)	6.94 (2.72)	1281.93
	SEm+	(0.08)	(0.12)	(0.09)		(0.19)	(0.21)	(0.07)		101.38
	CD at 5 %	NS	(0.37)	(0.26)		(NS)	(0.64)	(0.23)		305.55

Figures in parenthesis are V x+0.5 transformed values DAT = Days after Treatment

Table 3.28: ENT 7 i : Effect of microbial consortia on defoliators population on soybean at Sehore

S. No.	Treatment	Population of grey semilooper, <i>Chrysodeixis acuta</i> / mrl (I st Spray) / mrl				Population of grey semiloopers / mrl (II nd Spray)			
		Before treatment	3 DAT	7 DAT	Mean	Before treatment	3 DAT	7 DAT	Mean
1.	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	4.77 (2.26)	2.66 (1.77)	1.67 (1.46)	2.16 (1.61)	5.11 (2.40)	2.55 (1.73)	2.66 (1.78)	2.60 (1.75)
2.	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillus thuringiensis</i> (Bt)(1 kg/ha)	4.33 (2.12)	1.99 (1.57)	1.08 (1.33)	1.53 (1.45)	5.44 (2.43)	3.00 (1.87)	0.66 (1.05)	1.83 (1.46)
3.	<i>Nomuraea rileyi</i> (2kg/ha)+ <i>Metarhizium anisopliae</i> (2kg/ha)	4.55 (2.19)	2.33 (1.69)	1.33 (1.35)	1.83 (1.52)	7.67 (2.85)	3.33 (1.96)	1.99 (1.57)	2.66 (1.76)
4.	<i>Beauveria bassiana</i> (2kg/ha)+ <i>Nomuraea rileyi</i> (2kg/ha.)	4.99 (2.32)	1.89 (1.54)	0.89 (1.15)	1.39 (1.34)	6.56 (2.65)	2.88 (1.83)	0.44 (0.95)	1.66 (1.39)
5	<i>Beauveria bassiana</i> (2kg/ha)+ <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	3.88 (2.08)	1.66 (1.47)	0.66 (1.07)	1.16 (1.27)	6.89 (2.71)	2.33 (1.68)	0.77 (1.13)	1.55 (1.40)
6	<i>Metarhizium anisopliae</i> (2kg/ha)+ <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	4.22 (2.23)	3.33 (1.96)	1.99 (1.57)	2.66 (1.76)	5.78 (2.50)	3.66 (2.68)	2.00 (1.59)	2.83 (2.13)
7.	Untreated check	5.11 (2.40)	6.66 (2.62)	7.33 (2.80)	6.99 (2.71)	5.22 (2.36)	6.00 (2.54)	4.66 (2.24)	5.33 (2.39)
	SEm+	(0.15)	(0.17)	(0.09)		(0.30)	(0.13)	(0.11)	
	CD at 5 %	(NS)	(0.53)	(0.28)		(NS)	(0.41)	(0.34)	

Table 3.29: ENT 7 j : Effect of different treatments on Population of *Spodoptera litura* at Sehore

S. No.	Treatment	Population of <i>Spodoptera</i> / ml (II nd Spray)			
		Before treatment	3 DAT	7DAT	Mean
1.	<i>Beauveria bassiana</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	3.88 (2.08)	1.66 (1.55)	1.00 (1.22)	1.33 (1.38)
2.	<i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillu thuringiensis</i> (Bt)(1 kg/ha)	3.33 (1.95)	2.66 (1.79)	1.66 (1.45)	2.16 (1.62)
3	<i>Nomuraea rileyi</i> (2kg/ha) + <i>Metarhizium anisopliae</i> (2kg/ha)	3.00 (1.87)	1.33 (1.34)	0.74 (1.07)	1.03 (1.20)
4.	<i>Beauveria bassiana</i> (2kg/ha) + <i>Nomuraea rileyi</i> (2kg/ha.)	3.33 (1.95)	2.33 (1.62)	2.00 (1.59)	2.16 (1.60)
5	<i>Beauveria bassiana</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha	3.33 (1.95)	2.66 (1.79)	0.22 (0.82)	1.44 (1.30)
6	<i>Metarhizium anisopliae</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (Bt) (1 kg/ha)	3.00 (1.87)	1.33 (1.34)	0.22 (0.82)	0.77 (1.08)
7.	Untreated check	3.00 (1.87)	4.44 (2.29)	3.66 (3.11)	4.05 (2.70)
	SEm+	(0.25)	(0.14)	(0.18)	
	CD at 5 %	(NS)	(0.42)	(0.55)	

Table 3.30: ENT 7 k : Effect of microbial consortia on defoliators population on soybean at Pantnagar

Incidence of tobacco caterpillar in different treatments

Treatments	Spray I			Spray II			Spray III			% Defoliation	Yield (Kg/ha)
	Population mean/m row			Population mean /m row			Population mean/m row				
	1 DBT	3 DAT	7DAT	1 DBT	3DAT	7DAT	1 DBT	3DBT	7DBT		
T1: Beauveria bassiana (2kg/ha)+ Metarhizium anisopliae (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	2.16 (1.60)	1.75 (1.49)	1.54 (1.39)	1.86 (1.53)	1.66 (1.46)	0.84 (1.15)	14.20	2617
T2: Nomuraea rileyi (2kg/ha) and Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.86 (1.52)	0.92 (1.19)	0.85 (1.15)	1.65 (1.46)	0.83 (1.15)	0.70 (1.09)	14.70	2736
T3: Nomuraea rileyi (2kg/ha)+ Metarhizium anisopliae (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.76 (1.50)	0.54 (1.01)	0.60 (1.03)	1.78 (1.50)	0.85 (1.16)	0.66 (1.07)	12.10	2815
T4: Beauveria bassiana (2kg/ha)+ Nomuraea rileyi (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.90 (1.54)	0.93 (1.18)	0.86 (1.16)	1.70 (1.48)	1.30 (1.34)	1.00 (1.21)	16.15	2674
T5: Beauveria bassiana (2kg/ha)+ Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.37 (1.36)	0.87 (1.16)	0.81 (1.14)	1.76 (1.49)	1.20 (1.29)	1.09 (1.21)	17.80	2604
T6: Metarhizium anisopliae (2kg/ha) + Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.30 (1.34)	0.98 (1.21)	0.93 (1.19)	1.92 (1.55)	1.30 (1.33)	1.08 (1.23)	18.40	2548
T7: Control	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	1.05 (1.24)	1.37 (1.36)	1.43 (1.40)	1.80 (1.51)	1.92 (1.56)	2.10 (1.59)	20.60	2432
SEM±	-	-	-	0.99	0.70	0.95	0.53	0.45	0.12		
CD 5%	-	-	-	0.30	0.21	0.29	0.16	0.13	0.38		

Table 3.31: ENT 7 I : Effect of microbial consortia on defoliators population on soybean at Pantnagar

Incidence of Bihar hairy caterpillar in different treatments

Treatments	Spray I			Spray II			Spray III		
	Population mean/m row			Population mean /m row			Population mean/m row		
	1 DBT	3 DAT	7DAT	1 DBT	3DAT	7DAT	1 DBT	3DBT	7DBT
T1: Beauveria bassiana (2kg/ha) + Metarhizium anisopliae (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.35 (0.91)	0.29 (0.89)	0.18 (0.82)	0.27 (0.88)	0.20 (0.83)	0.00 (0.70)
T2: Nomuraea rileyi (2kg/ha) and Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.24 (0.85)	0.15 (0.80)	0.10 (0.77)	0.29 (0.89)	0.19 (0.83)	0.00 (0.70)
T3: Nomuraea rileyi (2kg/ha) + Metarhizium anisopliae (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.40 (0.94)	0.09 (0.77)	0.00 (0.70)	0.16 (0.81)	0.00 (0.70)	0.00 (0.70)
T4: Beauveria bassiana (2kg/ha) + Nomuraea rileyi (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.50 (0.98)	0.32 (0.90)	0.18 (0.82)	0.28 (0.88)	0.17 (0.82)	0.00 (0.70)
T5: Beauveria bassiana (2kg/ha) + Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.45 (1.02)	0.37 (0.93)	0.25 (0.86)	0.21 (0.84)	0.12 (0.79)	0.20 (0.83)
T6: Metarhizium anisopliae (2kg/ha) + Bacillus thuringiensis (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.51 (0.98)	0.40 (0.95)	0.20 (0.83)	0.20 (0.84)	0.25 (0.86)	0.23 (0.85)
T7: Control	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.63 (1.00)	0.71 (1.09)	0.75 (1.12)	0.35 (0.92)	0.42 (0.95)	0.30 (0.89)
SEM±	-	-	-	0.85	0.39	0.39	0.41	0.43	0.44
CD 5%	-	-	-	0.26	0.12	0.12	0.12	0.13	0.14

Table 3.32: ENT 7 m: Effect of microbial consortia on defoliators population on soybean at Pantnagar

Incidence of Green semilooper in different treatments

Treatments	Spray I			Spray II			Spray III		
	Population mean/m row			Population mean /m row			Population mean/m row		
	1 DBT	3 DAT	7DAT	1 DBT	3DAT	7DAT	1 DBT	3DBT	7DBT
T1: <i>Beauveria bassiana</i> (2kg/ha)+ <i>Metarhizium anisopliae</i> (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.47 (0.98)	0.35 (0.92)	0.17 (0.82)	0.43 (0.96)	0.31 (0.89)	0.28 (0.88)
T2: <i>Nomuraea rileyi</i> (2kg/ha) and <i>Bacillus thuringiensis</i> (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.52 (1.01)	0.12 (0.79)	0.08 (0.76)	0.29 (0.89)	0.20 (0.83)	0.19 (0.83)
T3: <i>Nomuraea rileyi</i> (2kg/ha)+ <i>Metarhizium anisopliae</i> (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.73 (1.11)	0.08 (0.76)	0.06 (0.75)	0.36 (0.93)	0.18 (0.82)	0.15 (0.80)
T4: <i>Beauveria bassiana</i> (2kg/ha)+ <i>Nomuraea rileyi</i> (2kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.39 (0.94)	0.25 (0.86)	0.18 (0.82)	0.29 (0.87)	0.20 (0.84)	0.20 (0.84)
T5: <i>Beauveria bassiana</i> (2kg/ha)+ <i>Bacillus thuringiensis</i> (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.45 (0.97)	0.32 (0.90)	0.20 (0.84)	0.46 (0.98)	0.28 (0.88)	0.23 (0.85)
T6: <i>Metarhizium anisopliae</i> (2kg/ha) + <i>Bacillus thuringiensis</i> (1kg/ha)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.46 (0.98)	0.30 (0.89)	0.12 (0.79)	0.42 (0.96)	0.31 (0.89)	0.36 (0.93)
T7: Control	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.35 (0.92)	0.49 (0.99)	0.75 (1.12)	0.57 (1.03)	0.68 (1.08)	0.84 (1.16)
SEM±	-	-	-	0.33	0.27	0.28	0.38	0.34	0.47
CD 5%	-	-	-	0.10	0.84	0.86	0.12	0.11	0.15

Table 3.33: ENT 8: Management of major defoliators of soybean through intercropping with suva, *Anethum graveolens*

Treatments and Treatment Details	Indore		Dharwad				Prabhani		Pantnagar		Sehore	
	Semi-loopers	Tobacco caterpillar	Semi-loopers	Spodoptera litura	Spilarctia obliqua	Semi-loopers	Spodoptera litura	Semiloopers	Spodoptera litura	Semiloopers	Spodoptera litura	
T1-Sole Soybean (12 rows)	3.92 (2.10)	2.00 (1.58)	3.01 (1.87)	5.01 (2.35)	3.98 (2.12)	10.00 (3.23)*	0.92 (1.18)*	1.30 (1.34)	2.62 (1.76)	7.21	5.71 (2.58)	
T2-Soybean + Suva (3 soybean: 1suva: 3 soybean rows combinations)	4.25 (2.18)	1.08 (1.26)	2.10 (1.61)	3.02 (1.88)	2.86 (1.83)	6.42 (2.62)	0.42 (0.95)	1.15 (1.27)	2.01 (1.57)	3.88	2.98 (1.98)	
T3-Soybean + Suva (6 soybean: 1 suva: 6 soybean rows combinations)	5.17 (2.38)	1.50 (1.41)	2.89 (1.84)	4.36 (2.20)	3.47 (1.99)	7.25 (2.78)	0.58 (1.03)	1.23 (1.27)	2.24 (1.65)	6.34	5.87 (2.61)	
T4-Soybean + Suva (3 soybean: 2 suva: 3 soybean rows combinations)	4.42 (2.22)	1.50 (1.41)	1.76 (1.50)	2.27 (1.66)	2.58 (1.75)	4.67 (2.26)	0.33 (0.90)	1.01 (1.20)	1.85 (1.52)	2.39	2.49 (1.85)	
T5-Soybean + Suva (6 soybean: 2 suva: 6 soybean rows combinations)	3.08 (1.89)	1.25 (1.32)	2.35 (1.69)	3.78 (2.07)	3.04 (1.88)	6.83 (2.70)	0.50 (0.99)	0.94 (1.16)	1.90 (1.55)	5.98	5.89 (2.61)	
CD at 5%	(0.96)	(0.74)	0.91	0.39	0.84	0.19	0.17	0.46	0.94			
SEm±	(0.44)	(0.34)	0.30	1.18	0.27	0.06	0.05	0.15	0.29			
CV	(24.64)	(31.76)	-									

Life to folk Microbiology

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AICRP Soybean Microbiological Trial -2021-22
Tables

MB 1/16: Isolation and functional characterization of selected rhizobia/rhizobacteria for developing inoculants to mitigate abiotic stress in soybean

Indore Centre

Table MB1/16A: PEG tolerant bacterial isolates

S. No.	Strain	Isolates	OD 600 ^{nm} in KB Broth 30% PEG
1	P1 (MB1)	<i>Pseudomonas-putida-biotype A</i>	0.247 c
2	P2 (MB2)	<i>Pseudomonas-mucidolens</i>	0.814 a
3	P3 (MB10)	<i>Pseudomonas-fluorescens-biotype A</i>	0.654 b
4	P4 (MB16)	No- match	0.254 c
LSD (P=0.05)			0.154

*Data are average of 3 replications; LSD, least significance difference at 5% level of significance by Duncans multiple range test of ANOVA

Ludhiana Centre

Table MB1/16B: Potential moisture stress tolerant PGP *Pseudomonads* and rhizobial strains and their evaluation for various abiotic stress tolerant traits (*In vitro*)

Trait	<i>Bradyrhizobium</i> sp.		<i>Pseudomonas</i> <i>fluorescence</i>		<i>Pseudomonas</i> <i>oryzihabitans</i>	
	28°C	45°C	28°C	45°C	28°C	45°C
IAA ((µg/ml)	9.19 ^a	9.11 ^a	11.85 ^a	11.41 ^b	10.98 ^a	10.92 ^a
P- solubilization (mg/100 ml)	6.31 ^a	7.63 ^a	10.06 ^b	11.03 ^b	8.03 ^a	8.99 ^a
Zn-solubilization index	1.11	1.01	1.51	1.16	1.58	1.23
ACC-deaminase production (OD)	1.11 ^a	1.01 ^b	1.51 ^b	1.16 ^b	1.58 ^b	1.23 ^a
Biofilm formation (OD)	0.277 ^b	0.649 ^a	0.2878 ^a	0.9087 ^b	0.3005 ^c	0.8874 ^a
Overall growth in NA broth	0.810a	0.210c	0.940a	0.323c	1.020a	0.587c
Proline (µg/ml) PEG 6000 (5%)	8.356 ^b	-	7.723 ^c	-	7.521 ^b	-
Proline (µg/ml) (NaCl 5%)	8.486 ^b	-	8.874 ^b	-	7.977 ^b	-

Pantnagar Centre

Table-MB1/16C: Potential moisture tolerant fluorescent *Pseudomonas* isolates

Isolates	OD 600 ^{nm} in KB Broth 35% PEG
Pant-1	0.179
Pant-2	0.047
Pant-3	0.198
Pant-4	0.013
Pant-5	0.017
Pant-6	0.496
Pant-7	0.197
Pant-8	0.110

MB2/21: Response of *Bradyrhizobium* with RDF/ farmer practice and with reduced 75% RDF on latest release variety of soybean of zone (all centres)

Indore Centre

Table MB2/21A: Comparative response of *Bradyrhizobium daqingense* inoculation and commercial rhizobia on N & P content in shoots and seeds, uptake in shoots and grain yield on soybean (Variety NRC 130) under field conditions. Data are average of 3 replications; LSD, least significance difference at 5% level of significance by Duncan's multiple range test of ANOVA.

Treatment	N-content in shoots (%)	N-content in Seed (%)	P-content in shoots (%)	P-content in seed (%)	N uptake (kg ha ⁻¹)	P uptake (kg ha ⁻¹)	Grain yield (kg/ha)
T1=RDF	1.4e	3.45e	0.17e	0.22e	68.64e	6.73d	1512.63d
T2=RDF+B. daqingense	2.9a	5.6a	0.30a	0.37a	188.76a	15.34a	2197.08a
T3=RDF+ Commercial/ local strain	2.5c	4.5c	0.22c	0.31c	148.15c	11.69bc	1868.05c
T4=75% RDF	2.7b	5.2b	0.25b	0.35b	165.52b	12.69b	1932.50bc
T5=75% RDF+ B. daqingense	2.3cd	4.2cd	0.19d	0.31c	141.21c	11.61bc	2065.27ab
T6=75% RDF+Commercial/local strain	2.2d	3.9d	0.18de	0.22d	123.85d	10.52c	2040.83b
LSD (P=0.05)	5.9	0.34	0.01	.02	12.16	1.39	136.42

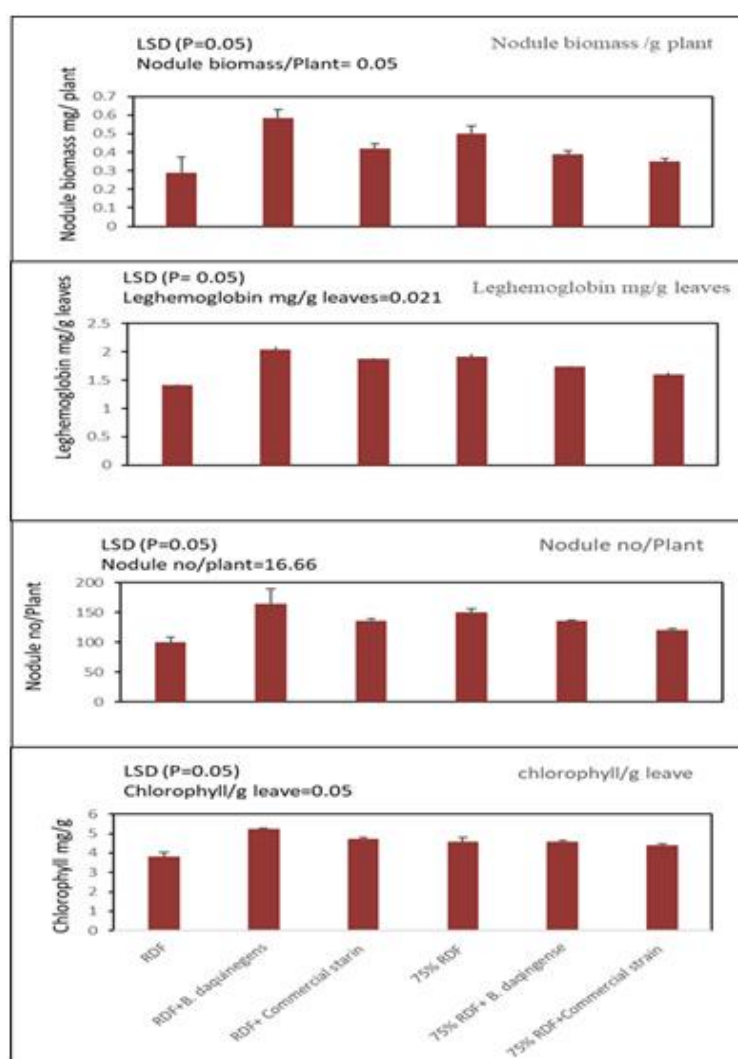


Figure MB2/21A: Comparative response of *Bradyrhizobium daqingense* inoculation and commercial rhizobia on root nodulation and chlorophyll content on soybean (Variety NRC 130) under field conditions. Data are average of 3 replications; LSD, least significance difference at 5% level of significance by Duncan's multiple range test of ANOVA. (Indore Centre)

Ludhiana Centre

Table MB2/21B: Effect of *Bradyrhizobium daqingense** with RDF/farmers practice on symbiotic traits and yield in soybean (Ludhiana Centre)

Treatments	Number of nodules/plant	Dry weight of nodules/plant (mg)	Leghaemoglobin content (mg/g of nodules)	Chlorophyll Content (mgg ⁻¹ of fresh leaf)	Grain yield (kg/ha)
T1=RDF	33	75.5	1.22	1.28	1845
T2=RDF+ <i>Bradyrhizobium daqingense</i>	45	88.5	1.45	1.37	1895
T3=RDF+ Local strain LSBR-3	48	92.3	1.49	1.40	1905
T4=75% RDF	32	72.5	1.18	1.25	1825
T5= 75% RDF+ <i>Bradyrhizobium daqingense</i>	44	85.0	1.42	1.35	1868
T6= 75% RDF+ local strain LSBR-3	45	87.8	1.45	1.38	1887
CD@ 5%	NS	6.5	0.16	0.03	28.8

Table MB2/21C: Economics of *Bradyrhizobium daqingense** with RDF/farmers practice in soybean (Ludhiana Centre)

Treatments	Grain yield (kg/ha)	*Gross returns (Rs/ha)	**Net returns (Rs/ha)	B :C ratio
T1=RDF	1845	72878	40333	1.24
T2=RDF+ <i>Bradyrhizobium daqingense</i>	1895	74853	42208	1.29
T3=RDF+ local strain LSBR-3	1905	75248	42603	1.31
T4=75% RDF	1825	72088	40350	1.27
T5= 75% RDF+ <i>Bradyrhizobium daqingense</i>	1868	73786	41948	1.32
T6= 75% RDF+ local strain LSBR-3	1887	74537	42699	1.34

*Market price of soybean = Rs.3950/- quintal; ** Cost of microbial consortium @ Rs. 100 per packet (for one hectare)

Cost of cultivation of RDF = Rs. 32,545; Cost of cultivation of RDF +*Bradyrhizobium daqingense* = Rs. 32,645; Cost of cultivation of 75% RDF = Rs31, 738; Cost of cultivation of 75% RDF +/local strain = Rs. 32,645

Pantnagar Centre

Table MB2/21D: Performance of *Bradyrhizobium daqingense* with two different doses i.e. 100 and 75 per cent of RDF on nodulation and plant dry matter in soybean (Pantnagar Centre)

Treatment	Nodule Number (No./plant)	Nodule dry weight (g/plant)	LegHb in legumes (mg/g)	Plant dry weight (g/plant)
T1=RDF	55.00	0.172	0.554	33.30
T2=RDF + <i>Brh. daqingense</i>	68.25	0.185	0.501	29.31
T3=RDF+ Pant 2 (local strain)	74.00	0.218	0.558	32.38
T4=75% RDF	59.50	0.167	0.504	27.34
T5=75%RDF+ <i>Brh. daqingense</i>	78.75	0.216	0.510	28.76
T6=75% RDF+ Pant 2 (local strain)	85.00	0.257	0.651	32.84
C.D. at 5%	13.98	0.048	0.094	NS

Table MB2/21E: Comparative performance of *Bradyrhizobium daqingense* with two different doses i.e. 100 and 75 per cent of RDF on grain and biological yield of soybean (Pantnagar Centre)

Treatment	Total Chlorophyll (mg/g)	Grain Yield (Kg/ha)	Biological Yield (Q/ha)
T1=RDF	27.88	1438	2.29
T2=RDF + <i>Brh. daqingense</i>	29.71	1422	2.13
T3=RDF+ Pant 2 (local strain)	27.14	1437	2.25
T4=75% RDF	29.18	1344	2.23
T5=75%RDF+ <i>Brh. daqingense</i>	26.39	1396	2.30
T6=75% RDF+ Pant 2 (local strain)	31.42	1401	2.23
C.D. at 5%	NS	NS	NS

*Nutrient status at zero time- OC=0.69%; Available NPK= 210.6, 21.9, 216.7 kg/ha

Delhi Centre

Table MB2/21F: Comparative performance of *Bradyrhizobium daqingense* with two different doses i.e. 100 and 75 per cent of RDF on nodulation, chlorophyll content and grain yield of soybean (Delhi Centre)

Treatment No.	Treatment description	No. of Nodules/plant	Nodule DW (mg)	Total Chlorophyll content (µg/mg FW)	LegHb content in nodules (mg/g FW)	Yield /ha (kg)
T1	Uninoculated Control	6.75	33.1	0.669	0.19	186.367
T2	<i>B. daqingense</i>	16.25	76.175	0.883	0.277	204.493
T3	RDF	13.25	62.95	1.483	0.211	260.182
T4	RDF+ <i>B. daqingense</i>	14.5	82.2	1.253	0.239	207.495
T5	RDF+ Commercial/local strain	26.75	135.4	1.076	0.248	205.637
T6	75% RDF	13.25	66.2	1.586	0.259	241.912
T7	75% RDF+ <i>B. daqingense</i>	23.75	127.7	1.494	0.277	229.666
T8	75% RDF+Commercial/local strain	23.25	111.175	1.719	0.286	230.176
	C.D (5%)	8.183	36.258	0.618	0.006	N/A

Sehore Centre

Table MB2/21G: Comparative performance of *Bradyrhizobium daqingense* with two different doses i.e. 100 and 75 per cent of RDF on root nodulation and chlorophyll content in leaves of soybean (Sehore Centre)

Treatment	Nodules (Number/plant)	Nodule dry weight (g/plant)	LegHb in legumes (mg/g)	Chlorophyll content (mg/g)
T1=RDF	44.50	92.81	2.19	26.69
T2=RDF + <i>B. daqingense</i>	48.28	111.11	3.36	31.65
T3=RDF+ local commercial strain	41.58	90.42	2.13	29.42
T4=75% RDF	40.88	91.03	2.25	33.04
T5=75%RDF+ <i>B. daqingense</i>	56.36	113.20	3.29	35.72
T6=75% RDF+ local strain	42.35	55.33	2.21	30.34
C.D. at 5%	1.53	15.87	0.09	1.52

Table MB2/21H: Comparative performance of *Bradyrhizobium daqingense* with two different doses i.e. 100 and 75 per cent of RDF on nutrient uptake and grain yield of soybean (Sehore Centre)

Treatment	Uptake (Kg/ha)			Grain yield (Kg /ha)	B:C Ratio
	N	P	K		
T1=RDF	92.75	9.41	42.61	1264.88	3.36:1
T2=RDF + <i>B. daqingense</i>	101.15	10.62	52.61	1428.62	3.29:1
T3=RDF+ local commercial strain	97.77	9.9	45.51	1266.59	2.29:1
T4=75% RDF	99.92	9.95	47.52	1173.57	2.88:1
T5=75%RDF+ <i>B. daqingense</i>	110.4	12.72	65.99	1547.69	3.81:1
T6=75% RDF+ local strain	98.99	11.4	54.97	1224.02	2.87:1
C.D. at 5%	-	-	-	67.6	-

Table MB2/21I: Nutrient budgeting (gain/loss) in experimental site under different fertilization and microbial treatments after soybean harvest (Sehore Centre)

Treatment	Gain in nutrient status (kg/ha)*		
	N	P	K
T1=RDF	89.71	7.66	36.61
T2=RDF+ <i>Bradyrhizobium daqingense</i>	97.15	8.37	50.61
T3=RDF+ Commercial/local strain available in the zone	95.77	7.35	45.51
T4=75%RDF	96.12	7.3	44.52
T5=75%RDF+ <i>Bradyrhizobium daqingense</i>	9.2	9.17	57.99
T6=75%RDF+Commercial/local strain available in zone	96.74	9.55	56.97

*Available nutrients at zero time: N=192; P=10.25; K=432 kg/ha

Dharwad Centre

Table MB2/21J: Nodule parameters as influenced by bradyrhizobial strains and fertilizer application in soybean (Dharwad centre)

Treatments	Nodule number/plant	Nodule dry weight (g plant ⁻¹)	LegHb (mg/g) in nodules	Chlorophyll content (mg/g)	Grain yield (kg/ha)
T1=100% RDF	35.94	1.80	0.16	41.74	2346.67
T2=100% RDF + <i>Bradyrhizobium daqingense</i>	44.14	3.92	0.70	48.23	2500.00
T3=100% RDF+ SB-120	42.09	2.99	0.43	46.14	2360.00
T4=75% RDF	38.77	2.65	0.35	39.16	2280.00
T5=75% RDF + <i>Bradyrhizobium daqingense</i>	43.47	3.39	0.58	48.07	2437.33
T6=75% RDF + SB-120	40.13	2.00	0.34	40.98	2320.00
T7=Absolute control	32.53	1.77	0.16	32.00	1976.00
CD (5%)	0.26	0.05	0.13	0.36	91.81

Table MB2/21K: Dehydrogenase enzyme, phosphatase and urease activity as influenced by bradyrhizobial strains and fertilizer application in soybean (Dharwad centre)

Treatments	Dehydrogenase (µg TPF formed g ⁻¹ soil d ⁻¹)	Phosphatase (µg pnp released g ⁻¹ soil h ⁻¹)	Urease (µg NH ₄ ⁺ N g ⁻¹ soil day ⁻¹)
T1=100% RDF	13.40	18.54	19.26
T2=100% RDF + <i>Bradyrhizobium daqingense</i>	17.22	24.05	29.93
T3=100% RDF+ SB-120	16.23	20.04	26.62
T4=75% RDF	14.71	19.24	21.88
T5=75% RDF + <i>Bradyrhizobium daqingense</i>	16.30	22.87	30.22
T6=75% RDF + SB-120	14.84	21.35	23.47
T7=Absolute control	11.40	14.90	16.00
CD (5%)	0.12	0.19	2.94

MB 3/21: Assessing the compatibility of pre and post emergence herbicides with PGPR including soybean rhizobia under *invitro* and their impact on soybean nodulation in unsterilized microcosms (All centres)

Indore Centre

Table MB3/21A: Assessing the compatibility of pre and post emergence herbicides with PGPR including soybean rhizobia under in vitro

Herbicide	Survival of different concentration of herbicide on rhizobial isolates against control (OD 620nm)							
	<i>B. daqingense</i>	% S	<i>B. japonicum</i>	% S	<i>Burkholderia arboris</i>	% S	<i>Paenibacillus polymyxa</i>	% S
Pre-emergence								
T1=Diclosulam 52ppm	1.414a	122.63	0.816ef	90.46	0.955b	94.92	0.826cd	93.33
T2=Diclosulam 56ppm	1.325b	114.91	0.783gh	86.88	0.826ef	82.10	0.773d	87.38
T3=Diclosulam 60ppm	1.218c	105.63	0.752i	83.37	0.736h	73.19	0.500f	56.57
T4=Pendimethalin 6ppm	0.907h	78.66	0.856cd	94.90	0.477k	47.44	0.810cd	91.56
T5=Pendimethalin 8ppm	0.854h	74.06	0.804fg	89.20	0.401l	39.85	0.806cd	91.11
T6=Pendimethalin 10ppm	0.756i	65.56	0.764hi	84.77	0.293m	29.12	0.791cd	89.37
Post-emergence								
Propaquizafop 10EC								
T7=Propaquizafop 1.2ppm	1.394a	120.90	0.875abc	97.00	0.937b	93.20	0.34cd	38.41
T8=Propaquizafop 1.5ppm	1.143ef	99.13	0.854cd	94.67	0.716i	71.23	0.336g	38.04
T9=Propaquizafop 1.6ppm	1.022g	88.63	0.835de	92.64	0.68j	67.59	0.246g	27.87
Imazethapyre 10SL (Pursuit)								
T10= Imazethapyre 2ppm	1.433a	124.28	0.887ab	98.41	0.896d	89.09	0.821cd	92.76
T11= Imazethapyre 2.5ppm	1.179cde	102.25	0.86cd	95.34	0.836e	83.16	0.787cd	89.00
T12= Imazethapyre 3ppm	1.305b	113.18	0.833de	92.42	0.755g	75.04	0.659e	74.50
T13=Cocktail 4ppm	1.326b	115.00	0.894ab	99.18	0.916c	91.05	0.995a	112.46
T14=Cocktail 5ppm	1.208cd	104.77	0.868bc	96.30	0.816f	81.11	0.927ab	104.74
T15=Cocktail 6ppm	1.118f	96.96	0.855cd	94.86	0.707i	70.27	0.859bcd	97.06
Control*	1.153def		0.902a		0.993a		0.884bc	
LSD (0.05)	0.056		0.025		0.018		0.089	0.064

Data are average of 3 replications; LSD, least significance difference at 5% level of significance by Duncan's multiple range test of ANOVA; * control: without herbicide; %S-per cent survival

Ludhiana Centre

Table MB 3/21B: Assessing the compatibility of pre and post emergence herbicides with PGPR including soybean rhizobia under *invitro* (Ludhiana Centre)

Herbicides	<i>B. daqingense</i>				<i>Paenibacillus polymyxa</i>				<i>Bradyrhizobium sp.</i>			
Pre-emergence												
Diclosulam 84 WDG	R1	R2	R3	R4	R1	R2	R3	R4	R1	R2	R3	R4
T ₁ - 52 ppm	+	+	+	+	-	-	-	-	+	+	+	+
T ₂ - 56 ppm	+	+	+	+	-	-	-	-	-	-	-	-
T ₃ - 60 ppm	+	+	+	+	-	-	-	-	-	-	-	-
Pendimethalin 30EC												
T ₄ - 6ppm	+	+	+	+	-	-	-	-	+	+	+	+
T ₅ - 8ppm	+	+	+	+	-	-	-	-	-	-	-	-
T ₆ - 10 ppm	+	+	+	+	-	-	-	-	-	-	-	-
Post Emergence												
Propaquizafop 10EC												
T ₇ - 1.2ppm	+	+	+	+	+	+	+	+	-	-	-	-
T ₈ - 1.5ppm	+	+	+	+	-	-	-	-	-	-	-	-
T ₉ - 3ppm	+	+	+	+	-	-	-	-	-	-	-	-
Imazethapyre 10 SL (Pursuit)												
T ₁₀ - 2ppm	+	+	+	+	+	+	+	+	+	+	+	+
T ₁₁ - 2.5ppm	-	-	-	-	-	-	-	-	-	-	-	-
T ₁₂ - 3ppm	-	-	-	-	-	-	-	-	-	-	-	-
Cocktail mix of Propaquizafop 10EC + Imazethapyre 10 SL (Pursuit)												
T ₁₃ - 4ppm	+	+	+	+	-	-	-	-	-	-	-	-
T ₁₄ - 5ppm	-	-	-	-	-	-	-	-	-	-	-	-
T ₁₅ - 6ppm	-	-	-	-	-	-	-	-	-	-	-	-

+ (Growth), -(No growth)

Pantnagar Centre

Table MB3/21C: Assessing the compatibility of pre and post emergence herbicides with PGPR including soybean rhizobia under *in vitro* (Pantnagar centre)

Herbicide	Inhibition of different concentration of herbicide on rhizo-bacterial isolates against control (OD 620 ^{nm}) observed in YEMB medium					
	<i>B. arboris</i> (5 th day)	% S	<i>B.diaqingense</i> (10 th day)	% S	Pant 2 (10 th day)	% S
Pre-emergence						
Diclosulam 84 WDG						
T1=Diclosulam 52ppm	0.522 ^{hi}	98.35	0.954 ⁱ	120.85	0.920 ^{hi}	103.31
T2=Diclosulam 56 ppm	0.370 ^d	69.79	0.743 ^e	94.25	0.734 ^{ef}	82.44
T3=Diclosulam 60 ppm	0.449 ^f	84.73	0.751 ^e	95.26	0.812 ^g	91.08
Pendimethalin 30EC						
T4=Pendimethalin 6ppm	0.249 ^c	46.89	0.554 ^c	70.18	0.661 ^c	74.26
T5=Pendimethalin 8 ppm	0.194 ^b	36.66	0.463 ^b	58.65	0.480 ^b	53.84
T6=Pendimethalin 10 ppm	0.159 ^a	29.97	0.401 ^a	50.80	0.334 ^a	37.46
Post-emergence						
Propaquizafop 10EC						
T7=Propaquizafop 1.2 ppm	0.486 ^g	91.66	0.921 ^h	116.67	0.922 ^{hi}	103.42
T8=Propaquizafop 1.5ppm	0.396 ^e	74.69	0.681 ^d	86.27	0.678 ^{cd}	76.05
T9=Propaquizafop 1.6 ppm	0.355 ^d	67.06	0.765 ^e	96.91	0.685 ^{cd}	76.84
Imazethapyre 10 SL (Pursuit)						
T10=Imezathypre 2 ppm	0.476 ^g	89.91	0.941 ^{hi}	119.21	0.94 ⁱⁱ	105.57
T11=Imezathypre 2.5 ppm	0.405 ^e	83.97	0.745 ^e	94.38	0.735 ^{ef}	82.44
T12=Imezathypre 3 ppm	0.445 ^f	76.43	0.810 ^f	102.67	0.817 ^g	91.64
Cocktail (Propaquizafop 2.5% + Imazethapyr 3.75%-Saked)						
T13=Cocktail 4ppm	0.507 ^h	95.43	0.886 ^g	112.24	0.889 ^h	99.72
T14=Cocktail 5ppm	0.402 ^e	75.72	0.685 ^d	86.78	0.702 ^{de}	78.74
T15=Cocktail 6ppm	0.407 ^e	76.81	0.761 ^e	96.40	0.761 ^f	85.36
T16=Control	0.530 ⁱ		0.789 ^f		0.891 ^h	

*Control-without herbicide; %S-per cent survival

Raipur Centre**Table MB3/21D: Assessing the compatibility of pre and post emergence herbicides with PGPR including soybean rhizobia under *in vitro* (Raipur centre)**

Herbicide	Inhibition of different concentration of herbicide on rhizo-bacterial isolates against control (colony diameter mm) observed in YEMB medium					
	<i>B. daqingense</i>	% S	<i>Paenibacillus polymyxa</i>	% S	<i>B. japonicum</i>	% S
Pre-emergence						
Diclosulam 84 WDG						
T1=Diclosulam 52ppm	9.40	94.0	5.48	84.3	11.98	86.82
T2=Diclosulam 56 ppm	9.12	91.2	5.10	78.46	11.59	83.98
T3=Diclosulam 60 ppm	8.21	82.1	4.52	69.54	11.03	79.92
Pendimethalin 30EC						
T4=Pendimethalin 6ppm	9.59	95.9	5.98	92.0	13.56	98.26
T5=Pendimethalin 8 ppm	9.28	92.8	5.21	80.15	13.04	94.49
T6=Pendimethalin 10 ppm	8.56	85.6	4.82	74.15	12.46	90.30
Post-emergence						
Propaquizafop 10EC						
T7=Propaquizafop 1.2 ppm	9.68	96.8	6.02	92.61	13.71	99.34
T8=Propaquizafop 1.5ppm	9.47	94.7	5.92	91.07	13.58	98.40
T9=Propaquizafop 1.6 ppm	9.03	90.3	5.67	87.23	13.28	96.23
Imazethapyre 10 SL (Pursuit)						
T10=Imezathypre 2 ppm	9.34	93.4	5.88	90.46	13.63	98.76
T11=Imezathypre 2.5 ppm	9.19	91.9	5.52	84.92	13.39	97.02
T12=Imezathypre 3 ppm	8.89		5.01	77.0	13.08	94.78
Cocktail (Propaquizafop 2.5% + Imazethapyr 3.75%-Saked)						
T13=Cocktail 4ppm	9.28	92.8	5.61	86.30	13.62	98.69
T14=Cocktail 5ppm	9.14	91.4	5.34	82.15	13.38	96.95
T15=Cocktail 6ppm	8.93	89.3	4.98	76.61	13.05	94.56
T16=Control	10.00	-	6.50	-	13.80	-

*Control-without herbicide; %S-per cent survival

Dharwad Centre

Table MB 3/21E: Impact of herbicide molecules on growth pattern of bio-inoculants assessed under *invitro*

Herbicide*	Microorganism	OD 660 ^{nm}		Survival % at 48hrs
		24hr	48hr	
Imazethapyr (Pursuit) 10 SL @ 1L/ha	<i>B.daqingense</i>	1.542	1.720	87.26
	<i>B.arboris</i>	1.322	1.530	87.83
	SB120	1.280	1.230	67.58
Haloxypop R – methyl 10.5 EC @1.25L/ha	<i>B.daqingense</i>	2.192	2.442	123.79
	<i>B.arboris</i>	2.112	2.213	127.03
	SB120	1.930	2.210	121.42
Haloxypop R – methyl (Market)	<i>B.daqingense</i>	2.142	2.230	113.14
	<i>B.arboris</i>	2.110	2.114	121.35
	SB120	1.825	2.213	121.59
Fenoxypop P –ethyl 9EC @ 1 L/ha	<i>B.daqingense</i>	2.192	2.240	113.64
	<i>B.arboris</i>	2.150	2.010	115.38
	SB120	1.920	2.312	127.03
Without herbicide	<i>B.daqingense</i>	1.608	1.971	-
	<i>B.arboris</i>	1.645	1.742	-
	SB120	1.763	1.820	-

*used as recommended dose

MB 4/13: Nodulation ability of AVT-II entries of respective centers at IISR Experiment farm (All centres)

Indore Centre

Table MB 4/13A: Evaluation of five AVT-II entries of respective center (Central zone entries) for nodulation parameters (Indore centre)

AVT II entries and checks	Nodule number	Nodule dry weight (mg/g nodules)	LegHb content (mg/g nodules)	Chlorophyll Content (mg g-1 of fresh leaf)
HIMSO 1689	227c	0.71c	4.29bc	1.6c
JS 21-72	358.66a	1.39a	5.15a	2.18b
NRC 152 (E)	150.33e	0.24e	4.20c	1.67c
NRC 165 (E)	15.33f	0.16f	3.64e	0.53e
NRC 86	171d	0.62d	3.86d	1.08d
JS20-98	248.b	1.24b	4.42b	2.59a
LSD (P=0.05)	10.54	0.027	0.135	0.359

Sehore Centre

Table MB 4/13B: Evaluation of five AVT-II entries of respective center (Central zone entries) for nodulation parameters (Sehore centre)

AVT II entries and checks	Nodule number	Nodule dry weight (mg/g nodules)	LegHb content (mg/g nodules)
HIMSO 1689	44.17	89.05	2.68
JS21-72	33.98	81.0	2.17
NRC 152 (E)	39.27	83.46	2.37
NRC 86	42.79	85.08	2.14
JS 20-98	40.94	87.84	2.34
RSC 10-46	48.51	90.10	2.74
CD (5%)	1.01	0.88	0.10

Ludhiana Centre

Table MB 4/13C: Evaluation of five AVT-II entries of respective center (North plain zone entries) for nodulation parameters (Ludhiana centre)

AVT-II entries and checks	Number of nodules/plant	Dry Weight of nodules/plant (mg)	LegHb content (mg/g of nodules)
NRC 149	43	83.4	1.78
SL955	42	79.4	1.72
SL1074	46	91.5	1.98
SL1104	48	89.9	1.85
SL958	43	88.0	1.89
PS 1347	41	77.5	1.68

Pantnagar Centre

Table MB 4/13D: Evaluation of five AVT-II entries of respective center (North plain zone entries) for nodulation parameters (Pantnagar centre)

AVT-II entries and checks	Nodule Number (No/plant) At 64 DAS	Nodule Dry Weight (g/plant)	Plant Dry Weight (g/plant)	LegHb content in legumes (mg/g)
NRC-149	69.67	0.183	14.4	0.402
SL-955	70.00	0.144	25.1	0.315
SL-1074	45.00	0.113	20.2	0.433
SL-958	63.67	0.221	15.1	0.509
PS-1347	47.67	0.106	27.0	0.384
DS-9712	45.67	0.138	18.7	0.482

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Jorhat (Assam)

Dr. Pezangulie Chakruno
Dr. Munmi Borah

Eastern Zone

Raipur (Chhattisgarh)
Dholi (Bihar)

Dr. R K Dantre
Dr. Ashim Kumar Mishra

Central Zone

Indore (Madhya Pradesh)

Sehore (Madhya Pradesh)
Jabalpur (Madhya Pradesh)
Amravati (Maharashtra)
Kota (Rajasthan)

Dr. Sanjeev Kumar
Dr. Laxman Singh Rajput
Dr. Moly Saxena
Dr. P.K. Amrate
Dr. D.L. Wasule
Dr. C.B. Meena

Southern Zone

Dharwad (Karnataka)
Ugar Khurd (Karnataka)
Kasbe Digraj (Maharashtra)

Dr. Shalini N Huilgol
Mr. Jagadish S. Patwardhan, Mr. R.D. Patil
Dr Sachin Mahajan

Abbreviations used for soybean diseases

S. No.	Disease	Abbreviation	Pathogen
1.	Charcoal rot	CR	<i>Macrophomina phaseolina</i>
2.	Collar rot	Coll. R	<i>Sclerotium rolfsii</i>
3.A.	Rhizoctonia Root Rot	RRR	<i>Rhizoctonia solani</i>
3.B.	Rhizoctonia Aerial Blight	RAB	<i>Rhizoctonia solani</i>
4.	Bacterial Pustule	BP	<i>Xanthomonas campestris</i> pv. <i>glycines</i>
5.	Bacterial Blight	BLB	<i>Pseudomonas savastanoi</i> pv. <i>glycinea</i>
6.	Fusarium Rot / Wilt	FR /FW	<i>Fusarium</i> species
7.	Soybean Mosaic Virus	SMV	<i>Soja virus I</i>
8.	Soybean Yellow Mosaic Virus	YMV	<i>Mungbean yellow mosaic virus</i>
9.	Bud Proliferation/ No Podding	BPro./N Pod.	<i>Phytoplasma</i>
9.	Myrothecium Leaf Spot	MLS	<i>Myrothecium roridum</i>
10.	Frogeye Leaf Spot	FLS	<i>Cercospora sojina</i>
11.A.	Cercospora Leaf Spot/Blight	CLS	<i>Cercospora kikuchii</i>
11.B.	Purple Seed Stain	PSS	<i>Cercospora kikuchii</i>
12.	Rust	Rust	<i>Phakopsora pachyrhizi</i>
13.	Alternaria Leaf Spot	ALS	<i>Alternaria</i> species
14.	Brown Spot	BS	<i>Septoria glycine</i>
15.	Target Leaf Spot	TLS	<i>Corynespora cassicola</i>
16.	Phoma Leaf Blight	PhB	<i>Phoma medicaginis</i>
17.	Cotyledon Spot	CS	A number of fungi involved
18.	Indian Bud Blight	IBB	A strain of <i>Groundnut bud necrosis virus</i>
29.	Powdery Mildew	PM	<i>Microspheera diffusa</i>
20.	Anthraxnose	Anth.	<i>Colletotrichum truncatum</i>
21.	Pod And Stem Blight	P&SB	<i>Diaporthe phaseolorum</i> var. <i>sojae</i>
22.	Wilt Complex	WC	-
23.	Pod Diseases/ Blight	PB PB(Ct) PB(Mr) PB(Mp) PB(Ph) PB(Fus) PB(Cer)	a. <i>Colletotrichum truncatum</i> b. <i>Myrothecium roridum</i> c. <i>Macrophomina phaseolina</i> d. <i>Phomopsis</i> species e. <i>Fusarium</i> species f. <i>Cercospora</i> species
24	Choanephora Leaf Blight	ChLB	<i>Choanephora infundibulifera</i>
25	Red Crown Rot	RCR	<i>Colonectria</i> species
26	Helminthosporium Leaf Spot	HLS	<i>Helminthosporium</i> species
27	Sudden Death Syndrome	SDS	<i>Fusarium</i> species
28	Seed Rot	SR	<i>Pythium</i> spp. <i>Phytophthora</i> spp.

Table 4.1: PP1 Survey for soybean diseases (diseases scenario at different centers)

S. No.	Location Disease	Northern Hill Zone		Northern Plain Zone			North Eastern Hill Zone		Central Zone				Eastern Zone	Southern Zone		No. of Centres (15)	
		Palampur	Almora	Ludhiana	Pantnagar	Delhi	Jorhat	Medziphema	Sehore	Kota	Indore	Jabalpur	Amravati	Raipur	K- Digraj		Dharwad
1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17
1	CR										+	+	+				3
2	Coll. R						+	+	+		+	+					5
3	RAB				+			+		+	+	+					6
4	Rust							+							+	+	3
5	BS																
6	TLS								+							+	2
7	CLS/PSS											+				+	3
8	FLS	+	+						+			+				+	5
9	ALS												+			+	3
10	Anth	+	+		+			+	+	+	+	+	+	+	+	+	13
11	BP	+	+		+							+	+			+	6
12	BLB				+								+				3
13	YMV	+		+	+	+	+			+	+	+	+				9
14	SMV			+	+						+	+					5
15	FR /FW				+												2
16	BND					+								+			2
17	SR						+				+						2
18	CMV										+						2
Centre-wise no. of diseases reported		4	3	2	7	2	10	4	4	3	8	9	6	2	2	7	73

Table 4.2.1: PP2 Weekly Per cent incidence of charcoal rot (%) in trap nursery during Kharif 2021 at Jabalpur centre

SMW	Month and date	JS 335	PK 472	Shivailk	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	1.50	0.00	0.00	2.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	1.00	6.50	13.00	0.00	1.50	14.50	0.00	6.50	2.50
36	Sept 3-9	0.00	12.00	17.50	35.50	0.00	4.50	38.00	4.00	28.00	24.50
37	Sept 10-16	6.00	23.00	28.50	49.00	1.00	11.50	49.00	11.00	42.50	37.50
38	Sept 17-23	12.00	51.50	45.50	59.00	4.50	17.50	48.00	17.50	46.00	47.50
39	Sept 24-30	14.50	62.50	51.00	69.50	8.00	17.50	-	18.50	-	56.50

Table 4.2.2: Weekly Per cent disease index (PDI) of Yellow mosaic disease in trap nursery during Kharif 2021 at Jabalpur centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.31	0.86	0.00	0.12	0.00	0.00	0.31	0.00	0.43	0.00
30	July 23-29	6.36	10.12	4.38	8.52	0.56	1.42	5.68	2.41	7.28	2.47
31	July 30- Aug 5	16.79	17.84	13.39	23.83	9.26	15.00	19.07	7.96	18.33	11.97
32	Aug 6-12	22.59	23.83	17.04	33.64	13.89	17.53	24.44	11.60	27.47	15.86
33	Aug 13-19	25.00	32.22	20.92	40.99	16.17	21.91	28.27	13.46	30.62	19.26
34	Aug 20-26	26.97	35.99	22.22	43.15	17.22	25.49	29.01	13.76	31.66	20.86
35	Aug 27 –Sept 2	27.71	36.54	22.71	44.07	17.41	25.62	29.20	13.89	31.97	21.30
36	Sept 3-9	28.08	36.79	22.90	44.13	17.59	25.74	29.07	13.83	31.79	21.54
37	Sept 10-16	28.27	42.71	22.96	44.01	17.41	25.49	-	13.83	-	21.48

Table 4.2.3: Weekly Per cent disease index (PDI) of RAB in trap nursery during Kharif 2021 at Jabalpur centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.31	0.00
34	Aug 20-26	0.00	0.56	0.37	0.93	0.49	0.56	0.99	0.99	0.99	0.80
35	Aug 27 –Sept 2	1.05	1.17	0.93	1.30	0.99	1.30	1.42	1.85	1.42	1.73
36	Sept 3-9	2.53	2.59	2.90	2.53	2.41	2.90	3.09	3.52	2.90	3.02
37	Sept 10-16	6.85	9.20	10.86	7.72	7.59	9.88	5.43	10.74	5.86	9.63
38	Sept 17-23	13.70	15.86	17.41	13.89	14.01	16.91	-	16.11	-	15.62

Table 4.2.4: Weekly Per cent disease index (PDI) of Anthracnose/Pb in trap nursery during Kharif 2021 at Jabalpur centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00
32	Aug 6-12	0.00	0.00	0.89	0.67	0.00	0.00	4.44	0.00	4.00	0.00
33	Aug 13-19	0.00	0.00	4.22	2.00	0.00	1.56	13.56	2.44	10.67	0.00
34	Aug 20-26	0.00	0.00	8.00	6.00	2.22	3.56	33.11	4.67	21.11	2.22
35	Aug 27 –Sept 2	1.78	3.11	13.33	10.00	4.67	6.00	41.78	8.22	28.22	4.22
36	Sept 3-9	3.33	5.33	19.56	14.44	6.44	8.22	52.89	14.22	33.78	7.11
37	Sept 10-16	6.22	7.56	25.56	18.67	7.33	9.78	57.78	17.56	39.11	10.22
38	Sept 17-23	7.33	9.33	29.56	22.44	8.89	11.33	-	18.89	-	11.11
39	Sept 24-30	7.78	9.78	29.56	22.44	8.89	12.22	-	19.56	-	11.33

Table 4.2.5. Weather parameters during cropping season of Kharif, 2021 at Jabalpur

Standard Weeks	Months & dates	Temperature		Sun shine Hrs.	Rain fall (mm)	Relative humidity %		Wind velocity	Vapour pressure		Evaporation (mm)	No. of rainy days
		Max.	Min.			Mor.	Eve.		Mor.	Eve.		
22	May 28-3 June	37.7	24.7	7.7	0.0	74.0	37.7	4.2	19.2	17.5	6.6	0
23	June 4-10	35.7	24.5	5.1	56.2	77.4	51.4	4.5	20.3	17.6	5.2	3
24	June 11-17	31.7	23.9	4.0	12.0	83.9	61.7	6.0	20.3	21.1	4.3	2
25	June 18-24	33.5	23.9	4.3	73.2	86.9	62.6	6.3	21.4	21.1	4.6	3
26	June 25-July 1	33.6	24.7	4.7	38.6	86.4	61.1	4.3	21.9	23.1	4.1	3
27	July 2-8	35.7	26.7	4.7	15.0	74.7	50.3	5.3	21.1	19.7	5.5	1
28	July 9-15	33.3	25.1	5.5	33.2	85.1	58.3	3.3	22.7	21.8	4.2	2
29	July 16-22	33.4	25.4	5.5	35.4	84.1	70.0	3.9	22.8	22.1	3.8	3
30	July 23-29	27.7	23.8	0.2	130.4	94.6	85.1	5.7	22.0	22.5	2.6	5
31	July 30- Aug 5	26.8	23.4	0.3	43.7	91.1	84.1	8.0	21.0	21.7	1.7	6
32	Aug 6-12	28.5	24.2	0.5	11.1	90	79	6.2	22.2	22.6	1.7	2
33	Aug 13-19	32.6	24.7	4.9	42.3	89	71	3.3	22.6	21.8	3.7	3
34	Aug 20-26	30.7	24.7	2.6	2.2	87	67	4.3	22.2	21.5	2.4	0
35	Aug 27-Sept 2	31.6	24.5	5.1	2.5	86	68	3.4	22.1	21.9	3.0	0
36	Sept 3-9	31.4	24.1	4.1	35.7	91	78	3.5	22.6	22.4	3.0	4
37	Sept 10-16	30.0	23.8	2.3	100.8	93	81	3.0	22.5	23.0	3.1	4
38	Sept 17-23	30.9	23.6	4.7	16.3	89	68	3.1	21.7	22.7	2.5	2
39	Sept 24-30	31.9	24.1	5.6	3.8	88	62	3.3	22.4	21.4	2.5	1
40	Oct 1-7	32.9	23.7	8.2	0.0	84	58	2.3	22.0	20.9	3.7	0
41	Oct 8-14	33.3	20.0	8.6	0.0	84	48	1.5	18.8	17.1	3.8	0
42	Oct 15-21	31.9	19.9	8.1	67.0	88	48	2.8	19.4	16.2	3.8	2
43	Oct 22-28	30.7	16.0	8.3	0.0	87	41	1.4	14.5	12.6	2.7	0
Total rainfall					719.4	Total rainy days						
						46						

Table 4.2.6: PP2 Weekly Per cent disease index (PDI) of anthracnose (%) in trap nursery during Kharif 2021 at Indore centre

SMW	Month and date	NRC7	JS 9560	JS 9305	PK 472	Shivalik	JS 335	Monetta	Punjab 1	PK 262
26	25-6-2021 to 1-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	2-7-2021 to 8-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	9-7-2021 to 15-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	16-7-2021 to 22-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	23-7-2021 to 29-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	30-7-2021 to 5-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	6-8-2021 to 12-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	13-8-2021 to 19-8-2021	11.11	23.12	23.12	11.11	11.11	11.11	11.11	11.11	11.11
34	20-8-2021 to 26-8-2021	16.11	25.12	25.12	16.11	16.11	16.11	16.11	16.11	16.11
35	27-8-2021 to 2-9-2021	22.23	30.12	30.12	22.23	22.23	22.23	22.23	22.23	22.23
36	3-9-2021 to 9-9-2021	22.23	35.12	35.12	25.23	35.12	35.12	25.23	25.23	25.23
37	10-9-2021 to 16-9-2021	22.23	35.12	35.12	25.23	35.12	35.12	25.23	25.23	25.23
38	17-9-2021 to 23-9-2021	25.23	38.12	35.12	25.23	38.26	38.26	27.66	27.66	27.66
39	24-9-2021 to 30-9-2021	27.32	-	-	27.32	38.26	45.12	29.66	29.66	29.66
40	1-10-2021 to 7-10-2021	29.66	-	-	29.66	38.26	45.66	29.66	29.66	29.66

Table 4.2.7: Weekly Per cent incidence of CR disease in trap nursery during Kharif 2021 at Indore centre

SMW	Month and date	NRC7	JS 9560	JS 9305	PK 472	Shivalik	JS 335	Monetta	Punjab 1	PK 262
26	25-6-2021 to 1-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	2-7-2021 to 8-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	9-7-2021 to 15-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	16-7-2021 to 22-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	23-7-2021 to 29-7-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	30-7-2021 to 5-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	6-8-2021 to 12-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	13-8-2021 to 19-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	20-8-2021 to 26-8-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	27-8-2021 to 2-9-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	3-9-2021 to 9-9-2021	12.12	12.12	12.12	0.00	22.12	23.12	0.00	0.00	0.00
37	10-9-2021 to 16-9-2021	28.32	22.12	32.12	0.00	45.56	55.12	0.00	0.00	0.00
38	17-9-2021 to 23-9-2021	39.66	35.12	55.12	65.23	65.12	72.12	22.66	22.66	27.66
39	24-9-2021 to 30-9-2021	47.56	-	-	27.32	72.12	72.12	25.23	25.23	27.66
40	1-10-2021 to 7-10-2021	69.66	-	-	29.66	72.12	72.12	25.23	25.23	27.66

Table 4.2.8. Weather parameters during cropping season of Kharif, 2021 at Indore

Weather report 1st January 2021 to 31st December 2021							
	Weekly Date	Temp (0C)		RH (%)		Rainfall (mm)	Rainy Days
MW		Tmin.	Tmax.	RHI	RHII		
26	25-6-2021 to 1-7-2021	22.1	34.6	80.7	75.4	29.2	3
27	2-7-2021 to 8-7-2021	23.9	36.0	66.4	52.7	1.6	0
28	9-7-2021 to 15-7-2021	21.5	32.2	88.9	80.0	70	4
29	16-7-2021 to 22-7-2021	21.9	31.1	84.0	82.3	26.4	2
30	23-7-2021 to 29-7-2021	20.7	28.8	89.7	83.9	77	3
31	30-7-2021 to 5-8-2021	20.7	28.9	86.9	77.4	6.8	0
32	6-8-2021 to 12-8-2021	21.7	32.7	78.1	68.3	0.8	0
33	13-8-2021 to 19-8-2021	21.2	33.4	84.3	73.7	83.2	3
34	20-8-2021 to 26-8-2021	21.0	33.2	91.4	74.9	10.6	2
35	27-8-2021 to 2-9-2021	15.1	23.5	63.1	59.0	74.8	3
36	3-9-2021 to 9-9-2021	20.7	32.0	93.7	82.3	213.4	6
37	10-9-2021 to 16-9-2021	21.0	31.0	90.9	83.0	63.2	4
38	17-9-2021 to 23-9-2021	20.7	31.4	93.1	77.6	12.8	2
39	24-9-2021 to 30-9-2021	20.6	31.7	95.4	90.0	77.2	4
40	1-10-2021 to 7-10-2021	20.6	33.2	92.0	82.0	114.4	3

Table 4.2.9: Weekly Per cent incidence of RAB disease in trap nursery during Kharif 2021 at Pantnagar centre

SMW*	RAB PDI (%) at WAS														
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
JS-95-60	0	0	0	0	0	0	0	5	8.45	14	22	32.5	37	43	44.68
JS 335	0	0	0	0	0	0	3	7.5	13	22.5	38.25	47.5	55	60.25	62.98
Shivalik	0	0	0	0	0	3.75	12.25	15.75	17.75	18.5	23.5	28.5	34.75	38.01	39.12
JS 93-05	0	0	0	0	0	0	3.5	7.5	11.75	13.5	19.33	26.6	35	40	41.9
Punjab 1	0	0	0	0	0	5.57	9.54	12.45	17.33	24.5	31	38.5	48.5	60	64.08
PK 472	0	0	0	0	0	3.15	7.5	17.5	20.25	25	36	29	38	43	45.25
Bragg	0	0	0	0	0	2.25	5	16.5	21.33	22	30	41.5	50.5	56	57.33
Monetta	0	0	0	0	0	1.34	3.65	5.35	7.5	10.5	13	22.75	29.5	34.5	36
NRC 7	0	0	0	0	0	3.5	5.4	8.5	12.5	16	22.59	31.75	39.85	45	46.68
PK 262	0	0	0	0	0	1.15	3.5	5.25	7.35	11.33	19.45	25.25	31	35	37.2

* Standard meteorological week

Table 4.2.10: Weekly Per cent disease incidence of YMV disease in trap nursery during Kharif 2021 at Pantnagar centre

SMW*	SYMV PDI (%) at WAS														
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
JS-95-60	0	0	0	0	1.21	5.8	6.5	7.2	8.5	11.2	13.5	15.8	17.5	18.2	19.43
JS 335	0	0	0	0	0	1	1.35	2.5	3.17	4.4	5.21	7.29	9.33	10.5	11.3
Shivalik	0	0	0	0	1.02	1.24	1.85	2.5	2.95	3.5	4.2	5.9	7.5	7.98	8.17
JS 93-05	0	0	0	0	1.76	3.37	5.5	8.5	10.5	13.9	17.54	20.15	24.5	26	27.58
Punjab 1	0	0	0	0	4.45	9.5	12.5	15.5	18.33	22.35	29.5	38	49.5	50.5	52.63
PK 472	0	0	0	0	2.85	6.9	8.5	13.5	20.75	24	26.75	30.25	33.33	33.85	34.17
Bragg	0	0	0	0	2.18	5.5	7.5	9.5	13.5	19	25.33	28.5	30	32.5	33.75
Monetta	0	0	0	0	1.14	1.45	2.15	3.58	5.25	7.5	10.75	12.5	13.75	14.01	14.91
NRC 7	0	0	0	0	2.25	3.5	3.7	4.8	5.33	7.12	9.5	11.12	13	13.85	14.25
PK 262	0	0	0	0	3.25	6.5	10.5	13.5	19	25	36.45	38	39.75	40.5	41.38

Table 4.2.11: Weekly Per cent incidence of charcoal rot (%) in trap nursery during Kharif 2021 at Amravati centre

SMMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 02-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Sept 10-16	0.00	0.00	18.55	0.00	0.00	0.00	5.88	0.00	0.00	0.00
38	Sept 17-23	2.11	0.00	23.88	0.00	0.00	0.00	20.33	0.00	0.00	0.00
39	Sept 24-30	4.33	0.00	46.01	0.00	0.00	2.33	40.24	0.00	0.00	0.00

Table 4.2.12: Weekly Meteorological Data 2021-22 of during Kharif 2021 at Amravati centre

MW	Weekly Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Rainy Days
		T _{min.}	T _{max.}	RH _I	RH _{II}		
27	02.07.2021 to 08.07.2021	23.9	36.0	66.4	52.7	1.6	0
28	09.07.2021 to 15.07.2021	21.5	32.2	88.9	80.0	70.0	4
29	16.07.201 to 22.07.2021	21.9	31.1	84.0	82.3	26.4	2
30	23.07.2021 to 29.07.2021	20.7	28.8	89.7	83.9	77.0	3
31	30.07.2021 to 05.08.2021	20.7	28.9	86.9	77.4	06.8	0
32	06.08.2021 to 12.08.2021	21.7	32.7	78.1	68.3	0.8	0
33	13.08.2021 to 19.08.2021	21.2	33.4	84.3	73.7	83.2	3
34	20.08.2021 to 26.08.2021	20.0	33.2	91.4	74.9	10.6	2
35	27.08.2021 to 02.09.2021	15.1	23.5	63.1	59.0	74.8	3
36	03.09.2021 to 09.09.2021	20.7	32.0	93.7	82.3	213.4	6
37	10.09.2021 to 16.09.2021	21.0	31.0	90.9	83.0	63.2	4
38	17.09.2021 to 23.09.2021	20.7	31.4	93.1	77.6	12.8	2
39	24.09.2021 to 30.09.2021	20.6	31.7	95.4	90.0	77.2	4
40	01.10.2021 to 07.10.2021	20.6	33.2	92.0	82.0	114.4	3

Table 4.2.13: Weekly Per cent incidence of Target leaf spot (%) in trap nursery during Kharif 2021 at Sehore centre

SMW	Month and date	JS 335	PK 472	Shivalk	Monetta	NRC 7	Punjab 1	JS 93-05
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	-0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3-9	0.00	11.11	0.00	5.555	3.66	11.11	3.66
37	Sept 10-16	0.00	13.33	0.00	8.888	0.33	16.66	17.77
38	Sept 17-23	0.00	18.44	0.00	7.9992	6.11	7.99	17.77
39	Sept 24-30	29.99	22.22	7.99	18.4426	28.33	29.99	16.55
40	Oct 1-6	56.66	67.77	51.10	56.661	62.21	57.77	59.8

Table 4.2.14: Weekly Meteorological Data 2021-22 of during Kharif 2021 at Sehore centre

Standard Week no.	Week	Temperature °C		Rainfall (mm)	No of rainy days	RH
		Max	Min			
27	2-8 July	36.07	24.93	0	0	93
28	9-15	35.89	26.16	13	1	93
29	16-22	35.43	25.16	0	0	93
30	23-29	27.81	22.5	188.6	7	93
31	30-5 Aug	27.29	24.14	89.6	6	100
32	6-12	32.26	24.33	81.5	4	100
33	13-19	32.64	26.66	13.9	2	100
34	20-26	29.4	24.5	53.5	3	100
35	27-2	31.67	25.03	64.5	3	100
36	3-9 Sep	34.43	26.09	68.5	4	99
37	10-16	35.2	25.57	74.3	4	99
38	17-23	32.11	24.21	35.4	4	99
39	24-30	31.3	25.6	0	0	99
40	1-7 Oct	33.8	25.6	0	0	62
41	8-14	33.9	22.5	0	0	62
	Week		Total	992.6	51	

Table 4.2.15: PP2 Weekly Per cent disease index of frogeye leaf spot in trap nursery during Kharif 2021 at Palampur centre

SMW	Month and date	JS 335	Shivalik	Monetta	NRC 7	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.5	4.81	0.00	0.00	0.00	0.00	0.00	5.55
34	Aug 20-26	5.55	12.59	2.33	0.00	1.00	5.55	0.55	11.11
35	Aug 27 –Sept 2	11.11	24.44	11.11	0.00	5.55	13.33	5.55	16.66
36	Sept 3-9	24.44	32.59	26.66	5.55	16.66	24.44	11.11	24.44
37	Sept 10-16	30.00	42.22	33.33	8.88	24.44	33.33	16.66	36.66
38	Sept 17-23	38.66	68.89	44.44	10.33	26.66	55.55	24.44	48.88
39	Sept 24-30	55.55	82.22	55.55	11.11	30.00	66.66	26.66	55.55
40	Oct 1-7	55.55	86.66	55.55	11.11	30.00	66.66	33.33	77.77

Table 4.2.16: Weekly Per cent disease index (PDI) of anthracnose/pod blight of soybean in trap nursery during Kharif 2021 at Palampur centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	1.33	0.50
33	Aug 13-19	0.50	0.00	0.50	0.00	1.66	0.00	1.55	1.66	3.33	3.33
34	Aug 20-26	5.55	0.00	3.33	1.66	5.55	0.50	5.55	3.33	6.33	11.11
35	Aug 27 -Sept 2	11.11	3.33	11.11	3.66	8.66	3.66	11.11	5.55	8.66	16.66
36	Sept 3-9	16.66	5.55	16.66	6.66	11.66	6.66	18.66	6.66	26.64	26.64
37	Sept 10-16	24.44	8.33	26.64	8.66	16.66	8.66	26.66	8.66	24.66	28.88
38	Sept 17-23	34.21	9.66	28.88	11.11	24.66	8.66	33.33	8.66	26.33	30.00
39	Sept 24-30	55.55	11.11	30.00	10.33	33.33	9.33	55.55	11.11	28.66	33.33
40	Oct 1-7	64.33	11.11	33.33	11.11	44.44	11.11	72.22	11.66	33.33	33.33

Table 4.2.17: Weather parameters during cropping season of Kharif, 2021 at Palampur

Standard Week	Date	Maximum Temp.	Minimum Temp.	Rainfall (mm)	Relative Humidity (%)	I	II	Wind Speed Km/h	Sunshine Hours	No. of Rainy Days
Palampur		(°C)	(°C)							
22-2021	28 May-3 June	29.57	17.47	22.00	68.43	52.71	6.41	7.79	04	
23-2021	4 June-10 June	29.93	20.01	78.00	63.43	56.14	5.73	6.43	01	
24-2021	11 June- 17 June	27.43	17.34	77.80	84.29	67.14	5.29	6.21	06	
25-2021	18 June- 24 June	28.64	18.59	9.20	73.86	63.57	4.99	8.64	02	
26-2021	25 June-01 July	30.50	19.41	6.20	68.86	51.14	5.40	9.57	02	
27-2021	02 Jul-08 Jul	31.07	19.39	62.20	74.71	52.71	5.77	8.71	03	
28-2021	09 Jul- 15 Jul	27.79	18.77	559.00	93.00	75.86	5.20	4.86	07	
29-2021	16 Jul- 22 Jul	26.21	20.21	281.80	96.14	88.14	3.91	2.14	06	
30-2021	23 Jul- 29 Jul	25.91	20.77	174.40	97.57	91.00	3.24	1.29	07	
31-2021	30 Jul- 5 Aug	27.46	19.96	89.20	94.43	83.14	3.33	3.86	06	
32-2021	6 Aug- 12 Aug	27.07	19.34	85.60	90.57	85.43	3.26	4.14	06	
33-2021	13 Aug- 19 Aug	27.71	18.64	45.00	87.86	80.57	3.19	6.64	04	
34-2021	20 Aug- 26 Aug	25.50	20.46	66.40	92.57	88.86	2.47	2.00	06	
35-2021	27 Aug- 2 Sep	26.46	18.29	80.40	92.57	82.00	3.51	5.00	06	
36-2021	3 Sep- 9 Sep	26.36	19.03	180.60	96.29	85.14	2.86	3.00	04	
37-2021	10 Sep- 16 Sep	25.49	18.24	85.20	93.14	87.00	3.77	4.00	06	
38-2021	17 Sep- 23 Sep	26.50	18.91	86.40	94.86	83.43	3.41	4.57	07	
39-2021	24 Sep- 30 Sep	26.71	17.89	29.80	85.86	84.71	3.94	5.79	04	
40-2021	01 Oct- 07 Oct	25.86	16.50	55.00	88.71	77.86	4.29	4.86	03	
41-2021	08 Oct – 14 Oct	26.79	14.93	15.00	73.00	55.29	4.66	8.36	01	
42-2021	15 Oct- 21 Oct	25.91	13.93	4.20	77.00	62.86	4.37	7.43	02	
43-2021	22 Oct- 28 Oct	22.11	10.47	14.40	74.43	60.43	5.37	6.50	03	
44-2021	29 Oct- 4 Nov	22.46	9.27	0.00	65.29	52.57	5.61	8.50	00	

Table 4.2.18: PP2 Weekly Per cent incidence of collar rot (%) in trap nursery during Kharif 2021 at Jorhat centre

SMW	Month and date	JS 95-60	JS 335	Shivalik	JS93-05	Punjab 1	PK 472	Bragg	Monetta	NRC 7	PK 262
32	Aug 6- 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13- 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20- 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27- Sept 2	0.83	0.00	0.00	0.00	12.66	0.00	16.50	16.50	0.00	0.00
36	Sept 3- 9	0.83	0.00	0.00	8.30	12.66	0.00	16.50	16.50	0.00	0.00
37	Sept 10- 16	0.83	0.00	0.00	8.30	12.66	0.00	16.50	16.50	5.50	28.33
38	Sept 17- 23	0.83	0.00	4.00	8.30	25.00	4.10	16.50	16.50	5.50	28.33
39	Sept 24- 30	0.83	0.00	4.00	8.30	25.00	4.10	27.50	29.1	10.83	28.33
40	Oct 1- 7	12.5	0.00	4.00	8.30	25.00	4.10	27.50	29.1	10.83	28.33
41	Oct 8- 14	12.5	0.00	4.00	8.30	25.00	4.10	27.50	29.1	10.83	28.33
42	Oct 15-21	12.5	0.00	4.00	8.30	25.00	4.10	27.50	29.1	10.83	43.33
43	Oct 22- 28	12.5	0.00	4.00	14.16	25.00	4.10	27.50	29.1	10.83	43.33
44	Oct 29- Nov 4	12.5	0.00	29.00	14.16	25.00	4.10	27.50	-	10.83	43.33
45	Nov 5-11	12.5	0.00	29.00	14.16	25.00	4.10	27.50	-	10.83	43.33
46	Nov 12-18	12.5	0.00	29.00	14.16	25.00	4.10	27.50	-	10.83	43.33

Table 4.2.19: Weekly Per cent disease index (PDI) of RAB in trap nursery during Kharif 2021 at Jorhat centre

SM W	Month and date	JS 95- 60	JS 335	Shivailik	JS93-05	Punjab 1	PK 472	Bragg	Monetta	NRC 7	PK 262
32	Aug 6- 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13- 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20- 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27- Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3- 9	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00
37	Sept 10- 16	7.50	9.50	2.50	0.00	0.00	0.00	25.00	7.00	5.50	0.00
38	Sept 17- 23	7.50	9.50	2.50	9.16	34.53	0.00	25.00	7.00	16.50	0.00
39	Sept 24- 30	7.50	9.50	10.00	9.16	34.53	0.00	25.00	7.00	16.50	0.00
40	Oct 1- 7	12.5	9.50	10.00	9.16	34.53	19.16	25.00	32.50	16.50	0.00
41	Oct 8- 14	12.5	22.00	10.00	16.33	34.53	19.16	33.60	32.50	16.50	25.83
42	Oct 15-21	12.5	22.00	38.30	16.33	34.53	19.16	33.60	32.50	29.16	25.83
43	Oct 22- 28	12.5	22.00	38.30	16.33	34.53	19.16	33.60	32.50	29.16	25.83
44	Oct 29- Nov 4	12.5	36.94	38.30	16.33	55.00	19.16	33.60	32.50	29.16	25.83
45	Nov 5-11	12.5	36.94	38.30	16.33	55.00	19.16	33.60	32.50	29.16	25.83
46	Nov 12-18	12.5	36.94	38.30	16.33	55.00	19.16	33.60	32.50	29.16	25.83

Table 4.2.20: Weekly Per cent disease index (PDI) of Anthracnose/Pb in trap nursery during Kharif 2021 at Jorhat centre

SMW	Month and date	JS 95-60	JS 335	Shivalik	JS93-05	Punjab 1	PK 472	Bragg	Monetta	NRC 7	PK 262
32	Aug 6- 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13- 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20- 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27- Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3- 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Sept 10- 16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	Sept 17- 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	Sept 24- 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	Oct 1- 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	Oct 8- 14	0.00	0.00	0.00	0.00	26.66	0.00	0.00	0.00	0.00	0.00
42	Oct 15-21	11.94	0.00	0.00	0.00	26.66	17.50	21.94	16.66	21.66	42.22
43	Oct 22- 28	11.94	9.16	0.00	34.60	26.66	17.50	21.94	16.66	21.66	42.22
44	Oct 29- Nov 4	19.52	19.52	16.66	34.60	26.66	17.50	21.94	36.70	45.83	42.22
45	Nov 5-11	19.52	20.83	16.66	82.50	26.66	17.50	31.60	36.70	45.83	56.66
46	Nov 12-18	19.52	20.83	16.66	82.50	26.66	17.50	31.60	36.70	45.83	56.66

Table 4.2.21 Weekly Per cent disease index (PDI) of Mosaic in trap nursery during Kharif 2021 at Jorhat centre

SMW	Month and date	JS 95-60	JS 335	Shivalik	JS93-05	Punjab 1	PK 472	Bragg	Monetta	NRC 7	PK 262
32	Aug 6- 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13- 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20- 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27- Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	11.11	11.11	0.00	0.00
36	Sept 3- 9	0.00	0.00	0.00	0.00	0.00	11.28	11.11	11.11	8.33	0.00
37	Sept 10- 16	0.00	0.00	0.00	0.00	0.00	11.28	11.11	11.11	8.33	0.00
38	Sept 17- 23	0.00	3.60	0.00	0.00	9.16	11.28	11.11	11.11	8.33	10.95
39	Sept 24- 30	6.94	3.60	0.00	0.00	9.16	11.28	11.11	11.11	8.33	10.95
40	Oct 1- 7	6.94	3.60	0.00	0.00	9.16	11.28	0.00	0.00	8.33	10.95
41	Oct 8- 14	6.94	10.00	0.50	0.50	9.16	11.28	0.00	0.00	8.33	10.95
42	Oct 15-21	6.94	10.00	0.50	0.50	9.16	0.00	0.00	0.00	0.00	0.00
43	Oct 22- 28	8.60	10.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
44	Oct 29- Nov 4	8.60	10.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
45	Nov 5-11	8.60	10.00	12.50	12.50	0.00	0.00	0.00	0.00	0.00	0.00
46	Nov 12-18	8.60	10.00	12.50	12.50	0.00	0.00	0.00	0.00	0.00	0.00

Table 4.2.22 Weather parameters during cropping season of Kharif, 2021 at Jorhat

SMW	Month and date	temperature		relative humidity (%)		rainfall (mm)
		Max	Min	Morning	Evening	
32	Aug 6- 12	34.5	25.3	91.28	70.57	16.2
33	Aug 13- 19	32.4	25.2	91.85	82.00	7.9
34	Aug 20- 26	32.2	24.8	94.85	80.85	2.9
35	Aug 27- Sept 2	31.1	24.2	94.85	81.42	4.6
36	Sept 3- 9	33.7	24.3	94.00	72.00	2.4
37	Sept 10- 16	35.6	25.4	91.28	61.57	0.4
38	Sept 17- 23	32.0	23.8	95.85	73.00	3.4
39	Sept 24- 30	34.2	24.2	94.42	64.28	6.5
40	Oct 1- 7	32.7	23.9	92.85	72.71	0.5
41	Oct 8- 14	34.5	24.3	94.281	66.14	3.2
42	Oct 15-21	33.8	24.1	94	73.00	8.9
43	Oct 22- 28	30.2	20.5	96.28	63.00	2.4
44	Oct 29- Nov 4	30.1	18.1	96.00	58.00	2.1
45	Nov 5-11	29.6	14.5	96.28	53.53	0.0
46	Nov 12-18	29.2	14.4	97.14	55.00	0.0

Table 4.2.23: PP2 : Weekly Per cent Disease Index(PDI) Rust in trap nursery during Kharif 2021 at Dharwad centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	5.55	4.55	3.55	3.42	3.33	3.55	4.55	4.55	5.05	4.12
34	Aug 20-26	11.11	11.11	11.11	11.11	11.11	8.88	10.13	10.13	11.11	10.16
35	Aug 27 –Sept 2	35.76	28.43	26.12	22.42	24.52	23.12	22.12	22.12	19.30	20.12
36	Sept 3-9	40.28	38.33	36.13	30.12	28.13	30.89	32.65	32.65	29.12	30.42
37	Sept 10-16	45.37	42.12	41.11	36.12	33.12	31.25	38.24	38.24	33.41	40.25
38	Sept 17-23	48.12	46.75	44.73	44.25	40.56	39.05	41.45	41.45	39.18	48.25
39	Sept 24-30	62.21	48.13	52.17	63.18	58.45	53.25	55.26	55.26	56.21	59.35
40	1 - 7 Oct	76.45	69.42	76.81	75.55	63.18	69.14	63.12	63.12	67.92	68.95
41	8 - 14 Oct	91.83	87.77	86.67	79.93	86.63	87.77	87.73	87.73	89.60	86.60

Table 4.2.24: PP2 : Weekly Per cent Disease Index (PDI) Pod blight in trap nursery during Kharif 2021 at Dharwad centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Sept 10-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	Sept 17-23	1.92	2.65	6.50	4.25	3.12	3.52	11.11	7.56	11.11	3.14
39	Sept 24-30	4.66	6.76	9.12	8.65	6.62	8.12	18.88	16.76	18.19	16.23
40	1 - 7 Oct	18.78	20.72	22.65	11.43	18.76	16.76	21.05	27.88	25.67	33.46
41	8 - 14 Oct	53.32	38.37	45.78	24.43	44.30	42.68	51.84	48.88	51.84	42.08

Table 4.2.25: Weather parameters during cropping season of Kharif, 2021 at Dharwad

Standard Weeks	Months & dates	Temperature		Rain fall (mm)	Relative humidity %		No. of rainy days
		Max.	Min.		Max.	Eve.	
29	July 16-22	25.7	20.7	44.0	91.4	88.6	5
30	July 23-29	26.1	20.4	104.6	91.4	86.9	3
31	July 30- Aug 5	27.0	20.7	16.4	91.7	87.1	3
32	Aug 6-12	29.2	20.8	12.3	88.6	83.0	2
33	Aug 13-19	26.8	20.1	14.0	90.4	90.3	3
34	Aug 20-26	29.0	20.2	11.0	88.7	81.3	1
35	Aug 27-Sept 2	28.2	20.6	26.6	88.0	79.1	2
36	Sept 3-9	27.5	20.5	11.4	90.9	79.6	2
37	Sept 10-16	27.1	21.0	16.6	92.4	85.6	3
38	Sept 17-23	29.1	20.3	0.0	88.6	70.9	0
39	Sept 24-30	28.0	20.3	19.4	88.4	78.3	2
40	Oct 1-7	30.9	21.1	39.8	87.0	80.1	4
41	Oct 8-14	29.2	20.9	25.0	91.4	75.3	2
42	Oct 15-21	30.6	19.6	0.0	83.0	60.6	0
43	Oct 22-28	29.8	18.5	33.4	76.7	62.3	1
Total rainfall				374.5	Total rainy days		33

Table 4.2.26: Weekly Per cent disease index (PDI) of Rust at Medziphema Centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	6.66	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	7.22	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	7.22	0.00	0.00	0.00	3.33	0.00	0.00
36	Sept 3-9	0.00	0.00	0.00	7.22	0.00	0.00	0.00	5.55	0.00	0.00
37	Sept 10-16	0.00	0.00	0.00	8.44	0.00	0.00	0.00	7.77	7.77	0.00
38	Sept 17-23	0.00	0.00	0.00	10.11	0.00	0.00	0.00	8.88	13.11	0.00
39	Sept 24-30	0.00	0.00	0.00	12.44	0.00	0.00	0.00	11.88	15.22	0.00
40	Oct 1-7	0.00	0.00	0.00	18.88	0.00	0.00	0.00	17.77	17.66	0.00
41	Oct 8-14	0.00	0.00	0.00	32.99	0.00	0.00	0.00	35.55	19.22	0.00
42	Oct 15-21	0.00	0.00	0.00	34.55	0.00	0.00	0.00	29.22	26.33	0.00
43	Oct 22-28	0.00	0.00	0.00	33.22	0.00	0.00	0.00	27.77	32.11	0.00
44	Oct 29- Nov 4	0.00	0.00	0.00	28.22	0.00	0.00	0.00	22.22	19.22	0.00
45	Nov 5 - 11	0.00	0.00	0.00	23.11	0.00	0.00	0.00	19.88	18.11	0.00

Table 4.2.27: Weekly Per cent disease index (PDI) of RAB at Medziphema Centre

SMW	Month and date	JS 335	PK 472	Shivailk	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3-9	0.00	25.22	32.22	7.77	0.00	16.22	1.11	9.22	1.11	9.99
37	Sept 10-16	0.00	31.22	35.55	11.22	3.33	21.33	1.11	23.33	2.22	14.55
38	Sept 17-23	0.00	55.55	39.44	22.22	9.66	26.77	4.44	33.22	6.77	25.66
39	Sept 24-30	8.88	63.22	57.77	28.77	17.88	42.77	5.55	53.22	8.22	29.21
40	Oct 1-7	14.33	65.55	69.88	38.22	25.55	56.44	6.66	57.66	13.22	54.33
41	Oct 8-14	22.22	65.77	72.11	36.55	29.66	55.22	7.44	68.77	23.22	57.66
42	Oct 15-21	25.33	66.55	70.22	34.45	34.22	45.33	5.55	61.11	25.22	61.22
43	Oct 22-28	18.22	63.33	67.88	31.22	27.44	42.11	3.33	53.11	17.11	58.33
44	Oct 29- Nov 4	12.44	54.33	58.66	22.77	22.99	32.00	0.00	44.44	11.11	32.77
45	Nov 5 - 11	11.11	50.99	52.11	20.11	18.99	27.55	0.00	39.11	11.22	22.11
	Mean	5.92	28.51	29.25	13.33	9.99	19.25	1.85	23.33	6.29	19.25

Table 4.2.28: Weekly Per cent disease index (PDI) of Anthracnose/Pod blight at Medziphema Centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.77	0.00
33	Aug 13-19	0.00	0.00	39.88	73.44	0.00	0.00	33.44	0.00	76.55	34.22
34	Aug 20-26	0.00	28.44	56.99	86.11	22.33	23.55	45.88	12.22	82.33	45.77
35	Aug 27 –Sept 2	1.11	45.44	59.77	89.99	23.55	48.77	45.77	20.11	83.44	55.88
36	Sept 3-9	12.11	65.33	71.22	91.44	45.66	63.33	51.88	21.00	94.55	72.77
37	Sept 10-16	13.44	78.66	74.33	92.88	45.99	65.77	54.77	40.11	95.66	74.66
38	Sept 17-23	16.33	76.44	75.44	94.88	46.77	66.77	55.55	50.33	96.55	81.22
39	Sept 24-30	16.77	74.55	86.33	95.66	48.22	67.55	57.88	51.22	96.77	84.33
40	Oct 1-7	17.22	67.99	89.44	96.23	49.33	68.66	58.77	53.22	97.55	85.33
41	Oct 8-14	23.55	63.11	94.22	97.66	76.44	75.44	66.66	60.55	98.55	87.66
42	Oct 15-21	26.66	60.11	95.22	97.88	78.22	76.55	70.11	60.99	97.44	88.44
43	Oct 22-28	23.88	55.66	92.11	96.88	72.44	77.33	67.55	61.22	97.11	73.22
44	Oct 29- Nov 4	19.88	52.99	89.22	95.11	67.66	77.55	65.44	59.33	97.11	70.22
45	Nov 5 - 11	18.77	48.99	88.99	94.88	56.44	69.66	64.99	58.33	97.11	64.33
	Mean	9.99	37.77	53.32	63.32	33.32	41.10	38.88	28.88	66.66	48.32

Table 4.2.29: Weather parameters during cropping season of Kharif, 2021 at Medziphema

Week No.	Temperature		Relative humidity		Rainfall (mm)	No. of rainy days
	Max	Min	Max	Min		
27	33.2	24.7	89	73	19.2	2
28	32.4	24.7	93	70	105.7	5
29	33.7	24.7	95	70	53.3	2
30	34.5	24.9	90	70	74.9	2
31	32.3	25.1	92	78	34.0	3
32	33.2	24.5	93	68	25.2	3
33	32.5	24.9	96	77	41.8	2
34	32.4	24.3	92	68	7.0	0
35	32.3	24.3	93	73	52.8	4
36	33.2	24.0	95	68	49.1	3
37	33.8	23.9	94	68	42.2	1
38	32.1	23.3	94	68	13.1	2
39	33.7	23.8	93	66	8.1	2
40	32.3	23.1	94	71	5.0	1
41	33.9	23.6	92	63	53.8	2
42	33.3	23.6	95	70	69.1	3
43	30.0	19.0	97	72	2.1	0
44	30.0	19.1	95	58	0.0	0
45	29.5	15.2	96	49	0.0	0
Total					656.4	37

Table 4.2.30: Weekly percent incidence of Frog eye leaf spot in trap nursery during Kharif 2021 at Almora centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	11.11	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	11.11	11.11	33.33	0.00	11.11	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	11.11	33.33	55.55	11.11	11.11	0.00	0.00	11.11	11.11	11.11
36	Sept 3-9	11.11	33.33	55.55	11.11	11.11	11.11	0.00	11.11	11.11	11.11
37	Sept 10-16	33.33	33.33	55.55	33.33	33.33	11.11	11.11	11.11	11.11	11.11
38	Sept 17-23	33.33	55.55	77.77	33.33	33.33	11.11	11.11	33.33	11.11	33.33
39	Sept 24-30	33.33	55.55	77.77	33.33	33.33	11.11	11.11	33.33	11.11	33.33
40	Oct 1-7	33.33	55.55	77.77	33.33	33.33	11.11	11.11	33.33	11.11	33.33

Table 4.2.31: Weekly percent incidence of Pod blight (Ct) in trap nursery during Kharif 2021 at Almora centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Sept 3-9	0.00	0.00	11.11	11.11	0.00	11.11	0.00	0.00	11.11	0.00
37	Sept 10-16	0.00	11.11	33.33	33.33	11.11	11.11	11.11	11.11	11.11	11.11
38	Sept 17-23	11.11	33.33	33.33	55.55	11.11	33.33	33.33	11.11	33.33	33.33
39	Sept 24-30	11.11	33.33	33.33	55.55	11.11	55.55	33.33	11.11	33.33	33.33
40	Oct 1-7	11.11	33.33	33.33	55.55	11.11	55.55	33.33	11.11	33.33	33.33

Table 4.2.32: Weekly percent incidence of Bacterial pustule in trap nursery during Kharif 2021 at Almora centre

SMW	Month and date	JS 335	PK 472	Shivalik	Monetta	NRC 7	PK 262	JS 95-60	Punjab 1	JS 93-05	Bragg
27	July 2-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	July 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	July 16-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	July 23-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	July 30- Aug 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Aug 6-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Aug 13-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Aug 20-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Aug 27 –Sept 2	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00
36	Sept 3-9	0.00	11.11	11.11	11.11	0.00	11.11	11.11	11.11	0.00	0.00
37	Sept 10-16	11.11	11.11	11.11	11.11	11.11	11.11	33.33	11.11	0.00	11.11
38	Sept 17-23	11.11	33.33	11.11	11.11	11.11	33.33	33.33	11.11	0.00	11.11
39	Sept 24-30	11.11	33.33	11.11	11.11	11.11	33.33	55.55	11.11	0.00	11.11
40	Oct 1-7	11.11	33.33	11.11	11.11	11.11	33.33	55.55	11.11	0.00	11.11

Table 4.2.33: Climatic data (Year 2021) of Experimental Station Hawalbagh of ICAR-VPKAS Almora

Standard Weeks	Months & dates	Temperature			Sun shine Hrs.	Rain fall (mm)	No. of rainy days	Relative humidity %			Evaporation (mm)
		Max.	Min.	Aver.				Mor.	Eve.	Average	
22	May 28-3 June	29.9	15.2	22.5	8.21	35	3	80.5	48.1	64.3	29.8
23	June 4-10	30.9	17.3	24.1	6.32	31	2	85.1	52.7	68.9	29.5
24	June 11-17	29.4	18.4	23.9	7.32	133	6	85.7	60.9	73.3	28.6
25	June 18-24	26.7	18.1	22.4	4.11	94.5	2	91.7	79.0	85.4	20.9
26	June 25-July 1	31.7	20.1	25.9	8.11	16.5	3	81.1	58.9	70.0	37.3
27	July 2-8	32.6	20.4	26.5	8.14	0	0	85.9	47.6	66.7	38.8
28	July 9-15	29.9	20.0	25.0	5.04	14.5	2	85.0	64.6	74.8	28.6
29	July 16-22	26.4	19.5	23.0	2.11	134	5	89.0	82.8	85.9	13
30	July 23-29	28.9	20.0	24.4	4.25	25.5	4	89.6	74.9	82.3	23.2
31	July 30- Aug 5	30.0	20.2	25.1	5.21	37.5	4	88.2	74.6	81.4	20.7
32	Aug 6-12	29.2	19.9	24.6	4.54	92.5	5	90.4	65.8	78.1	19.4
33	Aug 13-19	30.1	19.4	24.8	5.32	33.5	3	91.0	62.9	77.0	20.1
34	Aug 20-26	29.4	19.4	24.4	4.96	8	1	86.1	72.4	79.2	18.1
35	Aug 27-Sept 2	29.6	18.8	24.2	4.82	49.5	4	93.5	69.6	81.5	17.4
36	Sept 3-9	30.1	18.7	24.4	4.39	12	3	91.8	70.8	81.3	17.1
37	Sept 10-16	30.0	18.2	24.1	4.61	8.5	2	89.3	73.4	81.4	17.9
38	Sept 17-23	29.5	17.7	23.6	3.82	13.5	2	91.9	76.4	84.1	17.2
39	Sept 24-30	30.1	16.5	23.3	5.32	2	0	90.8	69.9	80.4	18.9
40	Oct 1-7	30.1	15.4	22.7	5.93	31	1	93.3	70.0	81.6	19.6
41	Oct 8-14	30.4	12.6	21.5	7.50	0	0	92.5	57.7	75.1	22.7
42	Oct 15-21	26.1	11.2	18.7	4.18	296	3	96.3	79.2	87.8	11.9
43	Oct 22-28	26.8	8.9	17.9	5.57	0	0	93.4	56.0	74.7	17.2

Table 4.3: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of Central zone

Entry	CR										Anthracnose														
	Amravati					Indore					Jabalpur					Indore					Jabalpur				
	R1	R2	Max Score	DR		R1	R2	Max Score	DR		R1	R2	Max Score	DR		R1	R2	Max Score	DR		R1	R2	Max Score	DR	
	IVT (Normal)																								
SKUAWSB.101	9	9	9	HS	3	9	9	9	HS	5	7	7	S	3	3	3	3	3	MR	3	5	5	5	MS	
KBS 21-1	0	0	0	HR	5	7	7	7	S	5	3	5	MS	3	3	3	3	3	MR	7	9	9	9	HS	
MAUS 818	0	0	0	HR	0	0	0	0	HR	0	0	0	HR	1	1	1	1	1	R	1	1	1	1	R	
MAUS 791	0	0	0	HR	9	3	9	9	HS	0	0	0	HR	3	1	3	3	3	MR	3	3	3	3	MR	
AMS 115	0	0	0	HR	0	0	0	0	HR	0	0	0	HR	3	3	3	3	3	MR	3	1	3	3	MR	
AMS1901	0	0	0	HR	9	3	9	9	HS	0	0	0	HR	1	1	1	1	1	R	1	0	1	1	R	
RVS 1320	0	0	0	HR	5	3	5	5	MS	0	0	0	HR	3	5	5	5	5	MS	3	0	3	3	MR	
RVS 1315	0	0	0	HR	3	3	3	3	MR	0	0	0	HR	3	3	3	3	3	MR	3	1	3	3	MR	
DLSb 3	0	0	0	HR	9	7	9	9	HS	7	5	7	S	3	3	3	3	3	MR	3	5	5	5	MS	
DLSb 4	9	9	9	HS	9	9	9	9	HS	9	7	9	HS	1	3	3	3	3	MR	7	5	7	7	S	
DSb39	9	9	9	HS	9	9	9	9	HS	7	5	7	S	3	3	3	3	3	MR	7	7	7	7	S	
AS 40	0	0	0	HR	0	0	0	0	HR	3	0	3	MR	3	1	3	3	3	MR	3	0	3	3	MR	
AS24	0	0	0	HR	3	0	3	3	MR	0	0	0	AR	5	3	5	5	5	MS	5	0	5	5	MS	
JS 23-08	3	3	3	MR	9	3	9	9	HS	3	0	3	MR	3	3	3	3	3	MR	3	3	3	3	MR	
JS 23-05	0	0	0	HR	0	0	0	0	HR	0	0	0	HR	3	3	3	3	3	MR	0	1	1	1	R	
DS 1312	0	0	0	HR	9	9	9	9	HS	7	9	9	HS	5	3	3	3	3	MR	0	3	3	3	MR	
DS3163	0	0	0	HR	9	9	9	9	HS	7	9	9	HS	9	7	9	9	9	HS	3	3	3	3	MR	
DS3168	0	0	0	HR	9	9	9	9	HS	5	9	9	HS	7	7	7	7	7	S	3	5	5	5	MS	
DS3124	0	0	0	HR	7	3	7	7	S	3	3	3	MR	1	1	1	1	1	R	5	3	3	3	MS	
SL 1282	0	0	0	HR	9	7	9	9	HS	0	3	3	MR	1	3	3	3	3	MR	3	1	3	3	MR	
SL 1230	9	9	9	HS	9	9	9	9	HS	9	9	9	HS	1	3	3	3	3	MR	3	1	3	3	MR	
HIMSO -1694	9	9	9	HS	9	9	9	9	HS	9	9	9	HS	5	9	9	9	9	HS	5	5	5	5	MS	

HIMSO -1693	9	9	9	HS	9	9	9	HS	7	5	7	S	7	5	7	S	7	5	7	S
VLS - 103	0	0	0	HR	9	9	9	HS	9	5	9	HS	5	5	5	MS	5	5	5	MS
VLS -102	7	9	9	HS	9	9	9	HS	5	3	5	MS	5	5	5	MS	5	5	5	MS
PS 1605	0	0	0	HR	0	0	0	HR	0	0	0	HR	1	3	3	MR	0	3	3	MR
PS 1689	0	0	0	HR	9	3	9	HS	0	0	0	HR	7	9	9	HS	0	0	0	HR
PS 1682	0	0	0	HR	3	0	3	MR	0	0	0	HR	3	1	3	MR	1	0	1	R
RSC 11-48	3	3	3	MR	3	0	3	MR	0	0	0	HR	3	1	3	MR	1	1	1	R
RSC 11-42	0	0	0	HR	9	3	9	HS	0	0	0	HR	3	1	3	MR	1	1	1	R
BAUS(M) -3	3	3	3	MR	9	3	9	HS	3	0	3	MR	1	1	1	R	5	3	5	MS
BAUS 116	0	0	0	HR	0	0	0	HR	0	3	3	MR	3	1	3	MR	1	1	1	R
CAUMS 2	0	0	0	HR	9	9	9	HS	9	5	9	HS	5	7	7	S	3	3	3	MR
NRC 195	0	0	0	HR	9	3	9	HS	3	0	3	MR	3	3	3	MR	1	1	1	R
NRC 203	0	0	0	HR	9	3	9	HS	0	0	0	HR	3	3	3	MR	5	3	5	MS
NRC 193	3	3	3	MR	3	0	3	MR	3	0	3	MR	1	1	1	R	0	1	1	R
NRC 192	0	0	0	HR	0	0	0	HR	0	0	0	HR	1	1	1	R	0	0	0	HR
NRC 191	0	0	0	HR	7	3	7	S	0	0	0	HR	3	3	3	MR	1	3	3	MR
NRC 190	0	0	0	HR	0	0	0	HR	0	0	0	HR	1	1	1	R	0	0	0	HR
NRC 189	0	0	0	HR	0	0	0	HR	0	0	0	HR	1	1	1	R	0	0	0	HR
RYSM 16-20	3	3	3	MR	0	0	0	HR	0	0	0	HR	3	3	3	MR	1	0	1	R
KDS 1175	9	9	9	HS	9	9	9	HS	7	5	7	S	1	1	1	R	7	9	9	HS
KDS 1187	0	0	0	HR	9	9	9	HS	5	7	7	S	3	5	5	MS	9	9	9	HS
KDS 1149	3	3	3	MR	9	7	9	HS	9	5	9	HS	1	3	3	MR	5	3	5	MS
MACS 1672	9	9	9	HS	9	3	9	HS	9	9	9	HS	1	3	3	MR	7	5	7	S
MACS 1735	0	0	0	HR	9	3	9	HS	0	0	0	HR	3	3	3	MR	9	7	9	HS
Asb 15	0	0	0	HR	9	5	9	HS	0	0	0	HR	3	3	3	MR	5	3	5	MS
TS 21-2	9	9	9	HS	9	9	9	HS	9	9	9	HS	7	5	7	S	3	5	5	MS
TS 21-1	0	0	0	HR	9	9	9	HS	9	9	9	HS	5	7	7	S	3	5	5	MS
LOKSOY -1	0	0	0	HR	9	9	9	HS	5	5	5	MS	5	5	5	MS	1	3	3	MR

KSS 204	0	0	0	HR	3	0	3	MR	0	0	0	HR	1	3	3	MR	1	3	3	MR
AVT I (Normal) and AVT II (Normal)																				
RVS 2011-10	0	0	0	HR	0	0	0	HR	0	0	0	HR	5	7	7	S	0	1	1	R
HIMSO 1689	0	0	0	HR	3	3	3	MR	3	3	3	MR	3	3	3	MR	1	1	1	R
JS 2172	0	0	0	HR	3	3	3	MR	0	0	0	HR	3	1	3	MR	0	0	0	HR
DLSb-1	3	3	3	MR	9	9	9	HS	0	0	0	HR	3	1	3	MR	0	0	0	HR
Breeder check																				
RVSM 2011-35	3	3	3	MR	5	3	5	MS	0	0	0	HR	5	3	5	MS	1	0	1	R
AMS 100-39	0	0	0	HR	9	7	9	HS	5	3	5	MS	1	3	3	MR	3	3	3	MR
RSC 10-52	0	0	0	HR	3	0	3	MR	3	0	3	MR	1	1	1	HR	5	3	5	MS
Pathological check																				
JS 95-60	0	0	0	HR	5	7	7	S	0	0	0	HR	3	3	3	MR	7	7	7	S
JS 335	0	0	0	HR	NG															

Table 4.3.1: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of Central zone

Entry	YMV										Target leaf spot				RAB				
	Jabalpur					Kota					Sethore				Jabalpur				
	R1	R2	Max Score	DR		R1	R2	Max Score	DR		R1	R2	Max Score	DR		R1	R2	Max Score	DR
IVT (N)																			
SKU/WSB.101	3	3	3	MR		NG			NG		3	3	3	MR	1	3	3		MR
KBS 21-1	7	7	7	S	5	1	5	MS	3	3	3	3	MR	3	3	3			
MAUS 818	9	9	9	HS	9	3	9	HS	3	3	3	3	MR	3	1	3			
MAUS 791	3	3	3	MR	0	0	0	HR	3	3	3	3	MR	3	3	3			
AMS 115	3	3	3	MR	0	1	1	R	3	3	3	3	MR	3	3	3			MR
AMS1901	3	3	3	MR	3	0	3	MR	3	3	3	3	MR	1	1	1			R
RVS 1320	3	0	3	MR	0	0	0	HR	3	3	3	3	MR	1	1	1			R
RVS 1315	0	0	0	HR	0	0	0	HR	3	3	3	3	MR	3	3	3			MR
DLsb 3	0	3	3	MR	1	1	1	R	3	3	3	3	MR	3	0	3			MR
DLsb 4	0	3	3	MR	5	3	5	MS	3	3	3	3	MR	3	3	3			MR
DSb39	3	5	5	MS	5	3	5	MS	3	3	3	3	MR	5	5	5			MS
AS 40	9	7	9	HS	9	9	9	HS	0	0	0	0	HR	5	3	5			MS
AS24	9	9	9	HS	3	5	5	MS	3	1	3	3	MR	5	3	5			MS
JS 23-08	0	3	3	MR	0	0	0	HR	3	3	3	3	MR	1	3	3			MR
JS 23-05	0	0	0	HR	3	0	3	MR	3	3	3	3	MR	3	1	3			MR
DS 1312	0	0	0	HR	0	0	0	HR	3	3	3	3	MR	5	3	5			MS
DS3163	0	3	3	MR	1	0	1	R	3	3	3	3	MR	7	5	7			S
DS3168	3	3	3	MR	3	0	3	MR	3	3	3	3	MR	3	5	5			MS
DS3124	1	0	1	R	0	0	0	HR	3	3	3	3	MR	3	5	5			MS
SL 1282	0	0	0	HR	0	0	0	HR	3	3	3	3	MR	3	3	3			MR
SL 1230	0	0	0	HR	0	0	0	HR	3	3	3	3	MR	5	3	5			MS
HIMSO -1694	3	3	3	MS	5	3	5	MS	3	3	3	3	MR	3	3	3			MR

HIMSO -1693	3	5	5	5	MS	5	0	5	MS	3	3	3	3	MR	5	5	5	MS
VLS - 103	9	7	9	3	HS	3	0	3	MR	3	3	3	3	MR	5	7	7	S
VLS -102	5	3	5	5	MS	5	3	5	MS	3	1	3	3	MR	5	3	5	MS
PS 1605	0	0	0	0	HR	0	3	3	MR	3	1	3	3	MR	1	3	3	MR
PS 1689	0	0	0	0	HR	0	0	0	HR	3	3	3	3	MR	1	1	1	R
PS 1682	3	0	3	0	MR	0	0	0	HR	3	1	3	3	MR	1	0	1	R
RSC 11-48	3	1	3	0	MR	0	0	0	HR	3	3	3	3	MR	3	0	3	MR
RSC 11-42	0	1	1	0	R	0	0	0	HR	3	3	3	3	MR	1	3	3	MR
BAUS(M) -3	9	9	9	9	HS	9	5	9	HS	3	3	3	3	MR	3	3	3	MR
BAUS 116	9	7	9	0	HS	0	5	5	MS	3	3	3	3	MR	3	0	3	MR
CAUMS 2	3	5	5	0	MS	0	3	3	MR	3	3	3	3	MR	5	5	5	MS
NRC 195	0	3	3	0	MR	0	0	0	HR	1	1	1	1	R	3	0	3	MR
NRC 203	3	3	3	5	MR	5	3	5	MS	3	3	3	3	MR	3	3	3	MR
NRC 193	3	3	3	3	MR	3	3	3	MR	3	1	3	3	MR	3	3	3	MR
NRC 192	3	3	3	0	MR	0	0	0	HR	3	3	3	3	MR	1	3	3	MR
NRC 191	5	5	5	0	MS	0	1	1	R	3	3	3	3	MR	3	3	3	MR
NRC 190	3	3	3	0	MR	0	0	0	HR	3	3	3	3	MR	3	0	3	MR
NRC 189	3	3	3	0	MR	0	3	3	MR	3	3	3	3	MR	1	0	1	R
RVSM 16-20	3	3	3	0	MR	0	0	0	HR	3	3	3	3	MR	3	0	3	MR
KDS 1175	5	3	5	9	MS	9	9	9	HS	3	3	3	3	MR	5	3	5	MS
KDS 1187	5	5	5	5	MS	5	5	5	MS	3	3	3	3	MR	3	3	3	MR
KDS 1149	7	9	9	9	HS	9	7	9	HS	3	3	3	3	MR	3	5	5	MS
MACS 1672	3	3	3	0	MR	0	0	0	HR	3	1	3	3	MR	3	3	3	MR
MACS 1735	5	5	5	5	MS	5	3	5	MS	3	3	3	3	MR	3	3	3	MR
Asb 15	3	3	3	0	MR	0	0	0	HR	3	3	3	3	MR	3	3	3	MR
TS 21-2	3	3	3	5	MR	5	7	7	S	3	3	3	3	MR	3	5	5	MS
TS 21-1	7	7	7	5	S	5	5	5	MS	3	3	3	3	MR	3	3	3	MR
LOKSOY -1	5	5	5	5	MS	5	5	5	MS	3	3	3	3	MR	3	3	3	MR
KSS 204	1	3	3	5	MR	5	3	5	MS	3	3	3	7	S	3	5	5	MS

AVT I (Normal) and AVT II (Normal)																			
RVS 2011-10	1	3	3	3	MR	0	0	0	HR	3	3	3	MR	1	1	1	R		
HIMSO 1689	5	7	7	S	3	3	3	MR	3	3	3	MR	3	3	3	MR			
JS 2172	3	0	3	MR	0	0	0	HR	3	1	3	MR	1	0	1	R			
DLsb-1	1	0	1	R	0	0	0	HR	3	3	3	MR	1	1	1	R			
Breeder check																			
RVSM 2011-35	0	0	0	HR	3	0	3	MR	3	3	3	MR	1	1	1	R			
AMS 100-39	3	3	3	MR	5	5	5	MS	3	1	3	MR	3	5	5	MS			
RSC 10-52	3	3	3	MR	9	9	9	HS	3	3	3	MR	3	3	3	MR			
Pathological check																			
JS 95-60	3	3	3	MR	0	0	0	HR	3	3	3	MR	3	3	3	MR			
JS 335	NG																		

Table 4.3.2: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of SZ

CODE	RUST				Pod blight				Purple seed stain			
	Dharwad				Kasbe-digraj				Dharwad			
	R 1	R 2	Max Score	DR	R1	R2	Max Score	DR	R 1	R 2	Max Score	DR (HR to HS)
SKUA-WSB.101	7	7	7	S				HS	5	5	5	MR
KBS 21-1	9	9	9	HS	5	5	5	MS	5	5	5	MR
MAUS 818	9	9	9	HS	9	9	9	HS	3	3	3	MR
MAUS 791	7	7	7	S	9	9	9	HS	3	3	3	MR
AMS 115	9	9	9	HS	9	9	9	HS	3	3	3	MR
AMS1901	9	9	9	HS	9	9	9	HS	3	3	3	MR
RVS 1320	7	7	7	S	9	9	9	HS	3	3	3	MR
RVS 1315	9	9	9	HS	7	7	7	S	3	3	3	MR
DLsb 3	5	5	5	MS	5	5	5	MS	3	3	3	MR
DLsb 4	5	5	5	MS	5	5	5	MS	3	3	3	MR
DSb39	3	3	3	MR	5	5	5	MS	3	3	3	MR
AS 40	9	9	9	HS	7	7	7	S	3	3	3	MR
AS24	7	7	7	S	9	9	9	HS	3	3	3	MR
JS 23-08	9	9	9	HS	9	9	9	HS	3	3	3	MR
JS 23-05	9	9	9	HS	9	9	9	HS	3	3	3	MR
DS 1312	9	9	9	HS	9	9	9	HS	3	3	3	MR
DS3163	9	9	9	HS	9	9	9	HS	3	3	3	MR
DS3168	9	9	9	HS	9	9	9	HS	3	3	3	MR
DS3124	7	7	7	S	9	9	9	HS	3	3	3	MR
SL 1282	9	9	9	HS	9	9	9	HS	1	1	1	R
SL 1230	9	9	9	HS	9	9	9	HS	3	3	3	MR

HIMSO -1694	9	9	9	9	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
HIMSO -1693	9	9	9	9	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
VLS - 103	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
VLS -102	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
PS 1605	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
PS 1689	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	1	1	1	R	3	3	MR
PS 1682	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
RSC 11-48	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
RSC 11-42	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
BAUS(M) -3	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	1	1	1	R	3	3	MR
BAUS 116	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	1	1	1	R	3	3	MR
CAUMS 2	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 195	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 203	5	5	5	MS	MS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 193	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 192	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 191	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	MR
NRC 190	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
NRC 189	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
RVSM 16-20	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
KDS 1175	9	9	9	HS	HS	5	5	5	5	MS	5	5	5	MS	3	3	3	MR	3	3	MR
KDS 1187	7	7	7	S	S	5	5	5	5	MS	5	5	5	MS	3	3	3	MR	3	3	MR
KDS 1149	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
MACS 1672	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
MACS 1735	7	7	7	S	S	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
Asb 15	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
TS 21-2	7	7	7	MS	MS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
TS 21-1	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR
LOKSOY -1	9	9	9	HS	HS	9	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	MR

KSS 204	9	9	9	HS	9	9	9	9	HS	5	5	5	5	5	MS	3	3	3	3	MR	3	3	3	MR
Breeder check																								
DSb 34	3	3	3	MR	7	7	7	7	S	3	3	3	3	3	MR	3	3	3	3	MR	3	3	3	MR
DSb 23	3	3	3	MR	7	7	7	7	S	3	3	3	3	3	MR	3	3	3	3	MR	3	3	3	MR
KDS 753	9	9	9	HS	9	9	9	9	HS	5	5	5	5	5	MS	3	3	3	3	MR	3	3	3	MR
Pathological Check																								
JS 335	9	9	9	HS	NG					5	5	5	5	5	MS	NG					3	3	3	MR
JS 93-05	9	9	9	HS	9	9	9	9	HS	5	5	5	5	5	MS	9	9	9	9	HS	3	3	3	MR

Table 4.3.3: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of NPZ

CODE	RAB			YMV						SMV		
	Pantnagar			Pantnagar			Ludhiana			Ludhiana		
	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR
SKU-A-WSB.101	1	3	3	MR	1	2	2	MR	3	3	3	MR
KBS 21-1	7	5	7	S	0	0	0	HR	3	3	3	MR
MAUS 818	5	3	5	MS	0	0	0	HR	5	5	5	MS
MAUS 791	0	0	0	HR	1	1	1	R	0	0	0	HR
AMS 115	3	3	3	MR	1	2	2	MR	5	7	7	S
AMS1901	1	1	1	R	1	3	3	MS	3	5	5	MS
RVS 1320	5	3	5	MS	0	0	0	HR	3	0	3	MR
RVS 1315	3	5	5	MS	0	0	0	HR	5	3	5	MS
DLsb 3	0	0	0	HR	0	0	0	HR	0	0	0	HR
DLsb 4	0	0	0	HR	0	1	1	R	0	1	1	R
DSb39	5	5	5	MS	0	1	1	R	3	5	5	MS
AS 40	1	1	1	R	0	0	0	HR	7	5	7	S
AS24	1	3	3	MR	0	0	0	HR	7	7	7	S
JS 23-08	7	9	9	HS	0	0	0	HR	1	3	3	MR
JS 23-05	0	0	0	HR	1	2	2	MR	1	3	3	MR
DS 1312	0	0	0	HR	0	0	0	HR	0	0	0	HR
DS3163	0	0	0	HR	1	1	1	R	1	0	1	R
DS3168	1	1	1	R	0	0	0	HR	0	1	1	R
DS3124	5	7	7	S	0	0	0	HR	0	0	0	HR
SL 1282	1	1	1	R	0	0	0	HR	0	0	0	HR
SL 1230	1	0	1	R	0	0	0	HR	1	1	1	R
HIMSO -1694	1	1	1	R	0	0	0	HR	5	3	5	MS
HIMSO -1693	5	3	5	MS	0	0	0	HR	5	5	5	MS

VLS - 103	0	0	0	HR	0	0	0	HR	5	5	5	MS	7	7	7	S
VLS -102	5	3	5	MS	0	0	0	HR	7	7	7	S	5	7	7	S
PS 1605	0	0	0	HR	1	3	3	MS	0	1	1	R	3	3	3	MR
PS 1689	5	3	5	MS	0	0	0	HR	1	3	3	MR	1	0	1	R
PS 1682	3	3	3	MR	0	0	0	HR	1	3	3	MR	3	3	3	MR
RSC 11-48	0	0	0	HR	0	0	0	HR	3	3	3	MR	1	3	3	MR
RSC 11-42	0	0	0	HR	0	0	0	HR	0	1	1	R	3	5	5	MS
BAUS(M) -3	5	5	5	MS	1	2	2	MR	3	5	5	MS	5	5	5	MS
BAUS 116	0	0	0	HR	2	3	3	MS	5	3	5	MS	7	5	7	S
CAUMS 2	0	0	0	HR	2	3	3	MS	3	5	5	MS	7	7	7	S
NRC 195	7	5	7	S	0	0	0	HR	1	0	1	R	5	5	5	MS
NRC 203	7	7	7	S	0	0	0	HR	5	3	5	MS	5	5	5	MS
NRC 193	3	5	5	MS	0	0	0	HR	5	3	5	MS	7	7	7	S
NRC 192	5	7	7	S	0	0	0	HR	5	5	5	MS	7	5	7	S
NRC 191	0	0	0	HR	0	0	0	HR	5	7	7	S	5	3	5	MS
NRC 190	0	0	0	HR	0	0	0	HR	3	5	5	MS	1	3	3	MR
NRC 189	7	5	7	S	0	0	0	HR	1	3	3	MR	3	1	3	MR
RVSM 16-20	3	5	5	MS	0	0	0	HR	5	3	5	MS	3	3	3	MR
KDS 1175	7	5	7	S	0	0	0	HR	5	5	5	MS	3	5	5	MS
KDS 1187	7	9	9	HS	3	4	4	S	7	5	7	S	7	5	7	S
KDS 1149	0	0	0	HR	1	2	2	MR	7	5	7	S	7	7	7	S
MACS 1672	5	3	5	MS	1	2	2	MR	5	4	5	MS	7	5	7	S
MACS 1735	5	5	5	MS	0	0	0	HR	4	5	5	MS	3	3	3	MR
Asb 15	5	3	5	MS	0	0	0	HR	3	5	5	MS	5	3	5	MS
TS 21-2	5	3	5	MS	0	0	0	HR	7	7	7	S	7	5	7	S
TS 21-1	3	3	3	MR	0	0	0	HR	7	7	7	S	7	5	7	S
LOKSOY -1	0	0	0	HR	2	3	3	MS	3	5	5	MS	7	5	7	S
KSS 204	3	5	5	MS	0	0	0	HR	3	3	3	MR	5	7	7	S

AVT I (Normal) and AVT II (Normal)																
NRC 149	0	0	0	HR	0	0	0	HR	5	5	5	MS	3	5	5	MS
PS 1670	5	7	7	S	0	0	0	HR	1	0	1	R	1	1	1	R
DS 9421	1	3	3	MR	0	0	0	HR	1	0	1	R	1	1	1	R
DS 9422	5	7	7	S	1	2	2	MR	1	1	1	R	1	1	1	R
Breeder check																
SL - 955	5	3	5	MS	0	0	0	HR	0	0	0	HR	1	1	1	R
SL -1074	3	3	3	MR	0	0	0	HR	3	1	3	MR	1	0	1	R
PS -26	5	5	5	MS	0	0	0	HR	1	0	1	R	1	1	1	R
Pathological check																
JS335	5	3	5	MS	0	0	0	HR	NG	NG	NG	-	NG	NG	NG	-
JS 93-05	0	0	0	HR	0	0	0	HR	5	3	5	MS	5	3	5	MS

Table 4.3.4: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of NHZ

	Frogeye leaf spot (<i>Cercosporasojina</i>)										Anthracnose					
	Palampur					Almora					Palampur					
CODE	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR
SKUAWSB.101	1	0	1	R	3	3	3	MR	3	7	7	S	3	7	7	S
KBS 21-1	5	3	5	MS	5	5	5	MS	5	3	5	MS	5	3	5	MS
MAUS 818	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR
MAUS 791	3	3	3	MR	1	1	1	R	3	5	5	MS	3	5	5	MS
AMS 115	5	5	5	MS	1	1	1	R	3	1	3	MR	3	1	3	MR
AMS1901	5	5	5	MS	1	3	3	MR	3	1	3	MR	3	1	3	MR
RVS 1320	5	3	5	MS	1	1	1	R	5	3	5	MS	5	3	5	MS
RVS 1315	5	3	5	MS	3	3	3	MR	7	5	7	S	7	5	7	S
DLSb 3	3	3	3	MR	5	5	5	MS	5	3	5	MS	5	3	5	MS
DLSb 4	3	3	3	MR	5	3	5	MS	7	5	7	S	7	5	7	S
DSb39	3	3	3	MR	3	3	3	MR	5	3	5	MS	5	3	5	MS
AS 40	3	1	3	MR	3	3	3	MR	0	0	0	HR	0	0	0	HR
AS24	5	7	7	S	3	3	3	MR	7	5	7	S	7	5	7	S
JS 23-08	5	5	5	MS	3	3	3	MR	5	3	5	MS	5	3	5	MS
JS 23-05	5	5	5	MS	7	7	7	S	9	7	9	HS	9	7	9	HS
DS 1312	5	7	7	S	7	7	7	S	3	1	3	MR	3	1	3	MR
DS3163	5	9	9	HS	7	7	7	S	0	0	0	HR	0	0	0	HR
DS3168	5	7	7	S	7	7	7	S	0	0	0	HR	0	0	0	HR
DS3124	7	7	7	S	5	5	5	MS	5	5	5	MS	5	5	5	MS
SL 1282	5	7	7	S	5	5	5	MS	0	0	0	HR	0	0	0	HR
SL 1230	7	5	7	S	5	7	7	S	5	3	5	MS	5	3	5	MS
HIMSO -1694	7	7	7	S	3	5	5	MS	5	5	5	MS	5	5	5	MS
HIMSO -1693	5	7	7	S	3	5	5	MS	5	3	5	MS	5	3	5	MS

VLS - 103	7	5	7	S	5	5	5	5	MS	3	3	3	MR
VLS -102	5	5	5	MS	5	3	5	5	MS	3	3	3	MR
PS 1605	1	0	1	R	1	1	1	1	R	5	3	5	MS
PS 1689	5	5	5	MS	3	3	3	3	MR	0	0	0	HR
PS 1682	5	5	5	MS	7	7	7	7	S	0	0	0	HR
RSC 11-48	5	3	5	MS	3	3	3	3	MR	5	3	5	MS
RSC 11-42	5	3	5	MS	1	1	1	1	R	5	3	5	MS
BAUS(M) -3	5	3	5	MS	3	3	3	3	MR	7	5	7	S
BAUS 116	5	3	5	MS	3	3	3	3	MR	3	1	3	MR
CAUMS 2	3	3	3	MR	5	5	5	5	MS	3	1	3	MR
NRC 195	9	5	9	HS	7	7	7	7	S	0	0	0	HR
NRC 203	3	3	3	MR	3	3	3	3	MR	5	5	5	MS
NRC 193	3	3	3	MR	3	3	3	3	MR	1	0	1	R
NRC 192	5	3	5	MS	3	3	3	3	MR	5	3	5	MS
NRC 191	3	3	3	MR	3	3	3	3	MR	7	9	9	HS
NRC 190	3	3	3	MR	5	5	5	5	MS	5	3	5	MS
NRC 189	5	5	5	MS	3	3	3	3	MR	5	3	5	MS
RVSM 16-20	5	5	5	MS	5	5	5	5	MS	1	3	3	MR
KDS 1175	5	3	5	MS	1	1	1	1	R	5	3	5	MS
KDS 1187	3	3	3	MR	3	3	3	3	MR	7	3	7	S
KDS 1149	1	3	3	MR	3	3	3	3	MR	0	0	0	HR
MACS 1672	3	3	3	MR	3	3	3	3	MR	5	3	5	MS
MACS 1735	3	5	5	MS	1	1	1	1	R	3	5	5	MS
Asb 15	3	3	3	MR	3	3	3	3	MR	7	7	7	S
TS 21-2	7	5	7	S	1	1	1	1	R	1	1	1	R
TS 21-1	7	5	7	S	7	7	7	7	S	0	0	0	HR
LOKSOY -1	0	1	1	R	5	5	5	5	MS	1	1	1	R
KSS 204	5	3	5	MS	1	1	1	1	R	1	0	1	R

AVT I (Normal) and AVT II (Normal)													
VLS 99	5	7	7	S	7	5	7	S	0	0	0	0	HR
Breeder check													
VLS 59	1	1	1	R	1	1	1	R	0	0	0	0	HR
VLS 89	5	3	5	MS	5	5	5	MS	3	3	3	3	MR
VLS 63	5	5	5	MS	5	5	5	MS	5	3	5	5	MS
Pathological check													
SHIVALIK	7	5	7	S	5	5	5	MS	7	7	7	7	S
VLS 2	1	3	3	MR	3	3	3	MR	3	1	3	3	MR

Table 4.3.5: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of NEHZ

	RAB										Anthracnose										Rust						YMV			
	Jorhat					Medziphema					Jorhat					Medziphema					Medziphema					Jorhat				
CODE	R1	R 2	Ma x Sc ore	DR	R 1	R 2	Ma x Sc ore	DR	R 1	R 2	Max Score	DR	R1	R 2	Max Score	DR	R 1	R 2	Max Score	DR	R 1	R 2	Max Score	DR	R2	Max Score	DR			
SKUA- WSB.101	0	0	0	HR	9	9	9	HS	0	0	0	HR	7	7	7	S	0	0	0	HR	0	0	0	HR	0	0	HR			
KBS 21-1	0	0	0	HR	3	3	3	MR	0	0	0	HR	9	9	9	HS	3	3	3	MR	0	0	0	HR	0	0	HR			
MAUS 818	3	3	3	HR	3	3	3	MR	0	0	0	HR	5	5	5	MS	1	1	1	R	0	0	0	HR	0	0	HR			
MAUS 791	0	0	0	HR	5	5	5	MS	3	3	3	HR	5	5	5	MS	1	1	1	R	0	0	0	HR	0	0	HR			
AMS 115	0	0	0	HR	3	3	3	MR	3	3	3	HR	5	5	5	MS	1	1	1	R	0	0	0	HR	0	0	HR			
AMS1901	3	3	3	HR	5	5	5	MS	3	3	3	HR	5	5	5	MS	5	5	5	MS	0	0	0	HR	0	0	HR			
RVS 1320	0	0	0	HR	3	3	3	MR	0	0	0	HR	1	1	1	R	3	3	3	MR	3	3	3	HR	3	3	HR			
RVS 1315	3	3	3	HR	1	1	1	R	3	3	3	HR	7	7	7	S	3	3	3	MR	0	0	0	HR	0	0	HR			
DLsb 3	0	0	0	HR	0	0	0	HR	0	0	0	HR	5	5	5	MS	3	3	3	MR	0	0	0	HR	0	0	HR			
DLsb 4	3	3	3	HR	3	3	3	MR	0	0	0	HR	5	5	5	MS	3	3	3	MR	0	0	0	HR	0	0	HR			
DSb39	3	3	3	HR	5	5	5	MS	3	3	3	HR	7	7	7	S	5	5	5	MS	5	5	5	MS	5	5	MS			
AS 40	3	3	3	HR	5	5	5	MS	3	3	3	HR	3	3	3	MR	3	3	3	MR	3	3	3	HR	3	3	HR			
AS24	3	3	3	HR	5	5	5	MS	3	3	3	HR	5	5	5	MS	1	1	1	R	3	3	3	HR	3	3	HR			
JS 23-08	3	3	3	HR	5	5	5	MS	3	3	3	HR	7	7	7	S	3	3	3	MR	3	3	3	HR	3	3	HR			
JS 23-05	0	0	0	HR	7	7	7	S	3	3	3	HR	7	7	7	S	3	3	3	MR	0	0	0	HR	0	0	HR			
DS 1312	0	0	0	HR	7	7	7	S	0	0	0	HR	5	5	5	MS	1	1	1	R	0	0	0	HR	0	0	HR			
DS3163	0	0	0	HR	7	7	7	S	3	3	3	HR	3	3	3	MR	1	1	1	R	0	0	0	HR	0	0	HR			
DS3168	0	0	0	HR	5	5	5	MS	3	3	3	HR	5	5	5	MS	1	1	1	R	0	0	0	HR	0	0	HR			
DS3124	0	0	0	HR	9	9	9	HS	3	3	3	HR	9	9	9	HS	3	3	3	MR	0	0	0	HR	0	0	HR			
SL 1282	3	3	3	HR	3	3	3	MR	3	3	3	HR	9	9	9	HS	1	1	1	R	0	0	0	HR	0	0	HR			
SL 1230	3	3	3	HR	5	5	5	MS	3	3	3	HR	5	5	5	MS	7	7	7	S	3	3	3	HR	3	3	HR			

HIMSO - 1694	0	0	0	HR	9	9	9	HS	5	5	5	MS	1	1	1	R	3	3	3	MR	3	3	3	MR
HIMSO - 1693	3	3	3	MR	3	3	3	MR	3	3	3	MR	7	7	7	S	3	3	3	MR	3	3	3	MR
VLS - 103	3	3	3	MR	3	3	3	MR	3	3	3	MR	1	1	1	R	1	1	1	R	0	0	0	HR
VLS - 102	3	3	3	MR	1	1	1	R	0	0	0	HR	1	1	1	R	7	7	7	S	0	0	0	HR
PS 1605	3	3	3	MR	7	7	7	S	3	3	3	MR	5	5	5	MS	3	3	3	MR	3	3	3	MR
PS 1689	3	3	3	MR	1	1	1	R	3	3	3	MR	1	1	1	R	0	0	0	HR	0	0	0	HR
PS 1682	3	3	3	MR	3	3	3	MR	3	3	3	MR	9	9	9	HS	0	0	0	HR	3	3	3	MR
RSC 11-48	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR	1	1	1	R	3	3	3	MR
RSC 11-42	3	3	3	MR	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR
BAUS(M) -3	3	3	3	MR	1	1	1	R	3	3	3	MR	0	0	0	HR	3	3	3	MR	3	3	3	MR
BAUS 116	3	3	3	MR	5	5	5	MS	3	3	3	MR	7	7	7	S	3	3	3	MR	0	0	0	HR
CAUMS 2	3	3	3	MR	7	7	7	S	3	3	3	MR	5	5	5	MS	1	1	1	R	0	0	0	HR
NRC 195	0	0	0	HR	7	7	7	S	3	3	3	MR	7	7	7	S	1	1	1	R	0	0	0	HR
NRC 203	3	3	3	MR	9	9	9	HS	3	3	3	MR	9	9	9	HS	9	9	9	HS	0	0	0	HR
NRC 193	3	3	3	MR	3	3	3	MR	3	3	3	MR	5	5	5	MS	1	1	1	R	0	0	0	HR
NRC 192	3	3	3	MR	7	7	7	S	5	5	5	MS	9	9	9	HS	1	1	1	HR	0	0	0	HR
NRC 191	3	3	3	MR	3	3	3	MR	5	5	5	MS	9	9	9	HS	3	3	3	MR	7	7	7	S
NRC 190	3	3	3	MR	1	1	1	R	5	5	5	MS	3	3	3	MR	7	7	7	S	0	0	0	HR
NRC 189	3	3	3	MR	5	5	5	MS	3	3	3	MR	5	5	5	MS	1	1	1	R	0	0	0	HR
RVSM 16-20	3	3	3	MR	5	5	5	MS	3	3	3	MR	9	9	9	MS	3	3	3	MR	0	0	0	HR
KDS 1175	3	3	3	MR	1	1	1	R	3	3	3	MR	7	7	7	S	7	7	7	S	3	3	3	MR
KDS 1187	3	3	3	MR	3	3	3	MR	3	3	3	MR	7	7	7	S	5	5	5	MS	0	0	0	HR
KDS 1149	3	3	3	MR	9	9	9	HS	3	3	3	MR	3	3	3	MR	7	7	7	S	3	3	3	MR
MACS 1672	3	3	3	MR	1	1	1	R	3	3	3	MR	3	3	3	MR	7	7	7	S	0	0	0	HR
MACS 1735	5	5	5	MS	1	1	1	HR	5	5	5	MS	5	5	5	MS	3	3	3	MR	0	0	0	HR
Asb 15	5	5	5	MS	1	1	1	R	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR
TS 21-2	3	3	3	MR	1	1	1	R	3	3	3	MR	5	5	5	MS	1	1	1	R	3	3	3	MR

TS 21-1	3	3	3	MR	5	5	5	MS	3	3	3	MR	7	7	7	S	5	5	5	MS	3	3	3	MR
LOKSOY -1	0	0	0	HR	7	7	7	S	3	3	3	MR	3	3	3	MR	9	9	9	HS	0	0	0	HR
KSS 204	0	0	0	HR	3	3	3	MR	5	5	5	MS	0	0	0	HR	3	3	3	MR	3	3	3	MR
KDS 1096	0	0	0	HR	1	1	1	R	0	0	0	HR	3	3	3	MR	5	5	5	MS	0	0	0	HR
AVT I (Normal) and AVT II (Normal)																								
DL Sb 1	0	0	0	HR	7	7	7	S	0	+	+	R	0	0	0	HR	1	1	1	R	0	0	0	HR
DSb 38	3	3	3	MR	-	-	-	-	-	-	-	-	5	1	5	MS	5	5	5	MS	0	0	0	HR
DS 3108	3	3	3	MR	-	-	-	-	-	-	-	-	0	1	1	R	3	3	3	MR	3	3	3	MR
Breeder check																								
MACS 1407	3	3	3	MR	9	9	9	HS	3	3	3	MR	3	3	3	MR	3	3	3	MR	0	0	0	HR
JS 20-116	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR	3	3	3	MR
RKS 113	0	0	0	HR	3	3	3	MR	3	3	3	MR	3	3	3	MR	0	0	0	HR	0	0	0	HR
Pathological check																								
JS 9305	0	0	0	HR	3	3	3	M R	3	3	3	M R	5	5	5	MS	1	1	1	R	0	0	0	HR
JS 335	-	-	-	-	NG	-	-	-	-	-	-	-	1	0	1	R	-	-	-	-	-	-	-	-

Table 4.3.6: PP3. Reaction of IVT, AVT I and AVT II entries for various diseases of EZ

CODE	IBB				PB (Ct)			
	Raipur							
	R1	R2	Max Score	DR	R1	R2	Max Score	DR
SKUA-WSB.101	5	5	5	MS	3	5	5	MS
KBS 21-1	3	5	5	MS	5	5	5	MS
MAUS 818	3	3	3	MR	3	3	3	MR
MAUS 791	3	3	3	MR	3	3	3	MR
AMS 115	0	3	3	MR	3	3	3	MR
AMS1901	3	3	3	MR	3	3	3	MR
RVS 1320	3	5	5	MS	3	3	3	MR
RVS 1315	3	3	3	MR	3	3	3	MR
DLSb 4	3	3	3	MR	3	3	3	MR
DLSb 4	3	5	5	MS	3	3	3	MR
DSb39	3	3	3	MR	3	3	3	MR
AS 40	3	3	3	MR	3	3	3	MR
AS24	3	5	5	MS	3	3	3	MR
JS 23-08	3	3	3	MR	3	3	3	MR
JS 23-05	3	3	3	MR	3	3	3	MR
DS 1312	3	3	3	MR	3	3	3	MR
DS3163	3	3	3	MR	5	3	3	MR
DS3168	3	3	3	MR	5	5	5	MS
DS3124	3	3	3	MR	5	5	5	MS
SL 1282	3	3	3	MR	5	5	5	MS
SL 1230	3	3	3	MR	3	3	3	MR
HIMSO -1694	3	3	3	MR	3	3	3	MR
HIMSO -1693	3	3	3	MR	3	3	3	MR

VLS - 103	5	7	7	5	3	3	3	3	MAR
VLS -102	3	3	3	MAR	3	3	3	3	MAR
PS 1605	3	3	3	MAR	5	5	5	5	MS
PS 1689	3	3	3	MAR	3	3	3	3	MAR
PS 1682	3	3	3	MAR	3	3	3	3	MAR
RSC 11-48	3	5	5	MS	3	3	3	3	MAR
RSC 11-42	3	5	5	MS	3	3	3	3	MAR
BAUS(M) -3	3	5	5	MS	5	3	5	5	MS
BAUS 116	3	5	5	MS	3	3	3	3	MAR
CAUMS 2	3	3	3	MAR	3	3	3	3	MAR
NRC 195	3	5	5	MS	3	3	3	3	MAR
NRC 194	3	3	3	MAR	3	3	3	3	MAR
NRC 203	3	3	3	MAR	3	3	3	3	MAR
NRC 192	3	3	3	MAR	3	3	3	3	MAR
NRC 191	3	3	3	MAR	3	3	3	3	MAR
NRC 190	3	3	3	MAR	3	3	3	3	MAR
NRC 189	3	3	3	MAR	3	3	3	3	MAR
RVSM 16-20	3	3	3	MAR	3	3	3	3	MAR
KDS 1175	3	3	3	MAR	3	3	3	3	MAR
KDS 1187	5	7	7	5	5	3	5	5	MS
KDS 1149	3	5	5	MS	3	3	3	3	MAR
MACS 1672	3	3	3	MAR	3	3	3	3	MAR
MACS 1735	5	7	7	5	5	5	5	5	MS
Asb 15	3	3	3	MAR	5	5	5	5	MS
TS 21-2	3	5	5	MS	5	3	5	5	MS
TS 21-1	5	7	7	5	5	3	5	5	MS
LOKSOY -1	3	5	5	MS	3	3	3	3	MAR
KSS 204	3	3	3	MAR	3	3	3	3	MAR

AVT I (Normal) and AVT II (Normal)									
KDS 1096	3	3	3	MR	3	3	3	3	MR
RSC 11-35	3	3	3	MR	3	3	3	3	MR
Breeder Check									
NRC 128	3	3	3	MR	3	3	3	3	MR
JS 20-116	3	3	3	MR	5	5	5	5	MS
AMS -2014-1	3	3	3	MR	3	5	5	5	MS
Pathological check									
NRC 37	5	3	5	MS	5	5	5	5	MS
JS 95-60	3	3	3	MR	3	3	3	3	MR

Table 4.4: PP3 (a). Reaction of CIVT (E), AVT I (E) and AVT II (E) entries for various diseases of Central zone

Entry		Charcoal rot										Anthracnose								
		Amravati			Indore			Jabalpur				Indore				Jabalpur				
		R 1	R2	Max Score	DR	R 1	R 2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR			
IVT (Early)																				
MAUS 819	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	0	1	1	R
MAUS 795	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	3	3	MR	1	3	3	MR
KDS 1201	0	0	0	HR	7	5	7	S	3	0	3	MR	3	4	3	MR	5	3	5	MS
KDS 1173	9	9	9	HS	9	9	9	HS	9	9	9	HS	3	5	5	MS	7	5	7	S
KDS 1172	9	9	9	HS	5	9	9	HS	7	9	9	HS	5	3	5	MS	7	5	7	S
KDS 1169	9	9	9	HS	9	9	9	HS	3	3	3	MR	5	3	5	MS	7	9	9	HS
KDS 1194	9	9	9	HS	9	9	9	HS	9	7	9	HS	3	4	3	MR	7	9	9	HS
RVS 13-7	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	0	1	1	R
JS 23-09	0	0	0	HR	3	0	3	MR	0	0	0	HR	3	3	3	MR	0	1	1	R
JS 23-03	7	7	7	S	0	0	0	HR	0	0	0	HR	3	3	3	MR	1	3	3	MR
PS 1569	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	3	3	MR	1	3	3	MR
PS 1660	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	0	0	0	HR
PS 1675	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	1	0	1	R
RSC11-60	0	0	0	HR	0	0	0	HR	3	5	5	MS	3	4	3	MR	3	7	7	S
NRC 186	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	1	1	1	R
NRC 202	0	0	0	HR	0	0	0	HR	0	0	0	HR	4	4	4	R	0	3	3	MR
NRC 201	0	0	0	HR	0	0	0	HR	0	0	0	HR	3	3	3	MR	0	3	3	MR
NRC 198	3	3	3	MR	0	0	0	HR	0	0	0	HR	4	3	3	MR	0	1	1	R
NRC 197	5	3	5	MS	0	0	0	HR	0	0	0	HR	3	3	3	MR	1	0	1	R
NRC 196	0	0	0	HR	0	0	0	HR	0	0	0	HR	3	3	3	MR	0	1	1	R
AMS 0542	0	0	0	HR	0	0	0	HR	0	3	3	MR	3	3	3	MR	0	1	1	R

Table 4.4.1: PP3 (a). Reaction of CIVT (E), AVT I (E) and AVT II (E) entries for various diseases of Central zone

Entry	YMV						Target leaf spot					
	Jabalpur			Kota			Sehore					
	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR
IVT (Early)												
MAUS 819	5	5	5	MS	9	9	9	HS	3	3	3	MR
MAUS 795	9	9	9	HS	5	5	5	MS	5	5	5	MS
KDS 1201	9	9	9	HS	5	9	9	HS	5	5	5	MS
KDS 1173	9	9	9	HS	9	9	9	HS	5	5	5	MS
KDS 1172	3	3	3	MR	9	9	9	HS	5	5	5	MS
KDS 1169	3	3	3	MR	0	3	3	MR	3	3	3	MR
KDS 1194	3	3	3	MR	5	5	5	MS	3	3	3	MR
RVS 13-7	7	7	7	S	9	9	9	HS	5	5	5	MS
JS 23-09	3	0	3	MR	0	0	0	HR	3	3	3	MR
JS 23-03	0	3	3	MR	3	0	3	MR	5	5	5	MS
PS 1569	3	3	3	MR	0	0	0	HR	5	5	5	MS
PS 1660	3	0	3	MR	0	0	0	HR	1	1	1	R
PS 1675	3	0	3	MR	0	0	0	HR	3	3	3	MR
RSC11-60	3	3	3	MR	0	0	0	HR	3	3	3	MR
NRC 186	3	5	5	MS	3	0	3	MR	3	3	3	MR
NRC 202	0	0	0	HR	0	0	0	HR	1	1	1	R
NRC 201	0	0	0	HR	0	0	0	HR	3	3	3	MR
NRC 198	0	3	3	MR	0	0	0	HR	1	1	1	R
NRC 197	0	3	3	MR	0	0	0	HR	0	0	0	HR
NRC 196	0	0	0	HR	0	0	0	HR	3	3	3	MR
AMS 0542	3	3	3	MR	-	-	-	-	7	7	7	S
AMS 19-9	7	5	7	S	5	3	5	MS	7	7	7	S

MACS 1724	9	9	9	9	HS	0	1	1	R	3	3	3	MR
AVT I (Early) and AVT II (Early)													
JS 22-12	3	0	3	3	MR	0	0	0	HR	7	7	7	S
JS 22-18	3	0	3	3	MR	0	0	0	HR	3	3	3	MR
JS 22-16	3	3	3	3	MR	0	0	0	HR	7	7	7	S
RVSM 2012-4	3	3	3	3	MR	0	0	0	HR	3	3	3	MR
NRC 181	3	3	3	3	MR	0	0	0	HR	1	1	1	R
NRC 165	3	0	3	3	MR	0	0	0	HR	3	3	3	MR
NRC 152	3	5	5	5	MS	0	0	0	HR	3	3	3	MR
NRC 150	1	3	3	3	MR	0	0	0	HR	5	5	5	MS
Breeder Check													
JS 2034	5	7	7	7	S	5	0	5	MS	5	5	5	MS
JS 95-60	3	3	3	3	MR	0	0	0	HR	5	5	5	MS
NRC 130	7	5	7	7	S	5	7	7	S	3	3	3	MR
NRC 138	3	3	3	3	MR	0	0	0	HR	3	3	3	MR
Pathological check													
JS 95-60	3	3	3	3	MR	0	0	0	HR	3	3	3	MR
JS 335	NG												

Table 4.4.2: PP3 (a). Reaction of CIYT (E) entries for various diseases of South Zone																									
Entry	RUST								Pod blight								Purple seed stain								
	Dharwad				Kasbe-digraj				Dharwad				Kasbe-digraj				Dharwad								
	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	
MAUS 819	9	9	9	HS	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MR	3	3	3	MR	
MAUS 795	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
KDS 1201	7	7	7	S	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
KDS 1173	9	9	9	HS	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
KDS 1172	9	9	9	HS	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
KDS 1169	7	7	7	S	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
KDS 1194	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
RVS 13-7	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
JS 23-09	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
JS 23-03	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
PS 1569	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
PS 1660	7	7	7	S	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
PS 1675	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
RSC11-60	7	7	7	S	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
NRC 186	9	9	9	HS	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
NRC 202	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
NRC 201	7	7	7	S	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
NRC 198	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
NRC 197	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
NRC 196	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
AMS 0542	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
AMS 19-9	7	7	7	S	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
MACS 1724	9	9	9	HS	9	9	9	HS	5	5	5	MS	3	3	3	MR	3	3	3	MR	3	3	3	MR	
Breeder Check																									
MACS 1460	7	7	7	S	9	9	9	HS	5	5	5	MS	5	5	5	MS	3	3	3	MS	3	3	3	MR	
JS 93-05	-	-	-	-	9	9	9	HS	-	-	-	-	5	5	5	MS	-	-	-	-	-	-	-	-	
DSb 34	3	3	3	MR	9	9	9	HS	3	3	3	MR	5	5	5	MS	3	3	3	MS	3	3	3	MR	
Pathological Check																									
JS 335	9	9	9	HS	NG					5	5	5	MS	NG					3	3	3	MS	3	3	MR
JS 93-05	9	9	9	HS	9	9	9	HS	5	5	5	MS	9	9	9	HS	3	3	3	MS	3	3	3	MR	

Table 4.4.3: PP3 (a). Reaction of CIVT (E) entries for various diseases of NPZ.

Entry	RAB						YMV						SMV			
	Pantnagar			Pantnagar			Ludhiana			Ludhiana			Ludhiana			
	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR	R1	R2	Max Score	DR
MAUS 819	1	3	3	MR	2	1	2	MR	7	7	7	S	7	7	7	S
MAUS 795	1	1	1	R	0	0	0	HR	7	7	7	S	5	7	7	S
KDS 1201	3	3	3	MR	0	0	0	HR	5	7	7	S	5	7	7	S
KDS 1173	3	5	5	MS	2	2	2	MR	7	7	7	S	7	5	7	S
KDS 1172	5	5	5	MS	3	1	3	MS	7	7	7	S	5	7	7	S
KDS 1169	1	1	1	R	0	0	0	HR	5	5	5	MS	5	5	5	MS
KDS 1194	5	7	7	S	0	0	0	HR	1	3	3	MR	3	3	3	MR
RVS 13-7	3	3	3	MR	0	0	0	HR	5	5	5	MS	5	5	5	MS
JS 23-09	1	1	1	R	0	0	0	HR	5	7	7	S	5	7	7	S
JS 23-03	1	1	1	R	0	0	0	HR	7	7	7	S	5	7	7	S
PS 1569	1	1	1	R	0	0	0	HR	5	5	5	MS	0	0	0	HR
PS 1660	1	1	1	R	0	0	0	HR	1	1	1	R	0	0	0	HR
PS 1675	1	1	1	R	0	0	0	HR	0	1	1	R	0	1	1	R
RSC11-60	3	7	7	S	0	0	0	HR	7	7	7	S	7	7	7	S
NRC 186	3	5	5	MS	0	0	0	HR	5	4	5	MS	5	5	5	MS
NRC 202	3	5	5	MS	2	3	3	MS	0	0	0	HR	3	3	3	MR
NRC 201	3	3	3	MR	0	0	0	HR	3	5	5	MS	3	3	3	MR
NRC 198	1	1	1	R	0	0	0	HR	5	5	5	MS	3	3	3	MR
NRC 197	1	3	3	MR	0	0	0	HR	7	5	7	S	7	5	7	S
NRC 196	1	1	1	R	0	0	0	HR	1	0	1	R	1	1	1	R
AMS 0542	1	3	3	MR	3	3	3	MS	5	5	5	MS	7	5	7	S
AMS 19-9	1	1	1	R	2	1	2	MR	7	7	7	S	7	5	7	S
MACS 1724	3	5	5	MS	0	0	0	HR	7	7	7	S	7	7	7	S
Breeder check																
SL 955	1	1	1	R	0	0	0	HR	3	1	3	MR	1	1	1	R
PS 26	1	1	1	R	0	0	0	HR	1	1	1	R	0	0	0	HR
SL 1104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pathological check																
JS 335	5	3	5	MS	0	0	0	HR	NG	NG	NG	NG	NG	NG	NG	NG
JS 9305	0	0	0	HR	0	0	0	HR	5	3	5	MS	5	3	5	MS

Table 4.4.4: PP3 (a). Reaction of CIVT (E) entries for various diseases of NHZ

Entry	Frogeye leaf spot								Anthracnose			
	Palampur				Almora				Palampur			
	R1	R2	Max Score	DR (HR to HS)	R1	R2	Max Score	DR	R1	R2	Max Score	DR
MAUS 819	1	0	1	R	5	5	5	MS	3	1	3	MR
MAUS 795	3	1	3	MR	5	5	5	MS	7	7	7	S
KDS 1201	1	0	1	R	1	1	1	R	3	7	7	S
KDS 1173	3	3	3	MR	1	1	1	R	1	3	3	MR
KDS 1172	3	1	3	MR	3	3	3	MR	3	5	5	MS
KDS 1169	0	0	0	HR	1	1	1	R	9	9	9	HS
KDS 1194	0	0	0	HR	3	3	3	MR	5	7	7	S
RVS 13-7	5	3	5	MS	3	5	5	MS	1	3	3	MR
JS 23-09	3	1	3	MR	3	3	3	MR	5	7	7	S
JS 23-03	3	1	3	MR	3	3	3	MR	5	7	7	S
PS 1569	5	3	5	MS	1	1	1	R	5	7	7	S
PS 1660	3	1	3	MR	5	5	5	MS	0	0	0	HR
PS 1675	7	5	7	S	7	5	7	S	0	1	1	R
RSC11-60	3	1	3	MR	3	3	3	MR	5	7	7	S
NRC 186	3	1	3	MR	3	3	3	MR	5	5	5	MS
NRC 202	5	3	5	MS	3	3	3	MR	5	5	5	MS
NRC 201	3	3	3	MR	5	5	5	MS	3	5	5	MS
NRC 198	3	3	3	MR	5	5	5	MS	1	0	1	R
NRC 197	5	5	5	MS	1	1	1	R	3	3	3	MR
NRC 196	3	5	5	MS	5	3	5	MS	3	5	5	MS
AMS 0542	1	0	1	R	3	3	3	MR	3	3	3	MR
AMS 19-9	1	1	1	R	3	3	3	MR	1	0	1	R
MACS 1724	5	3	5	MS	3	3	3	MR	3	5	5	MS
Breeder check												
PALAM EARLY	-	-	-		1	1	1	R	-	-	-	-
SOYA 1												
VLS 89	5	3	5	MS	5	5	5	MS	0	1	1	R
VLS 63	5	5	5	MS	5	5	5	MS	0	0	0	HR
Pathological check												
Shivalk	7	5	7	S	5	5	5	MS	7	7	7	S
VLS-2	1	3	3	MR	3	3	3	MR	3	1	3	MR

Table 4.4.5: PP3 (a). Reaction of CIVT (E) entries for various diseases of EZ

Entry	IBB			DR	R1	R2	Max Score	PB (Ct)			DR
	R1	R2	Max Score					R1	R2	Max Score	
MAUS 819	3	3	3	MR	3	5	5	3	5	5	MS
MAUS 795	3	3	3	MR	5	5	5	5	5	5	MS
KDS 1201	3	3	3	MR	5	5	5	5	5	5	MS
KDS 1173	5	5	5	MS	5	3	5	5	3	5	MS
KDS 1172	3	3	3	MR	3	5	5	3	5	5	MS
KDS 1169	3	5	5	MS	5	5	5	5	5	5	MS
KDS 1194	3	3	3	MR	5	5	5	5	5	5	MS
RVS 13-7	3	3	3	MR	3	3	3	3	3	3	MR
JS 23-09	3	3	3	MR	3	5	5	3	5	5	MS
JS 23-03	3	3	3	MR	5	7	7	5	7	7	S
PS 1569	3	3	3	MR	3	5	5	3	5	5	MS
PS 1660	3	3	3	MR	3	3	3	3	3	3	MR
PS 1675	3	3	3	MR	3	3	3	3	3	3	MR
RSC11-60	3	3	3	MR	5	5	5	5	5	5	MS
NRC 186	3	3	3	MR	3	5	5	3	5	5	MS
NRC 202	3	3	3	MR	5	5	5	5	5	5	MS
NRC 201	3	3	3	MR	5	5	5	5	5	5	MS
NRC 198	3	3	3	MR	3	3	3	3	3	3	MR
NRC 197	3	3	3	MR	3	3	3	3	3	3	MR
NRC 196	3	3	3	MR	3	3	3	3	3	3	MR
AMS 0542	3	3	3	MR	3	3	3	3	3	3	MR
AMS 19-9	3	3	3	MR	3	5	5	3	5	5	MS
MACS 1724	3	3	3	MR	5	5	5	5	5	5	MS
Breeder check											
RSC 11-07	3	3	3	MR	3	3	3	3	3	3	MR
JS 20-116	3	3	3	MR	3	3	3	3	3	3	MR
MACS 1460	3	3	3	MR	5	5	5	5	5	5	MS
Pathological check											
NRC37	3	3	3	MR	5	5	5	5	5	5	MS
JS 95-60	5	5	5	MS	3	3	3	3	3	3	MR

Table 4.5: PP4 Performance of the previous year's resistant entries

Northern Plain Zone														Northern Hill Zone														Central Zone													
S. No.	Pantnagar					Ludhiana					Palampur					Amravati																									
	Var.	Year of Test	BLB	RAB	Var.	YMV	VHR.	Year of Test	FLS	Anth (Ct)	Var.	Year of Test	CR																												
1	2	3	4	5	6	7	12	13	14	15	16	17	18																												
1	SL-1068	1 st	MR	MR	DSB38	R	VLS 99	1 st	R	R	AMS-2014-1	3 rd	AR																												
2	SL-1123	1 st	R	R	JS22-14	R	UPSL 77	1 st	MR	R	AMS100-39	3 rd	AR																												
3	DS-3108	1 st	MR	R	NRC128	R	PK 25	1 st	HR	HR	*Dsb-34	3 rd	AR																												
4	PS-1613	1 st	R	MS	NRC109	R	EC 241/780	1 st	HR	HR	DS-3110	2 nd	AR																												
5	SL-688	1 st	MR	MS	JS20-98	R	EC 141117	1 st	HR	HR	JS-335	-	HS																												
6	SL-1028	1 st	R	MR	PUSA97-12	R	UGM 77	1 st	HR	HR	Dsb-33	2 nd	AR																												
7	SL-1074	1 st	R	MS	NRC149	R	EC 391181	1 st	R	HR	JS-21-71	2 nd	AR																												
8	MACS-1460	1 st	MR	R	VLS99	R	Dsb 21	1 st	R	MR	MACS-1620	3 rd	MR																												
9	DS-3101	1 st	S	S	SL1212	R	Dsb 33	1 st	MS	MR	MAUS-732	3 rd	MR																												
10	MACS-1407	1 st	MR	MR	JS 335	HS	Dsb 37	1 st	R	R	NRC-128	3 rd	AR																												
11	DS-2705	1 st	MR	MR			Harder	1 st	HR	HR	JS-9305	-	S																												
12	PS-1540	1 st	MR	R			Asb 50	2	R	R	NRC-131	3 rd	HR																												
13	PS-1611	1 st	MR	MS			Asb 51	2	R	R	NRC-136	3 rd	HR																												
14	NRC-137	1 st	MR	R			AUKS 218	2	HR	MS	NRC-142	3 rd	HR																												
15	SL-1213	1 st	HR	MS			Dsb 37	2	R	MR	NRC-148	3 rd	HR																												
16	VLS-63	1 st	HR	R			TS 46	2	R	MR	NRCSL-2	3 rd	HR																												
17	SL-1234	1 st	R	MS			EC 241/778	2	HR	HR	@ Panjab-1	-	HR																												
18	VLS-89	1 st	MR	R			Cat 195 c (BR4)	2	HR	S	PS-1637	3 rd	HR																												
19	NRC-128	1 st	MR	MR			Cat 411A	2	R	R	PS-1611	3 rd	MR																												
20	SL-979	1 st	MS	MS			SKF 6029	2	R	R	PS-1613	3 rd	AR																												

Contd.,

Central Zone															Southern Zone														
S. No	Jabalpur								Sehore								Dharwad												
	VHR.	Year of Test	CR	RAB	VHR.	Year of Test	YMV	VHR.	Year of test	TL.S	VHR.	Year of Test	Rust	PSS	Anth														
1	2	3	4	5	JS 20-69	9 th	R	6	7	8	9	10	11	12	13														
1	JS 20-34	9 th	AR	MS	JS 20-98	8 th	R	AMS 475	4	HR	DSb 23	10 th	MR	MR	MR														
2	JS 20-98	8 th	HR	HR	JS 20-20	8 th	R	AMS 5-19	4	MR	DSb 34	5 th	MR	MR	MR														
3	JS 20-19	6 th	MR	MR	JS 20-116	7 th	MS	JS20 -82*	4		DSb 21	12 th	MS	MR	MR														
4	JS 20-20	6 th	AR	MR	JS 20-94	7 th	R	JS20 -98	6	MR	KDS 753	8 th	S	MR	MR														
5	JS 20-96	5 th	MR	MR	JS 21-05	6 th	HR	JS20 -103*	4		EC 242104	10 th	MR	MR	MR														
6	JS 21-17	5 th	AR	HR	JS 21-17	5 th	HR	JS20 -108*	4		EC 241780	14 th	MR	MR	MR														
7	JS 21-05	4 th	AR	HR	PS 1611	4 th	HR	JS21 -09*	4		EC 241778	14 th	MR	MR	MR														
8	AMS 100-39	4 th	MS	MR	PS 1613	4 th	R	SL 96*	4		DSb 32	8 th	MS	MR	MR														
9	RSC 11-03	4 th	MS	MS	NRC 129	4 th	HR	RVS 2002-4	5	HR	EC 251409	3 rd	MR	MR	MR														
10	AMS 264	4 th	MR	MR	NRC 136	4 th	MR	RVS 2001-4	6	MR	DL.Sb-1	2 nd	MS	MR	MR														
11	JS 21-72	4 th	AR	HR	NRC 137	4 th	R	SL 955	3 rd	MR	DL.Sb -2	2 nd	MS	MR	MR														
12	VLS 94	4 th	MS	MR	DS 3106	4 th	HR	SL 958	3 rd	MR	JS 335		MS	MR	MR														
13	MACS 1566	3 rd	MR	MR	DS 3109	4 th	HR	RVS 2002-4	5 th	HR																			
14	NRC 166	3 rd	HR	MR	JS 21-71	4 th	MR	RVS 2001-4	6 th	MR																			
15	JS 22-01	3 rd	AR	HR	JS 21-72	4 th	HR																						
16	NRC 154	3 rd	AR	MR	DSb 32	4 th	R																						

Table 4.6: PP5. Evaluation of germplasm lines for identification of multiple disease resistant sources

S.N	Palampur				Jabalpur				Indore				Pantnagar			
	Genotype	FLS	PB (ct)	BS	YMV	CR	RAB	Anth	CR	RAB	Anth	BLB	YMV			
1	2	3	4	5	6	7	8	9	10	11	12	13	14			
1	EC 251682	MS	R	MR	HR	MR	MS	MR	MR	MR	HR	MS	R			
2	EC 251827	MS	R	MS	HR	MR	MR	MR	MR	MR	HR	R	HR			
3	EC 251865	R	R	MS	HR	MR	MS	MR	MR	MR	R	MR	R			
4	EC 251861	MR	HR	MS	HR	S	MR	MR	MR	HR	HR	HR	R			
5	EC 251541	MR	HR	MR	S	HS	MR	MR	MR	MR	HR	MR	MS			
6	EC 251876	MS	HR	MS	MR	AR	MR	MR	MR	MR	HR	MS	R			
7	EC 274755	MS	R	MR	HR	AR	MS	MR	MR	MS	R	R	MR			
8	EC 280129	HR	R	MR	HR	MR	HR	MR	MR	MS	MR	MS	R			
9	EC 280148	-	-	-	-	-	-	-	-	-	-	-	-			
10	EC 280149	R	R	MR	MS	MR	HR	MR	MR	MR	HR	R	R			
11	EC 281462	MR	R	MR	S	HS	MR	MR	MR	MR	HR	R	R			
12	EC 287466	R	MR	MS	MS	S	MR	MR	MR	R	MR	R	R			
13	EC 287469	MR	HR	MR	HR	MR	HR	MR	MR	MR	HR	R	R			
14	EC 289099	MS	HR	MS	MS	MR	MR	MR	MR	R	HR	R	R			
15	EC 291401	R	R	MR	MS	MS	MR	MR	MR	MS	HR	MR	R			
16	EC 308312	HR	R	MR	-	-	-	-	-	MR	HR	R	R			
17	EC 309512	MS	R	MR	MR	MR	MR	MR	MR	MS	HR	R	MR			
18	EC 309537	R	MR	MR	-	-	-	-	-	-	-	-	-			
19	EC 309538	MR	MR	MR	-	-	-	-	-	MR	HR	MS	HR			
20	EC 313915	R	MR	MS	R	HS	MS	MR	MR	R	HR	MR	HR			
21	EC 313976	MS	R	MS	MS	S	MR	MR	MR	MR	S	S	HR			
22	EC 771199	MS	HS	MS	HR	MR	MR	MR	MR	MR	HR	S	MS			
23	EC 325098	HR	R	MR	S	HS	MR	MR	MR	S	S	MR	HR			
24	EC 325103	MR	R	MR	S	HS	AR	MR	MR	MR	HR	HR	R			
25	EC 333875	MS	R	MR	MR	MR	HR	MR	MR	MS	S	MS	HR			
26	EC 333879	R	HS	MS	-	-	-	-	-	HR	MS	MR	MR			

27	EC 333880	MR	R	MR	HR	AR	HR	MR	MR	-	-	-	-	-
28	EC 333876	MR	R	MR	-	-	-	MR	MR	MS	MR	MR	HR	HR
29	EC 333892	MR	R	MR	HR	AR	HR	MR	MR	HR	MR	MR	HR	HR
30	EC 333929	MS	R	MS	HR	MR	MR	MR	MR	MS	MS	MS	MS	R
31	EC 340506 B	MS	R	MR	HR	MR	MR	MR	MR	-	-	-	-	-
32	EC 343312	MR	R	MR	-	-	-	-	-	S	HR	R	MR	MR
33	EC 350664	R	R	MR	R	MS	MS	MR	MR	MS	HR	MS	MR	MR
34	EC 357998	R	R	MR	HR	MS	HR	MR	MR	-	-	-	-	-
35	EC 383165	R	R	MR				MR	MR	MR	HR	MR	MR	MR
36	EC 389149	R	MR	MR	HR	MR	MR	MR	MR	MR	HR	MR	MR	R
37	EC 389148	MR	MS	MR	-	-	-	MR	MR	MS	HR	MR	MR	R
38	EC 389153	HR	R	MR	S	AR	HR	MR	MR	S	HR	MR	MR	MR
39	EC 389154	MS	R	MR	HR	MR	MR	MR	MR	-	-	-	-	-
40	EC 389160	-	-	-	-	-	-	-	-	HR	HR	MS	HR	HR
41	EC 389170 (E 41)	MS	MR	MS	R	HS	MR	MR	MR	MS	HR	MR	MR	HR
42	EC 389170 (E 42)	MS	R	MR	R	MR	HR	MR	MR	MR	HR	R	R	R
43	EC 389174	MS	R	MR	HR	HS	MR	MR	MR	HR	HR	MR	MR	MR
44	EC 389179 B	MS	R	MR	-	-	-	MR	MR	R	HR	MR	MR	HR
45	EC 390981 A	HR	R	MR	-	-	-	MR	MR	S	HR	R	R	R
46	EC 393228	-	-	-	-	-	-	-	-	MR	HR	MR	MR	MR
47	EC 396059	S	R	MR	-	-	-	MR	MR	-	-	-	-	-
48	EC 457216	MS	MS	MR	MS	S	HR	MR	MR	S	HR	MR	MR	MS
49	EC 457366	S	MR	MR	HR	AR	HR	MR	MR	HS	MS	HR	HR	S
50	EC 458350	MS	R	MR	HR	MR	HR	MR	MR	-	-	-	-	-

Table 4.7a: PP 6/ENT 8 - Integrated management of root rot complex and stem borers of soybean

Dharwad Center

Tr.	Treatment details	Formulations	Dosage (g/ml/kg seed)	% field stand*	% Root rot incidence*	% Stem tunneling*	% Girdling*	Plant ht (cm)	No. of branches per plant	No. of pods per plant	100 seed wt (g)	Seed yield (kg/ha)
T ₁	Seed treatment (ST) with Carboxin + Thiram	75% WP	3	94.33 (76.28)	7.33 (15.71)	19.23 (26.00)	27.83 (31.83)	46.95	5.55	64.20	13.25	1642.75
T ₂	ST with Trifloxystrobin + Penflufen	240 FS	1	98.33 (82.11)	1.66 (7.34)	16.75 (24.15)	25.38 (30.24)	48.64	5.88	66.90	13.85	1724.46
T ₃	ST with Thiophanate methyl + Pyroclostrobin	500 FS	2	95.66 (78.04)	2.66 (9.36)	16.32 (23.82)	24.52 (29.67)	48.20	5.95	66.50	13.72	1710.25
T ₄	ST with <i>Trichoderma harzianum</i>	-	10	88.33 (70.11)	10.66 (19.06)	22.37 (28.22)	31.78 (34.30)	46.25	5.33	62.40	13.10	1610.22
T ₅	ST with Thiamethoxam	600 FS	2	86.66 (68.64)	12.33 (20.57)	7.15 (15.50)	10.37 (18.78)	44.35	5.10	64.10	13.15	1630.25
T ₆	T1 + T5	-	3+2	95.66 (78.04)	6.33 (14.57)	10.13 (18.55)	12.78 (20.94)	47.24	5.95	64.80	14.20	1690.26
T ₇	T2 + T5	-	1+2	98.66 (83.51)	1.33 (6.54)	4.87 (12.74)	7.15 (15.50)	48.58	6.01	66.85	14.62	1765.35
T ₈	T3 + T5	-	2+2	97.66 (81.30)	2.66 (9.36)	5.73 (13.84)	8.02 (16.44)	48.25	5.98	67.25	14.55	1745.35
T ₉	T4 + T5	-	10+2	93.33 (75.08)	7.66 (16.08)	12.41 (20.62)	17.31 (24.58)	46.25	5.85	58.45	13.64	1640.22
T ₁₀	ST with biopolymer chitosan based <i>Trichoderma</i> formulation (IIOB)	SC	4	92.66 (74.33)	8.66 (17.12)	13.62 (21.65)	21.54 (27.64)	46.60	5.60	62.55	13.20	1641.25
T ₁₁	ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOB)	SC	10	93.50 (75.45)	7.33 (15.71)	11.46 (19.78)	20.25 (26.73)	46.80	5.62	62.75	13.28	1642.11
T ₁₂	ST with biopolymer chitosan based <i>Trichoderma</i> formulation (IIOB) + Thiamethoxam		2+10	94.00 (76.10)	6.33 (14.57)	8.84 (17.29)	15.11 (22.87)	46.25	5.60	64.55	13.28	1640.32
T ₁₃	Untreated control	-	-	78.66 (62.56)	23.33 (28.89)	30.38 (30.43)	42.74 (40.84)	43.35	5.25	53.70	12.60	890.25
	S.E.m±	-	-	0.71	0.54	0.78	0.88	0.46	0.31	0.65	0.17	46.11
	CD @ 5%	-	-	2.82	1.57	2.37	2.65	1.52	1.09	1.85	0.55	189.02

Table 4.7b: Integrated management of root rot complex and stem borers of soybean Center: Pantnagar

S.No	Treatment	Dosage (g/ml/kg seed)	%Field Stand	%Root rot incidence	Anth PDI (%)	% Stem tunneling	% girdling	Plant height (cm)	No. of branches per plant	No. of pods per plant	100 seed weight (grams)	Seed Yield (q/ha)
1	(T1) ST with Carboxin+ Thiram	3	92.82	5.50	7.08	54.00	45.09	56.9	6.4	55.0	7.7	20.70
2	(T2) ST with Trifloxistrobin+ Penflufen	1	89.22	3.55	3.00	52.33	48.25	61.7	6.2	52.0	7.7	17.80
3	(T3) ST with Thiphanate methyl+ Pyroclostrobin	2	94.03	4.61	3.49	60.67	51.24	69.7	6.5	54.7	7.7	26.70
4	(T4) ST with <i>Trichodermaharzianum</i>	10	87.67	7.76	2.23	68.33	53.6	67.8	7.4	56.0	7.7	22.20
5	(T5) ST with Thiomethoxam	2	91.00	7.53	4.50	41.67	43.12	54.6	6.6	53.0	7.7	21.10
6	T1+ T5	3+2	93.67	4.50	6.88	72.00	65.4	55.9	7.0	57.0	7.7	18.90
7	T2+ T5	1+2	86.75	6.08	3.13	33.67	31.02	59.4	6.1	55.3	7.7	21.50
8	T3+ T5	2+2	88.82	2.22	4.17	62.33	55.56	65.9	6.9	54.0	7.7	27.80
9	T4+T5	10+2	85.33	2.94	3.99	54.33	44.57	70.3	7.6	56.0	7.7	16.70
10	ST with biopolymer chitosan based <i>Trichoderma</i> formulation	10ml	93.75	4.75	5.00	58.67	39.98	62.9	6.9	57.3	7.7	20.80
11	ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOR)	10ml	90.44	3.92	6.33	43.33	34.85	58.7	6.7	51.3	7.7	16.20
12	ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOR) + Thiomethoxam	2+10	86.18	3.26	2.94	55.33	40.45	57.9	7.5	61.3	7.7	24.80
13	Untreated Control	-	79.83	17.08	16.46	72.33	58.25	50.5	5.5	44.3	7.7	20.00
	CD @ 5%			2.43		2.44	3.83					

Table 4.7c Integrated Management of the root rot complex and stem borers of Soybean 2020 Center: Amaravati

Sr.No	Treatment	Germination%	Root rot %	% stem fly infestation 30 DAS	% stem fly infestation Maturity	% Tunneling at 30 DAS	% Tunneling at Maturity	No of Branches	Height of the plants	No of pods	Yield kg per Ha.
T1	T1- Seed treatment (ST) with Carboxin + Thiram 75 % WP (3gm/Kg of seed)	81.66	16.50 (23.95)	1.20 (1.60)	33.12	2.11 (1.95)	2.44 (2.06)	2.66 (2.13)*	45.33	39.55	1452.89
T2	T2- ST with Trifloxystrobin + Penflufen 240 FS (1gm/ Kg of seed)	82.45	14.90 (22.67)	0.00 (0.50)	40.20	2.41 (2.05)	3.41 (2.35)	3.22 (2.29)	46.59	39.58	1423.41
T3	T3- ST with Thiophanate methyl + Pyraclostrobin 500 FS (2gm/ Kg of seed)	78.63	14.70 (22.51)	3.20 (2.29)	36.20	2.45 (2.07)	3.20 (2.29)	2.88 (2.19)	44.33	41.38	1523.20
T4	T4- ST with <i>Trichoderma harzianum</i> (10gm/ Kg of seed)	78.56	19.40 (26.16)	2.10 (1.95)	33.52	2.87 (2.19)	3.55 (2.38)	3.10 (2.26)	45.68	41.56	1589.54
T5	T5-ST with Thiomethoxam 600 FS (2ml/ Kg of seed)	78.99	22.00 (27.96)	0.00 (0.50)	28.30	2.89 (2.20)	2.95 (2.22)	3.22 (2.29)	44.87	39.86	1532.10
T6	T1 + T5	80.45	19.80 (26.43)	1.10 (1.55)	25.30	2.10 (1.95)	3.10 (2.26)	3.55 (2.38)	44.61	39.40	1680.23
T7	T2+ T5	84.67 (II)	11.70 (19.99)	0.79 (1.39)	22.10	2.22 (1.99)	2.55 (2.10)	3.59 (2.39)	46.85	46.51	1756.23
T8	T3+ T5	86.99 (I)	9.50 (17.97)	0.00 (0.50)	21.35	1.11 (1.55)	1.87 (1.87)	3.88 (2.46)	49.97	46.88	1796.20
T9	T4+T5	76.83	22.90 (28.58)	3.55 (2.38)	33.98	1.99 (1.91)	3.10 (2.26)	2.89 (2.22)	46.22	44.37	1460.87
T10	ST with biopolymer Chitosan based Trichoderma formulation (IIOB) 4 ml / kg of seed	80.30	20.80 (27.12)	2.72 (2.15)	36.54	2.45 (2.07)	3.44 (2.35)	3.28 (2.31)	42.30	43.85	1556.48
T11	ST with biopolymer Cellulose based Trichoderma formulation (IIOB) 10 ml / kg of seed	74.66	23.50 (28.98)	1.66 (1.79)	34.87	3.20 (2.29)	3.87 (2.47)	3.42 (2.34)	41.56	40.20	1544.30
T12	ST with biopolymer Cellulose based Trichoderma formulation (IIOB) 10 ml / kg of seed + Thiomethoxam (2+10 ml)	79.40	20.90 (27.22)	2.33 (2.03)	41.33	3.41 (2.35)	4.15 (2.54)	2.99 (2.22)	40.88	39.57	1452.36
T13	Untreated Control	69.67	32.40 (34.68)	4.22 (2.55)	42.56	3.94 (2.48)	4.56 (2.64)	2.52 (2.08)	40.22	38.42	1356.20
	SE(m)	2.79	0.29	0.25	1.98	0.18	0.19	NS	NS	NS	NS
	CD(P=0.05)	8.32	0.85	0.76	5.97	0.58	0.57	-	-	-	-
	CV(%)	9.28	12.20	15.20	8.53	10.23	12.30	-	-	-	-

Table 4.7d: Integrated management of the root rot complex and stem borers of soybean Center: Palampur

Treatment	% field stand	% root rot incidence	Anthraxnose (PDI)	% Girdling	Plant height (cm)	No. of pods/Pt	100g seed wt.(g)	Seed yield (q/ha)
T1= ST with Carboxin +thiram (3g/kg)	90.3	6.67	3.7(10.96)	3.67	53.00	54.3	13.73	11.210
T2= ST with Trifloxystrobin + Penflufen (1ml/kg)	89.2	8.33	4.44(11.89)	4.33	50.33	52.0	13.40	11.480
T3= ST with Thiophanate methyl + Pyraclostrobin(2ml/kg)	88.3	8.33	5.18(13.08)	3.67	53.33	50.3	13.57	11.653
T4= ST with <i>Trichodermaharzianum</i> (10g/kg)	78.2	10.00	5.92(13.88)	5.00	53.33	53.3	13.73	11.900
T5= ST with Thiomethoxam (2g/kg)	82.2	16.67	6.66(14.81)	2.33	57.67	50.3	13.23	13.997
T6= T1 +T5	84.9	4.33	3.7(10.96)	1.33	50.00	46.7	13.37	14.670
T7= T2 +T5	86.5	6.67	5.18(13.08)	1.67	54.67	56.7	13.63	13.800
T8= T3 +T5	91.8	5.00	4.44(11.89)	1.33	56.67	58.7	13.63	14.417
T9=T4 +T5	84.8	6.67	4.44(11.89)	2.33	51.67	51.3	13.77	12.050
T10= ST with biopolymer chitosan based <i>Trichoderma</i> formulation (IIOR)@ 4ml/kg	82.7	8.33	19.27(26.01)	5.67	53.00	48.3	14.17	10.790
T11= ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOR),@ 10ml/kg	85.1	7.33	30.37(33.37)	5.00	54.33	51.3	14.17	9.877
T12=ST with biopolymer cellulose based <i>Trichoderma</i> formulation (IIOR) +Thiomethoxam (@10 + 2g/kg)	83.7	6.33	31.85(34.33)	6.00	52.33	48.3	13.57	10.863
T13= Untreated control	77.7	16.67	58.51(49.89)	6.33	49.00	49.3	12.60	8.767
CD (P= 0.05)	8.143	4.607	3.483	2.197	NS	NS	NS	2.285

Table 4.7e: Integrated management of the root rot complex and stem borers of soybean during kharif-2021 Center::Jabalpur

Treatments	Details	Root rot (%)	Field Stand (%)	CR mortality (%)	Stem tunnel g (%)	Girdling (%)	Plant ht (cm),	No. of branches per plant	No. of pods per plant	100 seed weight (g)	Pod blight (%)	Seed yield (kg/ha)
T ₁	Seed treatment (ST) with Carboxin + Thiram 75 % WP @ 3g/kg seed	5.00	76.94	5.33	25.93	2.33	53.60	2.80	30.50	11.97	4.00	1905.6
T ₂	ST with Trifloxystrobin + Penflufen 240 FS @ 1ml/kg seed	2.33	79.44	5.00	23.80	3.67	54.53	2.87	31.37	12.07	3.67	1950.0
T ₃	ST with Thiophanate methyl + Pyroclostrobin 500 FS @ 2ml/kg seed	3.67	79.17	4.33	22.77	3.00	54.00	2.90	30.55	12.08	3.33	1938.9
T ₄	ST with <i>Trichoderma harzianum</i> @ 10g/kg seed	4.67	74.72	5.67	22.33	2.67	54.90	2.90	30.57	12.00	5.00	1877.8
T ₅	ST with Thiomethoxam 600 FS FS @ 2ml/kg seed	6.33	72.50	7.00	9.27	3.00	54.03	2.77	29.90	12.03	4.67	1900.0
T ₆	T1 + T5	2.67	80.28	4.00	7.67	2.33	55.70	2.93	32.27	12.27	2.33	2094.4
T ₇	T2 + T5	2.00	83.61	2.67	6.80	2.67	56.17	3.03	34.33	12.35	1.67	2127.8
T ₈	T3 +T5	1.33	82.22	3.67	7.60	2.00	55.83	2.97	33.30	12.42	2.00	2138.9
T ₉	T4+ T5	4.67	79.44	3.00	8.10	3.33	56.43	2.93	33.00	12.27	3.67	2083.3
T ₁₀	ST <i>Trichoderma harzianum</i> (chitosan based - (IIOR)	5.00	76.94	5.33	23.20	2.33	54.57	2.87	30.10	12.10	4.33	1916.7
T ₁₁	ST <i>Trichoderma harzianum</i> (Cellulose based - (IIOR)	4.33	76.39	4.67	24.03	3.00	54.90	2.97	30.57	12.13	4.00	1900.0
T ₁₂	ST <i>Trichoderma harzianum</i> (Cellulose based - (IIOR) + T5	3.67	80.00	3.00	7.03	4.00	57.37	3.10	33.07	12.33	2.33	2088.9
T ₁₃	Untreated	7.33	70.56	11.00	39.53	9.33	52.13	2.67	27.20	11.27	7.67	1588.9
	CD (P=0.05)	2.02	1.77	3.21	3.91	NS	NS	NS	2.63	0.34	2.01	91.94
	SE(m)	0.69	0.60	1.09	1.33	1.33	1.30	0.124	0.90	0.11	0.68	31.31

Table 4.7f: Integrated management of the root rot complex and stem borers of soybean during kharif-2021 Center: Jorhat

Treatment s	Details	Field Stand (%)	Root rot (%)	Root rot PDI (%)	Plant ht (cm)	No. of pods per plant	100 seed weight (g)	Pod blight (%)	Seed yield
T ₁	Seed treatment (ST) with Carboxin + Thiram 75 % WP @ 3g/kg seed	93.33	8.89	5.92	39.75	61.24	12.13	10.44	0.83
T ₂	ST with Trifloxystrobin + Penflufen 240 FS @ 1ml/kg seed	97.56	5.56	5.55	37.88	59.07	11.33	10.00	0.82
T ₃	ST with Thiophanate methyl + Pyroclostrobin 500 FS @ 2ml/kg seed	96.00	3.33	1.48	38.99	59.07	12.33	6.67	0.83
T ₄	ST with <i>Trichoderma harzianum</i> @ 10g/kg seed	94.22	2.22	2.22	38.20	59.76	11.73	4.67	0.87
T ₅	ST with Thiomethoxam 600 FS FS @ 2ml/kg seed	95.33	4.44	2.66	39.07	57.73	13.33	7.11	0.76
T ₆	T1 + T5	97.56	6.44	3.77	39.07	58.84	11.43	4.22	0.85
T ₇	T2 + T5	96.67	3.56	2.07	38.47	58.69	13.60	2.67	0.85
T ₈	T3 +T5	98.89	1.11	0.37	40.18	78.58	14.17	0.89	0.93
T ₉	T4+ T5	97.11	2.67	2.37	39.09	58.07	13.40	5.11	0.83
T ₁₀	ST <i>Trichoderma harzianum</i> (chitosan based - (IIOR)	98.22	3.56	2.51	37.70	55.98	12.30	8.22	0.82
T ₁₁	ST <i>Trichoderma harzianum</i> (Cellulose based - (IIOR)	97.33	4.22	2.74	39.05	57.02	13.23	8.67	0.73
T ₁₂	ST <i>Trichoderma harzianum</i> (Cellulose based - (IIOR) + T5	97.11	4.67	4.51	38.65	56.80	13.40	9.33	0.87
T ₁₃	Untreated	88.67	12.22	9.25	37.78	54.73	12.33	12.22	0.71
	CD (P=0.05)	1.32	1.78					1.63	

Table 4.8. PP7. Development of Forewarning systems against major diseases of soybean, Correlation co-efficients of rhizoctonia aerial blight disease index in relation to weather variables during 2021 at Pantnagar centre

Cultivars	Environmental variable				
	Min temp (X1)	Max temp (X2)	RH (%) (X3)	Rainfall (X4)	No. of rainy days (X5)
JS-95-60	-0.295	-0.907	0.039	0.198	-0.473
JS 335	-0.265	-0.893	0.014	0.169	-0.504
Shivalik	-0.257	-0.872	-0.059	0.152	-0.570
JS 93-05	-0.305	-0.924	-0.006	0.206	-0.492
Punjab 1	-0.348	-0.927	0.021	0.213	-0.501
PK 472	-0.212	-0.843	-0.130	0.112	-0.601
Bragg	-0.257	-0.896	-0.035	0.170	-0.529
Monetta	-0.352	-0.936	0.057	0.237	-0.458
NRC 7	-0.312	-0.920	0.024	0.203	-0.495
PK 262	-0.309	-0.918	0.024	0.197	-0.494

Table 4.8.1 Multiple regression analysis for prediction of rhizoctonia aerial blight on different cultivars of soybean during 2021 at Pantnagar centre

Cultivars	Prediction equation	R ²
JS-95-60	$y = -116.977 + 4.396x_1 - 5.408x_2 + 1.387x_3 + 0.056x_4 - 3.418x_5$	0.923
JS 335	$y = -172.830 + 6.380x_1 - 7.521x_2 + 1.978x_3 + 0.080x_4 - 5.506x_5$	0.910
Shivailk	$y = -34.380 + 2.244x_1 - 3.588x_2 + 0.7880x_3 + 0.55x_4 - 4.832x_5$	0.913
JS 93-05	$y = -43.94 + 3.29x_1 - 4.83x_2 + 0.80x_3 + 0.51x_4 - 3.14x_5$	0.949
Punjab 1	$y = -41.69 + 3.28x_1 - 6.39x_2 + 1.32x_3 + 0.78x_4 - 5.70x_5$	0.954
PK 472	$y = 20.99 + 2.28x_1 - 4.14x_2 + 0.33x_3 + 0.58x_4 - 5.39x_5$	0.871
Bragg	$y = -86.50 + 4.96x_1 - 6.45x_2 + 1.22x_3 + 0.74x_4 - 5.18x_5$	0.922
Monetta	$y = -60.60 + 2.69x_1 - 4.09x_2 + 0.970x_3 + 0.05x_4 - 2.71x_5$	0.963
NRC 7	$y = -83.51 + 3.70x_1 - 5.22x_2 + 1.24x_3 + 0.06x_4 - 3.98x_5$	0.974
PK 262	$y = -69.15 + 3.00x_1 - 4.22x_2 + 0.98x_3 + 0.05x_4 - 3.08x_5$	0.942

Table 4.8.2 Correlation co-efficients of disease severity of YMV to weather variables during *Kharif* season in 2021 at Pantnagar centre

Cultivars	Environmental variable			
	Min temp	Max temp	RH (%)	Rainfall
JS-95-60	-0.251	-0.849	0.020	0.111
JS 335	-0.320	-0.923	0.023	0.187
Shivailk	-0.277	-0.904	0.029	0.187
JS 93-05	-0.301	-0.872	0.081	0.156
Punjab 1	-0.275	-0.902	0.020	0.168
PK 472	-0.158	-0.806	-0.055	0.080
Bragg	-0.222	-0.848	-0.001	0.119
Monetta	-0.208	-0.861	-0.003	0.112
NRC 7	-0.250	-0.874	0.030	0.153
PK 262	-0.167	-0.814	-0.039	0.086

Table 4.8.3: Multiple regression analysis for prediction of disease severity of SYMV on different cultivars of soybean during 2021 at Pantnagar centre

cultivars	Prediction equation	R ²
JS-95-60	$y = -58.40 + 1.32x_1 - 1.672x_2 + 0.770x_3 + 0.26x_4 - 2.62x_5$	0.887
JS 335	$y = -15.77 + 0.75x_1 - 1.190x_2 + 0.284x_3 + 0.013x_4 - x_5$	0.950
Shivalik	$y = -24.79 + 0.77x_1 - 0.876x_2 + 0.284x_3 + 0.011x_4 - 0.792x_5$	0.951
JS 93-05	$y = -110.46 + 1.94x_1 - 2.448x_2 + 1.381x_3 + 0.042x_4 - 3.962x_5$	0.930
Punjab 1	$y = -143.82 + 4.59x_1 - 5.549x_2 + 1.764x_3 + 0.069x_4 - 5.353x_5$	0.945
PK 472	$y = -118.68 + 3.592x_1 - 3.426x_2 + 1.207x_3 + 0.048x_4 - 4.44x_5$	0.832
Bragg	$y = -115.16 + 3.116x_1 - 3.349x_2 + 1.2930x_3 + 0.047x_4 - 4.157x_5$	0.879
Monetta	$y = -55.49 + 1.641x_1 - 1.654x_2 + 0.568x_3 + 0.019x_4 - 1.589x_5$	0.892
NRC 7	$y = -52.42 + 1.343x_1 - 1.413x_2 + 0.578x_3 + 0.020x_4 - 1.628x_5$	0.921
PK 262	$y = -160.70 + 4.445x_1 - 4.183x_2 + 1.624x_3 + 0.060x_4 - 5.567x_5$	0.847

Table 4.8.4 Correlation co-efficients of Anth to weather variables during *Khari* season in 2021 at Indore centre

Cultivars	Environmental variable						
	Min (X ₁)	temp	Max temp (X ₂)	RH max (X ₃)	RH (%) min (X ₄)	Rainfall (X ₅)	No. of rainy days (X ₆)
JS-95-60	0.01		0.00	0.17	0.32	0.05	0.05
JS 335	0.03		0.01	0.24	0.45	0.06	0.10
Shivalik	0.03		0.00	0.23	0.39	0.06	0.13
JS 93-05	0.00		0.01	0.13	0.28	0.10	0.19
Punjab 1	0.00		0.01	0.10	0.25	0.04	0.08
PK 472	0.00		0.01	0.08	0.22	0.08	0.11
Monetta	0.00		0.01	0.10	0.25	0.04	0.08
NRC 7	0.01		0.02	0.05	0.16	0.03	0.03
PK 262	0.00		0.01	0.10	0.25	0.04	0.08

Table 4.8.5: Multiple regression analysis for prediction of disease severity of Anth on different cultivars of soybean during 2021 at Indore centre

Cultivars	Prediction equation	R ²
JS-95-60	$Y = 37.43 + 5.48 X_1 - 6.508X_2 + 0.520X_3 + .78 X_4 + 0.19 X_5 - 10.22 X_6$	0.99
JS 335	$Y = 21.22 + 6.87 X_1 - 10.29 X_2 + 0.80 X_3 + 2.05 X_4 + 0.35 X_5 - 19.58 X_6$	0.99
Shivalk	$Y = 29.21 + 10.17 X_1 - 11.72 X_2 + 1.09 X_3 + 1.24 X_4 + 0.32 X_5 - 16.96 X_6$	0.99
JS 93-05	$Y = 37.29 + 5.09 X_1 - 5.67 X_2 + 0.48 X_3 + 0.51 X_4 + 0.15 X_5 - 7.27 X_6$	0.98
Punjab 1	$Y = 35.16 + 2.61 X_1 - 5.49 X_2 + 0.67 X_3 + 0.84 X_4 + 0.17 X_5 - 9.39 X_6$	0.99
PK 472	$Y = 34.70 + 2.41 X_1 - 4.98 X_2 + 0.58 X_3 + 0.76 X_4 + 0.16 X_5 - 8.67 X_6$	0.94
Moneta	$Y = 35.16 + 2.61 X_1 - 5.49 X_2 + 0.67 X_3 + 0.84 X_4 + 0.17 X_5 - 9.39 X_6$	0.99
NRC 7	$Y = 37.36 + 0.84 X_1 - 4.10919 X_2 + 0.53 X_3 + 0.86 X_4 + 0.16 X_5 - 9.33 X_6$	0.97
PK 262	$Y = 35.16 + 2.61 X_1 - 5.49 X_2 + 0.67 X_3 + 0.84 X_4 + 0.17 X_5 - 9.39 X_6$	0.99

Table 4.8.6 Correlation co-efficients of disease severity of CR to weather variables during Kharif season in 2021 at Indore centre

Cultivars	Environmental variable					
	Min temp (X ₁)	Max temp (X ₂)	RH max (X ₃)	RH (%) min (X ₄)	Rainfall (X ₅)	No. of rainy days (X ₆)
JS-95-60	0.01	0.29	0.02	0.71	0.88	0.99
JS 335	0.07	0.01	0.00	0.01	0.66	0.77
Shivalk	0.20	0.07	0.02	0.03	0.46	0.65
JS 93-05	0.00	0.32	0.03	0.68	0.90	1.00
Punjab 1	NS	0.40	0.04	0.60	0.87	0.75
PK 472	NS	NS	NS	NS	NS	NS
Moneta	NS	0.39	0.04	0.59	0.86	0.75
NRC 7	0.26	0.39	0.00	0.01	0.15	0.45
PK 262	1.00	0.34	0.06	0.65	0.83	0.80

Table 4.8.7: Multiple regression analysis for prediction of disease severity of CR on different cultivars of soybean during 2021 at Indore centre

Cultivars	Prediction equation	R ²
JS-95-60	NS	
JS 335	NS	
Shivalik	NS	
JS 93-05	NS	
Punjab 1	NS	
PK 472	NS	
Monetta	NS	
NRC 7	NS	
PK 262	NS	

Table 4.8.8 Correlation co-efficients of disease severity of FLS to weather variables during *Kharif* season in 2021 at Palampur centre

Cultivars	Max temp	Min temp	Rainfall	RH(I)	RH (II)	Wind Speed	Sunshine	No. of Rainy Days
JS 335	0.05	0.47	0.03	0.08	0.07	0.58	0.03	0.10
Shivalik	0.04	0.46	0.05	0.08	0.10	0.59	0.05	0.06
JS 95-60	0.07	0.50	0.05	0.17	0.19	0.59	0.40	0.16
Punjab 1	0.13	0.52	0.18	0.34	0.32	0.61	0.51	0.20
Monetta	0.12	0.56	0.10	0.28	0.29	0.63	0.48	0.24
NRC 7	0.01	0.40	0.92	0.56	0.24	0.75	0.85	0.00
JS 93-05	0.07	0.63	0.13	0.27	0.41	0.68	0.46	0.23
Bragg	0.08	0.56	0.05	0.08	0.16	0.64	0.03	0.10

Table 4.8.9 Multiple regression analysis for prediction of disease severity of FLS and Anth on different cultivars of soybean during 2021 at Palampur centre

Cultivars	Prediction equation (FLS)	Prediction equation (Anth)
JS 335	NS	NS
Shivalik	NS	NS
JS 95-60	NS	NS
Punjab 1	NS	NS
Moneta	NS	NS
NRC 7	NS	NS
JS 93-05	NS	NS
Bragg	NS	NS

Table 4.8.10 Correlation co-efficients of disease severity of Anth to weather variables during Kharif season in 2021 at Palampur centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	Rainfall(mm) (X ₃)	No. of rainy days (X ₄)	RH (%) (X ₅)
JS 335	NS	NS	NS	NS	NS
Shivalik	NS	NS	NS	NS	NS
JS 93-05	0.00	0.00	0.39	0.41	0.92
Punjab 1	0.00	0.08	0.53	0.74	0.82
PK 472	0.00	0.00	0.48	0.51	0.96
Moneta	0.00	0.02	0.49	0.59	0.94
NRC 7	0.04	0.02	0.69	0.78	0.82

Table 4.8.11 Correlation co-efficients of disease severity of CR to weather variables during Kharif season in 2021 at Jabalpur centre

Cultivars	Environmental variable							
	Max temp (X ₁)	Min temp (X ₂)	Sunshine Hrs (X ₃)	Rainfall (mm) (X ₄)	RH (%) mor (X ₅)	RH (%) eve (X ₆)	Wind velocity (x ₇)	No. of rainy days (x ₈)
JS 335	0.93	NS	NS	NS	NS	NS	NS	NS
PK 472	0.20	0.03	0.53	0.43	0.71	0.89	0.05	0.96
Shivalik	0.12	0.43	0.09	0.05	0.02	0.01	0.64	0.90
Monetta	0.01	0.49	0.00	0.01	0.08	0.08	0.25	0.03
NRC 7	NS	NS	NS	NS	NS	NS	NS	NS
PK 262	0.01	0.19	0.22	0.16	0.41	0.61	0.29	0.73
JS 95-60	0.58	0.91	0.40	0.39	0.66	0.23	0.46	0.58
Punjab 1	0.83	0.06	0.98	1.00	1.00	0.96	0.69	0.96
JS 93-05	0.41	0.95	0.01	0.01	0.03	0.22	0.87	0.42
Bragg	0.09	0.03	0.34	0.23	0.51	0.74	0.14	0.85

Table 4.8.12 Correlation co-efficients of disease severity of YMV to weather variables during *Kharif* season in 2021 at Jabalpur centre

Cultivars	Environmental variable								
	Max temp (X ₁)	Min temp (X ₂)	Sunshine Hrs (X ₃)	Rainfall (mm) (X ₄)	RH (%) X ₅	mor (	RH (%) eve (X ₆)	Wind velocity (x ₇)	No. of rainy days (x ₈)
JS 335	0.66	0.13	0.56	0.00	0.05		0.34	0.92	0.27
PK 472	0.53	0.16	0.41	0.08	0.00		0.18	0.88	0.15
Shivalik	0.71	0.33	0.58	0.01	0.06		0.34	0.93	0.26
Monetta	0.75	0.40	0.58	0.00	0.07		0.38	0.93	0.31
NRC 7	0.72	0.42	0.54	0.83	0.07		0.37	0.90	0.34
PK 262	0.61	0.26	0.53	0.00	0.07		0.33	0.83	0.25
JS 95-60	0.86	0.74	0.69	0.18	0.35		0.67	0.94	0.49
Punjab 1	0.77	0.49	0.55	0.00	0.09		0.41	0.91	0.37
JS 93-05	0.77	0.49	0.55	0.00	0.09		0.41	0.91	0.37
Bragg	0.69	0.33	0.56	0.00	0.06		0.34	0.91	0.28

Table 4.8.13 Multiple regression analysis for prediction of disease severity of CR, RAB and YMV on different cultivars of soybean during 2021 at Jabalpur centre

Cultivars	Prediction equation (CR)	Prediction equation (RAB)	Prediction equation (YMV)
JS 335	NS	NS	NS
PK 472	NS	NS	NS
Shivalik	NS	NS	NS
Monetta	NS	NS	NS
NRC 7	NS	NS	NS
PK 262	NS	NS	NS
JS 95-60	NS	NS	NS
Punjab 1	NS	NS	NS
JS 93-05	NS	NS	NS
Bragg	NS	NS	NS

Table 4.8.14 Correlation co-efficients of disease severity of RAB to weather variables during *Kharif* season in 2021 at Jabalpur centre

Cultivars	Environmental variable						
	Max temp (X ₁)	Min temp (X ₂)	Sunshine Hrs (X ₃)	Rainfall (mm) (X ₄)	RH (%) (X ₅)	RH (%) eve (X ₆)	No. of rainy days (x ₈)
JS 335	0.66	0.13	0.56	0.00	0.05	0.34	0.27
PK 472	0.53	0.16	0.41	0.08	0.00	0.18	0.15
Shivalik	0.71	0.33	0.58	0.01	0.06	0.34	0.26
Monetta	0.75	0.40	0.58	0.00	0.07	0.38	0.31
NRC 7	0.72	0.42	0.54	0.83	0.07	0.37	0.34
PK 262	0.61	0.26	0.53	0.00	0.07	0.33	0.25
JS 95-60	0.86	0.74	0.69	0.18	0.35	0.67	0.49
Punjab 1	0.77	0.49	0.55	0.00	0.09	0.41	0.37
JS 93-05	0.77	0.49	0.55	0.00	0.09	0.41	0.37
Bragg	0.69	0.33	0.56	0.00	0.06	0.34	0.28

Table 4.8.15 Correlation co-efficients of disease severity of Anth to weather variables during *Kharif* season in 2021 at Jabalpur centre

Cultivars	Environmental variable								
	Max temp (X ₁)	Min temp (X ₂)	Sunshine Hrs (X ₃)	Rainfall (mm) (X ₄)	RH (%) (X ₅)	mor	RH (%) eve (X ₆)	Wind velocity (x ₇)	No. of rainy days (x ₈)
JS 335	0.052	0.941	0.132	0.369	0.369		0.666	0.441	0.852
PK 472	0.332	0.857	0.031	0.033	0.077		0.021	0.640	0.031
Shivalik	0.385	0.884	0.054	0.057	0.108		0.008	0.678	0.048
Monetta	0.295	0.844	0.019	0.087	0.154		0.031	0.604	0.024
NRC 7	0.290	0.848	0.018	0.020	0.064		0.030	0.594	0.026
PK 262	0.334	0.861	0.032	0.035	0.080		0.020	0.639	0.032
JS 95-60	0.905	0.968	0.995	0.992	0.889		0.850	0.664	0.662
Punjab 1	0.406	0.886	0.063	0.067	0.117		0.006	0.697	0.052
JS 93-05	0.473	0.917	0.233	0.993	0.863		0.842	0.622	0.692
Bragg	0.355	0.861	0.039	0.042	0.085		0.017	0.663	0.034

Table 4.8.16 Correlation co-efficients of disease severity of CR to weather variables during *Kharif* season in 2021 at Amravati centre

Cultivars	Environmental variable					
	Min temp (X ₁)	Max temp (X ₂)	RH (%) (X ₃)	RH (%) max min (X ₄)	Rainfall (X ₅)	No. of rainy days (X ₆)
JS-95-60	0.868	0.970	0.994	0.405	0.087	0.008
Shivalik	0.662	0.832	0.897	0.650	0.271	0.111

Table 4.8.17 Multiple regression analysis for prediction of disease severity of CR on different cultivars of soybean during 2021 at Amravati centre

Cultivars	Prediction equation	R ²
JS-95-60	NS	
Shivalik	NS	

Table 4.8.18 Correlation co-efficients of disease severity of Rust to weather variables during *Kharif* season in 2021 at Medziphema centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	RH (%) Max.(X ₃)	RH (%) Min. (X ₄)	Rainfall (mm) (X ₅)	No. of rainy days (x ₆)
Monetta	0.15	0.23	0.00	0.08	0.20	0.01
Punjab 1	0.08	0.09	0.70	0.37	0.06	0.01
JS 93-05	0.30	0.56	0.60	0.29	0.03	0.14

Table 4.8.19 Multiple regression analysis for prediction of disease severity of Rust on different cultivars of soybean during 2021 at Medziphema centre

Cultivars	Prediction equation	R ²
Monetta	NS	NS
Punjab 1	NS	NS
JS 93-05	NS	NS

Table 4.8.20 Correlation co-efficients of disease severity of RAB to weather variables during *Kharif* season in 2021 at Medziphema centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	RH (%) Max.(X ₃)	RH (%) Min. (X ₄)	Rainfall (mm) (X ₅)	No. of rainy days (X ₆)
JS 335	0.02	0.00	0.06	0.00	0.88	0.36
PK 472	0.02	0.43	0.19	0.00	0.04	0.00
Shivalik	0.00	0.28	0.54	0.06	0.05	0.10
Monetta	0.21	0.62	0.35	0.15	0.89	0.22
NRC 7	0.00	0.07	0.00	0.00	0.17	0.31
PK 262	0.10	0.47	0.32	0.18	0.73	0.26
JS 95-60	0.28	0.46	0.09	0.08	0.96	0.07
Punjab 1	0.01	0.25	0.29	0.03	0.00	0.00
JS 93-05	0.02	0.14	0.07	0.01	0.17	0.05
Bragg	0.00	0.34	0.07	0.00	0.03	0.00

Table 4.8.21 Multiple regression analysis for prediction of disease severity of Anth on different cultivars of soybean during 2021 at Medziphema centre

Cultivars	Prediction equation	R ²
JS 335	NS	NS
PK 472	NS	NS
Shivalik	NS	NS
Monetta	NS	NS
NRC 7	NS	NS
PK 262	NS	NS
JS 95-60	NS	NS
Punjab 1	NS	NS
JS 93-05	NS	NS
Bragg	NS	NS

Table 4.8.22 Correlation co-efficients of disease severity of Rust to weather variables during *Kharif* season in 2021 at Dharwad centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	Rainfall (X ₃)	RH(I) (X ₄)	RH (II) (X ₅)	No. of Rainy Days (X ₆)
JS 335	0.31	0.50	0.27	0.00	0.33	0.04
PK 472	0.33	0.52	0.22	0.00	0.34	0.03
Shivalik	0.38	0.53	0.28	0.00	0.30	0.05
Monetta	0.38	0.40	0.26	0.02	0.31	0.04
NRC 7	0.32	0.37	0.23	0.00	0.34	0.02
PK 262	0.36	0.43	0.27	0.00	0.31	0.03
JK 95-60	0.28	0.42	0.20	0.00	0.31	0.02
Punjab 1	0.28	0.42	0.20	0.00	0.31	0.02
Js 93-05	0.34	0.40	0.24	0.00	0.29	0.03
Bragg	0.32	0.40	0.18	0.00	0.33	0.02

Table 4.8.23 Multiple regression analysis for prediction of disease severity of rust on different cultivars of soybean during 2021 at Dharwad centre

Cultivars	Prediction equation	R ²
JS 335	Y=104.18+2.88X1-20.01X2+0.06X3+8.30X4-6.63X5+22.15X6	0.94
PK 472	Y=-227.31+6.39X1-17.01X2+0.40X3+9.48X4-5.76X5+19.81X6	0.97
Shivalk	Y=-137.76+7.70X1-20.36X2+0.29X3+8.99X4-6.00X5+23.52X6	0.95
Monetta	Y=279.93+6.57X1-31.23X2+0.23X3+7.61X4-6.59X5+27.39X6	0.88
NRC 7	Y=128.09+6.22X1-39.17X2+1.09X3+10.89X4-6.20X5+19.15X6	0.89
PK 262	Y=66.89+8.38X1-41.31X2+0.93X3+11.51X4-6.40X5+22.70X6	0.94
JS 95-60	Y=-24.31+6.70X1-34.62X2+0.76X3+11.45X4-6.23X5+21.23X6	0.91
Punjab 1	Y=-24.31+6.70X1-34.62X2+0.76X3+11.45X4-6.23X5+21.23X6	0.91
Js 93-05	Y=13.82+9.82X1-46.07X2+0.92X3+12.68X4-6.34X5+23.09X6	0.91
Bragg	Y=39.02+7.50X1-30.83X2+0.25X3+9.96X4-6.59X5+25.45X6	0.88

Table 4.8.24 Correlation co-efficients of disease severity of Anth to weather variables during *Kharif* season in 2021 at Dharwad centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	Rainfall (X ₃)	RH(I)	RH (II)	No. of Rainy Days
JS 335	0.05	0.45	0.20	0.57	0.01	0.09
PK 472	0.12	0.61	0.35	0.39	0.07	0.21
Shivalk	0.08	0.53	0.26	0.48	0.03	0.14
Monetta	0.01	0.39	0.23	0.57	0.04	0.11
NRC 7	0.06	0.49	0.24	0.52	0.02	0.12
PK 262	0.03	0.43	0.21	0.57	0.02	0.10
JK 95-60	0.00	0.29	0.29	0.68	0.68	0.05
Punjab 1	0.07	0.55	0.36	0.42	0.09	0.22
Js 93-05	0.03	0.42	0.23	0.56	0.03	0.11
Bragg	0.19	0.76	0.66	0.15	0.30	0.50

Table 4.9.25 Multiple regression analysis for prediction of disease severity of Anth on different cultivars of soybean during 2021 at Dharwad centre

Cultivars	Prediction equation	R ²
JS 335	NS	
PK 472	NS	
Shivalik	NS	
Monetta	NS	
NRC 7	NS	
PK 262	NS	
JS 95-60	NS	
Punjab 1	NS	
Js 93-05	NS	
Bragg	NS	

Table 4.8.26 Correlation co-efficients of Coll R to weather variables during *Kharif* season in 2021 at Jorhat centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	RH (%) max (X ₃)	RH (%) min (X ₄)	Rainfall (X ₅)
JS-95-60	0.20	0.32	0.13	0.20	0.03
Shivalik	0.61	0.86	0.44	0.74	0.32
JS 93-05	0.82	0.83	0.57	0.63	0.20
Punjab 1	0.12	0.18	0.25	0.15	0.00
PK 472	NS	NS	NS	NS	NS
Bragg	0.09	0.23	0.11	0.26	0.00
NRC 7	0.13	0.16	0.13	0.05	0.02
PK 262	0.54	0.54	0.40	0.26	0.00

Table 4.8.27 Multiple regression analysis for prediction of disease severity of Coll R on different cultivars of soybean during 2021 at Jorhat centre

Cultivars	Prediction equation	R ²
Punjab 1	$-98.112 - 0.112X_1 + 0.239X_2 + 1.468X_3 - 0.343X_4 + 0.681X_5$	0.39
PK 262	$567.28 - 4.59X_1 - 0.66X_2 - 3.72X_3 - 0.36X_4 + 2.20X_5$	0.85

Table 4.8.28 Correlation co-efficients of disease severity of RAB to weather variables during *Kharif* season in 2021 at Jorhat centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	RH (%) max (X ₃)	RH (%) min (X ₄)	Rainfall (X ₅)
JS-95-60	0.27	0.26	0.14	0.04	0.02
JS 335	0.56	0.78	0.47	0.53	0.07
Shivailk	0.52	0.55	0.41	0.24	0.00
JS 93-05	0.17	0.30	0.21	0.31	0.01
Punjab 1	0.61	0.86	0.44	0.74	0.32
Bragg	0.31	0.40	0.35	0.27	0.0
Monetta	0.27	0.26	0.14	0.04	0.02

Table 4.8.29 Multiple regression analysis for prediction of disease severity of Coll R on different cultivars of soybean during 2021 at Jorhat centre

Cultivars	Prediction equation	R ²
JS-95-60	$95.593 - 0.294X_1 - 0.742X_2 - 0.767X_3 + 0.202X_4 + 0.168X_5$	0.43
JS 335	$102.90 + 0.86X_1 - 3.28X_2 - 0.37X_3 - 0.10X_4 + 1.01X_5$	0.83
Shivailk	$1124.70 - 9.11X_1 - 1.85X_2 - 7.81X_3 - 0.65X_4 + 4.82X_5$	0.86
JS 93-05	$23.971 + 0.198X_1 - 0.642X_2 + 0.010X_3 - 0.081X_4 + 0.465X_5$	0.42
Punjab 1	$190.054 + 0.555X_1 - 2.703X_2 - 1.089X_3 - 0.106X_4 + 0.182X_5$	0.88
Bragg	$55.222 - 0.134X_1 - 0.690X_2 - 0.002X_3 - 0.125X_4 + 0.726X_5$	0.55

Table 4.8.30 Correlation co-efficients of disease severity of Anth to weather variables during *Kharif* season in 2021 at Jorhat centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	RH (%) max (X ₃)	RH (%) min (X ₄)	Rainfall (X ₅)
JS 93-05	0.869	0.891	0.444	0.741	0.991
NRC 7	0.494	0.775	0.391	0.756	0.550
PK 472	0.341	0.732	0.364	0.524	0.448
Bragg	0.341	0.732	0.364	0.524	0.448
Monetta	0.494	0.775	0.391	0.756	0.550

Table 4.8.31 Multiple regression analysis for prediction of disease severity of Coll R on different cultivars of soybean during 2021 at Jorhat centre

Cultivars	Prediction equation	R ²
JS 93-05	NS	NS
NRC 7	NS	
PK 472	NS	
Bragg	NS	
Monetta	NS	

Table 4.8.30 Correlation co-efficients and Multiple regression analysis of disease severity of FLS to weather variables during *Kharif* season in 2021 at Almora centre

Cultivars	Max temp (X ₁)	Min temp (X ₂)	Sunshine (X ₆)	hr	Rainfall (X ₃)	No. of Days (X ₅)	RH (X ₄)	Prediction equation
JS 335	0.03	0.44	0.05		0.07	0.04	0.27	NS
PK 472	0.03	0.44	0.05		0.07	0.04	0.27	NS
Shivalik	NS	NS	NS		NS	NS	NS	NS
Monetta	0.03	0.44	0.05		0.07	0.04	0.27	NS
NRC 7	0.03	0.44	0.05		0.07	0.04	0.27	NS
PK 262	0.11	0.81	0.43		0.09	0.07	0.07	NS
JK 95-60	0.03	0.44	0.05		0.07	0.04	0.27	NS
Punjab 1	0.03	0.44	0.05		0.07	0.04	0.27	NS
Js 93-05	0.03	0.44	0.05		0.07	0.04	0.27	NS
Bragg	0.03	0.44	0.05		0.07	0.04	0.27	NS

Table 4.09 a: Estimation of avoidable yield loss due to CR, RAB and Frog eye leaf spot disease in soybean during 2021 **Center: Jabalpur**

Variety	Treatment	CR		RAB			FLS			Yield (Kg/ha)	Avoidable Yield loss (%)	Yield gain or loss (%)
		Incidence (%)	AUDPC	Incidence (%)	PDI	AUDPC	Incidence (%)	PDI	AUDPC			
JS 20-29	1	9.67	72.50	28.67	13.46	124.07	6.00	0.93	6.94	1888.9	11.17	(+) 39.92
	2	9.00	67.50	21.67	10.00	95.37	5.00	0.62	4.63	2016.7	16.80	(+) 49.38
	3	6.67	50.00	11.33	4.88	47.68	4.00	0.31	2.31	2100.0	20.10	(+) 55.55
	4	5.33	40.00	10.67	4.75	41.20	4.33	0.49	3.70	2133.3	21.35	(+) 58.02
	5	8.00	60.00	35.00	16.85	155.09	6.67	0.99	7.41	1827.8	8.21	(+) 35.39
	6	14.67	110.00	37.67	18.76	174.07	7.33	1.30	9.72	1677.8	-	(+) 24.28
JS 20-98	1	0.00	0.00	7.67	2.22	16.67	2.33	0.37	2.78	2638.9	3.37	(+) 19.95
	2	0.00	0.00	6.00	1.54	11.57	2.00	0.49	3.70	2672.2	4.57	(+) 21.46
	3	0.00	0.00	4.67	0.80	6.02	0.67	0.37	2.78	2705.5	5.75	(+) 22.98
	4	0.00	0.00	3.33	0.62	4.63	1.33	0.43	3.24	2727.8	6.52	(+) 23.99
	5	0.00	0.00	8.00	3.21	24.07	3.67	0.80	6.02	2611.1	2.34	(+) 18.69
	6	0.00	0.00	9.00	3.77	28.24	4.33	0.86	6.48	2550.0	-	(+) 15.91
	CD (p=0.05)	3.27	24.54	3.59	2.25	21.76	1.16	NS	NS	100.00	-	-
	SE(m)	1.10	8.31	1.21	0.76	7.37	0.39	0.23	1.77	33.87	-	-

Incidence and PDI= 75 DAS, AUDPC was calculated from PDI values of RAB and FLS at 30, 45, 60 and 75 DAS

Table 4.09 b: Estimation of avoidable yield loss due to CR, disease in soybean during 2021 **Center: Amravati**

Sub Treat.		30 Days		45 days		60 days		75 days			AUPDC		(JS-335)	Avoidable Yield Loss (V1) %	AMS 1002	Avoidable Yield Loss(V2)	
	Main Treat	JS-335	AMS-1002	JS-335	AMS-1002	JS-335	AMS-1002	JS-335	AMS-1002	JS-335	AMS-1002						
T1		0	0	0	0	23.61	8.33	28.2	12.55	693.9	219.075	1302.45	5.53	1546.50	8.81		
T2		0	0	0	0	19.33	5.84	22.2	11.55	564.9	174.225	1286.99	4.39	1566.42	9.97		
T3		0	0	0	0	12.64	5.88	16.20	10.62	409.35	167.85	1316.89	6.56	1689.47	16.53		
T4		0	0	0	0	9.2	3.22	11.33	9.56	290.47	120.00	1340.10	8.18	1720.44	18.03		
T5		0	0	0	0	10.5	4.8	12.45	8.6	365.77	137.70	1284.55	10.16	1456.33	3.17		
T6		0	0	0	0	33.2	19.52	36.4	26.2	1045.95	489.30	1230.44	-	1410.23	-		
CD (p=0.05)		-	-	-	-	SEm+ CD @5%						NS		SIG.			
MT						0.53	1.69	0.81	1.49			-		56.44			
ST						0.87	2.65	0.98	2.58			-		171.32			
MTXST						1.29	3.76	1.45	3.49								
CV						8.14		7.42									

Table 4.09 c: Estimation of avoidable yield loss due to Rust, disease in soybean during 2020 **Center: Dharwad**

Sub treat.	30DAS		45 DAS		60 DAS		75 DAS		Yield (q/ha.)		AUDPC		Avoidable yield loss	
	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23
T ₁	0.00	0.00	31.18 (33.92)	8.64 (16.67)	32.25 (34.56)	11.85 (19.53)	45.78 (42.56)	16.29 (23.64)	1356.66	1752.41	1555.40	429.475	33.93	8.12
T ₂	0.00	0.00	23.70 (29.02)	5.31 (12.43)	24.56 (31.21)	12.59 (20.70)	30.36 (33.40)	11.85 (20.11)	1465.33	1802.86	1038.63	357.325	38.83	10.69
T ₃	0.00	0.00	18.51 (25.42)	5.76 (13.20)	17.03 (24.38)	8.11 (16.29)	14.81 (22.53)	8.47 (16.76)	1599.08	1912.36	644.23	271.55	43.95	15.80
T ₄	0.00	0.00	17.77 (24.85)	4.94 (11.62)	14.07 (21.96)	6.31 (14.06)	12.59 (20.71)	6.33 (14.10)	1621.33	1953.22	572.08	216.2	44.72	17.56
T ₅	0.00	0.00	16.65 (24.04)	13.33 (21.36)	53.33 (46.89)	23.03 (28.48)	88.47 (70.15)	18.02 (25.08)	989.66	1564.32	1713.23	680.5	9.43	-2.93
T ₆	0.00	0.00	20.25 (26.70)	14.81 (22.53)	53.56 (47.03)	29.62 (32.94)	88.70 (70.35)	29.62 (32.94)	896.33	1610.18	1771.93	888.675	0.00	0.00
Mean			21.30 (27.32)	8.80 (16.30)	36.33 (36.40)	15.25 (22.00)	46.79 (43.28)	15.10 (22.11)	1321.39	1765.89				
			SEmt	CD @ 5%	SEmt	CD @ 5%	SEmt	CD @ 5%	SEmt	CD @ 5%				
MT			0.94	2.76	0.74	2.67	0.49	1.46	15.07	43.18				
ST			1.63	4.79	1.78	5.23	0.86	2.53	24.86	78.63				
MT x ST			2.31	6.78	1.28	3.76	1.22	3.58	26.40	85.57				
CV			18.37		10.78		6.29		8.95					

Table 4.09 d. Estimation of avoidable yield loss due to PB(Ct), disease in soybean during 2020 **Center: Dharwad**

Sub treat.	Pod blight									
	30DAS		45 DAS		60 DAS		75 DAS		Yield (q/ha.)	
	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23	JS 335	DSb 23
T ₁	0.00	0.00	0.00	0.00	26.33 (30.81)	13.33 (21.41)	26.58 (31.03)	13.11 (21.22)	1356.66	1752.41
T ₂	0.00	0.00	0.00	0.00	18.22 (23.20)	8.88 (17.33)	18.35 (25.36)	8.88 (17.33)	1465.33	1802.86
T ₃	0.00	0.00	0.00	0.00	15.55 (23.20)	5.66 (13.76)	14.54 (22.41)	6.77 (15.08)	1599.08	1912.36
T ₄	0.00	0.00	0.00	0.00	11.11 (19.47)	4.28 (11.93)	11.11 (19.47)	5.66 (13.76)	1621.33	1953.22
T ₅	0.00	0.00	0.00	0.00	33.66 (35.46)	16.66 (24.08)	34.56 (36.00)	16.89 (24.26)	989.66	1564.32
T ₆	0.00	0.00	0.00	0.00	38.78 (38.51)	18.55 (25.51)	39.29 (38.81)	18.88 (25.75)	896.33	1610.18
Mean					23.94 (29.29)	11.22 (19.57)	24.07 (29.38)	11.69 (20.05)	1321.39	1765.89
					SEm±	CD @ 5%			SEm±	CD @ 5%
MT					0.51	1.49	0.78	1.32	15.07	43.18
ST					0.88	2.59	0.94	2.38	24.86	78.63
MT x ST					1.25	3.67	1.36	3.42	26.40	85.57
CV					7.39		5.65		8.95	

Table 4.09 e: Estimation of avoidable yield loss due to disease in soybean during 2020 **Center: Palampur**

Variety/Treatment	PDI of Frogeye leaf spot				AUDPC	PDI of Pod blight		AUDPC	Yield (g/ha)	Avoidable yield loss (%)
	17 th Aug	1st Sept	16 th Sept	30 th Sept		16 th Sept.	30 th Sept.			
Variety 1: VL559										
Sub T 1= Seed treatment + one spray	5.18	7.77	18.81	34.07(35.65)	694.89	8.14	22.96(28.58)	233.28	14.663	11.27
Sub T 2= Seed treatment + two sprays	5.18	6.29	15.55	29.81(32.98)	540.05	6.66	17.03(24.24)	177.70	15.307	15.01
Sub T 3= Seed treatment + three sprays	4.81	5.55	6.29	18.52(25.44)	452.55	4.07	13.70(21.69)	133.28	17.677	26.40
Sub T 4= Seed treatment + four sprays	4.81	5.55	5.92	9.62(17.99)	283.33	3.70	7.03(15.30)	80.48	19.750	34.13
Sub T 5= Seed treatment + water spray	4.81	12.59	27.4	40.37(39.43)	938.72	10.00	24.44(29.60)	258.28	13.480	3.49
Sub T 6= No seed treatment and no spray	4.81	13.33	32.59	44.44(41.18)	1058.18	12.59	31.85(34.34)	333.30	13.010	0.00
Variety-2 (JS 335)										
Sub T 1= Seed treatment + one spray	6.29	14.44	31.11	47.03(43.27)	1083.41	22.49	50.15(45.06)	538.83	12.687	31.50
Sub T 2= Seed treatment + two sprays	5.92	7.4	20.74	37.03(37.45)	744.20	15.18	27.40(31.54)	338.83	14.643	40.65
Sub T 3= Seed treatment + three sprays	7.03	7.4	11.48	24.44(29.60)	516.45	11.85	19.63(26.25)	236.08	15.307	43.23
Sub T 4= Seed treatment + four sprays	6.66	7.4	8.88	15.55(23.12)	394.13	7.03	12.59(20.45)	147.15	17.923	51.51
Sub T 5= Seed treatment + water spray	7.03	26.66	44.81	58.15(49.67)	1560.83	28.89	57.03(49.02)	644.38	9.853	11.80
Sub T 6= No seed treatment and no spray	7.773	28.88	49.25	60.37(50.96)	1681.60	34.81	64.07(53.96)	741.58	8.690	0.00
CD (P=0.05)	A=0.88 B=N/A	A=1.27 B=2.21 AxB=3.13	A=3.02 B=5.23 AxB=7.93	A=1.052 B=1.821 A x B= 2.576	A=64.61 B=112.25 AxB=158.75	A=1.66 B=2.88 AxB= 4.08	A=1.517 B=2.628 A xB=3.717	A=22.15 B=38.37 A xB=54.26	A=1.03 B=1.78	-

Figures in parentheses are angular transformation value, A = main factor (variety), B = Sub-factor (Fungicide treatments)
Seed treatment: Thiophanate methyl + Pyraclostrobin @ 2ml/kg of seed

Foliar spray: Tebuconazole @ 625ml/ha

Table 4.09 f: Estimation of avoidable yield loss due to diseases RAB, ANT, rust, YMV in soybean during 2021 **Center: Medziphema**

Varieties/Treatments	Disease incidence (%)											Yield Loss (Kg/ha)	Avoidable yield loss (%)
	RAB				ANTH/PB(Ct.)								
	30DAS	45DAS	60DAS	75DAS	30DAS	45DAS	60DAS	75DAS	30DAS	45DAS	60DAS	75DAS	
	JS 335												
V1T1	12.67	15.00	18.67	27.67	3.33	10.67	19.33	25.00				1282.33	16.30
V1T2	10.33	13.00	16.33	22.33	2.00	6.00	11.00	18.33				1415.33	24.16
V1T3	9.33	13.33	15.33	17.00	1.67	5.00	8.00	12.67				1560.00	31.20
V1T4	9.00	13.67	14.67	15.33	1.00	4.67	6.33	10.67				1730.00	37.96
V1T5	17.33	27.33	27.67	48.33	5.67	11.33	31.67	41.33				1176.67	8.78
V1T6	21.67	32.33	43.00	57.00	7.00	13.67	34.33	70.67				1073.33	
V2T1	1.33	12.67	19.00	24.33	2.67	6.67	14.33	18.00				1768.33	11.33
V2T2	0.67	7.67	10.67	20.67	1.67	4.33	8.33	11.67				1824.00	14.04
V2T3	1.67	7.00	8.00	13.33	1.00	2.00	5.00	8.67				2116.67	25.92
V2T4	2.67	6.33	9.33	12.33	1.00	1.67	5.67	8.33				2326.67	32.61
V2T5	3.67	13.33	21.00	35.00	2.33	5.00	14.67	31.00				1586.33	1.16
V2T6	6.00	16.67	27.00	45.00	5.33	8.67	19.67	46.67				1568.00	
	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%				CD 5%	
Variety (V)	1.87	12.75	20.72	22.15	6.55	1.24	14.50	15.54				289.32	
Treatment (T)	6.13	10.58	15.77	24.77	2.82	7.11	19.59	17.77				279.04	
VXT	8.67	14.97	22.30	35.03	3.99	10.05	27.71	25.13				394.62	

Table 4.09 g: Estimation of avoidable yield loss due to diseases RAB, ANT, rust, YMV in soybean during 2021 **Center: Medziphema**

Varieties/Treatments	Per cent Disease Index								Yield (Kg/ha)	Avoidable yield loss (%)
	Rust				YMV					
	30DAS	45DAS	60DAS	75DAS	30DAS	45DAS	60DAS	75DAS		
	JS 335									
V1T1	2.07	5.81	17.44	25.52	1.11	13.51	21.11	38.81	1282.33	16.30
V1T2	1.74	5.52	9.18	18.92	0.74	6.74	9.77	22.15	1415.33	24.16
V1T3	1.93	5.51	6.14	13.18	1.48	6.89	9.66	11.14	1560.00	31.20
V1T4	1.78	4.33	5.70	11.93	1.11	4.37	9.66	10.40	1730.00	37.96
V1T5	1.67	6.11	18.66	26.66	3.33	13.48	20.74	48.11	1176.67	8.78
V1T6	2.48	8.55	22.57	50.39	5.66	15.36	32.37	64.07	1073.33	
V2T1	0.37	2.89	13.89	21.48	1.48	8.48	15.88	31.73	1768.33	11.33
V2T2	0.70	2.81	8.33	18.55	1.11	6.59	12.92	18.62	1824.00	14.04
V2T3	0.74	1.92	5.63	9.48	1.11	5.11	7.52	13.92	2116.67	25.92
V2T4	0.74	1.48	5.55	7.48	1.11	4.59	7.51	11.18	2326.67	32.61
V2T5	0.70	3.63	15.14	33.07	1.85	9.59	19.07	39.74	1586.33	1.16
V2T6	1.11	3.26	20.22	37.44	1.81	9.70	25.22	50.18	1568.00	
	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	CD 5%	
Variety (V)	1.20	4.32	19.05	11.29	0.59	6.14	15.24	16.85	289.32	
Treatment (T)	1.05	2.34	8.44	14.41	1.77	5.89	8.64	18.55	279.04	
VXT	1.48	3.32	11.93	20.38	2.51	8.33	12.22	26.23	394.62	

Table 4.09 h: Estimation of avoidable yield loss due to disease in soybean during 2021 **Center: Indore**

S.No	Treatment	Incidence (%) of CR						PDI (%) of Anth						Yield	AYL (%)
		30	45	60	75	30	45	60	75	30	45	60	75		
		DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS		
1	M1T1	0.00	0.00	0.00	16.25	0.00	0.00	0.00	20.45	0.00	0.00	0.00	18.42	2187.49	18.42
2	M1T2	0.00	0.00	0.00	12.12	0.00	0.00	0.00	18.00	0.00	0.00	0.00	19.93	2228.92	19.93
3	M1T3	0.00	0.00	0.00	12.12	0.00	0.00	0.00	16.66	0.00	0.00	0.00	28.29	2488.62	28.29
4	M1T4	0.00	0.00	0.00	12.12	0.00	0.00	0.00	12.24	0.00	0.00	0.00	32.99	2663.38	32.99
5	M1T5	0.00	0.00	0.00	18.66	0.00	0.00	0.00	28.27	0.00	0.00	0.00	4.29	1864.62	4.29
6	M1T6	0.00	0.00	0.00	22.12	0.00	0.00	0.00	32.12	0.00	0.00	0.00	0.00	1784.62	0.00
7	M2T1	0.00	0.00	0.00	6.25	0.00	0.00	0.00	20.86	0.00	0.00	0.00	20.94	2525.54	20.94
8	M2T2	0.00	0.00	0.00	4.24	0.00	0.00	0.00	18.66	0.00	0.00	0.00	27.63	2758.97	27.63
9	M2T3	0.00	0.00	0.00	3.65	0.00	0.00	0.00	16.00	0.00	0.00	0.00	34.92	3068.31	34.92
10	M2T4	0.00	0.00	0.00	3.24	0.00	0.00	0.00	12.25	0.00	0.00	0.00	36.70	3154.46	36.70
11	M2T5	0.00	0.00	0.00	8.25	0.00	0.00	0.00	22.12	0.00	0.00	0.00	15.18	2354.05	15.18
12	M2T6	0.00	0.00	0.00	10.00	0.00	0.00	0.00	27.12	0.00	0.00	0.00	0.00	1996.72	0.00
	CD @ 5%														
Variety (V)	NS	NS	NS	NS	NS	NS	NS	NS	1.20	NS	NS	NS	37.47		
Treatment (T)	NS	NS	NS	NS	NS	NS	NS	NS	1.05	NS	NS	NS	54.96		
VXT	NS	NS	NS	NS	NS	NS	NS	NS	1.48	NS	NS	NS	60.72		

Table 4.09 i: Estimation of avoidable yield loss due to RAB disease in soybean during 2021 **Center: Pantnagar**

S.No	Treatment	Incidence (%)				PDI (%)				AUDPC			Yield kg/4.5 m ² plot	AYL (%)
		30 DAS	45 DAS	60 DAS	75 DAS	30 DAS	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS		
1	M1T1	4.5	7.25	12.5	18.5	3.17	9.92	17.75	26.78	98.18	207.53	333.98	0.52	8.57
2	M1T2	3.2	4.50	8.5	13.15	5.33	12.67	14.50	15.75	135.00	203.78	226.88	0.58	17.10
3	M1T3	4.75	6.50	9.5	12.5	6.33	11.50	13.20	13.50	133.73	185.25	200.25	0.63	20.00
4	M1T4	5.2	5.90	8.25	10.5	4.77	7.57	9.50	12.50	92.55	128.03	165.00	0.57	12.20
5	M1T5	7.8	10.25	19.5	25.75	3.83	14.50	19.50	23.50	137.48	255.00	322.50	0.52	3.03
6	M1T6	11.39	21.50	29.5	47.5	10.33	21.51	31.25	61.50	238.80	395.70	695.63	0.50	-
7	M2T1	3.5	7.75	11.5	18.25	2.95	7.25	14.39	17.50	76.50	162.30	239.18	1.17	41.43
8	M2T2	1.34	5.50	7.25	11.25	3.00	7.85	12.50	14.43	81.38	152.63	201.98	1.30	47.44
9	M2T3	1.15	4.00	6.5	9.5	1.33	4.43	9.35	12.85	43.23	103.38	166.50	0.92	25.45
10	M2T4	2.2	3.12	4.75	7.5	0.75	3.67	8.78	9.39	33.15	93.38	136.28	1.20	43.06
11	M2T5	3.8	7.90	12	21.15	2.67	6.50	15.15	21.00	68.78	162.38	271.13	0.68	8.89
12	M2T6	8.5	11.50	15.5	20.75	8.83	11.55	16.90	22.90	152.85	213.38	298.50	0.65	-

Table 4.09 i: Estimation of avoidable yield loss due to Collar rot and Anth disease in soybean during 2021 **Center: Jorhat**

S.No	Treatment	Collar rot Incidence (%)						Anth PDI (%)				Yield kg/ 4.5 m ² plot	AYL (%)
		30 DAS	45 DAS	60 DAS	75 DAS	30 DAS	45 DAS	60 DAS	75 DAS				
1	M1T1	40	32	26	20	0	1.62	20.29	24.11		1740.00	30.91	
2	M1T2	36	24	16	12	0	2.14	17.51	21.64		1802.96	33.32	
3	M1T3	32	24	16.8	14	0	0.81	8.45	11.03		1789.63	32.82	
4	M1T4	28	20	16	14	0	0.691	3.77	4.22		1879.26	36.03	
5	M1T5	44	40	28	26	0	2.81	24.93	22.29		1694.07	29.03	
6	M1T6	44	40	28	26	0	3.28	24.44	33.52		1202.22	0.00	
7	M2T1	24	16	14	12	0	1.84	3.85	5.25		1808.15	40.76	
8	M2T2	20	14	10	8	0	0.76	3.09	3.40		1948.89	45.04	
9	M2T3	16	14	8	6	0	0.48	1.51	3.55		1740.74	38.47	
10	M2T4	12	10	6	4	0	0	0.16	0.66		2221.62	51.79	
11	M2T5	24	20	12	10	0	0.59	5.63	6.66		1648.15	35.01	
12	M2T6	24	20	16	14	0	3.77	9.18	16.47		1071.11	0.00	

Table 4.10 : PP-9. Evaluation of breeding material of F6 generation hot spot for disease(s) for resistant donor(s) at Pantnagar Centre

S.No	Variety	Disease Rating (0-9) scale										(0-4) scale	
		BP	BLB	BB	PB	RAB	SYMV	SMV					
1	Himso 1563 x G 828	R	MR	HR	HR	MR	R	HR					
2	PS 1592 x DT 21	R	MR	HR	HR	MR	MR	S					
3	UPSM 534 x JS 335	R	MS	HR	HR	R	R	MR					
4	PS 1241 x PS 1225 x JS 335	R	R	HR	HR	R	R	HR					
5	PS 1241 x JS 20-71	HR	HR	HR	HR	MS	R	HR					
6	DSb 21 x SL 958	R	R	HR	HR	MR	HR	R					
7	Cat 3293 (EC 602288) NRC 2	R	R	HR	HR	MR	MR	R					
8	JS 97-52 x 104-31 (JS 97-52 x JS 90-41)	R	R	HR	HR	MR	R	HR					
9	JS 97-52 x Bragg	R	MS	HR	HR	MR	MR	HR					
10	JS 97-52 x G 27 F6 (EC 390977 x EC 538828)	R	R	HR	HR	S	R	HR					
11	JS 97-52 x IVT 2 (JS 21-08)	R	MR	HR	HR	R	R	HR					
12	JS 97-52 x NRC37	R	R	HR	HR	MR	MS	HR					
13	JS 97-52 x Ankur	R	R	HR	HR	MR	HR	MR					
14	PP6 (EC 390977) x 2911 (EC 538828) (33)	R	MS	HR	HR	MR	R	R					
15	PS 1029 x G 29 (R6 EC 390977 x EC 538828)	R	HR	HR	HR	MS	MS	HR					
16	JS 97-52 x SL 688	R	MS	HR	HR	R	HR	MS					
17	JS 97-52 x PS 1029	R	R	HR	HR	MS	R	HR					
18	JS 97-52 x TAMS 98-21	R	R	HR	HR	S	R	HR					
19	JS 97-52 x Durga	R	R	HR	HR	MS	MR	HR					
20	JS 97-52 x SL 958	R	MR	HR	HR	R	HR	HR					
21	JS 97-52 x Lee	HR	HR	HR	HR	MR	HR	R					
22	JS 97-52 x PS 1225	R	R	HR	HR	MS	MR	HR					
23	Harasoya x RSC 10-46	R	MS	HR	HR	MS	HR	HR					
24	JS 97-52 x AGS 25	HR	HR	HR	HR	MR	MS	HR					
25	Cat 3406 x MACS 450	HR	HR	HR	HR	MS	R	MS					

Table 4.10.1 : PP-9. Evaluation of breeding material of F6 generation hot spot for disease(s) for resistant donor(s) at Indore Centre

Entry	Anthracnose			DR	CR			Disease reaction
	R1	R2	Max Score		R1	R2	Max Score	
VLS 2017-1	9	9	9	HS	9	9	9	HS
VLS 2016-11	9	9	9	HS	9	9	9	HS
GK 21-1	3	3	3	MR	0	0	0	HR
GK 21-2	3	3	3	MR	0	0	0	HR
GK 21-3	3	3	3	MR	0	0	0	HR
GK 21-4	3	3	3	MR	0	0	0	HR
GK 21-5	3	3	3	MR	0	0	0	HR
GK 21-6	3	3	3	MR	0	0	0	HR
AS 49	3	3	3	MR	0	0	0	HR
AS 56	3	3	3	MR	0	0	0	HR
AS 47	3	3	3	MR	0	0	0	HR
AS 40	3	3	3	MR	0	0	0	HR
AS 30	3	3	3	MR	0	0	0	HR
AS 48	3	3	3	MR	0	0	0	HR
AS 34	3	3	3	MR	0	0	0	HR
AS 55	3	3	3	MR	0	0	0	HR
AS 27	3	3	3	MR	0	0	0	HR
AS 24	3	3	3	MR	0	0	0	HR
AS 33	3	3	3	MR	0	0	0	HR
AS 36	3	3	3	MR	0	0	0	HR
MACS 1742	3	3	3	MR	0	0	0	HR
MACS 1743	3	3	3	MR	0	0	0	HR
MACS 1745	7	9	9	HS	0	0	0	HR
MACS 1746	9	9	9	HS	0	0	0	HR

MACS 1747	3	5	5	MS	0	0	0	HR
MACS 1748	9	9	9	HS	7	7	7	S
MACS 1744	5	5	5	MS	1	3	3	MR
MACS 1749	3	9	9	HS	9	9	9	HS
MACS 1757	3	3	3	MR	3	3	3	MR
MACS 1776	3	3	3	MR	0	0	0	HR
MACS 1777	3	3	3	MR	0	0	0	HR
MACS 1762	3	3	3	MR	0	0	0	HR
MACS 1756	5	5	5	MS	9	9	9	HS
MACS 1766	5	3	5	MS	5	9	9	HS
MACS 1779	3	3	3	MR	3	3	3	MR
MACS 1753	3	3	3	MR	3	3	3	MR
MACS 1752	5	5	5	MS	5	5	5	MS
MACS 1750	5	5	5	MS	0	0	0	HR
JS 2423	3	3	3	MR	0	0	0	HR
JS 2431	3	3	3	MR	0	0	0	HR
JS 2430	3	3	3	MR	0	0	0	HR
JS 2428	3	3	3	MR	0	0	0	HR
JS 2432	3	3	3	MR	0	0	0	HR
JS 2425	3	3	3	MR	0	0	0	HR
JS 2427	3	3	3	MR	0	0	0	HR
JS 2434	3	3	3	MR	0	0	0	HR
JS 2424	3	3	3	MR	0	0	0	HR
JS 2423	3	3	3	MR	0	0	0	HR
JS 2425	3	3	3	MR	0	0	0	HR
JS 2429	3	3	3	MR	0	0	0	HR
SL 1074	1	1	1	R	0	0	0	HR
SL 1104	3	3	3	MR	0	0	0	HR
SL 955	3	3	3	MR	0	0	0	HR

GKS 21-7	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-5	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-3	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-4	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-2	1	1	1	1	1	R	0	0	0	0	HR
WLP 21-1	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-6	3	3	3	3	3	MR	0	0	0	0	HR
WLP 21-7	3	3	3	3	3	MR	0	0	0	0	HR
P 97-1-2-1	5	9	9	9	9	HS	5	9	9	9	HS
P 104-11-1	5	9	9	9	9	HS	9	9	9	9	HS
P 145 -1-1-2	3	3	3	3	3	MR	0	0	0	0	HR
P 97-1-1-2	5	5	5	5	5	MS	7	7	7	7	S
P 104-13-7	5	5	5	5	5	MS	7	7	7	7	S
P 12-2-1-1	3	3	3	3	3	MR	0	0	0	0	HR
P 4-1-1	3	3	3	3	3	MR	0	0	0	0	HR
P 94-2-1-2	3	5	5	5	5	MS	5	7	7	7	S
P 61-1-1-1	3	5	5	5	5	MS	5	7	7	7	S
P 184-1-1	5	5	5	5	5	MS	5	5	5	5	MS
P 101-20-2-5	3	3	3	3	3	MR	3	3	3	3	MR
MAUS 793	3	3	3	3	3	MR	3	3	3	3	MR
MAUS 816	1	1	1	1	1	R	0	0	0	0	HR
MAUS 789	3	3	3	3	3	MR	0	0	0	0	HR
MAUS 734	3	3	3	3	3	MR	3	3	3	3	MR
MAUS 824	1	1	1	1	1	R	0	0	0	0	HR
MAUS 826	3	3	3	3	3	MR	0	0	0	0	HR
MAUS 829	3	3	3	3	3	MR	0	0	0	0	HR
MAUS 788	3	3	3	3	3	MR	0	0	0	0	HR
MAUS 780	3	3	3	3	3	MR	0	0	0	0	HR
MAUS 787	3	3	3	3	3	MR	0	0	0	0	HR

MAUS 827	3	3	3	MR	0	0	0	HR
MAUS 799	5	7	7	S	0	0	0	HR
MAUS 821	1	1	1	R	0	0	0	HR
YP 31	3	3	3	MR	0	0	0	HR
YP 32	3	3	3	MR	0	0	0	HR
YP 33	3	3	3	MR	0	0	0	HR
YP 34	1	1	1	R	0	0	0	HR
Sel 3-38	1		1	R	0	0	0	HR
A-20-24	3		3	MR	0	0	0	HR
Sel 3-21	3		3	MR	0	0	0	HR
A-20-26	3		3	MR	0	0	0	HR
A-20-33	3		3	MR	0	0	0	HR
A-20-17	3		3	MR	0	0	0	HR
A-20-30	3		3	MR	0	0	0	HR
A-20-34	3		3	MR	0	0	0	HR
C-20-8-6	3		3	MR	0	0	0	HR
C-20-2-1	3		3	MR	0	0	0	HR
C-20-12-4	3		3	MR	0	0	0	HR
C-20-5-10	3		3	MR	0	0	0	HR
C-20-10-7	3		3	MR	0	0	0	HR
C-20-11-2	3		3	MR	0	0	0	HR
C-20-15-7	3		3	MR	0	0	0	HR
C-20-8-3	3		3	MR	0	0	0	HR
C-20-10-10	3		3	MR	0	0	0	HR
C-20-8-7	3		3	MR	0	0	0	HR
C-20-2-10	3		3	MR	0	0	0	HR
C-20-5-2	NG							
C-20-1-10	3		3	MR	0	0	0	HR
C-20-7-5	3		3	MR	0	0	0	HR

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Frontline Demonstration

Principal Investigator	:	Dr. Raghavendra M., IISR, Indore
· Northern Hill Zone		
Palampur (Himachal Pradesh):	:	Dr. (Mrs.) VednaKumari
Almora (Uttarakhand)	:	Dr. AnuradhaBhartiya
· Northern Plain Zone		
Ludhiana (Punjab)	:	Ms. HarpreetKaur
	:	Dr. Guriqbal Singh
Pantnagar (Uttarakhand)	:	Dr. Ajay Kumar Srivastava
	:	Dr. D. K. Shukla
· North Eastern Hill Zone		
Imphal (Manipur)	:	Dr. (Mrs.) Toijam Sunanda Devi
Medziphema (Nagaland)	:	Dr. Engrala Ao
· Eastern Zone		
Raipur (Chhattisgarh)	:	Dr. Ram Mohan Savu
Ranchi (Jharkhand)	:	Dr. A.K. Singh
Dholi (Bihar)	:	Dr. Anil Pandey
	:	Dr. Vikram Bharti
· Central Zone		
Indore (Madhya Pradesh)	:	Dr Nita Khandekar/Dr. Raghavendra M.
Sehore (Madhya Pradesh)	:	Dr. M.D. Vyas
Kota (Rajasthan)	:	Dr. D.S. Meena
Parbhani (Maharashtra)	:	Dr. S.P. Mehtre
Amravati (Maharashtra)	:	Dr. M.S. Dandge
SOPA, Indore (Madhya Pradesh)	:	Shri. Jitendra Singh
Bharuch(Gujarat)	:	Dr. Mahendra.M. Patel
Karda (Maharashtra)	:	Dr. Ravindra L. Kale
Devgadh Baria (Gujarat)	:	Dr. G.J. Patel
Solidaridad	:	Dr. Suresh Motwani
	:	ShriG. Hasan
· Southern Zone		
Adilabad (Andhra Pradesh)	:	Dr. Chauhan Sreedhar
Dharwad (Karnataka)	:	Dr. G. Somanagouda
GKVK/UAS, Bangalore	:	Dr. T. Onkarappa
ICAR-KLE, KVK Belagavi	:	Mrs. Sridevi B. Angadi
Ugarkhurd (Karnataka)	:	Mr. Jagadish S. Patwardhan
Sangli (Maharastra)	:	Dr. DilipKathmale
KVK, Kanerimath Kolhapur	:	Dr. Ravindra Singh

Soybean Frontline Demonstration

Table 6.1 Final Progress Report of Frontline Demonstrations (FLDs) of SOYBEAN crop

Name and Postal address of the ICAR Crop Improvement Project with Pin code	ICAR-Indian Institute of Soybean Research, Khandwa Road, Indore-452 001, Madhya Pradesh 452001
For the Year	2021-22

S. No.	Name of implementing centre	State	Physical				Financial Allocation (Gross)	Trainings conducted				Financial Allocation (Gross)
			Allocation		Achievement			Extension officer		Farmer		
			Number of FLDs	Area in ha	Number of FLDs	Area in ha		Allotted	Conducted	Allotted	Conducted	
1	Palampur (CSKHPKV)	Himachal Pradesh	10	4.0	34	4.98	27000	-	-	-	-	-
2	Almora (VPKAS)	Uttarakhand	10	4.0	114	3.88	27000	-	-	-	-	-
3	Pantnagar (GBPUA&T)	Uttarakhand	10	4.0	10	4.0	27000	-	-	-	-	-
4	Ludhiana (PAU)	Punjab	50	20.0	51	20.0	135000	-	-	-	-	-
5	Indore (IISR/AICRPS)	Madhya Pradesh	385	154.0	240	96.0	1039500	-	-	-	-	-
6	Sehore (RVSKVV)	Madhya Pradesh	10	4.0	10	4.0	27000	-	-	-	-	-
7	Kota (MPUA&T)	Rajasthan	30	12.0	30	12.0	81000	-	-	-	-	-
8	Parbhani (MAU)	Maharashtra	50	20.0	50	20.0	135000	-	-	-	-	-
9	Amravati (PDKV)	Maharashtra	20	8.0	20	8.0	54000	-	-	-	-	-
10	Sangli (MPKV)	Maharashtra	25	10.0	25	10.0	67500	-	-	-	-	-
11	Pune (ARI)	Maharashtra	15	6.0	15	6.0	40500	-	-	-	-	-
12	Dharwad (UAS)	Karnataka	10	4.0	10	4.0	27000	-	-	-	-	-
13	Adilabad (ANGRAU)	Telangana	100	40.0	100	40.0	270000	-	-	-	-	-
14	Medziphema	Nagaland	10	4.0	10	4.0	27000	-	-	-	-	-
15	Ugar Khurd (Ugar Sugar Works Ltd.)	Karnataka	50	20.0	23	9.2	135000	-	-	-	-	-
16	Raipur (IGKVV)	Chhattisgarh	100	40.0	100	40.0	270000	-	-	-	-	-
17	Ranchi (BAU)	Jharkhand	10	4.0	20	4.0	27000	-	-	-	-	-
18	Imphal (CAU)	Manipur	15	6.0	15	6.0	40500	-	-	-	-	-
19	SOPA, Indore	Madhya Pradesh	250	100.0	250	100.0	675000	8	8	-	-	288000
20	Soildaridad, Bhopal	Madhya Pradesh	250	100.0	250	106.0	675000	-	-	-	-	-
21	KVK, Bharuch	Gujrat	15	6.0	15	6.0	40500	-	-	-	-	-
22	KVK Karda	Maharashtra	100	40.0	81	40.0	270000	-	-	-	-	-
23	Dholi (RAU)	Bihar	15	6.0	-	-	40500					
24	DevgrahBaria (TRTC)	Gujrat	10	4.0	10	4.0	27000	-	-	-	-	-
25	KVK, Belagavi	Karnataka	250	100.0	250	100.0	675000	-	-	5	5	120000
26	Bengaluru (UAS)	Karnataka	100	40.0	80	32.0	270000	-	-	-	-	-
27	*KVK, Kanerimath, Kolhapur	Maharashtra	100	40.0	100	40.0	270000	-	-	-	-	-
Total			2000	800.0	1913	724.06	5400000	8	8	5	5	408000

*Allotted for rabi/summer 2021-22, **Allotted 150 FLDs for rabi/summer 2021-22

Table 6.2 Details of category wise beneficiaries of frontline demonstrations (FLDs)

Name and Postal address of the ICAR Crop Improvement Project with Pin code	ICAR-Indian Institute of Soybean Research, Khandwa Road, Indore-452 001, Madhya Pradesh
For the Year	2021-22

S. No.	Name of implementing Centre	Man					Women					Total
		SC	ST	OBC	Gen.	Total	SC	ST	OBC	Gen.	Total	
1	Palampur (CSKHPKV)	7	2	11	12	32	1	-	-	1	2	34
2	Almora (VPKAS)	-	-	-	51	51	-	-	-	63	63	114
3	Pantnagar (GBPUA&T)	-	-	-	10	10	-	-	-	-	-	10
4	Ludhiana (PAU)	2	-	1	47	50	-	-	-	1	1	51
5	Indore (IISR/AICRPS)	213	-	-	-	213	27	-	-	-	27	240
6	Sehore (RVSKVV)	-	-	9	1	10	-	-	-	-	-	10
7	Kota (MPUA&T)	-	12	18	-	30	-	-	-	-	-	30
8	Parbhani (MAU)	1	8	21	13	43	1	1	3	2	7	50
9	Amravati (PDKV)	2	-	8	5	15	-	-	2	3	5	20
10	Sangli (MPKV)	4	2	7	11	24	-	1	-	-	1	25
11	Pune (ARI)	1	2	4	7	14	1	-	-	-	1	15
12	Dharwad (UAS)	-	-	-	10	10	-	-	-	-	-	10
13	Adilabad (ANGRAU)	6	25	34	4	69	2	12	15	2	31	100
14	Medziphema	-	4	-	-	4	-	6	-	-	6	10
15	Ugar Khurd (Ugar Sugar Works Ltd.)	-	-	-	23	23	-	-	-	-	-	23
16	Raipur (IGKVV)	5	10	54	10	79	-	1	15	5	21	100
17	Ranchi (BAU)	-	17	-	-	17	-	3	-	-	3	20
18	Imphal (CAU)	2	8	-	2	12	-	2	-	1	3	15
19	SOPA, Indore	1	5	155	65	226	-	-	13	11	24	250
20	Soildaridad, Bhopal	32	11	183	22	248	-	-	2	-	2	250
21	KVK, Bharuch	-	5	-	1	6	-	6	-	3	9	15
22	KVK Karda	10	8.0	44	12.0	74	1	0	5	1	7	81
23	Dholi (RAU)	-	-	-	-	0	-	-	-	-	0	0
24	DevgrahBaria (TRTC)	-	10	-	-	10	-	-	-	-	-	10
25	KVK, Belagavi	-	-	-	94	94	-	-	-	6	6	100
26	Bengaluru (UAS)	5	5	6	64	80	-	-	-	-	-	80
Total		291	134	555	464	1444	33	32	55	99	219	1663
Percentage		20.15	9.28	38.43	32.13	86.83	15.07	14.61	25.11	45.21	13.17	100
Total (Men+Women)		324	166	610	563	1663						
Percentage (Men + Women)		19.48	9.98	36.68	33.85							

Table 6.3 Results of Frontline Demonstrations (FLDs) on WHOLE PACKAGE in SOYBEAN conducted at various locations on farmers' fields

Name and Postal address of the ICAR Crop Improvement Project with Pin code	ICAR- Indian Institute of Soybean Research, Khandwa Road, Indore-452 001, Madhya Pradesh
For the Year	2021-22

S. No.	Name of implementing centre	No. of Trial	Area (ha)	Grain yield (kg/ha)		Gross Returns (Rs/ha)		Cost of cultivation (Rs/ha)		Net returns (Rs/ha)	
				IP	FP	IP	FP	IP	FP	IP	FP
1	Palampur (CSKHPKV)	34	4.98	1295	1015	71225	55825	43687	38968	27538	16857
2	Almora (VPKAS)	114	3.88	1606	1280	103738	84463	55477	55100	48260	29363
3	Pantnagar (GBPUA&T)	10	4.00	1750	1380	69125	54510	32053	27031	37072	27479
4	Ludhiana (PAU)	51	20.0	1500	-	59250	-	32489	-	26761	-
5	Indore (IISR/AICRPS)	240	96.0	2476	1651	148556	99038	33743	30400	114813	68638
6	Sehore (RVSKVV)	10	4.00	1538	955	58425	36290	19214	17067	39211	19223
7	Kota (MPUA&T)	30	12.0	1453	1256	57374	49625	33493	29700	23881	19925
8	Parbhani (MAU)	50	20.0	2280	1830	90068	72269	40307	39249	49761	33020
9	Amravati (PDKV)	20	8.00	2048	1480	84593	61103	34894	30492	49699	30611
10	Sangli (MPKV)	25	10.0	2931	2493	161216	137097	59793	55900	101423	81197
11	Pune (ARI)	15	6.00	2960	2567	116920	101383	34153	31995	82767	69388
12	Dharwad (UAS)	10	4.00	2245	1581	123448	86955	43755	37471	79693	49484
13	Adilabad (ANGRAU)	100	40.0	2257	2000	132350	117277	52466	47264	79884	70013
14	Medziphema	10	4.00	1674	1232	100440	73920	33109	25360	67331	48560
15	Ugar Khurd (Ugar Sugar Works Ltd.)	23	9.20	2078	1842	106002	93929	58234	50850	47768	42979
16	Raipur (IGKV)	100	40.0	1524	1083	60201	42771	21498	17508	38703	25263
17	Ranchi (BAU)	20	4.00	1606	1088	63418	42982	31500	25400	31918	17582
18	Imphal (CAU)	15	6.00	1727	1119	112233	72735	43600	29256	68633	43479
19	SOPA, Indore	250	100	1425	1173	85479	70350	23227	20350	62252	50000
20	Soildaridad, Bhopal	250	106	1634	1398	101298	86692	29093	33186	72205	53506
21	KVK, Bharuch	15	6.00	1895	1582	96662	80665	23217	20471	73445	60194
22	KVK Karda	81	40.0	2175	1883	84388	73043	55144	52019	29245	21024
23	Dholi (RAU)	-	-	-	-	-	-	-	-	-	-
24	DevgrahBaria (TRTC)	10	4.00	1207	835	42235	29239	21155	16862	21080	12377
25	KVK, Belagavi	100	40.0	1895	1432	115610	87352	27590	28835	88020	58517
26	Bengaluru (UAS)	80	32.0	1716	1505	85802	75225	34986	29204	50816	46021
Total		1663	624	1876	1486	93202	74364	36715	32914	56487	41446
Percent increase (%)				26.25		25.33		11.55		36.29	

IP= Improved practice, FP= Farmer's practice

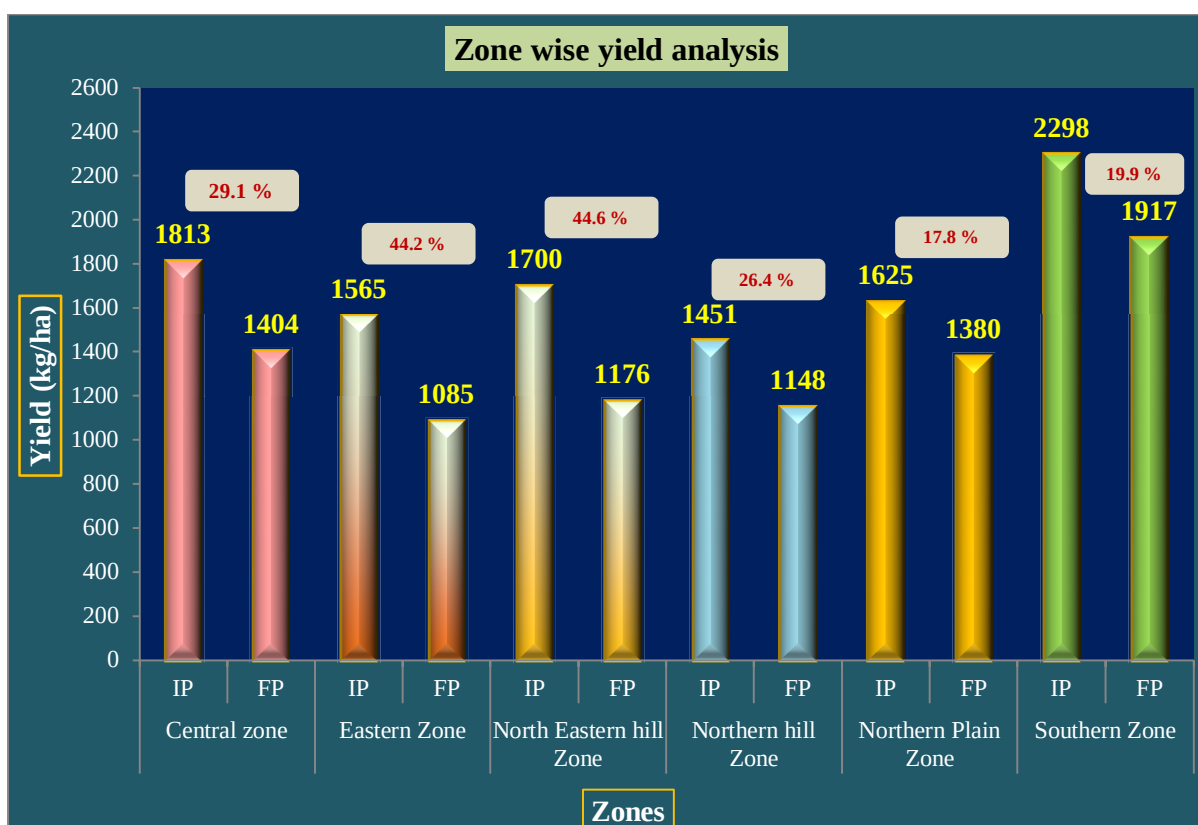


Figure 1 Zone wise yield analysis under improved and farmer's practices

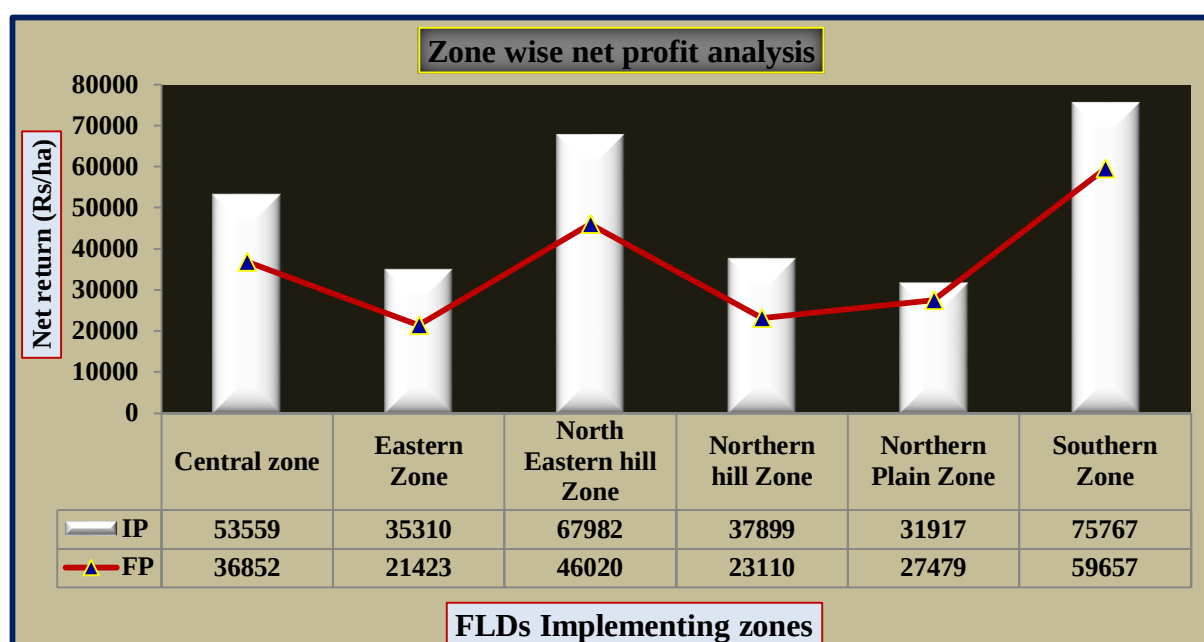


Figure 2. Zone wise net profit analysis under improved and farmer's practices

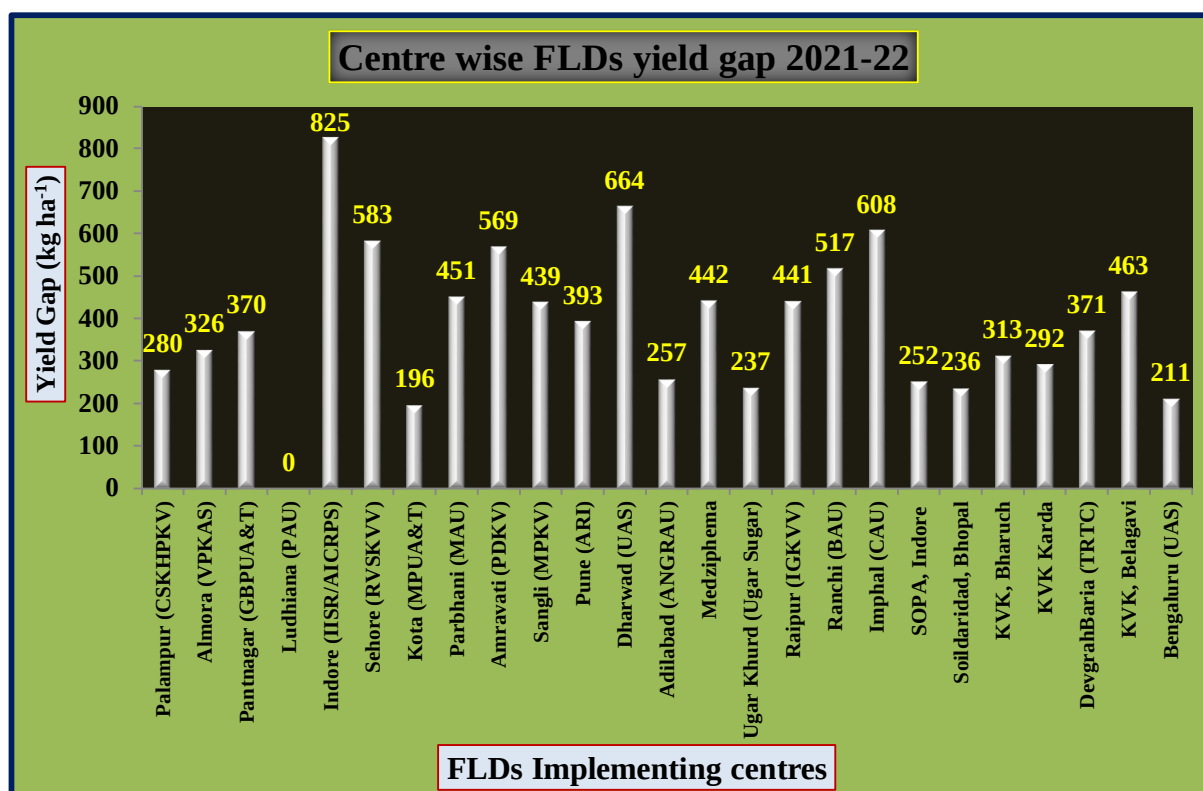


Figure 3. Yield gap (Improved Practices-Farmers practices) of different centers across India

Table 6.4 Performance of SOYBEAN varieties under whole package in FLDs conducted at various locations on farmers' fields

Name and Postal address of the ICAR Crop Improvement Project with Pin code	ICAR-Indian Institute of Soybean Research, Khandwa Road, Indore-452 001, Madhya Pradesh 452001
For the Year	2021-22

No. of trial	Variety	Grain yield (kg/ha)		Gross Returns (Rs/ha)		Cost of cultivation (Rs./ha)		Net returns (Rs/ha)		Net BC Ratio	
		IP	FP	IP	FP	IP	FP	IP	FP	IP	FP
328	JS 20-34	1770	1408	97500	76996	28470	26839	69029	50157	2.49	1.98
205	JS 20-69	1966	1378	117939	82678	28485	25352	89454	57326	3.08	2.26
186	JS 95-60	1550	1320	94684	80668	26870	26810	67814	53858	2.55	2.09
128	Dsb 21	2155	1677	119558	92639	43193	39052	76365	53553	2.05	1.48
100	CG Soya-1	1524	1083	60201	42771	21498	17508	38703	25263	1.80	1.44
95	MAUS-612	2275	1939	98898	84697	51072	47996	47827	36700	0.97	0.79
54	JS 335	1560	1323	85174	71956	29107	24777	56067	47179	2.06	1.98
51	KDS-726 (Phule Sangam)	2616	2265	148027	128272	56143	51598	91884	76674	1.63	1.49
51	VLS 89	1818	1477	101828	82728	54530	53780	47298	28948	0.87	0.54
50	SL 958	1465	-	57851	-	32489	-	25362	-	0.78	-
36	VLB 201	1247	898	113434	90690	57530	57960	55904	32730	0.97	0.57
35	KBS 23	1755	1532	87735	76613	34986	29204	52749	47409	1.51	1.62
31	JS 20-29	1999	1763	77581	68407	55500	52375	22081	16032	0.41	0.32
31	JS 93-05	1428	1197	85650	71816	23227	20350	62423	51466	2.69	2.53
30	Basara	2341	2066	137321	121166	52252	46781	85069	74385	1.63	1.59
27	VLS 63	1686	1419	94417	79437	54530	53780	39887	25657	0.73	0.48
24	RVS 24	1475	1072	71561	53813	21221	18709	50340	35104	2.34	1.82
20	AMS 100-39 (PDKV)	2048	1480	84593	61103	34894	30492	49699	30611	1.42	1.00
20	MAUS 158	2218	1773	87621	70024	40307	39249	47314	30775	1.17	0.78
15	Hara Soya	1322	1075	72727	59125	43687	38968	29040	20157	0.66	0.52
15	MAUS 162	2219	1782	87651	70402	40307	39249	47344	31153	1.17	0.79
14	KDS-753 (Phule Kimaya)	2354	2047	132759	115563	56371	52210	76389	63353	1.35	1.21
13	JS 97-52	1600	1136	79458	56963	32305	25380	47154	31583	1.44	1.22
13	MACS 1460	2068	1586	107150	80161	36811	28799	70339	51362	1.97	1.80
10	BSS-2	1595	1085	63019	42838	31500	25400	31519	17438	1.00	0.69
10	NRC 37	1207	835	42235	29239	21155	16862	21080	12377	1.00	0.74
10	Palam Soya	1103	878	60638	48290	43687	38968	16951	9322	0.39	0.24
9	Him Soya	1304	1081	71744	59431	43687	38968	28057	20463	0.64	0.53
8	DSb 19	1696	1108	110256	71988	43600	29160	66656	42828	1.53	1.47
7	MACS 1188	2911	2489	114973	98327	34434	32560	80539	65767	2.34	2.01
6	JS 10-40	1813	1438	112375	89125	28956	38010	83419	51115	2.93	1.36
6	PS 26	1783	1400	70442	55300	32053	27031	38389	28269	1.20	1.05
5	DSb 34	1997	1405	109835	77275	43755	37471	66080	39804	1.51	1.06
5	MACS 1281	3085	2745	121858	108428	34018	31602	87840	76826	2.59	2.44
4	DSb 32	1880	1200	122200	78000	43600	29110	78600	48890	1.80	1.68
4	RVS 2000_4	1719	1519	106563	94163	29225	31088	77338	63075	2.85	2.16
3	PS 1347	1733	1400	68467	55300	32053	27031	36414	28269	1.14	1.05
1	PS 1225	1600	1200	63200	47400	32053	27031	31147	20369	0.97	0.75
1	RVS 18	1505	1095	90300	65700	23227	20350	67073	45350	2.89	2.23
1	SL 1074	1375	-	54313	-	32489	-	21824	-	0.67	-

Table 6.5 Per day productivity of soybean cultivars under whole package technologies (2021-22)

S. No.	No. of trial	Variety	Year of Release	Grain yield (kg/ha)		Duration (Days)	Per day productivity (kg/day/ha)	
				IP	FP		IP	FP
1	328	JS 20-34	2014	1770	1408	88	20.1	16.0
2	205	JS 20-69	2016	1966	1378	102	19.3	13.5
3	186	JS 95-60	2006	1550	1320	88	17.6	15.0
4	128	Dsb 21	2015	2155	1677	95	22.7	17.7
5	100	CG Soya-1	2018	1524	1083	103	14.8	10.5
6	95	MAUS-612	2002	2275	1939	105	21.7	18.5
7	54	JS 335	1994	1560	1323	100	15.6	13.2
8	51	KDS-726 (Phule Sangam)	2019	2616	2265	97	27.0	23.4
9	51	VLS 89	2019	1818	1477	116	15.7	12.7
10	50	SL 958	2015	1465	-	145	10.1	-
11	36	VLB 201	2016	1247	898	117	10.7	7.7
12	35	KBS 23	2014	1755	1532	97	18.1	15.8
13	31	JS 20-29	2014	1999	1763	102	19.6	17.3
14	31	JS 93-05	2002	1428	1197	98	14.6	12.2
15	30	Basara	2018	2341	2066	118	19.8	17.5
16	27	VLS 63	2008	1686	1419	135	12.5	10.5
17	24	RVS 24	2017	1475	1072	100	14.7	10.7
18	20	AMS 100-39 (PDKV Amba)	2021	2048	1480	102	20.1	14.5
19	20	MAUS 158	2010	2218	1773	103	21.5	17.2
20	15	Hara Soya	2001	1322	1075	120	11.0	9.0
21	15	MAUS 162	2018	2219	1782	95	23.4	18.8
22	14	KDS-753 (Phule Kimaya)	2017	2354	2047	107	22.0	19.1
23	13	JS 97-52	2008	1600	1136	109	14.7	10.4
24	13	MACS 1460	2021	2068	1586	101	20.5	15.7
25	10	BSS-2	2019	1595	1085	120	13.3	9.0
26	10	NRC 37	2001	1207	835	110	11.0	7.6
27	10	Palam Soya	2003	1103	878	130	8.5	6.8
28	9	Him Soya	2019	1304	1081	135	9.7	8.0
29	8	DSb 19	2015	1696	1108	100	17.0	11.1
30	7	MACS 1188	2013	2911	2489	101	28.8	24.6
31	6	JS 10-40	-	1813	1438	104	17.4	13.8
32	6	PS 26	2020	1783	1400	125	14.3	11.2
33	5	DSb 34	2021	1997	1405	101	19.8	13.9
34	5	MACS 1281	2016	3085	2745	96	32.1	28.6
35	4	DSb 32	2020	1880	1200	104	18.1	11.5
36	4	RVS 2000_4	2000	1719	1519	101	17.0	15.0
37	3	PS 1347	2008	1733	1400	128	13.5	10.9
38	1	PS 1225	2009	1600	1200	130	12.3	9.2
39	1	RVS 18	2018	1505	1095	92	16.4	11.9
40	1	SL 1074	2021	1375	-	130	10.6	-

Table 6.6 Details of soybean cultivation cost under improved technology and farmers practice 2021-22

S. No.	Name of implementing centre		Land preparation	Seed & Sowing	ST & Ino'n	Fertili. & appli'n	Herb'e & appli'n	Bird watching	Hand weeding/ Iner-Culti'n	Insec'e & appli'n	Fungi'e & appli'n	Harvesting	Threshing	Any other	Total
1	Palampur (CSKHPKV)	IT	7000	10854	60	9918	3543	1368	-	-	-	4788	4104	2052	43687
		FP	7000	9000	-	5184	-	-	6840		-	4788	4104	2052	38968
2	Almora (VPKAS)	IT	-	-	-	-	-	-	-	-	-	-	-	-	-
		FP	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Pantnagar (GBPUA&T)	IT	3960	5888	163	5454	3213	694	5000	2637	-	3470	1227	347	32053
		FP	3960	5138	113	3525	1420	694	4500	2637	-	3470	1227	347	27031
4	Ludhiana (PAU)	IT	3915	3750	75	3172	1575	-	-	950	-	-	-	19052	32489
		FP	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Indore (IISR/AICRPS)	IT	5500	8755	469	2544	3755	-	1945	2710	915	3150	4000	-	33743
		FP	5500	8100	-	2081	1925	-	1900	2680	900	3000	4000	-	30086
6	Sehore (RVSKVV)	IT	4500	4250	292	3634	1900	1000	4000	1800	3000	-	1200	800	26376
		FP	4500	5250	-	1519	1700	-	2000	1400	3000	-	1200	400	20969
7	Kota (MPUA&T)	IT	7500	8200	233	2360	2250	-	-	2150	-	6000	-	4800	33493
		FP	7500	7000	-	-	2250	-	-	2150	-	6000	-	4800	29700
8	Parbhani (MAU)	IT	5700	7400	400	5796	2649	-	1200	2878	1559	7000	5725	-	40307
		FP	5700	8200	-	3750	2649	-	1200	4618	1559	7000	4573	-	39249
9	Amravati (PDKV)	IT	6750	6250	260	3823	2350	-	6200	2664	-	4500	3800	-	36597
		FP	6750	6270	-	3275	2060	-	2000	1930	748	4500	2850	-	30383
10	Sangli (MPKV)	IT	5750	9375	625	7018	2400	-	12500	3000	-	8625	8625	1875	59793
		FP	5750	6000	375	6125	2400	-	12500	3000	3000	8625	6250	1875	55900
11	Pune (ARI)	IT	2613	2250	76	2483	762	-	190	326	-	1470	2960	527	13657
		FP	2547	2493	-	1931	240	-	900	276	-	1470	2567	374	12798
12	Dharwad (UAS)	IT	8800	8551	475	6455	1638	2028	5218	3298	-	3042	4250	-	43755
		FP	8800	7400	-	3475	-	2400	6400	846	900	3000	4250	-	37471
13	Adilabad (ANGRAU)	IT	5625	11625	288	5050	3375	-	4580	5100	1963	5925	6375	880	50785
		FP	5869	10625	291	4925	3771	-	2113	5485	1406	5656	4889	1781	46811
14	Medziphema	IT	2500	5800	1291	7518	-	220	4400	440	-	1760	3300	5880	33109
		FP	2500	6260	-	440	-	-	3520	-	-	2640	2200	7800	25360
15	Ugar Khurd (Ugar Sugar Works Ltd.)	IT	6500	6223	103	10738	-	-	11821	1944	1335	12158	4000	3413	58235
		FP	6500	6223	-	11413	-	-	9456	-	1451	10132	3400	2275	50850
16	Raipur (IGKVV)	IT	1800	6338	460	4500	2100	-	-	1800	-	2500	-	2000	21498
		FP	1800	6338	370	4500	-	-	-	-	-	2500	-	2000	17508
17	Ranchi (BAU)	IT	4250	7354	281	8116	1351	-	2704	2376	-	2028	3042	-	31502
		FP	3400	6340	-	6538	-	-	4056	676	-	1690	2704	-	25404
18	Imphal (CAU)	IT	3200	10474	450	8152	-	-	7360	736	368	2944	4416	5500	43600
		FP	2400	8616	-	2838	-	-	5520	736	-	2944	4416	1500	28970
19	SOPA, Indore	IT	4000	8250	125	3152	1200	-	-	2500	-	2500	-	1500	23227
		FP	4000	8250	-	1200	1200	-	-	1700	-	2500	-	1500	20350
20	Soildaridad, Bhopal	IT	6543	9278	373	1170	1521	-	4236	1161	1000	2407	1904	-	29593
		FP	6800	9874	373	1170	1800	-	6171	1371	1000	2795	2032	-	33386
21	KVK, Bharuch	IT	6000	9300	309	2540	1600	-	-	800	-	4000	-	-	24549
		FP	6000	8700	-	1490	1600	-	-	-	-	4000	-	-	21790
22	KVK Karda	IT	-	-	-	-	-	-	-	-	-	-	-	-	-
		FP	-	-	-	-	-	-	-	-	-	-	-	-	-
23	Dholi (RAU)	IT	-	-	-	-	-	-	-	-	-	-	-	-	-
		FP	-	-	-	-	-	-	-	-	-	-	-	-	-
24	DevgrahBaria (TRTC)	IT	7200	6700	430	3640	2040	-	-	4672	-	1200	1300	-	27182
		FP	4800	1750	-	4816	-	-	1000	2500	-	1200	1300	-	17366
25	KVK, Belagavi	IT	1100	2850	240	1780	-	-	1200	1000	-	1500	1500	-	11170
		FP	1100	3300	-	2450	-	-	1200	1200	800	1500	1500	-	13050
26	Bengaluru (UAS)	IT	2500	8750	282	3554	3750	-	6250	2400	1750	4500	-	1250	34986
		FP	2500	5500	-	1554	2750	-	6250	1650	1750	3750	2500	1000	29204
Mean		IT	4922	7325	337	4894	2262	1062	4925	2152	1486	4070	3631	3563	34147
Percentage			14.4	21.5	0.99	14.3	6.62	3.11	14.4	6.30	4.35	11.9	10.6	10.4	
Mean		FP	4803	6665	304	3533	1982	1547	4307	2050	1501	3960	3109	2131	29664
Percentage			16.2	22.5	1.03	11.9	6.68	5.22	14.5	6.91	5.06	13.3	10.5	7.18	
Overall increase in soybean cultivation cost over farmers practices															15.11

Table 6.7 Productivity potentials and profitability of whole package technologies (2021-22)

S. No.	Name of implementing Centre	No of Dem.	Mean yield (kg/ha)		Increase in yield (%)	Gross Returns (Rs/ha)		Cost of cultivation (Rs/ha)		Addi. net returns (Rs/ha)	B:C ratio	
			IP	FP		IP	FP	IP	FP		IP	FP
1	Palampur (CSKHPKV)	34	1295	1015	27.6	71225	55825	43687	38968	15400	1.63	1.43
2	Almora (VPKAS)	114	1606	1280	25.5	103738	84463	55477	55100	19275	1.87	1.53
3	Pantnagar (GBPUA&T)	10	1750	1380	26.8	69125	54510	32053	27031	14615	2.16	2.02
4	Ludhiana (PAU)	51	1500	-	-	59250	-	32489	-	-	1.82	-
5	Indore (IISR/AICRPS)	240	2476	1651	50.0	148556	99038	33743	30400	49518	4.40	3.26
6	Sehore (RVSKVV)	10	1538	955	61.0	58425	36290	19214	17067	22135	3.04	2.13
7	Kota (MPUA&T)	30	1453	1256	15.6	57374	49625	33493	29700	7749	1.71	1.67
8	Parbhani (MAU)	50	2280	1830	24.6	90068	72269	40307	39249	17799	2.23	1.84
9	Amravati (PDKV)	20	2048	1480	38.4	84593	61103	34894	30492	23489	2.42	2.00
10	Sangli (MPKV)	25	2931	2493	17.6	161216	137097	59793	55900	24119	2.70	2.45
11	Pune (ARI)	15	2960	2567	15.3	116920	101383	34153	31995	15537	3.42	3.17
12	Dharwad (UAS)	10	2245	1581	42.0	123448	86955	43755	37471	36493	2.82	2.32
13	Adilabad (ANGRAU)	100	2257	2000	12.9	132350	117277	52466	47264	15073	2.52	2.48
14	Medziphema	10	1674	1232	35.9	100440	73920	33109	25360	26520	3.03	2.91
15	Ugar Khurd (Ugar Sugar Works Ltd.)	23	2078	1842	12.9	106002	93929	58234	50850	12074	1.82	1.85
16	Raipur (IGKVV)	100	1524	1083	40.8	60201	42771	21498	17508	17430	2.80	2.44
17	Ranchi (BAU)	20	1606	1088	47.5	63418	42982	31500	25400	20435	2.01	1.69
18	Imphal (CAU)	15	1727	1119	54.3	112233	72735	43600	29256	39498	2.57	2.49
19	SOPA, Indore	250	1425	1173	21.5	85479	70350	23227	20350	15129	3.68	3.46
20	Soildaridad, Bhopal	250	1634	1398	16.8	101298	86692	29093	33186	14606	3.48	2.61
21	KVK, Bharuch	15	1895	1582	19.8	96662	80665	23217	20471	15997	4.16	3.94
22	KVK Karda	81	2175	1883	15.5	84388	73043	55144	52019	11346	1.53	1.40
23	Dholi (RAU)	-	-	-	-	-	-	-	-	-	-	-
24	DevgrahBaria (TRTC)	10	1207	835	44.4	42235	29239	21155	16862	12996	2.00	1.73
25	KVK, Belagavi	100	1895	1432	32.3	115610	87352	27590	28835	28258	4.19	3.03
26	Bengaluru (UAS)	80	1716	1505	14.0	85802	75225	34986	29204	10577	2.45	2.58
Total/Average		1663	1876	1486		93202	74364	36715	32914	20253	2.66	2.35

Lkkjk'k ifronu
Summary Reports

SUMMARY REPORT OF BREEDING TRIALS

KHARIF 2021

1. Northern Hill Zone

1.1 Initial Varietal Trial

Proposed Testing Centres: Almora, Palampur, Majhera, Kashmir (Budgam, Wadura)

Data received from: Almora, Palampur, Majhera

Trial failed at both of the centres of Kashmir viz Budgam and Wadura due to low temperature after September. Most of the entries had good vegetative growth but failed to set pod or pod remain arrested at the initial stage of development. Sowing in the first week of June is recommended for successful completion of the trial and AICRP material could not reach to them in time.

The yield and ancillary data of 51 test entries and three checks is presented in Table 1.1.1 to Table 1.1.7 of this compilation. Data of Majhera centre was rejected due to <1000 Kg/ha grain yield. Mean grain yield of the zone varied from 828 kg/ha (SKAU-WSB-101) to 2235 kg/ha (VLS 89, best check) with an average of 1608 kg/ha and none of the entries was superior to the best check. The maturity duration of the trial ranged from 108 to 125 days with a mean of 120 days.

1.2 Initial Varietal Trial (Early)

Proposed Testing Centres: Almora, Palampur, Majhera

Data received from: Palampur and Majhera

Almora centre could not conduct trial. Mean grain yield and ancillary data of twenty three test entries and 3 checks is given in Table 1.1.8 to Table 1.1.14 of this compilation. Only three entries matured in equivalent or significantly earlier number of days to the early maturing check Palam Early Soya (Table 1.1.10) but only the yield of JS 23-03 was equivalent to the check (Table 1)

Table 1:Mean maturity and grain yield performance of early maturing entries in IVT trial in NHZ

S. No.	Entry	Days to Maturity	Grain Yield (Kg/ha)
1.	JS 23-03	106	1186
2.	KDS 1169	104	766
3.	JS 23-09	103	1074
4.	Palam Early Soy (Early Check)	110	1173
5.	VLS 89 (Best Check)	116	1260
Zonal CD (0.5)		1.98	70

1.3 Advanced Varietal Trial-II

Proposed Testing Centres: Almora, Palampur, Majhera

Data received from: All Centres

VLS 99 was tested with three checks and was the top performing entry (2424 Kg/ha). Although the entry recorded the yield advantage of 4.9% over the best check VLS 89 (2310 Kg/ha) it was not significantly superior (Table 1.1.15). The maturity duration varied from 119 (Check VLS 63) to 124 days (Check PS 1556) with the test entry taking 122 days to mature (Table 1.1.17).

VLS 99 was the top ranking entry in mean performance in AICRP trials and its mean maturity duration was 117 days which was equivalent to that of the best check VLS 89 (Table 2).

Table 2: Mean Performance of VLS 99 in AICRP Trials

S.No.	Entry	Yield (Kg/ha)			Mean	Rank	Maturity
		IVT-2019	AVT I-2020	AVT II-2021			
1.	VLS 99	2568	2107	2424	2366	I	117
2.	VLS 89 (c)	2312	1820	2310	2147	II	118
3.	PS 1556 (c)	2099	1450	2222	1924	IV	120
4.	VLS 63 (c)	2189	1928	2183	2100	III	117

2. Northern Plain Zone

2.1 Initial Varietal Trial

Proposed Testing Centres: Pantnagar, Delhi, Ludhiana.

Data received from: All the Centres

The yield and ancillary data of 51 test entries and three checks has been presented in Table 1.2.1 to 1.2.7 of this compilation. Two entries did not survive at any of the three locations and additional 14 entries did not survive both at Delhi and Ludhiana centres. Grain yield ranged from 107 to 2132 kg/ha with a mean of 884 kg/ha. NRC 195 was the highest yielding entry (2132 Kg/ha) and it was significantly superior to the best check SL 1074 (1597 Kg/ha). The maturity duration of the trial ranged from 109 to 125 days with mean maturity duration of 116 days Table 1.2.3. NRC 195 matured in 120 days while the best check SL 1074 matured in 117 days.

2.2 Initial Varietal Trial (Early)

Proposed Testing Centres: Pantnagar, Delhi, Ludhiana.

Data received from: All the Centres

Data of Delhi centre was rejected due to less mean yield. Grain yield and maturity performance of 23 test entries and 3 checks are given in Table 1.2.8 and Table 1.2.10. Although 5 entries qualified the first promotion criteria of at least 10 days earlier to the best check but none of them could qualify the second criteria of yield up to 10% (Zonal CD) less than the best check.

2.3 Advanced Varietal Trial-I + II

Proposed Testing Centres: Pantnagar, Delhi, Ludhiana,

Data received from: All the Centres

The grain yield and ancillary data of AVT I (PS 1670, DS 9421 and DS 9422) and AVT II (NRC 149) is presented in Tables 1.2.15 to 1.2.21 of this compilation. NRC 149 was the YMV resistant high oil entry and DS 9421 and DS 9422 are EDVs of DS 9712 for null KTi. While DS 9422 was the fresh AVT I EDV entry, DS 9421 was the repeat EDV AVT I entry. PS 1670 (2394 Kg/ha) was the top performing entry followed by AVT II entry NRC 149 (2133 Kg/ha) and both of these entries had significantly higher yield than the best check SL 955 (1847 Kg/ha). Maturity duration of NRC 149, PS 1670 and SL 955 was 124, 122 and 125 days respectively.

Year wise performance of AVT I and AVT II entries in AICRP trials is given in Tables 3 to 5. AVT I entry PS 1670 and AVT II entry NRC 149 were superior to their respective best checks but repeat AVT I entry DS 9421 was inferior to its check DS 9712.

Table 3: Mean Performance of PS 1670 in NPZ

S.No.	Entry	Yield (Kg/ha)		Mean	Rank	Maturity
		IVT I-2020	AVT I-2021			
1.	PS 1670	2313	2394	2354	I	119
2.	SL 955 (c)	2115	1847	1981	II	121
3.	SL 1074 (c)	2066	1188	1627	III	121
4.	SL 1104 (c)	716	704	710	IV	118

Table 4: Mean Performance of Repeat AVT I Entry DS 9421 in NPZ

S.No.	Entry	Yield (Kg/ha)		Mean	Rank
		AVT I-2020	AVT I-2021		
1.	DS 9421	1197	972	1085	II
2.	DS 9712 (c)	1280	1122	1201	I

Table 5: Mean Performance of AVT II Entry NRC 149 in NPZ

S.No.	Entry	Yield (Kg/ha)			Mean	Rank
		IVT-2019	AVT I-2020	AVT II-2021		
3.	NRC 149	2716	2325	2133	2391	I
4.	SL 958 (c)	1193	1727	1298	1406	III
5.	SL 1074 (c)	2346	1939	1188	1824	II
6.	DS 9712 (c)	650	1280	1122	1017	IV

3. North Eastern Hill Zone**3.1 Initial Varietal Trial****Proposed Testing Centres: Jorhat, Imphal, Umiam****Data received from: All the Centres**

The yield and ancillary data of 51 test entries and 3 checks has been presented in Table 1.3.1 to 1.3.7 of this compilation. Mean grain yield of the Umiam centre was less than 10 Q/ha and the data was rejected. Mean grain yield of the trial varied from 1617 Kg/ha to 4025 Kg/ha with a mean of 2510 Kg/ha. KDS 1149 (4025 Kg/ha) out yielded the best JS 20-116 check (3728 Kg/ha) by 8% but was not significantly superior. The maturity duration of KDS 1149 (108 days) was 6 days more than that of JS 20-116.

Advanced Varietal Trial-I + II**Proposed Testing Centres: Jorhat, Imphal, Umiam****Data received from: All the Centres**

Data of Jorhat and Umiam centres was rejected due to high CV. One AVT II entry DS 3108 and 3 AVT I entries were tested in the trial (Table 1.3.8). None of the AVT I entries was significantly superior to the best check JS 20-116.

Mean performance of AVT I entries (KDS 1096, DLSb 1 and DSb 38) is given in Table 6. Mean performance of all the test entries was superior to the best check JS 20-116.

Table 6: Mean Performance of AVT I Entries in NEHZ

S.No.	Entry	Yield (Kg/ha)		Mean	Rank	Maturity
		IVT-2020	AVT I-2021			
1.	KDS 1096	1177	3056	2117	I	97
2.	DLSb 1	897	3017	1957	II	102
3.	DSb 38	1226	2667	1947	III	102
4.	RKS 113 (c)	395	2339	1367	VI	101
5.	JS 20-116 (c)	798	2533	1666	IV	101
6.	MACS 1460 (c)	749	2278	1514	V	96

DS 3108 was tested in AICRP during 2017 to 2019 and, on the recommendation of varietal identification committee, in 2021 in AVT II trial again. Mean performance of the entry was 4% less than its check JS 335 in AVT II trial of 2021 (Table 7).

Table 7: Mean Performance of AVT II Entry DS 3108 in NEHZ

S.No.	Entry	Yield (Kg/ha)				Mean	Rank
		IVT 2017	AVT I-2018	AVT II 2019	AVTII 2021		
1.	DS 3108	1506	1850	2189	2744	2073	II
2.	JS 335	1297	1867	2278	2861	2076	I
3.	JS 97-52	1247	1144	2074	2917	1846	IV
4.	RKS 18	1235	1867	2241	2244	1897	III

4. Eastern Zone

4.1 Initial Varietal Trial

Proposed Testing Centres: Bhawanipatna, Raipur, Ranchi, Dholi

Data received from: Bhawanipatna, Raipur, Ranchi

The yield and ancillary data of 51 test entries and 3 checks has been presented in Table 1.4.1 to Table 1.4.7 of this compilation. Trials could not be conducted at Dholi centre due to heavy

rains at the time of sowing. The mean grain yield of the trial varied from 1127 Kg/ha to 2659 Kg/ha with an average of 2009 Kg/ha and the mean maturity duration had the range and mean of 94 to 110 days and 104 days, respectively. The best check variety NRC 128 had the mean yield of 2000 Kg/ha and 8 entries RVS 13-20, CAUMS 2, MAUS 791, RSC 11-42, AS 24, VLS 102, DLSb 3, and KDS 1149 were significantly superior to the check. The maturity duration of the trial ranged from 94 to 110 days with a mean of 104 days.

4.2 Initial Varietal Trial (Early)

Proposed Testing Centres: Bhawanipatna, Raipur, Ranchi, Dholi

Data received from: Bhawanipatna, Raipur, Ranchi

Trial was not conducted at Dholi due to heavy rains at the time of sowing. Mean yield and ancillary data of 23 test entries and 3 checks are given in Table 1.4.8 and Table 1.4.14 of this compilation. Maturity duration of the trial ranged from 94 to 104 days with a mean of 98 days. The best check JS 20-116 matured in 98 days and none of the entries qualified the promotion criteria of 10 days early maturity than check.

4.3 Advanced Varietal Trial-I

Proposed Testing Centres: Bhawanipatna, Raipur, Ranchi, Dholi

Data received from: Bhawanipatna, Raipur, Ranchi

Table 1.4.15 to 1.4.21 of this compilation show the yield and ancillary data of two test entries (KDS 1096, RSC 11-35) and three checks. None of the test entries was significantly superior to the best check RSC 10-46 (2501 Kg/ha).

5. Central Zone

5.1 Initial Varietal Trial

Proposed Testing Centres: Amravati, Amreli, Anand, Indore, Jabalpur, Kota, Sanosara, Mandsaur, Morena, Nagpur, Parbhani, Sehore

Data received from: All the Centres

Data of Indore and Morena was rejected due to low mean and high CV while that of Mandsaur and Nagpur rejected due to high CV and low mean, respectively. Yield and ancillary data of 51 test entries and 3 checks is given in Table 1.5.1 to Table 1.5.7. The mean grain yield of the

trial ranged from 867 to 2537 Kg/ha, with a mean of 1834 Kg/ha. Mean maturity duration ranged from 91 to 130 days with a mean of 103 days. RVSM 11-35 was the best check with yield and maturity duration of 2157 Kg/ha and 103 days, respectively. Nine entries had higher grain yield than RVSM 2011-35 but none of the entries was significantly superior to it. NRC 192, AS 24, RSC 11-42, NRC 189, NRC 190 had more than 13% yield increase over RVSM 2011-35.

5.2 Initial Varietal Trial (Early)

Proposed Testing Centres: Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara, Mandsaur, Morena, Parbhani, Sehore, Nagpur

Data received from: All the centres

Data from Indore and Morena centres was rejected due to high CV and low mean yield. Mean grain yield and ancillary data of 23 test entries and 4 checks is given in Table 1.5.8 to Table 1.5.14. The maturity duration of the trial ranged from 90 to 106 days with a mean of 99 days. This trial consisted of two maturity duration trials of extra early (checks JS 95-60 & JS 20-34) and early (Checks NRC 130 & NRC 138). Performance of extra early and early entries is summarized in Table 8. For extra early only one entry PS 1569 qualified the criteria of equivalent maturity (89.7 days) and yield (1284 Kg/ha) to the best extra early check JS 20-34 (1353 Kg/ha, 90.2 days). For early maturity KDS 1169, JS 23-09 and JS 23-03 were equivalent to the best check NRC 138 but none of them was significantly superior in yield.

Table 8: Performance of Extra Early and Early Entries in CZ

S. No.	Entry	Days to Maturity	Grain Yield (Kg/ha)
Extra Early			
1.	PS 1569	89.67	1284.1
2.	JS 20-34 (C)	90.25	1353.1
3.	JS 95-60 (C)	90.58	1022.3
Early			
1.	KDS 1169	91.33	1000
2.	JS 23-09	92.82	1794
3.	JS 23-03	94.17	1884
4.	NRC 130 (C)	93.0	1280
5.	NRC 138 (C)	93.5	1561
Zonal CD		0.70	115

5.3 Advanced Varietal Trial-I

Proposed Testing Centres: Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara, Nagpur, Morena, Mandsaur, Parbhani, Sehore

Data received from: All the Centres except Nagpur and Morena

Mean yield and maturity performance of two test entries and three checks is given in Table 1.5.15 and Table 1.5.17. None of the test entries was superior to the best check RVS 20-116 in grain yield in AVT I.

5.4 Advanced Varietal Trial-I (Early)

Proposed Testing Centres: Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Parbhani, Sehore, Amreli, Sanosara, Mandsaur

Data received from: All the centres except Morena and Nagpur

Seven test entries along with 2 extra early checks JS 20-34 and JS 95-60 were evaluated in this trial. Yield and ancillary data is presented in Tables 1.5.22 to 1.5.28. NRC 150 was the repeat AVT I entry and its maturity duration (92.4 days) was significantly more than the earliest maturing best check JS 20-34 (89.0 days) but yield was significantly superior. PS 1569 has already reached AVT I of CZ. IVT trials in other than CZ started in 2021. To test the performance of PS 1569 in other zones it again entered in IVT trials and was evaluated both in IVT and AVT I. In AVT I the mean maturity duration of PS 1569 was at par with the checks JS 20-34 and JS 95-60. None of the other entries was at par with the check in maturity. Mean maturity and yield performances of PS 1569, repeat entry NRC 150, and other entries are given in Table 9 to 11. PS 1569 is the earliest maturing entry in all the three trials in AICRP.

Table 9: Mean Performance of PS 1569 in CZ AVT-I(Early) AICRP Trials

S.No	Entry	Yield (Kg/ha)				Maturity			
		IVT 2020	IVT 2021	AVTI 2021	Mean	IVT 2020	IVT 2021	AVTI 2021	Mean
1.	PS 1569	1219	1284	1857	1453	84.9	89.7	88.4	88
2.	JS 20-34	1614	1353	1700	1556	89.8	90.3	89.0	90
3.	JS 95-60	1071	1022	1247	1113	87.6	90.6	88.3	89
Zonal CD			115??	113??			0.70??	0.54??	

Table 10: Mean Performance of Repeat Entry NRC 150 in CZ (Early) AICRP Trials

S.No	Entry	Yield (Kg/ha)				Maturity			
		IVT -2019	AVT I- 2020	AVT I-2021	Mean	IVT -2019	AVT I-2020	AVT I-2021	Mean
1.	NRC 150	1796.25	1483.5	1836	1705	91.86	90.83	92.44	91.7
2.	JS 20-34	1784	1636	1699	1706	89.33	88.17	89.00	88.8
3.	JS 95-60	1589.5	1244.25	1247	1360	88.42	88.83	88.33	88.5
Zonal CD				113				0.54	

Table11 : Mean Performance of Early Maturing Entries in CZ (Early)AICRP Trials

S.No.	Entry	Yield (Kg/ha)		Mean	Maturity		Mean	Rank
		IVT -2020	AVT I-2021		IVT -2020	AVT I-2021		
1	JS 22-12	1988	2109	2049	89.6	91.7	90.7	III
2	JS 22-18	1818	2237	2028	89.6	93.4	91.5	V
3	JS 22-16	1901	2204	2053	90	92.6	91.3	IV
4	RVSM 2012-4	1901	2037	1969	91	93.6	92.3	VII
5	NRC 181	1608	1790	1699	91.4	93	92.2	VI
6	JS 95-60(C)	1071	1247	1159	87.6	88.3	88	I
7	JS 20-34(C)	1614	1699	1657	89.9	89	89.5	II
Zonal CD (0.05)			113			0.54		

5.5 Advanced Varietal Trial-II

Proposed Testing Centres Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara, Morena, Parbhani, Sehore, Mandsaur, Nagpur

Data received from:Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara,Parbhani, Sehore

Two entries (Himso 1689 and JS 21-72) were evaluated in AVT-II trial along with 3 checks (Table 1.5.29 to 1.5.35). None of the entries was significantly superior to the best check in grain yield. Performance of these entries during 3 years of their evaluation in AICRP trials is shown in Table 12. JS 21-72 and Himso 1689 had 8% and 5% superiority over the best check NRC 86.

Table 12: Mean Performance of Himso 1689 and JS 21-72 in CZ AVT-II AICRP Trials

S.No.	Entry	Yield (Kg/ha)				Mean	Rank	Maturity
		IVT-2018	AVT I-2019	AVT I-2020	AVT II-2021			
1	HIMSO 1689	2010	2041	2099	2155	2076	II	99.9
2	JS 21-72	1860	2000	2219	2451	2133	I	97.7
3	NRC 86(C)	1648	2004	1932	2303	1972	III	100.2
4	JS 20-98(C)	1701	1703	2005	2360	1942	IV	99.4

5.6 Advanced Varietal Trial-II (Early)

Proposed Testing Centres Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara, Morena, Mandsaur, Parbhani, Sehore, Nagpur

Data received from: Amravati, Anand, Amreli, Indore, Jabalpur, Kota, Sanosara, Parbhani, Mandsaur

Data of Jabalpur not included due to low <1000kg/ha mean yield. Two entries NRC 165 and NRC 152 were evaluated for high yield and early maturity (Table 1.5.36 to 1.5.42). Only NRC 152 was at par with the early maturing check JS 20-34 both for maturity and grain yield. NRC 165 was the top ranking entry but its maturity duration of 91.8 days was significantly more than the best check's maturity duration (89.7 days). In the mean performances of both the entries during three years of testing NRC 165 and NRC 152 were 4.7% and 0.03% superior to the best check JS 20-34 (Table).

S. No.	Entry	Yield (Kg/ha)			Mean	Rank	Maturity			Mean
		IVT -2019	AVT I -2020	AVT II-2021			2019	2020	2021	
1	NRC 165	1886	1613	1938	1812	I	91.8	86.8	91.8	90.1
2	NRC 152	1880	1664	1843	1796	II	90.4	88.2	89.8	89.5
3	JS 20-34(C)	1784	1636	1771	1730	III	89.3	88.2	89.7	89.1
4	JS 95-60(C)	1590	1244	1497	1444	IV	88.4	88.8	87.6	88.3

5.7 Advanced Varietal Trial-I (Vegetable)

Proposed Testing Centres: Parbhani, Kota, Indore

Data received from: All the centres

Single vegetable soybean entry NRC 188 was evaluated with 4 checks in AVT I trial and the yield and ancillary data are given in Tables 1.5.43 to 1.5.50. Green pod yield of NRC 188 was significantly less than the check varieties JS 20-34 and JS 95-60.

Southern Zone

5.8 Initial Varietal Trial

Proposed Testing Centres: Adilabad, Bidar, Bengaluru, Dharwad, K.Digraj, Pune, Ugarkhurd

Data received from: All the centres except Ugarkhurd

Trial failed at Ugarkhurd due to severe rains. Mean yield and ancillary data of 51 test entries and 3 checks is given in Table 1.6.1 to 1.6.7. None of the entries was significantly superior to the best check DSb 23 (3114 Kg/ha).

5.9 Initial Varietal Trial (Early)

Proposed Testing Centres: Adilabad, Bidar, Bengaluru, Dharwad, K.Digraj, Pune

Data received from: All the centres

Mean yield and ancillary data of 23 entries and 3 checks is compiled in Table 1.6.8 to 1.6.14. There were many entries which matured earlier than or equivalent to the early maturity check MACS 1460 (90.7 days, 2764 Kg/ha) but all were inferior to check in grain yield.

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SUMMARY REPORT OF AGRONOMIC EXPERIMENTS

By and large, all the trials were conducted during *kharif* 2021 at all the Centre representing 6 zones of the country as per technical programme. The experiment-wise salient findings (Table 2.1.1 to 2.6.7) are given as under.

1. AGRON1 /21. Evaluation of AVT II entries under different row spacing

The new entries with two row-spacing (30 and 45 cm) were tested in split plot design with three replications to study the response of soybean new entries to different row spacing (Table 2.1.1-2.1.8).

1.1. North Hill Zone (Almora))

1.1.1. New Entry

Seed yield of soybean new entry differed significantly at Almora Centre (Table 2.1.1). New entry VLS 99 produce significantly higher seed yield than check PS 1556 and found at par with check VLS 63 and check VLS 89. Similar trend was also recorded in most of the growth and development and yield attributes, straw yield, grain production index and rainfall use efficiency (Table 2.1.2).

1.1.2. Row spacing

The soybean yield remained unaffected due to row spacing at Almora centre. Generally, the wider row spacing (45 cm) yielded numerically higher than narrow planting (30 cm). On mean basis, the wider row spacing yielded more (1.25%) than narrow planting (Table 2.1.1). A similar trend was also noted in all the growth and yield attributes parameters (Table 2.1.2).

1.1.3. Interaction effect

Interaction effect at Almora centre was found to be non-significant.

1.2. North plain Zone (Pantnagar and Ludhiana)

1.2.1. New Entry

The new entry NRC 149 produce significantly higher yield than check varieties PS 1347 and SL 1074 and found at par with check variety SL 955 at Pantnagar centre. At Ludhiana centre, entry NRC 149 produce significantly lower yield than check varieties SL 955 and PS 1347 and found at par with check variety SL 1074. On zonal mean basis, numerically the highest seed was registered with check variety SL 955 followed by PS 1347 then NRC-149 (Table 2.1.3). On zonal mean basis, more or less a similar trend was also observed in all the growth and yield attribute parameters under study (Table 2.1.5).

1.2.2. Row spacing

Non-significant effect of row spacing on soybean yield was observed at both the centre (Table 2.1.3). At Pantnagar centre, numerically the higher seed yield was recorded with narrow row spacing (30 cm) than wider row spacing (45 cm). Whereas, at Ludhiana centre numerically higher seed was registered with wider row spacing than narrow row spacing. On zonal mean basis, the higher yield (2.26%) was recorded under narrow planting as compared to wider planting.

On zonal mean basis, maximum values of all the growth and yield attributes were associated with wider planting (Table 2.1.5).

1.2.3. Interaction effect

The interaction between entries and row spacing was found non-significant at both the centre (Table 2.1.3).

1.3. North Eastern Zone (Imphal and Medziphema)

1.3.1. New Entry

The new entry DS-3108 produce significantly higher seed yield than all the three check varieties (JS-335, RKS 18 and JS 97-52) at Imphal centre (Table 2.1.4). At Medziphema centre, the seed yield of new entry DS-3108 found at par with all the three check varieties (JS-335, RKS 18 and JS 97-52). On zonal mean basis, the new entry DS-3108, yielded higher than all the check varieties namely; JS-335, RKS 18 and JS 97-52. The new entry DS 3108 yielded 23.5% higher seed yield than check JS 335; 22.7% higher seed yield than check RKS 18 and 18.4% higher seed yield than check JS 97-52.

1.3.2. Row spacing

Non-significant effect of row spacing on soybean yield was observed at both the centre (Table 2.1.4). At Imphal centre, numerically the higher seed yield was recorded with wider row spacing (45 cm) than narrow row spacing (30 cm). Whereas, at Medziphema centre numerically higher seed was registered with narrow row spacing than wider row spacing. On zonal mean basis, numerically the higher seed yield was recorded under narrow planting as compared to wider planting. A similar trend was also noted in all the growth and yield attribute parameters (Table 2.1.6).

1.3.3. Interaction effect

Interaction effect at Almora centre was found to be non-significant

1.4. Central Zone (Kota, Sehore and Amravati)

1.4.1. New Entry

The new entry NRC 152 (early), yielded 11.5% higher than check JS 20-34 at Sehore centre. Similarly, new entries HIMSO 1689 and JS 21-72, yielded 13.4% and 3.90% higher than check variety NRC 86, respectively (Table 2.1.7). At Amravati centre, both the new entries NRC 152 and NRC 165 produce significantly lower yield than check JS 20-34. However, new entries HIMSO 1689 (23.3%) and JS 21-72 (39.7%) produce significantly higher seed yield than check variety NRC 86 at Amravati centre. At Kota centre, new entry NRC 152 yielded 21.3% higher than check JS 20-34. Similarly, new entries HIMSO 1689 and JS 21-72 yielded 8.13% and 21.6% higher than check NRC 86, respectively.

1.4.2. Row spacing

The seed yield of soybean significantly influenced by different row spacing at all the centre (Table 2.1.7). At Sehore centre, numerically the higher seed yield was recorded with wider row spacing (45 cm) than narrow row spacing (30 cm). Similarly, at Amravati centre significantly higher seed was recorded with wider row spacing (45 cm) than narrow row spacing (30 cm). Whereas, at Kota centre maximum seed was registered with narrow row (30 cm) spacing than wider row spacing (45 cm). On zonal mean basis, numerically the higher seed yield was recorded under wider planting as compared to narrow planting. A similar trend was also noted in all the growth and yield attribute parameters (Table 2.1.8).

1.4.3. Interaction effect

The interaction between entries and row spacing was found non-significant at all the centre (Table 2.1.8).

2. AGRON 2/15. Sustainable soybean production through crop diversification and tillage systems

Two tillage systems (minimum and conventional) and four crop rotations were tested in strip plot design with four replications to study the response of soybean to tillage systems and crop rotations (Table 2.2.1-2.2.23).

2.1. North plain zone (Pantnagar and Ludhiana)

2.1.1. Crop rotation

Soybean yield did not influence by the crop rotation at Pantnagar and Ludhiana. Similarly, *rabi* and soybean equivalent yield (SEY) remained unaffected due to different crop rotation at both the centre (Table 2.2.1, 2.2.2 and 2.2.3). Soybean-Soybean-Maize-Soybean rotation yielded maximum SEY (3263 kg/ha) followed by soybean-soybean-soybean-maize as evidenced from the

zonal mean data. The maximum net return and B:C ratio was observed under the Soybean-Maize-Soybean-Maize rotation (Table 2.2.4).

2.1.2. Tillage system

Soybean, *rabi* and soybean equivalent yield differed non-significantly between two tillage systems at Ludhiana and Pantnagar (Table 2.2.1, 2.2.2 and 2.2.3.). Zonal mean basis, the numerically higher yield of *kharif* season crop was registered under minimum tillage as compared to conventional tillage system. Similarly, the numerically higher yield of *rabi* season crops were found under conventional tillage as compared to minimum tillage system. However, the higher soybean equivalent yield was observed under minimum system on zonal average basis. The net returns and B:C ratio were marginally higher with minimum tillage (Table 2.2.4).

2.1.3. Interaction effect

Interaction between tillage systems and crop rotations for soybean, *rabi* yield and SEY were found to be non-significant at both the centre.

2.2. Eastern zone (Raipur and Ranchi)

2.2.1. Crop rotation

On zonal mean basis, the highest soybean seed yield was associated with soybean-maize-soybean-maize system (Table 2.2.5.). Soybean-soybean-maize-soybean crop rotation produced maximum *rabi* yield at Ranchi centre and Soybean-Soybean-Soybean-Maize crop rotation produced maximum *rabi* yield at Raipur centre (Table 2.2.6). Similarly, the highest soybean equivalent yield was registered under soybean-soybean-maize-soybean as compared to remaining system (Table 2.2.7).

Among crop rotations, the higher net returns and B:C ratio were registered with soybean-soybean-maize-soybean (Table 2.2.8)

2.2.2. Tillage system

Soybean and soybean equivalent yield remained unaffected due to tillage systems at Ranchi centre (Table 2.2.5 and 2.2.7). The *rabi* yield was significantly higher under conventional as compared to minimum tillage at Ranchi. The numerically highest soybean equivalent yield was with conventional tillage (Table 2.2.7). At Raipur centre, significantly the higher seed yield of soybean and soybean equivalent yield were found under conventional tillage as compared to minimum tillage practice. Similarly, *rabi* yield was also higher under conventional tillage practices as compared to minimum tillage.

Among the tillage systems, the maximum cost of cultivation, gross returns, net returns were found under conventional tillage system (Table 2.2.8). The economical parameters and initial values of soil OC, N, P, and K and nutrient uptake were given in (Table 2.2.8 to 2.2.10).

2.2.3. Interaction effect

Interaction between tillage systems and crop rotations was found to be non-significant for soybean, *rabi* and soybean equivalent yield.

2.3. Central zone (Kota and Amravati)

2.3.1. Crop rotation

Crop rotation failed to cause appreciable improvement in soybean and *rabi* yield at Kota (Table 2.2.11 to 2.2.12). However, numerically higher soybean seed yield was registered under soybean-soybean-soybean-maize system. At Amravati, the highest soybean seed yield was registered under the soybean-maize-soybean-maize system. The significantly higher *rabi* yield was recorded with soybean-soybean-soybean-soybean system. On zonal mean basis, the maximum SEY was observed in soybean-soybean-soybean-soybean and followed by soybean-soybean-maize-soybean crop rotation (Table 2.2.13).

The maximum net returns and B:C ratio was with soybean-soybean-maize-soybean crop rotation (Table 2.2.14). The initial values of soil parameters and nutrient uptake at of Kota and Amravati are given in Table 2.2.15 and 2.2.16.

2.3.2. Tillage system

Minimum tillage produced higher yield (soybean, *rabi* and SEY) than conventional tillage at both Kota and Amravati (Table 2.2.11 to 2.2.13). On zonal mean basis, minimum tillage gave higher yield to the tune of 8.17, 4.0% and 5.90% of soybean yield, *rabi* yield and SEY over conventional tillage, respectively (Table 2.2.11 to 2.2.13).

As economic point of view, the highest net returns and B:C ratio was registered under minimum tillage as compared to conventional tillage. Among the crop rotations, the maximum net returns and B:C ratio was with soybean-soybean-maize-soybean crop rotation (Table 2.2.14). The initial values of soil parameters and nutrient uptake at of Kota and Amravati are given in Table 2.2.15 and 2.2.17.

2.3.3. Interaction effect

Interaction between tillage systems and crop rotations was found to be non-significant at both the centre (Table 2.2.12 to 2.2.13).

2.2. Southern zone (Dharwad and Adilabad)

2.4.1. Crop rotation

Soybean seed yield and *rabi* crop yield were highest with soybean-soybean-soybean-maize at Dharwad centre (Table 2.2.18 & 2.2.19). At Adilabad centre, the maximum soybean yield and *rabi* yield registered with Soybean-Maize-Soybean-Maize crop rotation and closely followed by soybean-soybean-soybean-maize rotation (Table 2.2.18 & 2.2.19). On zonal mean

basis, the higher yield of *kharif* was found with soybean-soybean-soybean-maize rotation. soybean-soybean-maize-soybean rotation produced maximum SEY as evidenced from zonal mean (Table 2.2.20).

The economics of different treatments and soil analysis and nutrient uptake data are given in table 2.2.21 to 2.2.23.

2.4.2. Tillage system

Conventional tillage yielded higher than minimum tillage at both the centre. On zonal mean basis, conventional tillage gave higher soybean (12.2%), *rabi* yield (24.9%) and SEY (17.3%) over minimum tillage (Table 2.2.18 to 2.2.20).

The economics, soil analysis and nutrient uptake data are given in table 2.2.21 and 2.2.23.

2.4.3. Interaction effect

Interaction between tillage systems and crop rotations was found to be non-significant at both the centre.

3. AGRON. 3/18/21. Evaluation of novel bio formulation for yield enhancement in soybean

Novel bio-formulations (seven treatments) such as Bio Zn, Bio NPK and Rhizobium + MDSR14 + 12c (12c= *Burkholderia arboris*-High P solubilizing) were tested with 100% and 75% RDF under field conditions with three replications to evaluate the effect of novel bio formulations on productivity of soybean (Table 2.3.1 to 2.3.17).

3.1 Southern zone (Dharwad, Adilabad and Pune):

3.1.1 Dharwad

The yield data of soybean for Dharwad centre was presented in the table 2.3.1. The use of novel bio formulations significantly influenced the yield of soybean. At Dharwad centre, the maximum soybean yield was registered with application of 100% RDF followed by 75 % RDF + Rhizobium + MDSR14 + 12c (12c= *Burkholderia arboris*-High solubilizing) and 75 % RDF + Bio Zn + Bio NPK. The yield of soybean increased by 22.9% with the application of 100% RDF, 16.6% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c, and 15.3% with the application of 75 % RDF + Bio Zn + Bio NPK as compared to control (Table 2.3.1).

3.1.2 Adilabad

The yield data of soybean for Adilabad centre was presented in the table 2.3.1. The use of novel bio formulations significantly influenced the yield of soybean. At Adilabad centre, the maximum soybean yield was registered with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 100% RDF and then 75 % RDF + Bio Zn + Bio NPK. The yield of soybean increased by 90.3% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c, 88.9% with the application of 100% RDF, and 64.4% with the application of 75 % RDF + Bio

Zn + Bio NPK as compared to control (Table 2.3.1). Available nutrients in soil and their uptake depicted in Table 2.3.11.

3.1.3 Pune

The yield data of soybean for Pune centre was presented in the table 2.3.1. The use of novel bio formulations significantly influenced the yield of soybean. At Pune centre, the maximum soybean yield was registered with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK and then 100% RDF only. The yield of soybean increased by 29.5% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c, 27.5% with the application of 75 % RDF + Bio Zn + Bio NPK, and 21.7% with the application of 100% RDF over the control treatment (Table 2.3.1). Available nutrients in soil and their uptake depicted in Table 2.3.12.

3.1.4 Zonal mean

Overall, zonal mean basis the highest seed yield of soybean was registered with the application 75 % RDF + Rhizobium + MDSR14 + 12c followed by 100% RDF only and 75 % RDF + Bio Zn + Bio NPK. The increase was 38.9% under 75 % RDF + Rhizobium + MDSR14 + 12c, 38.3% under 100% RDF application and 31.9% under 75 % RDF + Bio Zn + Bio NPK treatment as compared to control.

Growth, development and yield attributes follows the same trend as was observed in yield (Table 2.3.5 & 2.3.6)

Economics point of view, maximum gross returns, net returns and B:C ratio were associated with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK treatment. Whereas, the maximum cost of cultivation was associated with the application of 100% RDF only (2.3.5).

The available nutrients in soil and their uptake depicted in Table 2.3.6 to 2.3.8.

3.2 Central zone (Sehore, Kota, Amravati and Devgarh Baria):

3.2.1 Sehore

The yield data of soybean for Sehore centre was presented in the table 2.3.2. The use of novel bio formulations significantly influenced the yield of soybean. At Sehore centre, the maximum soybean yield was registered with application of 100% RDF followed by 75% RDF + Bio Zn + Bio NPK and 75% RDF + Bio NPK. The yield of soybean increased by 55.5% with the application of 100% RDF, 46.3% with the application of 75 % RDF + Bio Zn + Bio NPK as compared to control (Table 2.3.2).

3.2.2 Kota

The yield data of soybean for Kota centre was presented in the table 2.3.2. The use of novel bio formulations significantly influenced the yield of soybean. At Kota centre, the maximum soybean yield was registered with the application of 100% RDF followed by 75 % RDF + Rhizobium + MDSR14 + 12c and then 75 % RDF + Bio Zn + Bio NPK. The yield of soybean increased by 45.8% with the application of 100% RDF, 43.0% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c, as compared to control (Table 2.3.2).

3.2.3 Amravati

The yield data of soybean for Amravati centre was presented in the table 2.3.2. The use of novel bio formulations significantly influenced the yield of soybean. At Amravati centre, the maximum soybean yield was registered with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK. The yield of soybean increased by 72.4% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c and 56.2% with the application of 75 % RDF + Bio Zn + Bio NPK over the control treatment (Table 2.3.2).

3.2.4 Devgarh Baria

The yield data of soybean for Devgarh Baria centre was presented in the table 2.3.2. The use of novel bio formulations significantly influenced the yield of soybean. At Devgarh Baria centre, the maximum soybean yield was registered with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 100% RDF only. The yield of soybean increased by 28.7% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c and 16.4% under the application of 100% RDF over the control treatment (Table 2.3.2).

3.2.5 Zonal mean

Overall, zonal mean basis the highest seed yield of soybean was registered with the application 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK treatment. The increase was 47.2% under 75 % RDF + Rhizobium + MDSR14 + 12c and 38.7% under 75 % RDF + Bio Zn + Bio NPK treatment as compared to control.

Growth, development and yield attributes follows the same trend as was observed in yield (Table 2.3.14 and 2.3.16)

Economics point of view, maximum gross returns, net returns and B:C ratio were associated with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK treatment. Whereas, the maximum cost of cultivation was associated with the application of 100% RDF only (2.3.14).

3.3 North Plain Zone (Delhi, Pantnagar and Ludhiana):

3.3.1 Delhi

The yield data of soybean for Delhi centre was presented in the table 2.3.3. The use of novel bio formulations significantly influenced the yield of soybean. At Delhi centre, the maximum soybean yield was registered with application of 75 % RDF + Bio Zn + Bio NPK followed by 75 % RDF + Rhizobium + MDSR14 + 12c. The yield of soybean increased by 91.9% with the application of 75 % RDF + Bio Zn + Bio NPK and 87.8% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c as compared to control (Table 2.3.3).

3.3.2 Pantnagar

The yield data of soybean for Pantnagar centre was presented in the table 2.3.3. The use of novel bio formulations significantly influenced the yield of soybean. At Pantnagar centre, the maximum soybean yield was registered with the application of 100% RDF followed by 75 % RDF + Bio Zn + Bio NPK and 75 % RDF + Bio NPK. The yield of soybean increased by 60.5% with the application of 100% RDF, 49.4% with the application of 75 % RDF + Bio Zn + Bio NPK and 46.9% with the application of 75 % RDF + Bio NPK over the control treatment.

3.3.3 Ludhiana

The yield data of soybean for Ludhiana centre was presented in the table 2.3.3. The use of novel bio formulations significantly influenced the yield of soybean. At Ludhiana centre, the maximum soybean yield was registered with the application of 75 % RDF + Bio Zn + Bio NPK and then 100% RDF. The yield of soybean increased by 26.9% with the application of 75 % RDF + Bio Zn + Bio NPK, and 21.9% with application of 100% RDF over the control treatment (Table 2.3.3).

3.3.4 Zonal mean

Overall, zonal mean basis the maximum soybean yield was registered with the application of 100% RDF followed by 75 % RDF + Bio Zn + Bio NPK and then 75 % RDF + Bio NPK. The yield of soybean increased by 51.6% with the application of 100% RDF, 49.5% with the application of 75 % RDF + Bio Zn + Bio NPK, and 45.9% with the application of 75 % RDF + Bio NPK over the control treatment (Table 2.3.3).

Growth, development and yield attributes follows the same trend as was observed in yield (Table 2.3.15& 2.3.17)

Economics point of view, maximum gross returns, net returns and B:C ratio were associated with the application of 75 % RDF + Rhizobium + MDSR14 + 12c followed by 75 % RDF + Bio Zn + Bio NPK treatment and then with 100% RDF. Whereas, the maximum cost of cultivation was associated with the application of 100% RDF only (2.3.15).

3.4 Eastern Zone (Bhawanipatna, Ranchi and Raipur):

3.4.1 Bhawanipatna

The yield data of soybean for Bhawanipatna centre was presented in the table 2.3.4. The use of novel bio formulations significantly influenced the yield of soybean. At Bhawanipatna centre, the maximum soybean yield was registered with application of 75 % RDF + Bio Zn + Bio NPK followed by 100% RDF and then with the 75 % RDF + Rhizobium + MDSR14 + 12c. The yield of soybean increased by 84.3% with the application of 75 % RDF + Bio Zn + Bio NPK, 61.1% with the application of 100% RDF, and 56.7% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c as compared to control (Table 2.3.4).

3.4.2 Ranchi

The yield data of soybean for Ranchi centre was presented in the table 2.3.3. The use of novel bio formulations significantly influenced the yield of soybean. At Ranchi centre, the maximum soybean yield was registered with the application of 100% RDF followed by 75 % RDF + Rhizobium + MDSR14 + 12c and then with the 75 % RDF + Bio Zn + Bio NPK. The yield of soybean increased by 132.8% with the application of 100% RDF, 124.2% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c and 121.7% with the application of 75 % RDF + Bio Zn + Bio NPK as compared to control treatment.

3.4.3 Raipur

The yield data of soybean for Raipur centre was presented in the table 2.3.4. The use of novel bio formulations significantly influenced the yield of soybean. At Raipur centre, the maximum soybean yield was registered with the application of 75 % RDF + Bio Zn + Bio NPK followed by 75 % RDF + Rhizobium + MDSR14 + 12c and 100% RDF. The yield of soybean increased by 89.1% with the application of 75 % RDF + Bio Zn + Bio NPK, 77.8% with the application of 75 % RDF + Rhizobium + MDSR14 + 12c and 68.2 % with application of 100% RDF over the control treatment (Table 2.3.3).

3.3.4 Zonal mean

Overall, zonal mean basis the maximum soybean yield was registered with the application of 75 % RDF + Bio Zn + Bio NPK followed by 100% RDF and 75 % RDF + Rhizobium + MDSR14 + 12c. The yield of soybean increased by 97.7% with the application of 75 % RDF + Bio Zn + Bio NPK, 86.3% with the application of 100% RDF and 84.8% 75 % RDF + Rhizobium + MDSR14 + 12c over the control treatment (Table 2.3.4).

Growth, development and yield attributes follows the same trend as was observed in yield (Table 2.3.9, 2.3.10)

Economics point of view, maximum gross returns, net returns and B:C ratio were associated with the application of 75 % RDF + Bio Zn + Bio NPK followed by 75 % RDF + Rhizobium + MDSR14 + 12c and then with 100% RDF. Whereas, the maximum cost of cultivation was associated with the application of 100% RDF only (2.3.9).

4. AGRON 5/19.Evaluation of partial factor productivity for soybean

Seven treatments of nutrient under RBD to evaluate the yield gap of soybean due to omission of nutrients (Table 2.4.1. to 2.4.10).

4.1 North plain zone (Pantnagar and Ludhiana)

The data of partial factor productivity for Pantnagar and Ludhiana was presented in table 2.4.1. to 2.4.4). Soybean was grown with full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) yielded maximum as compared to other treatments (Table 2.4.1). The omission of weed management from full package showed highest yield gap followed by the omission of recommended dose of fertilizers (RDF) and then seed treatment. The minimum yield gap was with the omission of pesticide application and seed inoculation. The maximum cost incurred due to RDF followed by weed management and insecticide application. The lowest cost was observed in seed treatment and inoculation. The highest B:C ratio was recorded with full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) followed by pesticide application, ridge furrow, and seed inoculation. The similar trend was also observed in other economical parameters. The yield attributes, biological and straw yield depicted in Table 2.4.2).

4.2 Central zone (Sehore, Kota, Devgarhbaria and Amravati)

Data of individual centre were presented in table 2.4.3 to 2.4.4. Soybean was grown with full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) yielded maximum as compared to other treatments (Table 2.4.3). The omission of weed management from full package showed highest yield gap followed by the omission of recommended dose of fertilizers, insecticides and ridge and furrow. The lowest net return and B:C ratio was registered under omission of weed management from full package followed by the omission of recommended dose of fertilizers and insecticides. The minimum yield gap was with omission of seed treatment. The maximum cost incurred due to weed management followed by RDF and insecticide application. The lowest cost was observed in seed inoculation and treatment. The similar trend was also observed in economical parameters. The yield attributes, biological and straw yield depicted in Table 2.4.4).

4.3 Eastern zone (Raipur, Ranchi and Bhawanipatna)

Data of individual centre were presented in table 2.4.9 to 2.4.10. Soybean was grown with full package (Seed treatment, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) yielded maximum as compared to other treatments (Table 2.4.9). The omission of weed management from full package showed highest yield gap followed by the omission of recommended dose of fertilizers, and insecticides application. The lowest net return and B:C ratio was registered under omission of weed management from full package followed by the

omission of recommended dose of fertilizers and insecticides application. The minimum yield gap was with omission of ridge and furrow system. The maximum cost incurred due to RDF followed by weed management, ridge and furrow planting and insecticide application. The lowest cost was observed in inoculation and seed treatment. The highest IBCR was recorded under omission of seed treatment followed by seed inoculation. The yield attributes, biological and straw yield depicted in Table 2.4.10.

4.4 North eastern hill zone (Imphal and Medziphema)

Individual centre data were depicted in table 2.4.5 to 2.4.6. Cultivation of soybean was with full package (Seed treatments, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) yielded maximum as compared to other treatments (Table 2.4.5). The omission of weed management from full package showed highest yield gap followed by the omission of recommended dose of fertilizers and insecticides. The maximum reduction in the cost of cultivation was associated with omission of recommended dose of fertilizers followed by weed management, ridge and furrow and insecticide application. The lowest cost was observed in seed inoculation and treatment. The yield attributes, biological and straw yield depicted in Table 2.4.6.

4.5 Southern zone (Pune, Dharwad and Adilabad)

The individual centre data were embodied in table 2.4.7 to 2.4.8. Soybean was grown with full package (Seed treatments, seed inoculation, RDF, weed management, insecticide, Ridge and furrow) yielded maximum as compared to other treatments (Table 2.4.7). The omission of weed management from full package showed highest yield gap followed by the omission of pesticide application and then omission of recommended dose of fertilizers. The lowest yield gap was associated with seed treatment followed by seed inoculation. The maximum cost incurred due to weed management followed by RDF and insecticide application. The lowest cost was observed in seed treatment followed by seed inoculation. The similar trend was also observed in economical parameters. The highest IBCR was recorded under omission of seed inoculation followed by seed treatment. The yield attributes, biological and straw yield depicted in Table 2.4.8.

5. AGRON. 5/20: Drought alleviation in soybean through foliar application of Thiourea

Five treatments of thiourea application including control were tested under factorial RBD to evaluate the effect of foliar spray of thiourea on growth and yield of soybean varieties under different zones (Table 2.5.1. to 2.5.8).

5.1. North plain zone (Pantnagar Ludhiana and Delhi)

Foliar application of thiourea in soybean at 20-25 and 50-55 days after sowing significantly affect the growth and yields of soybean at all the centre (Table 2.5.1 & 2.5.2).

5.1.1. Variety

Among the two varieties, significantly the highest seed yield was recorded with PS 1347 at Pantnagar and Ludhiana centre. While, variety SL 958 produce significantly higher seed yield than PS 1347 at Delhi centre. The similar trend was also observed for growth and economics parameters (Table 2.5.1).

5.1.2. Thiourea

The application of thiourea with increasing dose increase the seed yield of soybean at Pantnagar and Delhi centre highest yield was recorded with the application of thiourea @ 750 ppm/ha. However, at Ludhiana centre, the highest seed yield was recorded with the application of thiourea @ 500 ppm/ha. On zonal mean basis, the highest seed yield was registered with the application of thiourea @ 750 ppm/ha followed by 500 ppm/ha. The similar trend was also observed for growth and economical parameters (Table 2.5.1).

5.2. North Eastern zone (Raipur and Ranchi)

5.2.1. Variety

Among the two varieties, significantly the highest seed yield was recorded with the RSC 10-46 as compared to JS 95-60 at both the centre. The variety RSC 10-46 yielded 14.2% higher than JS 95-60 as evidenced from zonal mean. The similar trend was also observed for growth and economics parameters (Table 2.5.3 and 2.5.4).

5.2.2. Thiourea

Foliar application of thiourea in soybean at 20-25 and 50-55 days after sowing significantly affect the growth and yields of soybean at both the center's (Table 2.5.3 to 2.5.4). Furthermore, the foliar application of thiourea with increasing dose increase the seed yield at both the centre and the highest yield was recorded with the application of thiourea @ 750 ppm/ha followed by application of thiourea @ 500 ppm/ha. Overall, the similar trend was also observed among all the remaining growth and economical parameters. On zonal mean basis, the seed yield was increased by 18.9% with the application of thiourea @ 750 ppm/ha and followed by 15.0% with the application of thiourea @ 500 ppm/ha as compared to control treatment.

5.3. Central zone (Sehore, Kota, Amravati and Devgarh Baria)

5.3.1. Variety

Among the varieties, significantly the highest seed yield was recorded with the JS 20-69 as compared to JS 20-29 at Sehore. At Kota centre the highest seed yield was recorded with JS 95-60 than JS 20-34 variety. At Amravati centre, the highest seed yield was recorded with the RVS 24 than NRC 86 variety. Similarly, at Devgarh Baria centre, the highest seed yield was recorded with the NRC 86 than RVS 24 and the similar trend was also observed among other growth, yield attributes and economical parameters (Table 2.5.5 and 2.5.6).

5.3.2. Thiourea

Foliar application of thiourea in soybean at 20-25 and 50-55 days after sowing significantly affect the growth and yields of soybean at central zone (Sehore, Kota and Amravati) (Table 2.5.5 to 2.5.6). Among the foliar spray application treatments, the highest seed yield at Amravati centre was registered with the application of thiourea @ 500 ppm/ha and closely followed by the application of thiourea @ 750 ppm/ha. However, at Sehore, Kota and Devgarh Baria centers, the highest yield was registered with the application of thiourea @ 750 ppm/ha followed by 500 ppm/ha. On zonal mean basis, the highest seed yield was registered with the

application of thiourea @ 750 ppm/ha followed by application of thiourea @ 500 ppm/ha. The similar trend was also observed for the yield attributes and economical parameters (Table 2.5.6). The yield was increased by 22.0% with the application of thiourea @ 750 ppm/ha and with the application of thiourea @ 500 ppm/ha over control, as evidenced by zonal mean data.

5.4. Southern zone (Dharwad and Adilabad)

5.4.1. Variety

Among the varieties, the highest seed yield was recorded with the MACS 1188 as compared to JS 93-05 at both the centre. On zonal mean basis, variety MACS 1188 produced 16.3% higher yield as compared to JS 93-05 (Table 2.5.8).

5.4.2. Thiourea

Foliar application of thiourea in soybean at 20-25 and 50-55 days after sowing significantly affect the growth and yields of soybean at both the center's (Table 2.5.7 to 2.5.8). Among the foliar spray application treatments, the yield of soybean was increased with the increased dose of the thiourea foliar spray and the highest yield of soybean was registered with the application of thiourea @ 750 ppm/ha followed by application of thiourea @ 500 ppm/ha. The similar trend was also observed for the yield attributes and economical parameters (Table 2.5.7 and 2.3.8). The yield was increased by 24.4% under the application of thiourea @ 750 ppm/ha and 20.4% under the application of thiourea @ 500 ppm/ha over control, as evidenced by zonal mean.

AGRON. 6/21. Bio efficacy testing of Cytozyme bio stimulant product Crop Max (Crop 100) on Soybean (*Glycine max*)

Six (One for phytotoxicity) treatment of Cytozyme bio stimulant product Crop Max (Crop 100) were tested under RBD to evaluate the Bio-efficacy of Cytozyme bio stimulant product Crop Max (Crop 100) on Soybean (*Glycine max*) (Table 2.6.1. to 2.6.6).

6.1. Central zone

6.1.1 Sehore, Kota and Amravati

Application of Crop Max on soybean influenced the growth and yield of soybean (Table 2.6.1). Numerically, the higher seed yield of soybean was registered with the application Crop Max 750 ml/ha and closely followed by the application of Crop Max 625 ml/ha treatment at Sehore centre. Application of Crop Max on soybean significantly influenced the growth and yield of soybean at Amravati centre. The higher seed yield of soybean was recorded with application Crop Max 750 ml/ha followed by the application of Biozyme (Liquid) – Standard check, (500 ml/ha). At Kota centre, the maximum yield of soybean was registered with application of Biozyme (Liquid) – Standard check, (500 ml/ha) followed by Crop Max 750 ml/ha.

On zonal mean basis, the maximum seed yield of soybean was registered with the application of Crop Max 750 ml/ha followed by the application of Biozyme (Liquid) – Standard

check, (500 ml/ha). The yield was increased by 24.0% under the application of Crop Max 750 ml/ha treatment as compared to Untreated control.

6.2. Southern zone

6.2.1. Dharwad and Adilabad

Application of Crop Max on soybean significantly influenced the growth and yield of soybean (Table 2.6.2). Significantly the higher seed yield of soybean was registered with the application Crop Max 750 ml/ha followed by the application of Biozyme (Liquid) – Standard check, (500 ml/ha) as compared to remaining treatments. Similar trend was also observed at Adilabad centre (Table 2.6.2).

On zonal mean basis, the maximum seed yield of soybean was registered with the application of Crop Max 750 ml/ha followed by the application of Biozyme (Liquid) – Standard check, (500 ml/ha). The yield was increased by 21.8% under the application of Crop Max 750 ml/ha treatment as compared to Untreated control.

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SUMMARY REPORT OF ENTOMOLOGY EXPERIMENTS CONDUCTED DURING KHARIF - 2021

Eight entomological field trials were conducted during *khariif* 2021 at **11** Coordinated centres viz. Delhi, Pantnagar, Ludhiana (Northern Plain Zone), Sehore, Parbhani, Kota, Amravati, Indore (Central Zone), Dharwad and Bidar (Southern Zone) and Imphal (North Eastern Hill Zone). Trial wise salient findings are presented below:

Ent. 1. Seasonal incidence of insect-pests and their bio-control agents

A. Incidence of insect-pests: The information on incidence of major insect-pests at different coordinating centres is compiled. Total **21** insect spp. infested soybean crop in different zones during *khariif* 2021 at 11 different coordinating centres:

Zone	Insects
North Plain Zone (Pantnagar, Delhi)	<i>Bemisia tabaci</i> , <i>Obereopsis brevis</i> , <i>S. obliqua</i> , <i>S. litura</i> , semilooper, <i>Melanagromyza sojae</i>, Aphids.
North Eastern Hill Zone (Imphal)	<i>Helicoverpa armigera</i> , <i>Spilarctia obliqua</i> , <i>A. modicella</i> , Aphids , <i>M. sojae</i> , <i>Bemisia tabaci</i> , <i>S. litura</i> , <i>C. acuta</i> , <i>Obereopsis brevis</i> , Bean bug, Thrips.
Central Zone (Sehore, Kota, Parbhani, Amravati)	<i>Cneorane</i> spp, <i>Melanagromyza sojae</i> , <i>Gesonina gemma</i> , <i>Chrysodeixis acuta</i> , <i>Spodoptera litura</i> , <i>Obereopsis brevis</i> , <i>Helicoverpa armigera</i> , <i>Diachrysa orichalcea</i> , <i>Spilarctia obliqua</i> , <i>Hedylepta indicata</i> , <i>Bemisia tabaci</i> , <i>Myloccerus</i> spp., Grass hopper, Field Crickets.
Southern Zone (Dharwad)	<i>Melanagromyza sojae</i> , <i>Obereopsis brevis</i> , <i>S. litura</i> , , <i>D. orichalcea</i> , <i>Spilarctia obliqua</i> , <i>N. viridula</i> , <i>Cydia ptychora</i> , Thrips, Aphids, Jassids, <i>Bemisia tabaci</i> , <i>Myloccerus</i> spp., <i>A. modicella</i> , <i>H. indicata</i> , <i>Helicoverpa armigera</i> .

The extent of infestation/damage by major insect-pests at different coordinating centres is given below:

Location	Major insects (infestation / damage)
Pantnagar	Stem fly –24.65 % stem tunneling; Aphids – 2.83/ 3 leaves; Defoliation 21.53% leaf damage at peak incidence.
Sehore	<i>Gessonina</i> -. <i>gemma</i> -5.33 larvae /mrl ; <i>Chrysodeixis .acuta</i> -7.66 larvae /mrl ;Stem fly 50% infestation With maximum tunneling 22.40 per cent . Girdle beetle -10.5 % infestation. Defoliation -5.5 % at vegetative stage, 17.5% at flowering and 25.5% at peak population.
Parbhani	Girdle beetle – 13.33% infestation; Stem fly – 36.10 % stem tunnelling; Semiloopers – 13.33 larvae/MRL
Amravati	Stem fly with 80 % infestation.
Kota	Girdle beetle – 23.00% infestation ; Semiloopers – 1.33 larvae/m; Defoliation – 3.5 at flowering and 18.5 at peak larval incidence at 37-38 (SMW)

Dharwad	<i>C. ptychora</i> – 48.85% pod damage
Imphal	<i>S. obliqua</i> – 81.33 larvae/m; Leaf Webber – 8.33 larvae / mrl; <i>S. litura</i> – 6.00 larvae/m; Defoliation – 31.84% ; Aphids – 31.20 aphids /plant

B. Incidence of Bio-control agents (BCAs): Periodic incidence of natural bio-control agents were recorded in soybean ecosystem. The important ones were; entomopathogenic fungi – *Beauveria bassiana*, *Nomurea rileyi*, Parasitoids – *Bracon* sp., *Apanteles* sp., *Cotesia flavipus*; Predators – Spiders, Coccinelids, *Cantheconidia furcellata*. The extent of larval mortality due to bio-control agents (BCAs) is given hereunder:

Location	BCAs	Period	Extent
Sehore	<i>B. bassiana</i>	August last week 2021	14.20 % mortality due to <i>B. bassiana</i> .
Kota	<i>Cotesia</i> Coccinelid beetle Spiders	35 th SMW 1.67 beetle/mrl 1.0 spider/plant	3.00% parasitisation
Dharwad	<i>N. rileyi</i> , <i>Apanteles</i>	September 38 th SMW 37 th SMW	18.17% larval mortality 8.35% parasitisation
Imphal	<i>N. Rileyi</i> and <i>B. bassiana</i>	--	5 to 20 % larval mortality
Pantnagar	Bacterial infection Virus infection Fungi	-- --	45.5% larval mortality 17.5% larval mortality 8% larval mortality
Parbhani	<i>Coccinella</i> Spiders	35 th SMW 35 th SMW	1.67/m 4.33/m

Ent. 2. Field screening of AVT-I&II entries for resistance against major insect-pests

AVT-I and -II entries of different zones, along with those found resistant in previous years were screened for insect resistance / tolerance. Further, they were categorized into different resistance categories against individual insect spp. by employing **AICRPS method** and against location specific insect-pest complex by **Maximin - Minimax method**. Information on reaction of different entries against major insect-pests during last three years (2019, 2020 and 2021) was compiled and promising genotypes were identified by using following criteria:

1. Resistance against one or more insect spp. at 3 or more locations in any of the 3 years.
2. Location specific insect-pest complex by **Maximin - Minimax method** (R-HY/S-HY(T) at 3 or more locations in any of the 3 years.

Based on above criteria, lines identified as potential donors for insect resistance / tolerance against specific insect pests are mentioned below:

Insect(s)	Genotype(s)
Stem fly	AMS 100-39, MACS 1566, NRC 148, AMS 2014-1, MAUS732, PS 1611, RSC11-03, RSC11-07, RSC11-15, RSC11-17, NRC 142, MACS 1620, HIMSO 1689, DS 3108.
Girdle beetle	NRC 149.
Defoliators	DLSb 1, NRC 152, NRC 149, AMS 100-39, MACS 1493, DS 3108, DSb 34, NRC 148, DSb 33, KDS 992, SKF-SP-11, JS-20-34, MACS-NRC1575
PC	KDS 1096, RVS 2011-10, RSC 10-46, AMS 100-39, DSb 33, JS-21-72, NRC 142, NRC 149, NRCSL2, RVSM 2011-35, JS-20-116, MACS 1566, NRC 148, AMS 2014-1, MAUS732, PS 1611, RSC11-03, RSC11-07, RSC11-15, RSC11-17, MACS 1620, HIMSO 1689, DS 3108.

ENT 3: Status of AVT-II entries for antixenosis and antibiosis against *S. litura*

Antixenosis studies have been done on 8 AVT-II entries at Indore, Pantnagar and Dharwad. Among 8 genotypes tested, none of the entry was exhibited **strong/extreme antixenosis** against *S. litura*.

Antixenosis reaction of AVT-II entries:

S. No.	Genotypes	Pantnagar		Dharwad		Indore	
		C value	Response	C value	Response	C value	Response
1	VLS 99	1.28	Preferred host	1.21	Preferred host	1.07	Preferred host
2	JS 21-72	1.12	Preferred host	0.83	Slight antixenosis	0.78	Slight antixenosis
3	Himso 1689	0.93	Slight antixenosis	1.09	Preferred host	0.79	Slight antixenosis
4	NRC 149	1.33	Preferred host	0.92	Slight antixenosis	0.69	Moderate antixenosis
5	NRC 152	0.57	Moderate Antixenosis	-	-	0.86	Slight antixenosis
6	JS 335	Check	Check	1.19	Preferred host	1.00	Preferred host
7	DS 3108	1.01	Preferred host	1.16	Preferred host		
8	DS 9421	0.87	Slight antixenosis		-		

Antibiosis reaction of AVT-II entries

The lowest AD was found in JS 21-72 and the lowest ECI and ECD were found in NRC 152. These entries were found good antibiosis reaction.

Sr. no.	Genotype	AD (Approximate Digestibility)			ECI (Efficiency of Conversion of Ingested food)			ECD (Efficiency of Conversion of Digested food)		
		Pantnagar	Indore	Dharwad	Pantnagar	Indore	Dharwad	Pantnagar	Indore	Dharwad
1.	VLS 99	92.60 (74.67)	83.11 (65.73)	73.80 (59.19)	25.71 (30.01)	70.02 (56.80)	57.43 (49.25)	25.71 (30.01)	84.10 (66.50)	77.82 (61.88)
2.	JS 21-72	90.57 (72.42)	79.69 (63.21)	68.29 (55.71)	33.00 (33.69)	66.07 (54.38)	36.43 (37.11)	36.73 (36.18)	83.21 (65.81)	53.35 (46.90)
3.	Himso 1689	92.4 (74.21)	80.32 (63.66)	70.56 (57.12)	18.28 (25.30)	73.84 (59.24)	51.34 (45.75)	19.76 (26.39)	92.01 (73.58)	72.76 (58.52)
4.	NRC 149	90.19 (71.79)	80.37 (63.70)	67.14 (55.00)	34.30 (35.73)	66.94 (54.90)	38.75 (38.48)	38.16 (38.03)	83.90 (66.34)	57.72 (49.42)
5.	NRC 152	88.20 (70.20)	82.87 (65.55)		5.44 (12.88)	54.06 (47.33)		6.39 (13.87)	65.36 (53.94)	
6.	JS 335	86.86 (68.88)	83.49 (66.03)	76.43 (60.93)	25.02 (30.00)	71.66 (57.84)	58.44 (49.84)	28.79 (32.45)	85.93 (67.97)	76.47 (60.96)
7.	DS 3108	87.13 (68.96)		73.48 (58.98)	17.34 (23.99)		56.60 (48.77)	20.01 (25.90)		77.02 (61.33)
8.	DS 9421	92.51 (74.22)			13.44 (21.32)			14.58 (22.23)		
	SEm±	2.00	(1.97)		4.84	(5.29)		5.46	(9.38)	
	CD at 5%	6.07	(4.12)		14.68	(11.03)		16.55	(19.57)	

Ent. 4. Field screening of IVT entries for resistance to major insect-pests

Fifty eight coded entries were screened against major insect-pests in **IVT (Normal)** at different coordinating centres. Promising entries showing desirable reaction against one major insect-pest at more than one location and/or against more than one insect spp. at one or more locations are listed below, which will be tested further in next season:

Insect	Promising entries (IVT Normal)
Stem fly	RVS 1315, DLSb 3, DLSb 4, AS24, JS 23-08, JS 23-05, DS 1312, DS3163, DS3124, DS3168, HIMSO -1693, PS 1689, RSC 11-48, RSC 11-42, BAUS(M) -3, CAUMS 2, NRC 192, NRC 191, NRC 190, RSC 10-52, NRC 189, RVSM 16-20.
Girdle beetle	RVS 1320, DSb39, RVSM 2011-35, NRC 203, Asb 15, JS 23-05, DS 1312, DS3163, DS3124, PS 1689, RSC 11-48, BAUS(M) -3, NRC 193, NRC 190.
Defoliators	KBS 21-1, MAUS 791, AMS1901, DSb39, SL 1230, VLS – 103, PS 1605, KDS 1149, MACS 1735, DS3124, NRC 193, NRC 191, RVSM 16-20, RVS 2011-10.

Forty four coded entries were screened against major insect-pests in **IVT (Early)** at different coordinating centres of Central Region (Kota, Sehore, Prabhani, Indore and Amravati) and thirty four entries (Pantnagar, Bidar, Dharwad and Ludhiana) at rest of the centres. Promising entries showing desirable reaction against one major insect-pest at more than one

location and/or against more than one insect spp. at one or more locations are listed below, which will be tested further in next season:

Insect	Promising entries
Stem fly	MAUS 819, NRC 186, NRC 202, KDS 1172, AMS 19-9, MACS 1724.
Girdle beetle	JS 23-03, NRC 186, NRC 196, JS 23-09, PS 1569.
Defoliators	MAUS 819, JS 23-03, NRC 186, NRC 130, NRC 196.

ENT 5. Evaluation of germplasm lines at hot spots for resistance against major insect-pests

Fifty germplasm lines were evaluated for their insect reaction at their respective hot spots (Sehore, Indore, Kota, Ludhiana, Dharwad and Imphal). On the basis of insect reaction these following promising lines were identified for further evaluation during next season:

Insect	Promising entries
Girdle beetle	EC 251827, EC 383165, EC 389149, EC 457366, EC 458350.
Defoliators	EC 251541, EC 280149, EC 357998, EC 389170, EC 251827, EC 291401, EC 383165, EC 389149, EC 389174, EC 457366, EC 458350.

ENT 6: Integrated management of root rot complex and stem borers of soybean

Among 13 treatments, **T8**: integration of Seed Treatment with Thiophanate methyl + Pyroclostrobin @ 2g/kg of seeds + ST with Thiamethoxam @ 2 ml/kg of seeds recorded maximum per cent field stand with least root rot incidence, lower stem tunneling and per cent girdling and found on par with **T7** (ST with Trifloxystrobin + Penflufen 240 FS @ 1 ml/kg of seeds + Thiamethoxam 600 FS @ 2 ml/kg of seeds).

The treatment **T₈ i.e. seed treatment with Thiophanate methyl + Pyroclostrobin @ 2g per kg of seeds + ST with Thiamethoxam @ 2 ml per kg of seeds** and followed by spraying of Chlorantraniliprole @ 0.2 ml/l at 15 & 35 DAS and Propiconazole @ 1 ml/l at 35 & 45 DAS had recorded lower incidence of per cent root rot (1.33), per cent stem tunneling (4.87) and per cent girdling (7.15) as compared to other treatments. Further, it had recorded higher per cent field stand (98.66), plant height (48.58 cm), number of branches per plant (6.01), number of pods per plant (66.85), 100 seed weight (14.62) and seed yield (1765 kg/ha). The next best treatment was **T₇ i.e. seed treatment with Trifloxystrobin + Penflufen 240 FS @ 1 ml/kg of seeds + Thiamethoxam 600 FS @ 2 ml/kg of seeds** was found on par with **T₈**.

ENT 7. Management of major insect-pests of soybean through microbial consortia

In order to identify suitable microbial insecticides for management of major insect-pests of soybean six microbial insecticidal mixtures were tested at Dharwad, Sehore, Kota, Pantnagar Prabhani and Imphal.

At **Dharwad** the treatment T3 (*Nomuraea rileyi* @ 2kg/ha)+ *Metarhizium anisopliae* @ 2kg/ha) was recorded least number of *S. litura* (0.21 larvae/plant), semilooper (0.00 larvae/plant), bihar hairy caterpillar (0.19 larvae/mrl) and leaf damage (17.14%) and found significantly superior over all other treatments. The treatment T2 (*Nomuraea rileyi* @2kg/ha) + *Bacillus thuringiensis* @1kg/ha) was next best treatment by recording lowest *S. litura* (0.29 larvae/plant), Semilooper (0.24 larvae/plant) Bihar hairy caterpillar (0.31 larvae/mrl) and leaf damage (20.28%).

Seed yield was differed significantly among the treatments and it was ranged from 903 to 1838 kg/ha. The treatment, *Nomuraea rileyi* (2 kg/ha)+ *Metarhizium anisopliae* (2 kg/ha) recorded higher seed yield of 1838 kg/ha and found significantly superior over other treatments.

At **Pantnagar** the infestation of major insect pests like lepidopterous defoliators was observed on treatments. The treatment 3 (*Nomuraearileyi* (2kg/ha) + *Metarhiziumanisopliae* (2kg/ha)) has shown good results.

At **Prabhani** the incidence of semilooper observed was non-significant differences in larval population (Range: 7.89 to 9.00 larvae/mrl) among the treatments before spray. Treatment T4 (*B.bassiana* + *N. rileyi*) recorded significantly lowest population of semiloopers after two microbial consortia spray and found superior over rest of the microbial agents in reducing the population of semiloopers as well as *Spodoptera litura*.

At **Kota** the treatment (T6) (*Metarhizium anisopliae* @2 kg/ha+*Bacillus thuringiensis* (Bt) @1 kg/ha) found better over other treatments giving higher yield and minimum incidence of defoliators.

At **Sehore** T5 (*Beauveria bassiana* (2kg/ha)+ *Bacillus thuringiensis* (Bt) (1 kg/ha) was found the best treatment followed by T4 (*Beauveria bassiana* (2kg/ha)+ *Beauveria bassiana* 2kg/ha) and T2 (*Nomuraea rileyi* (2kg/ha) and *Bacillu thuringiensis* (Bt) (1 kg/ha) and recorded significantly lower population of both the grey and green semilooper. The Population of tobacco

caterpillar was lowest in T6 (*Metarhizium anisopliae* (2kg/ha)+ *Bacillus thuringiensis* (Bt) (1 kg/ha) which was at par T3 (*Nomuraea rileyi* (2kg/ha)+ *Metarhizium anisopliae* (2kg/ha).

At **Imphal**, high population of BHC prior to insecticidal application in all plots varied from 14.00 – 36.67 larvae/mrl. After 3 days of spray treatment, population of BHC was observed to reduce ranging from 12.89 – 26.44 larvae/mrl but there were no significant differences among treatment including untreated control. After 7 days of application, *B. bassiana* + *Bt* commercial was observed with 5.22 larvae/mrl followed by *N. rileyi* + *Bt* commercial recording 8.00 larvae/mrl and both are statistically similar in effectiveness. At the start of 2nd treatment, there was a slight increase in the number of BHC with population varying from 11.00 – 21.89 larvae/mrl. There was a higher reduction in larval population on the 7th day after 2nd treatment in all treated plots as pathogenicity starts to manifest leading to high mortality of larva within 3-5 days after treatment. *B. bassiana* + *Bt* commercial treatment and *N. rileyi* + *Bt* treatment harboured only 2.89 larvae/mrl each which were 5.1 and 7.8 times reduced than initial population respectively. No profound effect could be seen at 3rd treatment as BHC incidence was observed to reduce as the crop ages with even untreated control observed with 0.89 larvae/mrl. The Population of bean leaf webber ranging from 2.89 – 3.67 larvae/mrl was observed in the experimental plots before application of microbial combinations. Difference among treatments could be observed from 7th day after first treatment in all the plots with treatment *B. bassiana* + *Bt* harbouring only 1.33 larvae/mrl. At 3days after 3rd application, it could be observed that treatment combination of *B. bassiana* + *Bt* with 0.67 larvae/mrl was the best and resulted in 4.97 times reduction of population of leaf webber as observed before treatment.

The Population of tobacco caterpillar at the beginning of pest initiation ranged from 0.11 – 0.48 larvae/mrl but was observed with no significant difference among treatments. Difference among treatments could be observed from 7th day after first treatment in all the plots. Population of tobacco caterpillar after 7 days of 1st treatment was lowest with *B. bassiana* + *Bt* observed with 0.70 larvae/mrl. At 3rd treatment, negligible count of tobacco caterpillar could be observed in all microbial treatment combinations with *B. bassiana* + *Bt* and *N. rileyi* + *Bt* recording 0.89 larvae/mrl.

At **Amravati**, the tobacco leaf eating caterpillar infestation was observed after one month of sowing. Initial the infestation was found to be in the range of 1.83 – 2.67 larvae/mrl. No

significant difference was observed upto 3rd day after spray in all the treatment plots. The effect of population reduction in microbial treatment was observed after 7th day after treatment. The 3rd spray was not taken due to negligible pest population in the experimental plot.

ENT 8. Management of major defoliators of soybean through intercropping with suva, *Anethum graveolens*

For management of defoliators of soybean through intercropping with **suva, *Anethum graveolens*** five treatments of different rows combinations of soybean and sows were tested at Dharwad, Sehore, Pantnagar, Prabhani and Indore. At **Dharwad**, treatment **T4 (3 Soybean: 2 suva: 3 Soybean rows combination)** was found be significantly superior by recording lower *Spodoptera litura* (2.27 larvae/mrl), *Thysanoplusia orichalcea* (1.76 larvae/mrl), *Spilarctia obliqua* (2.58 larvae/mrl) larval population and recorded less leaf damage (24.15%) followed by **T2: Soybean + Suva (3 Soybean: 1 suva: 3 Soybean rows combination)**. This indicates that, Soybean + Suva intercropping system has got added advantage in controlling defoliator population.

At **Pantnagar**, treatment T4 (3 soybean: 2 suva: 3 soybean rows combination) has shown the best result among all the treatments.

At **Prabhani** treatment T4 (3 Soybean: 2 Suva: 3 Soybean rows combination) was found be significantly superior over rest of the treatments by recording lower (4.67 larvae/mrl) semiloopers larval population. The next best treatments were T2: Soybean + Suva (3 Soybean: 1 Suva: 3 Soybean rows combination) (6.42 larvae/mrl), T5: Soybean + Suva (6 Soybean: 2 Suva: 6 Soybean rows combination) (6.83 larvae/mrl) and T3: (6 Soybean: 1 Suva: 6 Soybean rows combination) (7.25 larvae/mrl) which were found at par with each other. In case of *Spodoptera litura* treatment T4 (3 Soybean: 2 Suva: 3 Soybean rows combination) recorded lowest population (0.33 larvae/mrl) and it was found at par with treatments T2 (3 Soybean: 1 Suva: 3 Soybean rows combination) (0.42 larvae/mrl), T5: Soybean + Suva (6 Soybean: 2 Suva: 6 Soybean rows combination) (0.50 larvae/mrl) and T3: (6 Soybean: 1 Suva: 6 Soybean rows combination) (0.58 larvae/mrl). Thus the results indicated that, Soybean + Suva intercropping system will be useful in controlling defoliators population.

At **Sehore** all the treatment combinations of soybean with suva was found significantly differed with each other. However, T4 (3 Soybean: 2 Suva: 3 Soybean) was recorded significantly lowest

population of all the defoliators larvae particularly grey and green semilooper and tobacco caterpillar.

At **Indore**, treatment T5 (6 Soybean: 2 suva: 6 Soybean rows combination) was found be significantly superior by recording lowest population of semiloopers (3.08 larvae/mrl). In case of *Spodoptera litura* treatment T2 (3 Soybean: 1 Suva: 3 Soybean rows combination) recorded lowest population (0.33 larvae/mrl).

Compiled and Summarized by

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SUMMARY REPORT OF PLANT PATHOLOGY EXPERIMENTS

Nine Pathology field trials were conducted during *kharif* 2021 at 14 co-ordinated centres spread over six zones to generate the information on prevalence of diseases, their severity, sources of resistance to either a single disease or multiple diseases, integrated management strategies against root rot complex and stem borers, yield loss due to various disease and develop forecasting model of various soybean diseases. Trial wise salient findings are presented below: (Table 4.1 to 4.10). As reported by various centres, only anthracnose disease appeared across the country on soybean, whereas 06 diseases were appeared 3 or more zones. The PB (Ct) appeared at all the centre across the country except Delhi and Ludhiana centre, whereas YMV appeared in all zone except southern and eastern zone. Similarly BP disease was also appeared in all zones except eastern and north eastern hill zone. YMV disease was appeared at Palampur, Pantnagar, Jorhat, Ludhiana, Delhi, Jabalpur, Indore, Kota and Amravati centres. BP disease was appeared at Palampur, Almora, Pantnagar, Jabalpur, Amravati, and Dharwad centres. RAB disease was appeared at Pantnagar, Jorhat, Medziphema, Jabalpur, Indore and Kota centres. SMV disease was appeared at Pantnagar, Ludhiana, Jorhat, Jabalpur and Indore centres. FLS disease was appeared at Palampur, Almora, Sehore Jabalpur and Dharwad centres. High severity of rust disease was appeared in southern zone. The other hemibiotrophic diseases at different locations appeared in mild to moderate form. In general, the disease pressure differed at different locations across the zones mainly due to favourable and congenial weather that prevailed across the different locations during the cropping period. The severity of foliar fungal diseases was less during this year when compared to previous year except rust disease in south, where disease pressure was higher than previous years.

The major results of the trials are presented here as under:

PP 1: Survey for soybean diseases

Disease scenario across the locations has been reported by synthesis and analysis of the available information from survey and surveillance and also based on severity of diseases recorded in other trials of soybean pathology (Table 4.1 to 4.10). In NHZ, at Almora, FLS was moderate to severe and PB (Ct) was in mild form. In NPZ, at Pantnagar, RAB was appeared in severe form whereas BLB and YMV were appeared in moderate to severe form. At Ludhiana YMV and SMV were appeared in moderate to severe form, while at Delhi, YMV were severe and BND was mild to moderate. In NEHZ, at Jorhat, disease pressure of SMV, Coll. R, RAB and PB (Ct) were noticed in mild to moderate form whereas at Medziphema, PB (Ct), rust, RAB were appeared in moderate to severe form. In EZ, at Raipur PB (Ct) and IBB diseases were appeared in mild to moderate form. In CZ, at Sehore, TLS appeared in severe form, whereas at Amravati, Charcoal Rot was appeared in moderate to severe form. At Jabalpur centre disease pressure of YMV, RAB and CR were moderate to severe, whereas PB (Ct) and BP were in mild to moderate form. At Indore centre, disease pressure of CR was moderate to severe whereas disease pressure of PB (Ct) was mild to moderate form. At Sehore centre disease pressure of TLS was moderate to severe form. In SZ, rust was severe at Dharwad and Kasbe Digraj. The PB (Ct) was moderate at Dharwad and K. Digraj and PSS appeared in moderate form at Dharwad.

PP 2: Trap nursery trial

Appearance of various major diseases was monitored at 10 centres across the zones on 16 susceptible varieties (Table 4.2). At Jabalpur maximum severity of CR 69.50% was recorded in Monetta, whereas maximum severity of YMV 42.71% was observed PK 472. Severity of RAB and Anth was low at Jabalpur centre. At Indore centre maximum severity of anthracnose 45.66% was observed IN JS 335 variety, whereas maximum severity of CR 72.12% was observed in JS 335 and Shivalik. Maximum RAB severity 64.08% was observed in Punjab 1 variety at Pantnagar centre, whereas maximum severity of YMV 41.38% was observed in PK 262. Interestingly CR was observed in only two varieties JS 65-60 and Shivalik at Amravati centre. Maximum severity of TLS 67.77% was observed in PK 472 at Sehore centre. Highest FLS severity 86.66% observed in Shivalik and highest Anth severity 72.22% in JS 9560 was observed at Palampur centre. Maximum RAB severity 36.49%, maximum collar rot severity 29.00%, maximum Anth severity 82.50% was observed in Jorhat centre. Uniform high severity of rust was observed at Dharwad centre in each variety, interestingly highest severity of Anth 53.32% was observed in JS 335 variety. Disease severity of Rust, Anth, RAB was obtained highest severity up to oct 15th letter on disease severity was reduced at Medziphema centre.

PP 3: Incidence of various diseases in IVT (N)

Fifty one entries along with checks were screened at 15 locations across the zones against major diseases (Table 4.3). Evaluation of entries was considered reliable for CR, Anth, YMV, RAB and TLS in CZ. Entries MAUS 818, AMS 115, JS 23-05, NRC 190 and NRC 189 were found HR against CR at three locations of CZ, whereas, entries MAUS 818 and AMS1901 were showed R against Anth at two locations of CZ. Entries RVS 1315, DS 1312, SL 1282, SL 1230 and PS 1689 were found HR against YMV at Jabalpur centre. Entries AMS1901, RVS 1320, PS 1689, PS 1682 and NRC 189 were found HR against RAB at Jabalpur centre. Only one entry NRC 195 showed HR against TLS at Sehore centre. Evaluation of entries was considered reliable for rust and Anth in SZ. None of entry found MR against rust in south India, where as entries KBS 21-1, SL 1282, PS 1689, BAUS (M)-3 and BAUS 116 were found HR against Anth at Kasbe Digraj centre. Evaluation of entries was considered reliable for RAB, YMV and SMV in NPZ. In NPZ, entries MAUS 791, DLSb 3, DLSb 4, JS 23-05, DS 1312, DS3163, VLS-103, PS 1605, RSC 11-48, RSC 11-42, BAUS 116, CAUMS 2, NRC 191, NRC 190, KDS 1149 and LOKSOY -1 were showed HR against RAB at Pantnagar centre. Entries, DLSb 3, DS3124 and SL 1282 were showed HR reaction against YMV at both the locations. PS 1689, DLSb 3, DS3124, SL 1282 and SL 1230 were showed HR reaction against YMV at Ludhiana centre. Evaluation of entries was considered reliable for FLS and Anth in NHZ. In NHZ, only one entry PS 1605 showed R reaction against FLS, whereas entries AS 40, DS3163, DS3168, SL 1282, PS 1689, PS 1682, NRC 195, KDS 1149 and TS 21-1 were showed HR reaction against Anth. Evaluation of entries was considered reliable for RAB, rust and Anth in NEHZ. Only one entry DLSb 3 was found HR against RAB in NEHZ, whereas entry KSS 204 found HR against Anth, entries SKUA-WSB.101, PS 1689 and PS 1682 were showed HR against rust in NEHZ. No disease was considered for evaluation of entries in EZ.

PP 3 (a): Incidence of various diseases in IVT (E)

Twenty three entries along with checks were screened at 14 locations across the zones against major diseases (Table 4.3). Evaluation of entries was considered reliable for CR, Anth, YMV, RAB and TLS in CZ. Entries MAUS 819, MAUS 795, PS 1569, PS 1660, PS 1675, NRC 186, NRC 202, NRC 201 and

NRC 196 were found HR against CR at three locations of CZ, MAUS 819, RVS 13-7, PS 1675, JS 23-09, NRC 186, NRC 198, NRC 197, NRC 196, AMS 0542 and MACS 1724 were showed R against Anth at Jabalpur centre. Entries NRC 202, NRC 201 and NRC 196 were found HR against YMV at Jabalpur centre and entries NRC 181 and NRC 165 were showed HR against TLS at Sehore centre. Evaluation of entries was considered reliable for rust and Anth in SZ. None of entry found resistance against rust and anthracnose in SZ. Evaluation of entries was considered reliable for RAB, YMV and SMV in NPZ. Entries MAUS 795, KDS 1169, JS 23-09, JS 23-03, PS 1569, PS 1660, PS 1675, NRC 198, NRC 196 and AMS 19-9 were showed R against RAB at Pantnagar centre. Only one entry NRC 196 showed resistance against YMV in NPZ, whereas two entries PS 1569 and PS 1660 showed HR against YMV in NPZ. Evaluation of entries was considered reliable for FLS and Anth in NHZ. Only one entry, KDS 1169 showed HR and R reaction against FLS, whereas PS 1660 showed HR against Anth in NHZ. In EZ, RVS 13-7, PS 1660, PS 1675, NRC 196, AMS 0542 and NRC 197 showed MR reaction against Anth.

PP 3.1: Incidence of various diseases in AVT I and AVT II (N)

Eighteen entries along with checks were screened at 14 locations across the zones against major diseases (Table 4.3). Entry RVS 2011-10 was found HR against CR at three locations of CZ. Entries JS 2172 and DLSb-1 were showed HR and R reaction against Anth in CZ. Entries RVS 2011-10, JS 2172 and DLSb-1 were showed MR reaction against YMV and TLS, and also showed R reaction against RAB in CZ. Entry NRC 149 showed HR reaction against RAB in NPZ. Entries PS 1670, DS 9421 and DS 9422 showed resistance reaction against YMV and SMV in NPZ. Entry VLS 99 was showed HR reaction against Anth in NHZ. DLSb 1 showed HR against Anth and R against rust in NEHZ, whereas DS 3108 showed R against Anth and MR against rust.

PP 3.1 (a): Incidence of various diseases in AVT I (E) and AVT II (E)

Eight entries along with checks were screened at 05 locations in CZ against major diseases (Table 4.4.1). Entries JS 22-12, JS 22-18, JS 22-16, RVSM 2012-4, NRC 150 and NRC 152 were showed HR reaction against CR at three locations of CZ. Entries JS 22-16 and NRC 150 were showed HR reaction against Anth at CZ. Except NRC 152 all the entries showed resistance against YMV in CZ. None of entry showed resistance against TLS in Sehore centre.

PP 4: Performance of previous year resistant entries

Disease specific resistant entries/varieties of past years were further evaluated to select those which are showing durable resistance status at various identified locations (Table 4.5). In the trial on performance of previous year resistant entries screened across four different zones, the entries AMS-2014-1, AMS100-39 and Dsb-34 maintained HR reaction at 3rd year of their testing at Amravati centre under sick plot conditions. The entries JS 20-98 showed resistance against CR, YMV and RAB at 8th year of their testing at Jabalpur centre under hot spot conditions. The resistance of DSb 23 was break down after 9 years of testing and showed MR reaction against rust at Dharwad centre. The resistance of germplasm line EC 241778, EC 241780 & EC 242104 were also break down after prolong testing at Dharwad centre. AMS 475 maintained HR reaction against TLS at 4th year of their testing at Sehore centre under hot spot conditions. At Ludhiana and Pantnagar all the entry maintained MR to R reaction against major diseases in 1st year of testing (Table 4.6)

PP.5. Evaluation of germplasm lines for identification of multiple disease resistant sources

Fifty germplasm lines were evaluated at Palampur, Jabalpur, Indore, Dharwad and Pantnagar centres for identification of sources of multiple disease resistance (Table 4.6). EC 280129 lines showed multiple disease resistance against FLS, Anth, BS, YMV and CR at Palampur, Jabalpur, Indore and Pantnagar centres. At Palampur, six entries EC 280129, EC 280149, EC 291401, EC 308312, EC 325098 and EC 390981 A showed multiple disease resistance to PB (Ct), BS and FLS, whereas three germplasm lines EC 333880, EC 333892 and EC 457366 showed multiple disease resistance to YMV, CR and RAB at Jabalpur centre. At Pantnagar, the entry EC 251861 showed multiple resistances to RAB, YMV, Anth and BLB.

PP 6/ENT 8 - Integrated management of root rot complex and stem borers of soybean

Integrated management trails were conducted at Dharwad, Amravati, Jabalpur, Pantnagar, Palampur and Jorhat for effective management of root rot complex and stem borers (Table 4.7). In third year of experimentation conducted at Dharwad, root rot incidence was too low to evaluate the efficacy of fungicide and biocontrol agents against root rot. Seed treatment with Trifloxystrobin + Penflufen @ 1g/kg of seed along with Thiamethoxam @ 2 ml/kg of seed was found effective in management of root rot complex and stem borers of soybean and enhanced the yield, similar result found at Pantnagar . At Pantnagar also severity of root rot was too low to evaluate. At Amravati seed treatment with Thiphanate methyl+ Pyroclostrobin @ 2ml/kg of seed along with Thiamethoxam @ 2 ml/kg of seed was found effective in management of root rot complex and stem borers of soybean. At Palampur and Jorhat centre severity of root rot and stem borer was too low to evaluate (Table 4.8).

PP 7: Development of forewarning systems against major diseases of soybean.

Considering the importance of forewarning systems in timely management of important diseases in soybean, the disease severity of every centre was recorded for each varieties of trap nursery in 10 centres (Table 4.8). At Pantnagar centre maximum temperature was highly negatively correlated with RAB severity, whereas number of rainy fall was positively correlated with RAB severity. Multiple regression analysis revealed that each equation were suitable with prediction of RAB disease with excellent R^2 value (0.87 to 0.97). Similar trend was observed for YMV disease also. In Indore centre all weather parameters were positively correlated with Anth but interestingly none of weather parameters was highly correlated with Anth severity. Multiple regression analysis revealed that each equation were suitable with prediction of Anth disease with excellent R^2 value (0.94 to 0.99). All weather parameters were positively correlated with CR and number of rainy days, rainfall and minimum temperature was highly correlated with CR severity in different varieties. At Palampur centre FLS severity on NRC 7 was highly positively correlated with rainfall, wind speed and sunshine hours ($R^2 > 0.75$). At Palampur centre number of rainy day and RH were highly positively correlated with severity of Anth. Disease severity of CR in Punjab 1 variety was high positively correlated to maximum temperature, Sunshine hrs, Rainfall, RH % at morning RH % at evening and no. of rainy days. Wind velocity is highly and positively correlated with YMV severity at

Jabalpur centre. In Dharwad centre all weather parameters were positively correlated with Anth and Rust severity but interestingly none of weather parameters was highly correlated with Anth and Rust severity. Multiple regression analysis revealed that each equation were suitable with prediction of rust disease with excellent R^2 value (0.88 to 0.97). In Medziphema centre, all weather parameters were positively correlated with Rust and RAB severity but interestingly none of weather parameters was highly correlated with RAB and Rust severity except Rainfall for JS 335, Monetta and JS 95-60 with excellent R^2 value (0.88 to 0.96). In Jorhat centre, all weather parameters were positively correlated with Coll R severity and interestingly, minimum and maximum temperature for JS 93-05 and minimum temperature for Shivalik was highly correlated with Coll R severity. Multiple regression analysis for Coll R revealed that equation was suitable with prediction of Coll R disease with excellent R^2 value (0.85). Similarly, RAB severity was highly correlated with minimum temperature on JS 335 and Punjab-1. Multiple regression analysis for RAB revealed that equations were suitable with prediction of Coll R disease with excellent R^2 value (0.83 to 0.88). For Anth severity on JS 93-05 was highly correlated minimum temperature, maximum temperature and Rainfall at Jorhat centre.

PP 8: Estimation of avoidable losses soybean diseases (II year)

At various AICRPS centre avoidable yield loss due to various diseases such as CR, PB (Ct), RAB, Rust, FLS were recorded (Table 4.09). The disease pressure at Jabalpur centre was low to estimate yield loss due to diseases. Cumulative 14.67 % of CR incidence, 37.67 % RAB incidence, 7.33% incidence of FLS caused 21.35% of yield loss in variety JS 2029. In resistance variety the cumulative RAB, CR and FLS caused 6.52% of yield loss. At Amravati centre due to low disease pressure chemical application of fungicide could avoid only 10.12% of yield loss in susceptible variety and 18.03% in resistance variety. At Dharwad centre full protection of fungicides can avoid 44.72% of yield loss in susceptible variety, whereas 17.56% of yield loss in resistance variety due to rust and anthracnose diseases. At Palampur centre full protection of fungicides can avoid 51.51 % of yield loss in susceptible variety, whereas 17.56% of yield loss in resistance variety due to FLS and anthracnose diseases. At Medziphema centre full protection of fungicides can avoid 37.96 % of yield loss in susceptible variety, whereas 32.61 % of yield loss in resistance variety due to RAB, YMV, rust and anthracnose diseases. Disease pressure at Indore centre was too low to evaluate.

PP-9. Evaluation of breeding material of F6 generation hot spot for disease(s) for resistant donor(s)

Considering the importance of resistance variety, breeding material of F6 generation was screened at Indore and Pantnagar centres (Table 4.10). At Pantnagar, breeding material derived from PS 1241 x PS 1225 x JS 335, JS 97-52 x SL 688 and JS 97-52 x SL 958 showed resistance against BP, BLB, BB, PB, RAB, YMV and SMV. SL 1074, WLP 21-2, MAUS 816, MAUS 824, MAUS 821, YP 34 and Sel 3-38 showed resistance against CR and Anth at Indore centre.

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MB 1/16: Isolation and functional characterization of selected rhizobia/rhizobacteria for developing inoculants to mitigate abiotic stress in soybean (Centre: Indore, Delhi, Ludhiana & Pantnagar)

This experiment was initiated at various centers to explore fluorescent pseudomonads and rhizobia from the soybean rhizosphere soil and root nodules eventually to use as potential microbial inoculants for application in soybean. The colonies exhibiting fluorescence under UV light in Kings B media were selected for isolation and further investigations. The rhizobia were isolated on YEMA medium with congo red and white/creamy colonies were selected based on generation time.

Table: MB 1/16A to MB1/16C lists the results on evaluation of strains for PGP and moisture stress tolerant parameters carried out at different centres. Across the centers, out of more than 100 isolates recovered in the past 3 years, a total of 10 isolates were evaluated and identified as potential candidate strains for drought stress tolerance characteristics using PEG 6000.

At Indore centre, four potential *Pseudomonas* strains (identified through FAME) were selected based on 30% PEG (6000) and these strains were characterized previously for PGP and ACC deaminase and other physiological trait activities. Overall, two strains viz., MB 10 (*P. fluorescens*) and MB 16 were found to be superior in terms of producing higher amount of EPS, siderophore, proline, ACC deaminase than the other two. These strains are being targeted for molecular identification through 16S rRNA gene sequencing (**Tables MB1/16A**). At Ludhiana, three potential PGPRs have been characterized and identified as potential PGP and moisture tolerant strains. All bacterial isolates were able to grow on LB broth with each of 5% NaCl and PEG 6000 incubated at 28°, 37° and 45°C temperatures. With the increase in temperature, the growth in all dual and single treatments decreased significantly. All bacterial isolates were able to grow on LB broth with each of 5% NaCl and PEG 6000 and maintained PGP and physiological traits (Zn and P solubilization, Proline, IAA etc.,) incubated at 28°, 37° and 45 °C (**Tables MB1/16B**).

At Pantnagar centre, more than 20 putative fluorescent *Pseudomonas* were screened for their capability to resist the stress conditions under laboratory conditions using PEG-6000, 08 isolates were evaluated at varying concentration (0, 15, 25 and 35%) of PEG-6000. Out of these isolates, 03 fluorescent Pseudomonads Pf-pant-1, Pf-pant 3 and 6 could able to grow in the medium containing highest concentration of PEG-6000 i.e. 35%. Further screening of these isolates for the production of ACC deaminase activity, antioxidant potential and phytohormones is in progress (**Table MB1/16C**).

MB 2/21: Response of *Bradyrhizobium daqingense with RDF/farmers practice and with reduced 75% RDF on latest release variety of soybean of a zone**

Centres: Ludhiana, Delhi, Pantnagar, Indore, Sehore and Dharwad

This field trial was initiated last year after evaluating the strains in microcosms under simulated moisture stress conditions at different centres. The novel moisture tolerant superior soybean (*B. daqingense*) recovered from drought tolerant soybean variety (PK 472) was planned to test in the field. The performance and its comparative efficacy with commercial/local soybean *Rhizobium* culture available with that zone at 25% reduced doses of NPK fertilizer was evaluated during Kharif 2021. The six treatments comprised of 02 rhizobial strains (*B. daqingense* and commercial/local strain) each with and without 100 and 75% recommended doses of NPK fertilizers were taken up. The 100% RDF serves as farmers practice as control. The experiment at different centres was laid out in a RDB design with three replications.

At Indore centre, the inoculation responses of *B. daqingense* was evaluated with commercial strain available in the market at 100 and 75% RDF of NPK (20, 40 and 50 NPK kg/ha as 100% RDF) on soybean (variety NRC 130). During field evaluation, when compared to local farmer practice, the microbial application has significantly increased the soybean nodulation (nodule dry weight and number) and leghaemoglobin content in nodules. The response of *B. daqingense*-inoculated plants grown at 100% RDF and 75% RDF on nodulation, chlorophyll content was at par but was significantly higher than plants inoculated with commercial strains. However, the N & P content, uptake and grain yield of *B. daqingense*-inoculated plants grown at 100% RDF was found significantly higher than the non-inoculated plants and commercial strain inoculated plants. Nevertheless, the grain yield of *B. daqingense*-inoculated plants grown at 100% and 75% RDF was at par. This indicates that seed priming with *B. daqingense* can reduce 25% NPK fertilizers without significant reduction of yield (**Table MB 2/21A, Fig. MB 2/21A**).

At Sehore centre, the *B. daqingense*-inoculated plants grown either 100% or 75% of RDF showed significantly higher nodules, biomass, leghaemoglobin in nodules, NPK uptake in plants when compared to non-inoculated and inoculated plants of commercial strain. The inoculation response of *B. daqingense* was found to be superior (the response was significantly different) over the commercial rhizobia for all the parameters. The *B. daqingense*-inoculated plants grown at 75% RDF has not only comparable yield and cost benefit ratio with 100% RDF application but was little higher than 100% RDF applied plots. Moreover, based on nutrient budgeting assessed in terms of gain and loss of NPK status in soil the inoculation of *B. daqingense* showed less mining of nutrients and had maximum gain in soil without compromising grain yield when compared to other treatment plots (**Table MB2/21G; MB 2/21H; MB2/21I**). Hence application of *B. daqingense* to soybean can reduce 25% NPK fertilizers and found highly beneficial, economical and may be recommended for application in soybean after rigorous evaluation and validation in the field.

At Ludhiana centre, inoculated plants had significantly higher nodulation, leghaemoglobin content, chlorophyll content and grain yield over their respective non inoculated counterparts. However magnitude of response varies with the strain. The plants inoculated with PAU local strain (LSBR-3) comparatively showed higher responses than *B. daqingense* although found non-significantly different. Overall both the strains i.e., PAU Ludhiana strain LSBR-3 and Indore strain *B. daqingense* found highly responsive and showed higher gross and net returns which resulted in to higher cost benefit ratio when compared to non-inoculated plants grown at 100% or 75% RDF and can save 25% NPK fertilizers without compromising net returns (**Table MB2/21B, MB2/21C**).

Similarly at Pantnagar centre, plants inoculated with either local strain (pant-2) or *B. daqingense* had higher response (although non-significantly different) than their respective counterparts. However, plants inoculated with local strain pant-2 showed comparatively higher response although non-significantly different in terms of nodulation parameters, grain

and biological yield than *B. daqingense*. This indicates that local strain performed better than other region strain. Overall, inoculation either at 75 or 100% RDF did not have significant impact for higher yield therefore it is suggested to continue the trial for the second year (Tables MB2/21D; MB2/21E).

At Delhi centre, it was observed that inoculation of both *B. daqingense* and IARI local strain although had higher nodulation and leghaemoglobin but did not produce higher grain yield when compared to their respective non-inoculated plants grown at 100% RDF. However grain yield of inoculated plants (of both strains) grown at 100% RDF was at par with plants grown at 75% RDF. This signifies that rhizobial inoculation of soybean with either of strains can save 25% fertilizer inputs (Table- MB 2/21F).

At Dharwad centre, the inoculation of *B. daqingense* has performed better in terms of having higher nodulation, nodule dry weight, leghaemoglobin content, chlorophyll, and grain yield over the non inoculated treatments and Dharwad local strain. Overall, the response of *B. daqingense* at 75% RDF has comparable yield than 100% RDF indicating a saving of 25% NPK fertilizers. The inoculation of *B. daqingense* particularly with 75% RDF has also promoted soil enzyme activities such as soil dehydrogenases, phosphatases and urease in the rhizosphere over the other treatment indicating good soil quality sustaining higher yields. Hence, novel strain *B. daqingense*, extra slow growing rhizobia can be promoted for large scale utilization after field evaluation in the south zone (Tables MB2/21J; MB2/21K).

Overall, after one year of field experimentation, it is concluded that across all the centres (06), inoculation of *B. daqingense* performed better and produced comparable yield at 75% RDF with 100% RDF which signify its potential in saving of NPK fertilizers and can be promoted particularly in central and south zone for its large scale utilization after field validation.

MB 3/21: Assessing the compatibility of pre and post emergence herbicides with PGPRs including soybean rhizobia under *in vitro* and their impact on soybean nodulation in unsterilized microcosms (All centres)

This trial was planned for all the centres to assess the compatibility of recommended pre and post emergence herbicides on potential PGPR including rhizobial strains available with the coordinating and other centres using broth YEMB, NB media under *in vitro*. Different doses of herbicides (recommended and higher) were simulated in the medium and depending upon growth habit of culture, growth was recorded after inoculation through spectrophotometer (optical density at 600 nm). Based on *in vitro* trial results, the impact of herbicides on nodulation will be evaluated under microcosms during 2022.

At Indore centre two soybean rhizobia (*B. daqingense* and *B. japonicum*) and three PGPR strains (*Burkholderia arboris*, *Paenibacillus polymyxa* and *Pseudomonas fluorescence*) were evaluated against two pre-emergence and three post emergence herbicides at three different doses (one recommended and two above the recommended levels). Amongst all the strain tested, the diclosulan application even at highest concentration (60 ppm) did not have any negative effect on *B. daqingense* and *P. fluorescence* rather it has promoted the growth of these cultures. However, the growth of *B. arboris* and *P. polymyxa* was adversely affected when diclosulan was applied beyond 52 ppm (above recommended dose). Among all the strains, the growth of *B. japonicum* was highly affected with the increased dose of diclosulan application. On the other hand, pendimethalin application particularly beyond recommended dose (above 6 ppm) has inhibited the growth of rhizobia and PGPR strains. In general PGPR strains except *B. arboris* are less affected. However, pendimethalin application inhibited the growth of *B. arboris* significantly.

The impact of post-emergence herbicide (Propaquizafop 10EC, Imazethapyre and its cocktail) on culture growth indicates that among all the strains the application (even at higher doses) promoted the growth of *B. daqingense* followed by *P. fluorescence*. The growth of *P. polymyxa* was found to be highly affected due to Propaquizafop application than the application of Imazethapyre. Comparatively the application of cocktail of Propaquizafop and Imazethapyre showed less impact than individual post-emergence herbicides (**Table MB3/21A**).

At Ludhiana centre three strains (*B. daqingense*, *P. polymyxa* and *Bradyrhizobium* sp. local strain) were evaluated for all the herbicides. Among all the strains, *B. daqingense* was found to be compatible even at higher concentrations of pre-emergence herbicides. However, local strain showed growth only at lowest level (recommended dose) of both the herbicides used in the medium. The other strain *P. polymyxa* was inhibited by both the pre-emergence herbicides but could able to grow in post-emergence herbicides (Propaquizafop and Imazethapyre) when use at recommended dose. When compared to other strains, *B. daqingense* strain found compatible with both the post-emergence herbicides whether used individually or in cocktail at recommended dose (**Table MB2/21B**).

At Pantnagar centre, three strains (*B. arboris*, *B. daqingense* and pant-2/local strain) were tested against herbicides. Among all strains, *B. daqingense* and pant-2 could able to grow well in diclosulan and other two post-emergence herbicides when used at recommended dose further increase in dose inhibit the growth of both the strains. *B. arboris* showed poor grow in all the pre and post-emergence herbicides. However, all the three strains were inhibited by pendimethalin even used at lowest dose. Interestingly among all the strains, *B. daqingense* strain followed by pant-2 found highly compatible with all the herbicides including cocktail of both the post-emergence herbicides (**Table M3/21C**).

Similarly at Raipur centre, three strains (*B. arboris*, *B. daqingense* and pant-2/local strain) were tested against herbicides. Among all the stains, *B. daqingense* strain was found to be highly compatible with all the herbicides when used at recommended doses than the other herbicides (**Table MB3/21D**).

At Dharwad centre, three microbial strains (*B. daqingense*, *B. arboris* and SB 120/local strain) were tested against recommended doses of three post-emergence herbicides under *in vitro*. Results indicate that except Imazethapyre the other two herbicides (Haloxypop-R methyl 10.5EC and Fenoxypop-P ethyl 9EC) enhanced the growth of all the three strains when compared to their respective control. However, *B. daqingense* and *B. arboris* strains were comparatively less inhibited by Imazethapyre than local strain SB 120 (**Table MB 3/21E**).

Overall, across all the locations, *B. daqingense* strain was found highly compatible with all the herbicides indicating its adaptivness to the chemical weed management practices of soybean.

MB 4/13: Nodulation ability of AVT-II entries at respective centres (All centres)

The performance of AVT II entries in terms of nodulation and compatibility with native homologous rhizobia was assessed in the field and data are presented in **Table MB4/13A to MB 4/13D**). In the central zone, across two centres (Sehore and Indore) all the four entries (HIMSO 1689, JS 21-72, Two early entries- NRC 152 and NRC 165) along with checks NRC 86 and JS 20-98 were examined for nodulation, leghaemoglobin in the fresh nodules at 50% flowering stage. At Indore centre, for nodulation parameters and chlorophyll content (nodule number, nodule dry weight, and leghaemoglobin content) were observed. Out of all entries

only one entry i.e., JS 21-72 found to be super nodulating and showed significantly higher nodulation, nodule biomass, leghaemoglobin and chlorophyll content over the checks and other entries tested. However, HIMSO 1689 also performed better and showed higher nodulation parameters when compared to checks. Among the two early entries entry NRC 152 found to be superior to the NRC 165 and checks. On the other hand at Sehore, when compared to JS 21-72, entry HIMSO 1689 performed better and had significantly higher nodules, biomass and leghaemoglobin content over the checks. Entry JS 21-72 at this location did not perform well when compared to checks (**Tables MB4/13A to MB 4/13B**).

In the north plain zone (Ludhiana and Pantnagar) one entry i.e., NRC 149 along with four checks (SL 955, SL 1074, SL 958 and PS 1347) were evaluated at both the locations. When compared to checks, entry NRC 149 showed comparable response in terms of nodulation and leghaemoglobin content in root nodules over the checks. However, when compared to checks, the entry NRC 149 particularly at Pantnagar centre performed better than Ludhiana centre (**Table MB 4/13 C to MB 4/13D**).

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Frontline demonstrations

During the year, 26 centers have conducted a total of 1913 FLDs on farmer's fields against the target of 2000 FLDs in plot of 0.40 ha each (Table 6.1). However, out of 1913 FLDs, 250 soybean FLDs were conducted in *Rabi/Summer* 2021-2022 at ICAR-KLE-KVK-Belagavi and KVK Kanerimath, Kolhapur. Five farmer's trainings and eight extension officers/input dealer's trainings were successfully conducted by ICAR-KLE-KVK, Belagavi and SOPA, Indore, respectively. The physical and financial targets and achievements were presented in Table 6.1. The center namely Dholi did not conduct the FLDs due to flood during cropping season. Of the 1663 FLDs conducted during *kharif* 2021, 86.83 and 13.17 % were represented by man and farm women, respectively. However, the representation of categories wise beneficiaries was 19.48 % by SC, 9.98 % by ST, 36.68 % by OBC and 33.85 % by general (Table 6.2).

Data accrued from successful 1663 FLDs on full package (all the recommended inputs and cultural practices and improved soybean varieties) revealed that, the adoption of research emanated improved soybean production technology led to an increase in yield and net returns to the tune of 26.25 and 36.29 %, respectively over farmers practice. Which was achieved by the additional expenditure of only ₹3801/ha (Table 6.3). The difference in gross returns due to improved technology and farmer's practice was 25.33%. Soybean yield as high as [2960-2931 kg/ha (IP)] and [2567-2493 kg/ha (FP)] could be obtained in some farmer's field under the improved production technology and farmer's practice at Pune and Sangli, respectively. The lowest yield under improved technology and Farmer's practice was recorded at DevgrahBaria (1207 and 835 kg/ha). The zone wise yield analysis indicated that, among six zones, highest % yield increase under improved practices was recorded in north eastern hill zone (44.6%) followed by (fb) eastern zone (44.2%) and central zone (29.1%). Lowest yield increase was observed in northern plain zone (17.8%) fb southern zone (19.9%) and northern hill zone (26.4%) over farmer's practices. Further, zone wise average highest and lowest yield was observed in southern zone (2298 kg ha⁻¹) and northern hill zone (1451 kg ha⁻¹), respectively under improved practices(Figure 1).The zone wise profit analysis indicated that, highest net returns was recorded in southern zone under both improved (Rs 75767/ha) and farmer's practices (Rs 59657/ha). However, lowest net profit was recorded in northern plain zone (Rs 31917/ha) under improved practices and eastern zone (Rs 21423/ha) under farmer's practices (Figure 2). The yield gap II estimation(Figure 3)across 26 centersrevealedthat,

highest was observed in Indore (825 kg/ha) and lowest was in Kota (196 kg/ha). However, the average estimated yield gap II was 390 kg/ha across India.

In all 1663 frontline demonstrations, a total of 40 improved varieties were demonstrated in farmer's fields (Table 6.4). The maximum demonstrations were conducted on variety JS 20-34 followed by JS 20-69. Among the varieties, MACS 1281 gave highest yield (3085 kg/ha) followed by MACS 1188 (2911 kg/ha), KDS-726 (Phule Sangam) (2616 kg/ha) and KDS-753 (Phule Kimaya) (2354 kg/ha) under improved practices. However, lowest yield was recorded with Palam soya (1103 kg/ha). The per day productivity of different soybean cultivars estimated under both improved and farmer's practices (Table 6.5). Among different cultivars, highest per day productivity was observed in MACS 1281 fb MACS 1181 under both improved and farmer's practices. Lowest per day productivity was recorded in Palam soy under both improved and farmer's practices. The details of cost of soybean cultivation of 23 centers have worked out. The cost of cultivation under improved technology and farmers practice (Table 6.6) indicated that, the soybean cultivation cost under improved technology was higher to the tune of 15.11% as compared to farmers practice cultivation cost. Under the improved production technology, the trend of expenditure was in line- seed and sowing, followed by land preparation, fertilizer application, hand weeding/intercultural operations, harvesting, threshing, herbicide, insecticide, fungicide and application, and others. However, in case of farmers practice the trend was seed and sowing, land preparation, hand weeding/intercultural operations, harvesting, fertilizer, threshing and other cost.

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Summary Report of Food Technology Experiment

Multi-location analysis of food grade characteristics AVT entries

Introduction:

Soybean [*Glycine max* (L.) Merr.] is one of the most important crops in the world. Soybean seeds are distinguished from other legume grains especially by their high protein content. It is a major source of vegetable protein and oil in human food industries because of its nutritive and health benefits. Soybeans typically possess protein and oil contents of approximately 40% and 20%, respectively. Soyfood has nutritional qualities that reduce human blood serum cholesterol levels and lower the risk of cardiovascular diseases. Soy food is a natural source of isoflavones (daidzein, genistein, and glycitein) and a good source of calcium. Commercially, soybean can be categorized as (i) commodity type, mainly used for oil and animal feed, and (ii) food type soybean, mainly used for human consumption.

Approximately 85% of the soybean is crushed into oil and meal. The greatest part of the meal is used as protein source in animal feed, Approximately 6% of the produced soybean is directly used for food purposes. Usually, food-grade soybeans are used for production of soy milk, tofu or soy paneer, soy sprouts, and other soy-based food items. The unraveling of the health and nutritional benefits of soybean contributed to increased interest for soybeans destined for food production, the so-called food-grade soybeans. Hence, the breeding of cultivars with enhanced food-grade traits is gaining great importance.

Soy food available in the market is classified into two groups based on the soybean seed size. Soy foods made of large seeds (>20 g/100 seeds) include tofu, edamame, miso, and soy milk. Seeds with high protein content (>45%), low oil content, high sucrose content, and low oligosaccharides (raffinose and stachyose) content are suitable for making tofu. For soy food such as natto made through short fermentation process, soybean seed with a high carbohydrate content are preferred for the purpose of getting a quick conversion to simple sugars.

Soy milk is a popular beverage with abundant vegetable protein in Asian countries. However, soy milk is still considered unpleasant to Indian consumers due to its off-flavour, especially its bitter taste, as well as its beany and rancid flavour (Damondaran & Kinsella, 1981; Wrick, 2003). Two types of off-flavour in soy milk have been reported. The volatile beany and herbal flavour is composed of the aldehydes, alcohols, ketones, and furans (Kaneko, Kumazawa, & Nishimura, 2011; Wang, Dou, Macura, Durance, & Nakai, 1998; Wilkens & whereas the nonvolatile bitterness and astringency consist of phenolic acid, isoflavone, saponin, tetro, and other substances (Heng et al., 2006; Kudou et al., 1991). The off-flavour development in soy milk is primarily due to the lipoxygenase or the oxidative rancidity of unsaturated fatty acids (Gardner, 1985; Lee, Min, Choe, & Min, 2003; Wolf, 1975). Unfortunately, the off-flavour compounds are highly difficult to remove from soy milk processing due to these compounds' high affinities with the soy protein (Gkionakis, David Anthony Taylor, Ahmad, & Heliopoulos, 2007; O'Keefe,

Resurreccion, Wilson, & Murphy, 1991; Zhou, Boatright, Johnson, & Reuber, 2002). The flavour property of soymilk is affected by many factors, such as the genotype of soybean cultivars, the processing method, and environmental conditions. Owing to soymilk's off-flavour, many efforts have been taken to improve soymilk flavour based on the selection of soybean cultivars and enhancement of the processing technology (Hildebrand & Hymowitz, 1981; Kwok, Liang, & Niranjana, 2002; Suppavorasatit, Lee, & Cadwallader, 2013). However, the adjustment of processing may lead to a risk of protein denaturation and nutrition destruction in soymilk (Kwok et al., 2002). Therefore, it is necessary to select specific soybean cultivars suitable for soymilk processing in soybean breeding programs.

Additionally, soy milk and its products are regarded as nutritious and cholesterol-free health foods, with considerable potential application. However, information regarding soymilk sensory evaluation and the effect of soybean seed quality traits on soymilk sensory attributes were notably limited (Poysa & Woodrow, 2002; Terhaag et al., 2013). As a result, it is difficult to select suitable cultivars for soy soymilk and tofu processing. Therefore there is need to design system of indices for identification of the varieties on basis of food grade characteristics. Therefore, present investigation was undertaken to screen AVT entries for food grade characters with following objectives,

Objectives:

Objectives:

1. To analyse AVT entries for physical characteristics of seed
Seed color, hilum color, seed dimensions, 100 seed weight, seed lustre
2. To analyse cooking characteristics of seed
Cooking time, hydration ratio, hull fragility, sensory of cooked bean
3. To evaluate food quality parameters of seed related to milk analogues
Milk yield, tofu yield, sensory characteristics

Plan of Work:**NORTHERN PLAIN ZONE:****Advanced Varietal Trial II (AVT II)**

DESIGN	R.B.D.
CROSS PLOT SIZE	12 rows, 5 m long (5.4 x 5 m sq)
NET PLOT SIZE	10 rows, 4.8 m long (4.5 x 4.8 m sq)
REPLICATION	3
LOCATIONS	Ludhiana
ENTRIES	NRC 149, PS 1670, DS 9421, DS 9422
CHECKS	SL 955 (C), SL 1074(C), SL 1104 (C), DS 9712 (C), SL 958 (C), PS 1347 (C)
SEED	1.5kg/entry/location

North Eastern Hill Zone (NEHZ)**Advanced Varietal Trial I and Advance Varietal Trial II (AVT I & II)**

DESIGN	R.B.D.
CROSS PLOT SIZE	8 rows, 5 m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8 m long (2.7 x 4.8 m sq)
REPLICATION	3
LOCATION	Imphal
ENTRIES	KDS 1096, DLSb 1, DS 3108*, DSb 38
CHECKS	MACS 1460, JS 20-116, RKS 113, JS 335**, RKS 18**, JS 97-52**
SEED	1.0kg/entry/location

Central Zone (CZ)**Advanced Varietal Trial I (AVT I)**

DESIGN	R.B.D.
CROSS PLOT SIZE	8 rows, 5 m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8 m long (2.7 x 4.8 m sq)
REPLICATION	3
LOCATIONS	Indore
ENTRIES	RVS 2011-10, DLSb 1,
CHECKS	MACS 1520, NRC 86, JS 20-116
SEED	1.0kg/entry/location

Advanced Varietal Trial I (AVT-I): Early

DESIGN	R.B.D.
CROSS PLOT SIZE	8 rows, 5 m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8 m long (2.7 x 4.8 m sq)
REPLICATION	3
LOCATIONS	Indore
ENTRIES	PS 1569, JS 22-12, JS 22-18, JS 22-16, RVSM 2012-4, NRC 181, NRC 150
CHECKS	JS 95-60, JS 20-34
SEED	1.0kg/entry/location

Advanced Varietal Trial II (AVT II)

DESIGN	R.B.D.
CROSS PLOT SIZE	12 rows, 5 m long (5.4 x 5 m sq)
NET PLOT SIZE	10 rows, 4.8 m long (4.5 x 4.8 m sq)
REPLICATION	3
LOCATIONS	Indore
ENTRIES	HIMSO 1689, JS 21-72
CHECKS	NRC 86, JS 20-98, RSC 10-46
SEED	1.5kg/entry/location

Advanced Varietal Trial II (AVT II) Early

DESIGN	R.B.D.
CROSS PLOT SIZE	12 rows, 5 m long (5.4 x 5 m sq)
NET PLOT SIZE	10 rows, 4.8 m long (4.5 x 4.8 m sq)
REPLICATION	3
LOCATIONS	Indore
ENTRIES	NRC 165, NRC 152
CHECKS	JS 20-34, JS 95-60
SEED	1.5kg/entry/location

Objectives:

1. To analyse soybean varieties in different zones for physical characteristics of seed

Parameter to be analysed	Instrument/ method used
Yield	Seed weight (kg)/ Ha
Seed color	Manual
Hilum color	Manual
Seed dimension	Vernier calipers
100 seed weight	Weighing balance
Seed lustre	Manual

2. To analyse soybean entries sown in different zones for food grade characteristics of seed

Parameter to be analysed	Instrument/ method used
Cooking time	Time to cook seed in boiling water, cooking index-pressing between fingers
Hydration ratio	Ratio between weight of seed after absorption of water/weight of dry seed
hull fragility	Number of hulls removed during cooking per 10 g seed
sensory of cooked bean, milk and tofu	Parameters: Beaniness, nuttiness, sweetness, aftertaste, mouthfeel
Milk yield	· Weigh 5 g seed blanch for 2 minutes and soak in water overnight · Grind imbibed seed in pestle mortar · Add 50 ml hot water and cook for one minute · Sieve through muslin cloth · Measure volume in measuring cylinder
Tofu yield	· Take hot milk (80ml) prepared and coagulate using 0.2% MgCl₂ · Centrifuge the curd to separate whey at 5000 rpm for 15 minutes · Weigh the curd for tofu yield

3. To study effect of location of sowing on food grade qualities of seed
Comparative analysis of data of seed samples grown in NPZ, NEHZ, CZ and SZ

Results Tables:

1. Physical analysis:

Physical analysis of soybean seed include parameters like 100 seed weight, seed yield, seed size (dimensions), seed colour and lustre, hilum colour. Ideally, varieties suitable for soy milk and tofu should have larger size (higher 100 seed weight and dimensions), creamish white colour, clear or light coloured hilum. The aim of the experiment was to evaluate the suitability of AVT 1& 2 entries for desired physical traits for soy milk and tofu manufacturing industry. AVT 1 and 2 entries for three agro climatic zones viz. north plain zone (Ludhiana), central zone (Indore) and North East Hill zone (Imphal) were studied for given parameters and results are depicted in Table 1 to 10.

In NPZ, PS1670 gave highest yield followed by NRC 149 and SL955 (C) [Table 1]. 100 seed weight and seed dimension data suggested that NPZ entries viz. NRC149, PS1347 (C) and PS 1670 has largest seed size [Table 1&4]. However, entries NRC 149 and SL955 had greenish yellow color which makes them unsuitable to use in milk analogue processing [Table 4]. Control variety, SL1104 used for NPZ had white hilum colour which is most suitable for milk analogue processing [Table 7].

Table 1: 100 seed weight and yield parameters for NPZ entries

Sl. No	Entries	1. 100 seed weight (g)				2. Yield (Kg)
		Replication				
		I	II	III	Mean	Mean
1	NRC 149	9.66	10.12	9.47	9.75	1986 (2)
2	PS 1670	9.26	8.93	9.58	9.26	2264 (1)
3	DS 9421	7.34	7.19	6.84	7.12	764
4	DS 9422	8.49	7.46	7.25	7.73	1199
5	SL 955 (C)	6.96	6.99	6.64	6.86	1824 (3)
6	SL 1074(C)	6.73	6.65	5.70	6.36	634
7	SL 1104 (C)	7.78	7.36	8.39	7.84	704
8	DS 9712 (C)	6.77	6.78	6.98	6.84	699
9	SL 958 (C)	7.94	7.38	7.47	7.60	611
10	PS 1347 (C)	9.93	9.02	10.15	9.70	1546

In CZ-AVT I trials, RVS 2011-10 gave highest yield which was higher than control. In CZ-AVT I early trials, RVSM 2012-4 gave highest yield, in AVT II trials yield was highest in JS21-22

and in AVT II early trials yield was highest for NRC 152. 100 seed weight and seed dimension data suggested that for AVT I trial RVS 2011-10, for AVT I early trial 22-18 and PS 1569, for AVT II trial **JS 21-72** (highest among all) and for AVT II early trial NRC 152 has high seed dimension. However, entries NRC 149 and SL955 had greenish yellow color which makes them unsuitable to use in milk analogue processing.

Table 2: 100 seed weight and yield parameters for CZ entries

Sl. No	Entries	1. 100 seed weight (g)				2. Yield (Kg)
		Replication				
		I	II	III	Mean	Mean
CZ-AVT1						
1	RVS 2011-10	9.9	9.6	9.7	9.73	2037
2	DLSb 1	6.3	6.1	6.5	6.3	304
3	MACS 1520(C)	9.4	9.6	9.4	9.46	911
4	NRC 86(C)	10.85	10.82	10.81	10.82	1593
5	JS 20-116(C)	8.22	8.24	8.26	8.24	1933
CZ AVT 1 Early						
6	PS 1569	11.05	11.02	11.02	11.03	1541
7	JS 22-12	9.3	9.6	9.6	9.5	1422
8	JS 22-18	13.3	13.2	13.3	13.26	1622
9	JS 22-16	9.27	9.25	9.24	9.25	1615
10	RVSM 2012-4	9.2	9.6	9.3	9.36	1763
11	NRC 181	11.82	11.79	11.80	11.80	1230
12	NRC 150	6.2	6.5	6.4	6.36	1022
13	JS 95-60(C)	9.0	9.0	8.8	8.93	770
14	JS 20-34(C)	11.8	11.5	11.6	11.63	1363
CZ AVT 2						
16	HIMSO-1689	9.2	9.4	9.5	9.36	1360
17	JS-21-72	15.1	15.0	15.3	15.13	1444
18	NRC 86(C)	8.6	8.4	8.3	8.43	1591
19	JS-20-98 (C)	9.8	9.8	9.7	9.76	1520
20	RSC 10-46(C)	7.6	7.5	7.3	7.46	778
AVT 2 Early						
21	NRC 165	8.2	8.3	8.4	8.3	1476
22	NRC 152	10.1	9.8	10	9.96	1591
23	JS 20-34(C)	11.8	11.5	11.6	11.63	1271
24	JS 95-60(C)	9.0	9.0	8.8	8.93	391

In NEHZ-AVT trials, KDS 1096 and DLSb 1 gave highest yield which was higher than control. Dimension of DLSb 1 and DS 3108 were largest among all entries.

Table 3: 100 seed weight and yield parameters for NEHZ entries

Sl. No	Entries	1. 100 seed weight (g)				2. Yield (Kg)
		Replication				
		I	II	III	Mean	Mean
1	KDS 1096	13.00	14.76	14.23	13.99	3056
2	DLSb 1	15.67	17.28	18.10	17.01	3017
3	DS 3108	15.13	16.96	16.54	16.21	2744
4	DSb 38	13.06	15.23	16.19	14.82	2667
5	MACS 1460	12.39	13.36	12.14	12.63	2278
6	JS 20-116	11.56	12.38	13.02	12.32	2533
7	RKS 113 (C)	13.53	12.46	15.14	13.71	2339
8	JS 335 (C)	14.21	18.38	15.63	16.07	2861
9	RKS 18 (C)	11.07	14.18	14.45	13.23	2244
10	JS 97-52 (C)	12.19	12.93	13.10	12.74	2917

Table 4: Seed dimensions and seed colour of NPZ entries

Sl. No	Entries	3. Seed dimension (mm)				4. Seed colour			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	NRC 149	5.3	5.6	5.6	5.50	Greenish yellow	Greenish yellow	Greenish yellow	Greenish yellow
2	PS 1670	5.2	5.5	5.3	5.33	Yellow	Yellow	Yellow	Yellow
3	DS 9421	5.5	5.0	5.4	5.30	Shiny yellow	Shiny yellow	Shiny yellow	Shiny yellow
4	DS 9422	5.6	5.2	5.8	5.53	Yellow	Yellow	Yellow	Yellow
5	SL 955 (C)	4.9	5.4	4.8	5.03	Greenish yellow	Greenish yellow	Greenish yellow	Greenish yellow
6	SL 1074(C)	5.4	4.9	5.2	5.16	Yellow	Yellow	Yellow	Yellow
7	SL 1104 (C)	5.5	5.5	5.0	5.33	Yellow	Yellow	Yellow	Yellow
8	DS 9712 (C)	5.4	5.1	5.4	5.30	Yellow	Yellow	Yellow	Yellow
9	SL 958 (C)	4.7	5.6	5.1	5.13	Yellow	Yellow	Yellow	Yellow
10	PS 1347 (C)	6.0	5.6	5.6	5.73	Yellow	Yellow	Yellow	Yellow

Table 5: Seed dimensions and colour of CZ entries (AVT1 &2)

Sl. No	Entries	3. Seed dimension (mm)				4. Seed colour			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
CZ-AVT1									
1	RVS-2011-10	5.92	5.90	5.89	5.90	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
2	DLSB-1	6.76	6.89	6.99	6.88	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
3	MACS 1520(C)	5.82	5.87	5.92	5.87	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
4	NRC 86(C)	6.37	6.67	6.45	6.49	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
5	JS-20-116	6.54	6.57	6.89	6.66	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
CZ AVT 1 Early									
6	PS-1569	6.87	6.78	6.92	6.85	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
7	JS-22-12	6.88	6.98	6.77	6.87	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
8	JS-22-18	6.77	6.89	6.70	6.78	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
9	JS-22-16	6.21	6.18	6.23	6.20	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
10	RVSM 2012-4	6.40	6.35	6.56	6.43	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
11	NRC-181	6.44	6.33	6.45	6.40	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
12	NRC-150	5.99	5.97	6.0	5.98	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
13	JS-95-60 (C)	6.45	6.34	6.78	6.52	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
14	JS-20-34 (C)	6.56	6.54	6.50	6.53	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
CZ AVT 2									
15	HIMSO-1689	6.25	6.20	6.24	6.23	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
16	JS-21-72	6.98	6.98	6.89	6.95	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
17	NRC 86(C)	6.93	6.89	6.78	6.86	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
18	JS-20-98 (C)	6.23	6.26	6.28	6.25	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
19	RSC 10-46(C)	6.11	6.20	6.15	6.15	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
AVT 2 Early									
20	NRC-165	6.35	6.45	6.67	6.49	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
21	NRC-152	5.87	5.98	5.76	5.87	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
22	JS-20-34 (C)	6.56	6.54	6.50	6.53	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
23	JS-95-60 (C)	6.45	6.34	6.78	6.52	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown

Table 6: Seed dimensions and colour of NEHZ entries (AVT1 &2)

Sl. No	Entries	3. Seed dimension (mm)				4. Seed colour			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	KDS 1096	6.16	6.33	6.36	6.28	yellow	yellow	Yellow	Yellow
2	DL Sb 1	6.26	6.60	6.50	6.45	yellow	yellow	Yellow	Yellow
3	DS 3108	6.36	6.40	5.70	6.15	yellow	yellow	Yellow	Yellow
4	DSb 38	6.36	6.40	6.40	6.39	yellow	yellow	Yellow	Yellow
5	MACS 1460	6.56	6.30	6.13	6.33	Shiny yellow	Shiny yellow	Shiny yellow	Shiny yellow
6	JS 20-116	6.33	5.93	6.13	6.13	Yellow	Yellow	Yellow	Yellow
7	RKS 113	6.16	6.00	6.46	6.20	Yellow	Yellow	Yellow	Yellow
8	JS 335	6.66	6.56	6.13	6.45	Yellow	Yellow	Yellow	Yellow
9	RKS 18	5.8	5.80	6.36	5.98	Yellowish dull brown	Yellowish dull brown	Yellowish dull brown	Yellowish dull brown
10	JS 97-52	6.03	6.16	6.06	6.08	Yellowish brown	Yellowish brown	Yellowish Brown	Yellowish brown

Table 7: Hilum colour and seed lustre of NPZ entries

Sl. No	Entries	5. Hilum colour				6. Seed lustre			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	NRC 149	Light Brown	Light Brown	Light Brown	<i>Light Brown</i>	Shiny	Shiny	Shiny	Shiny
2	PS 1670	Light Brown	Light Brown	Light Brown	<i>Light Brown</i>	Shiny	Shiny	Shiny	Shiny
3	DS 9421	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Shiny	Shiny	Shiny	Shiny
4	DS 9422	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Shiny	Shiny	Shiny	Shiny
5	SL 955 (C)	Light Brown	Light Brown	Light Brown	<i>Light Brown</i>	Shiny	Shiny	Shiny	Shiny
6	SL 1074(C)	Light Brown	Light Brown	Light Brown	<i>Light Brown</i>	Shiny	Shiny	Shiny	Shiny
7	SL 1104 (C)	White	White	White	White	Shiny	Shiny	Shiny	Shiny
8	DS 9712 (C)	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Shiny	Shiny	Shiny	Shiny
9	SL 958 (C)	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Shiny	Shiny	Shiny	Shiny
10	PS 1347 (C)	Light Brown	Light Brown	Light Brown	Light Brown	Shiny	Shiny	Shiny	Shiny

Table 8: Hilum colour and seed lustre of AVT entries of CZ.

Sl. No	Entries	5. Hilum colour				6. Seed lustre			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
CZ-AVT1									
1	RVS-2011-10	Brown	Brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny
2	DLSB-1	Brown	Brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny
3	MACS 1520(C)	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
4	NRC-86 (C)	Brown	Brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny
5	JS-20-116	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
CZ AVT 1 Early									
6	PS-1569	Brown	brown	brown	Brown	Intermediate	Intermediate	Intermediate	Intermediate
7	JS-22-12	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
8	JS-22-18	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
9	JS-22-16	Dark brown	Dark brown	Dark brown	Dark brown	Intermediate	Intermediate	Intermediate	Intermediate
10	RVSM 2012-4	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
11	NRC-181	Dark brown	Dark brown	Dark brown	Dark brown	Intermediate	Intermediate	Intermediate	Intermediate
12	NRC-150	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
13	JS-95-60	Brown	brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny
14	JS-20-34 (C)	Dark brown	Dark brown	Dark brown	Dark brown	Intermediate	Intermediate	Intermediate	Intermediate
CZ AVT 2									
15	HIMSO-1689	Dark brown	Dark brown	Dark brown	Dark brown	Intermediate	Intermediate	Intermediate	Intermediate
16	JS-21-72	Brown	brown	brown	Brown	Intermediate	Intermediate	Intermediate	Intermediate
17	NRC-86 (C)	Brown	Brown	Brown	Brown	Intermediate	Intermediate	Intermediate	Intermediate

18	JS-20-98 (C)	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
19	RSC 10-46(C)	Brown	Brown	Brown	Brown	Intermediate	Intermediate	Intermediate	Intermediate
AVT 2 Early									
20	NRC-152	Dark brown	Dark brown	Dark brown	Dark brown	Shiny	Shiny	Shiny	Shiny
21	NRC-165	Brown	brown	brown	Brown	Shiny	Shiny	Shiny	Shiny
22	JS-20-34 (C)	Dark brown	Dark brown	Dark brown	Dark brown	Intermediate	Intermediate	Intermediate	Intermediate
23	JS-95-60 (C)	Brown	brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny

Table 9: Hilum colour and seed lustre of AVT entries of NEHZ.

Sl. No	Entries	5. Hilum color				6. Seed lustre			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	KDS 1096	Brown	Brown	Brown	Brown	Shiny	Shiny	Shiny	Shiny
2	DLSb 1	Black	Black	Black	Black	Shiny	Shiny	Shiny	Shiny
3	DS 3108	Light Brown	Light brown	Light Brown	Light Brown	Shiny	Shiny	Shiny	Shiny
4	DSb 38	Light Brown	Light Brown	Light Brown	Light Brown	Shiny	Shiny	Shiny	Shiny
5	MACS 1460	Light Brown	Light Brown	Light Brown	Light Brown	Shiny	Shiny	Shiny	Shiny
6	JS 20-116	Black	Black	Black	Black	Intermediate	Intermediate	Intermediate	Intermediate
7	RKS 113	Light Brown	Light Brown	Light Brown	Light Brown	Intermediate	Intermediate	Intermediate	Intermediate
8	JS 335	Light Black	Light Black	Light Black	Light Black	Dull	Dull	Dull	Dull
9	RKS 18	Black	Black	Black	Black	Intermediate	Intermediate	Intermediate	Intermediate
10	JS 97-52	Brown	Brown	Brown	Brown	Dull	Dull	Dull	Dull

Table 10: Summarized physical analysis data for AVT 1&2 entries-NPZ (means of all replications)

Entry Code	100 seed Wt. (g)	Yield (Kg)	Seed dimension (mm)	Seed colour	Hilum colour	Seed lustre
NRC 149	9.75	1986	5.50	Greenish yellow	Light Brown	Shiny
PS 1670	9.26	2264	5.33	Yellow	Light Brown	Shiny
DS 9421	7.12	764	5.30	Shiny yellow	Dark Brown	Shiny
DS 9422	7.73	1199	5.53	Yellow	Dark Brown	Shiny
SL 955 (C)	6.86	1824	5.03	Greenish yellow	Light Brown	Shiny
SL 1074(C)	6.36	634	5.16	Yellow	Light Brown	Shiny
SL 1104 (C)	7.84	704	5.33	Yellow	White	Shiny
DS 9712 (C)	6.84	699	5.30	Yellow	Dark Brown	Shiny
SL 958 (C)	7.60	611	5.13	Yellow	Dark Brown	Shiny
PS 1347 (C)	9.70	1546	5.73	Yellow	Light Brown	Dull

Table 11: Summarized physical analysis data for AVT 1&2 entries-CZ (means of all replications)

Entry Code	100 seed Wt. (g)	Yield (Kg)	Seed dimension (mm)	Seed colour	Hilum colour	Seed lustre
JS-95-60 (C)	8.93	800	6.52	Yellowish brown	Brown	Shiny
JS-22-18	13.26	1622	6.78	Yellowish brown	Dark brown	Shiny
MACS-1520 (C)	9.46	63	5.87	Yellowish brown	Dark brown	Shiny
JS-20-98 (C)	9.76	1520	6.25	Yellowish brown	Dark brown	Shiny
NRC-181	11.80	1230	6.40	Yellowish brown	Dark brown	Intermediate
JS-22-16	9.25	1615	6.20	Yellowish brown	Dark brown	Intermediate
PS-1569	11.03	1541	6.85	Yellowish brown	Brown	Intermediate
JS-20-34 (C)	11.63	1363	6.53	Yellowish brown	Dark brown	Intermediate
HIMSO-1689	9.36	1360	6.23	Yellowish brown	Dark brown	Intermediate

JS-21-72	15.13	1444	6.95	Yellowish brown	Brown	Intermediate
JS-20-116 (C)	8.24	1933	6.66	Yellowish brown	Dark brown	Shiny
RVSM 2012-4	9.36	1763	6.43	Yellowish brown	Dark brown	Shiny
NRC-150	6.36	1022	5.98	Yellowish brown	Dark brown	Shiny
NRC-152	9.96	1591	5.87	Yellowish brown	Dark brown	Shiny
NRC-165	8.3	1476	6.49	Yellowish brown	Brown	Shiny
JS-22-12	9.5	1422	6.87	Yellowish brown	Dark brown	Shiny
DLSB-1	6.3	304	6.88	Yellowish brown	Brown	Shiny
RVS-2011-10	9.73	2037	5.90	Yellowish brown	Brown	Shiny
RSC-10-46 (C)	7.46	778	6.15	Yellowish brown	Brown	Intermediate
NRC-86 (C)	8.43	1520	6.49	Yellowish brown	Brown	Intermediate
NRC-86 (C)	10.82		6.86	Yellowish brown	Brown	Shiny

Table 12: Summarized physical analysis data for AVT 1&2 entries-NEHZ (means of all replications)

Entry Code	100 seed Wt. (g)	Yield (Kg)	Seed dimension (mm)	Seed colour	Hilum colour	Seed lustre
KDS 1096	13.99	3056	6.28	Yellow	Brown	Shiny
DLSb 1	17.01	3017	6.45	Yellow	Black	Shiny
DS 3108	16.21	2744	6.15	Yellow	Light Brown	Shiny
DSb 38	14.82	2667	6.39	Yellow	Light Brown	Shiny
MACS 1460	12.63	2278	6.33	Shiny yellow	Light Brown	Shiny
JS 20-116	12.32	2533	6.13	Yellow	Black	Intermediate
RKS 113	13.71	2339	6.20	Yellow	Light Brown	Intermediate
JS 335	16.07	2861	6.45	Yellow	Light Black	Dull
RKS 18	13.23	2244	5.98	Yellowish dull brown	Black	Intermediate
JS 97-52	12.74	2917	6.08	Yellowish brown	Brown	Dull

Results: Food grade characteristics

Soy milk and tofu yield as well as sensory parameters are essential for screening of soybean entries for milk analogue preparation. Lesser cooking time and higher hydration ratio indicates better cooking quality.

Table 13: Cooking time and hydration ratio of AVT 1&2 -CZ

Sl. No	Entries	1. Cooking time (min.)				2. Hydration ratio			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
AVT 1									
1	RVS-2011-10	30	37	31	32.66	1.98	1.97	1.96	1.97
2	DLSB-1	26	28	21	25	1.53	1.51	1.55	1.53
3	MACS 1520(C)	45	50	46	47	2.35	2.34	2.35	2.35
4	NRC-86 (C)	48	41	50	46.33	1.87	1.86	1.85	1.86
5	JS-20-116 (C)	20	18	18	18.66	2.23	2.21	2.22	2.22
AVT I Early									
6	PS-1569	50	58	56	54.66	2.04	2.02	2.05	2.03
7	JS-22-12	40	35	31	35.33	2.12	2.10	2.14	2.12
8	JS-22-18	45	47	54	48.66	1.94	1.96	1.99	1.96
9	JS-22-16	30	36	30	32	2.08	2.06	2.05	2.06
10	RVSM 2012-4	25	29	27	27	2.15	2.19	2.17	2.17
11	NRC-181	30	35	40	35	2.89	2.86	2.87	2.87
12	NRC-150	50	45	48	47.66	0.88	0.86	0.82	0.85
13	JS-95-60 (C)	35	38	40	37.66	2.28	2.30	2.27	2.28
14	JS-20-34 (C)	55	54	41	50	2.72	2.76	2.73	2.73
AVT II									
15	HIMSO-1689	30	33	37	33.33	2.86	2.85	2.82	2.84
16	JS-21-72	25	29	31	28.33	2.31	2.29	2.28	2.29
17	NRC-86 (C)	54	60	52	55.33	2.58	2.58	2.57	2.57
18	JS-20-98 (C)	40	35	46	40.33	2.87	2.84	2.82	2.84
19	RSC 10-46(C)	38	32	39	36.33	2.45	2.41	2.46	2.44
AVT II Early									
20	NRC-152	48	43	40	43.66	2.71	2.68	2.67	2.68
21	NRC-165	37	34	31	34	2.18	2.15	2.14	2.16
22	JS-20-34 (C)	55	54	41	50	2.72	2.76	2.73	2.73
23	JS-95-60 (C)	35	38	40	37.66	2.28	2.30	2.27	2.28

Table 14: Cooking time and hydration ratio of AVT 1&2 -NEHZ

Sl. No	Entries	1. Cooking time (min.)				2. Hydration ratio			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	KDS 1096	53	55	45	51.00	2.23	2.19	2.25	2.22
2	DLSb 1	70	68	60	66.00	2.18	2.28	2.06	2.17
3	DS 3108	55	50	50	51.67	2.16	2.18	2.15	2.16
4	DSb 38	53	55	55	54.33	2.25	2.18	2.33	2.25
5	MACS 1460	58	50	50	52.67	2.28	2.3	2.17	2.25
6	JS 20-116	45	45	45	45.00	2.24	2.17	2.26	2.22
7	RKS 113	55	52	50	52.33	2.13	2.12	2.14	2.13
8	JS 335	50	55	57	54.00	2.27	2.21	2.26	2.24
9	RKS 18	42	44	45	43.67	2.21	2.19	2.18	2.19
10	JS 97-52	43	55	57	51.67	2.19	2.17	2.14	2.16

Table 15: Hull fragility and milk yield of AVT I&II -CZ

Sl. No	Entries	3. Hull fragility (no.)				4. Milk yield (lit./kg)			
		Replication				Parameters			
		I	II	III	Mean	I	II	III	Mean
AVT I									
1	RVS-2011-10	25	35	39	33	8400	8600	8200	8400
2	DLSB-1	13	17	19	16.33	9200	8000	9000	8733
3	MACS 1520(C)	15	12	11	12.66	9400	8200	8400	8666
4	NRC-86 (C)	24	27	29	26.66	8000	8200	8200	8133
5	JS-20-116 (C)	12	15	14	13.66	8000	8600	8400	8333
AVT I Early									
6	PS-1569	11	17	12	13.33	7800	7800	7200	7600
7	JS-22-12	8	14	15	12.33	8000	8200	8200	8133
8	JS-22-18	12	15	13	13.33	8000	8200	8200	8133
9	JS-22-16	21	15	18	18	9200	8200	9000	8800
10	RVSM 2012-4	19	16	14	16.33	9800	8000	8200	8666
11	NRC-181	10	6	12	9.33	5571	8800	8000	7457
12	NRC-150	21	25	23	23	8600	7600	7200	7800
13	JS-95-60 (C)	7	8	9	8	7600	8000	7800	7800
14	JS-20-34 (C)	5	6	8	6.33	8600	8200	8000	8266
AVT II									
15	HIMSO-1689	9	12	15	12	8200	8200	8600	8333
16	JS-21-72	22	24	26	24	9800	8000	8200	8666
17	NRC-86 (C)	23	29	25	25.66	9600	8000	8400	8666
18	JS-20-98 (C)	21	19	17	19	7000	9600	7800	8133
19	RSC 10-46(C)	41	42	33	38.66	8000	10000	9600	9200
AVT II Early									
20	NRC-152	19	17	16	17.33	8000	8000	8400	8133
21	NRC-165	7	5	6	6	7600	10000	9600	9066
22	JS-20-34 (C)	5	6	8	6.33	8600	8200	8000	8266
23	JS-95-60 (C)	7	8	9	8	8600	8200	8000	8266

Table 16: Hull fragility and milk yield of AVT 1&2 -NEHZ

Sl. No	Entries	3. Hull fragility (no.)				4. Milk yield (lit./kg)			
		Replication				Replication			
		I	II	III	Mean	I	II	III	Mean
1	KDS 1096	8	9	8	8.33	8.00	8.20	8.00	8.06
2	DLSb 1	7	5	7	6.33	8.00	8.00	8.20	8.06
3	DS 3108	10	7	8	8.33	8.00	8.00	8.40	8.13
4	DSb 38	21	19	20	20.00	9.60	9.60	9.60	9.60
5	MACS 1460	4	7	5	5.33	8.00	8.40	8.60	8.33
6	JS 20-116	22	19	20	20.33	8.40	8.40	8.60	8.46
7	RKS 113	12	12	9	11.00	7.80	8.60	8.00	8.13
8	JS 335	13	12	12	12.33	8.40	8.60	8.80	8.60
9	RKS 18	15	13	16	14.66	9.20	9.80	9.80	9.60
10	JS 97-52	11	9	9	9.67	8.80	8.40	8.60	8.60

Table 17: Tofu yield and sensory parameters of cooked beans for AVT 1& 2 Entries CZ

Sl. No	Entries	5. Tofu yield (g/kg)				6. Sensory (Cooked soybean)		
		Replication				Parameters		
		I	II	III	Mean	Softness/ Mouth feel	Beaniness	Overall acceptability
AVT I								
1	RVS-2011-10	1268	1200	1256	1241	6.8	7.0	5.9
2	DLSB-1	1092	1086	1046	1074	3.7	5.7	8.3
3	MACS 1520(C)	1062	1232	1110	1134	6.2	6.7	7.0
4	NRC-86 (C)	864	904	804	857	8.0	7.8	6.4
5	JS-20-116 (C)	568	984	690	747	6.6	7.4	8.1
AVT I Early								
6	PS-1569	254	496	470	407	8.3	7.0	6.0
7	JS-22-12	810	798	864	824	7.9	6.5	8.1
8	JS-22-18	722	884	766	790	5.8	6.5	7.0
9	JS-22-16	412	482	430	441	7.2	7.8	8.0
10	RVSM 2012-4	1124	684	1002	937	8.0	7.0	6.7
11	NRC-181	76	60	66	67	5.5	6.0	6.5
12	NRC-150	912	1174	846	977	5.8	4.7	8.0
13	JS-95-60 (C)	568	742	690	666	6.5	7.2	8.0
14	JS-20-34 (C)	542	342	490	458	6.5	5.8	5.3
AVT II								
15	HIMSO-1689	740	536	664	647	7.4	5.3	4.9
16	JS-21-72	1106	884	1010	1000	7.0	8.0	5.9
17	NRC-86 (C)	796	846	840	827	6.8	5.5	7.0
18	JS-20-98 (C)	54	66	60	60	7.9	8.1	8.5
19	RSC 10-46(C)	434	450	600	495	5.0	6.2	4.9
AVT II Early								
20	NRC-152	1010	996	992	999	6.7	5.1	8.3
21	NRC-165	996	952	796	915	7.9	8.1	6.0
22	JS-20-34 (C)	542	342	490	458	6.5	5.8	5.3
23	JS-95-60 (C)	568	742	690	666	6.5	7.2	8.0

Table 18: Tofu yield and Sensory analysis cooked soybeans from AVT 1& 2 entries of NEHZ

Sl. No	Entries	5. Tofu yield (g/kg)				6. Sensory (Cooked soybean)		
		Replication				Parameters		
		I	II	III	Mean	Softness/ Mouth feel	Beaniness	Overall acceptability
1	KDS 1096	1270	1334	1186	1263	7.75	6.88	7.32
2	DLSb 1	1688	1578	1451	1572	6.75	5.88	6.32
3	DS 3108	1412	1486	1466	1454	5.63	5.88	5.76
4	DSb 38	1513	1862	1762	1712	5.75	6.00	5.88
5	MACS 1460	2556	2238	2075	2289	5.38	5.25	5.32
6	JS 20-116	1752	1916	1852	1840	5.13	6.50	5.82
7	RKS 113	1370	1685	1905	1653	6.63	5.88	6.26
8	JS 335	1386	1637	1744	1589	6.00	5.88	5.94
9	RKS 18	2285	2566	2161	2337	5.75	6.00	5.88
10	JS 97-52	2061	2431	2557	2349	4.13	5.00	4.57

Table 19: Sensory analysis of Soymilk from AVT 1& 2 entries of NPZ

Sl. No	Entries	Sensory (Soymilk)			
		Parameters			
		Colour	Consistency	Beaniness	Overall acceptability
1	NRC 149	6.75	6.50	3.00	5.43
2	PS 1670	6.00	5.50	5.00	5.50
3	DS 9421	5.75	4.50	3.75	4.68
4	DS 9422	6.25	5.25	4.75	5.43
5	SL 955 (C)	6.50	5.50	5.00	5.68
6	SL 1074(C)	5.00	5.25	6.50	5.60
7	SL 1104 (C)	6.50	6.50	5.75	6.28
8	DS 9712 (C)	6.00	5.25	6.00	5.75
9	SL 958 (C)	7.30	6.00	5.25	6.15
10	PS 1347 (C)	6.25	4.75	4.75	5.25

Table 20: Sensory parameters of soymilk prepared from AVT 1 and 2 entries -CZ

S. No.	Entry Code	8. Sensory (Soymilk) Parameters			
		Colour	Texture	Flavour/ Beaniness	Overall acceptability
AVT I					
1	RVS-2011-10	4.9	4.7	3.7	6.0
2	DLSB-1	7.0	5.0	6.8	4.3
3	MACS 1520(C)	4.9	8.0	7.5	8.8
4	NRC-86 (C)	3.6	7.0	7.0	6.5
5	JS-20-116 (C)	8.0	7.8	6.3	5.5
AVT 1 Early					
6	PS-1569	5.6	7.0	8.4	6.7
7	JS-22-12	8.0	4.3	7.2	8.0
8	JS-22-18	6.9	7.2	7.0	4.9
9	JS-22-16	6.5	7.2	8.0	5.4
10	RVSM 2012-4	7.3	5.9	6.6	8.8
11	NRC-181	8.7	7.0	8.0	6.2
12	NRC-150	5.4	7.6	6.5	8.0
13	JS-95-60 ©	5.8	6.0	7.0	8.5
14	JS-20-34 ©	8.8	8.0	5.8	6.2
AVT II					
15	HIMSO-1689	5.4	7.5	8.2	4.7
16	JS-21-72	6.6	7.4	6.0	5.0
17	NRC-86 (C)	8.0	6.1	8.0	4.9
18	JS-20-98 (C)	8.7	5.5	4.0	7.5
19	RSC 10-46(C)	6.1	8.0	6.5	7.9
AVT II Early					
20	NRC-152	8.0	7.2	4.7	5.6
21	NRC-165	4.9	7.3	6.6	7.0
22	JS-20-34 (C)	8.8	8.0	5.8	6.2
23	JS-95-60 (C)	5.8	6.0	7.0	8.5

Table 21: Sensory analysis of Soymilk from AVT 1& 2 entries of NEHZ

Sl. No	Entries	7. Sensory (Soymilk)			
		Parameters			
		Colour	Consistency	Beaniness	Overall acceptability
1	KDS 1096	7.40	5.80	5.60	6.27
2	DLSb 1	7.20	6.20	5.20	6.20
3	DS 3108	7.20	5.80	4.00	5.67
4	DSb 38	5.80	6.40	3.60	5.27
5	MACS 1460	6.80	6.20	6.20	6.40
6	JS 20-116	5.40	6.20	5.20	5.60
7	RKS 113	6.80	6.20	6.20	6.40
8	JS 335	7.20	7.00	7.20	7.13
9	RKS 18	5.80	5.60	3.40	4.93
10	JS 97-52	5.00	6.40	5.60	5.67

Table 22: Sensory analysis of Tofu from AVT 1& 2 entries of NPZ

Sl. No	Entries	Sensory (TOFU)			
		Parameters			
		Colour	Texture	Flavour/ Beaniness	Overall acceptability
1	NRC 149	6.75	6.75	6.25	6.52
2	PS 1670	7.00	7.00	5.75	6.52
3	DS 9421	4.75	7.00	5.50	5.70
4	DS 9422	6.00	7.00	5.00	5.97
5	SL 955 (C)	5.50	5.75	5.25	5.47
6	SL 1074(C)	4.75	6.50	4.75	5.27
7	SL 1104 (C)	4.75	5.75	5.25	5.22
8	DS 9712 (C)	6.50	5.50	4.50	5.62
9	SL 958 (C)	6.00	6.50	5.25	5.87
10	PS 1347 (C)	6.75	6.25	5.00	6.00

Table 23: Sensory evaluation of Tofu prepared from NEHZ-AVT entries

Sl. No	Entries	8. Sensory (TOFU)			
		Parameters			
		Colour	Texture	Flavour/ Beaniness	Overall acceptability
1	KDS 1096	5.60	5.80	5.40	5.60
2	DLSb 1	6.60	6.20	5.40	6.07
3	DS 3108	6.00	4.80	5.80	5.53
4	DSb 38	6.40	6.40	6.00	6.26
5	MACS 1460	7.20	7.20	6.00	6.80
6	JS 20-116	6.40	7.40	5.80	6.53
7	RKS 113	6.20	6.60	5.20	6.00
8	JS 335	7.20	7.40	6.20	6.93
9	RKS 18	4.20	4.40	5.20	4.60
10	JS 97-52	4.80	4.60	5.00	4.80

Table 24: Sensory evaluation of Tofu prepared from CZ-AVT entries

Sl. No	Entries	Sensory (TOFU)			
		Parameters			
		Colour	Texture	Flavour	Overall acceptability
CZ-AVT1					
1	RVS 2011-10	6.9	6.6	6.7	6.73
2	DLSb 1	6.3	6.1	6.5	6.3
3	MACS 1520(C)	6.4	6.6	6.4	6.46
4	NRC 86(C)	7.85	7.82	7.81	7.82
5	JS 20-116(C)	5.22	5.24	5.26	5.24
CZ AVT 1 Early					
6	PS 1569	8.05	8.02	8.02	8.03
7	JS 22-12	6.3	6.6	6.6	6.5
8	JS 22-18	9.3	9.2	9.3	9.26
9	JS 22-16	6.27	6.25	6.24	6.25
10	RVSM 2012-4	6.2	6.6	6.3	6.36
11	NRC 181	8.82	8.79	8.80	8.80
12	NRC 150	6.2	6.5	6.4	6.36
13	JS 95-60(C)	6.0	6.0	6.8	6.93
14	JS 20-34(C)	8.8	7.5	7.6	7.63
CZ AVT 2					
15	HIMSO-1689	6.2	6.4	6.5	6.36
16	JS-21-72	9.1	9.0	9.3	9.13
17	NRC 86(C)	5.6	5.4	5.3	5.43
18	JS-20-98 (C)	6.8	6.8	6.7	6.76
19	RSC 10-46(C)	6.6	7.5	7.3	7.46
AVT 2 Early					
20	NRC 165	6.2	6.3	7.4	6.3
21	NRC 152	10.1	9.8	10	9.96
22	JS 20-34(C)	8.8	7.5	7.6	7.63
23	JS 95-60(C)	7.0	8.0	6.8	7.93

**Table 25: Summarized Data for food grade characteristics of AVT 1& 2 entries: NPZ
(means of all replications)**

Entry Code	Cooking time (min.)	Hydration ratio	Hull fragility	Milk Yield (lit/kg.)	Tofu yield (g/kg)
NRC 149	59	2.22	12	8.5	1286
PS 1670	74	2.12	12	8.0	2239
DS 9421	67	2.04	8	8.3	1712
DS 9422	76	2.28	5	8.8	1465
SL 955 (C)	73	2.44	11	8.2	1524
SL 1074(C)	62	2.41	15	8.0	2363
SL 1104 (C)	59	2.42	11	8.3	1502
DS 9712 (C)	60	1.74	8	8.5	2071
SL 958 (C)	70	2.18	9	8.3	2324
PS 1347 (C)	67	2.10	7	8.3	1673

Table 26: Summarized Data for food grade characteristics of AVT 1& 2 entries: CZ (means of all replications)

Entry Code	Cooking time (min.)	Hydration ratio	Hull fragility	Milk Yield (lit.)	Tofu yield (g)
AVT I					
RVS-2011-10	32.66	1.97	33	8.4	1240
DLSB-1	25	1.53	16.33	8.7	1074
MACS 1520(C)	47	2.35	12.66	8.6	1134
NRC-86 (C)	46.33	1.86	26.66	8.6	826
JS-20-116 (C)	18.66	2.22	13.66	8.3	746
AVT I Early					
PS-1569	54.66	2.03	13.33	7.6	406
JS-22-12	35.33	2.12	12.33	8.13	824
JS-22-18	48.66	1.96	13.33	8.13	790
JS-22-16	32	2.06	18	8.8	440
RVSM 2012-4	27	2.17	16.33	8.6	936
NRC-181	35	2.87	9.33	8.2	50
NRC-150	47.66	0.85	23	7.9	976
JS-95-60 (C)	37.66	2.28	8	7.9	666
JS-20-34 (C)	50	2.73	6.33	8.2	458
AVT II					
HIMSO-1689	33.33	2.84	12	8.3	4.85
JS-21-72	28.33	2.29	24	8.6	5.00
NRC-86 (C)	55.33	2.57	25.66	8.1	4.28
JS-20-98 (C)	40.33	2.84	19	8.1	0.3
RSC 10-46(C)	36.33	2.44	38.66	9.2	2.47
AVT II Early					
NRC-152	43.66	2.68	17.33	8.1	4.99
NRC-165	34	2.16	6	9.1	4.57
JS-20-34 (C)	50	2.73	6.33	8.3	2.29
JS-95-60 (C)	37.66	2.28	8	7.8	3.33

Table 27: Summarized Data food grade characteristics (means of all replications): NEHZ

Entry Code	Cooking time (min.)	Hydration ratio	Hull fragility	Milk Yield (lit.)	Tofu yield (g)
KDS 1096	51.00	2.22	8.33	8.06	1263
DLSb 1	66.00	2.17	6.33	8.06	1572
DS 3108	51.67	2.16	8.33	8.13	1455
DSb 38	54.33	2.25	20.00	9.60	1712
MACS 1460	52.67	2.25	5.33	8.33	2289
JS 20-116	45.00	2.22	20.33	8.46	1840
RKS 113 (C)	52.33	2.13	11.00	8.13	1653
JS 335 (C)	54.00	2.24	12.33	8.60	1589
RKS 18 (C)	43.67	2.19	14.66	9.60	2337
JS 97-52 (C)	51.67	2.16	9.67	8.60	2349

Summary and conclusion

From summary tables we may interpret that cooking time among all AVT Entries was lesser for RVS 2011-10, DSLb 1 (CZ-AVT I), JS 22-16, JS 22-12, NRC 181, RVSM 2012-4, HIMSO 1689, JS 21-72, NRC 165 (CZ-AVT). Hydration ratio did not vary significantly among entries. Hull fragility was highest for RVS 2011-10 (CZ-AVT I), DSB 38 and JS 20-116 (NEHZ).

Milk yield of NRC 165 (CZ-AVT), DSb 38 (NEHZ-AVT) was maximum and tofu yield for DLSb 1, DSb 38, MACS 1460, JS 20-116 (NEHZ), RVS 2011-10, DLSb 1, RVSM 2012-4, NRC 150, NRC 152, JS 21-72 (CZ-AVT I), was highest.

Sensory evaluation was done by panellist on 9 point hedonic scale by semi-trained panellists. Keeping score 6 as acceptable sensory score, NRC 149, PS 1670 (NPZ), DLSb 1, DSb 38, MACS 1460, JS 20-116 (NEHZ), and all entries from CZ were acceptable for tofu sensory.

Therefore, we may conclude from all the compiled results that there is significant difference in terms of food grade characteristics among AVT entries of three zones.

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Appendices

3.10 Recommendation and Action Taken Report

S. No	Comment	Action Taken
1.	Strengthening of sharing of segregating material especially for centers with poor varietal developmental programme. More crosses should be shared by ICAR-IISR, Indore for this programme.	Working toward this, 118 crosses for drought, water logging tolerance, photo-insensitivity, long juvenility, charcoal rot and anthracnose resistance were made. Hybridity was confirmed and material being sent for advancement of 2 generations at Bengaluru. F4s would be distributed to centres.
2.	Explore the possibility of developing soy protein isolates in collaboration with ICAR-CIPHET	A multi-institutional project for food uses and protein isolates has been submitted to DBT, New Delhi for financial support.
3.	More concerted efforts to be made for directed pre-breeding programme.	Fresh crossing programme, backcrossing and three way crosses of last year F1s involving <i>G soja</i> were attempted for incorporation of YMV resistance, insect tolerance and reducing reproductive period.
4.	Parents should be suggested to centres based on diversity analysis	Diversity analysis was conducted for 322 germplasm evaluated at 8 centres in different zones and crosses based on most diverse parents and the objective of the centre have been suggested. In all the suggested crosses one parent is high yielding variety of the zone.
5.	Early maturity trials to be taken up in all zones.	Early maturity trials were taken up in all zones except NEHZ.
6.	A trial on 'effect of different ratios and levels of nitrogen and phosphorus fertilizers on the growth and yield of soybean [<i>Glycine max</i> (L.) Merrill.] during <i>kharif</i> under rainfed situations' should be taken up from <i>Kharif</i> 2022.	The proposal was presented in pre-workshop meeting and was not found suitable for taking up the experiments.
7.	In collaboration with breeders and molecular biologists, decipher the molecular mechanism for showing multiple disease resistance in selected lines	From the multiple disease resistance germplasm identified under field condition, EC 34372 showed resistance to Indore isolates Anthracnose and CR under epiphytotic of conditions. This line will

		further be utilized in deciphering the molecular mechanism.
8.	Artificial screening facilities and sick plots have to be developed at ICAR-IISR at least for nationally important diseases.	Action has been initiated for creating facility for artificial screening of disease after EFC approval. Sick plot development is being taken up from this year.
9.	If the number of F6 breeding lines is less (~20), artificial screening may be followed.	Total 152 F6 breeding lines were screened for Anthracnose and Collar Rot at Indore centre and 25 F6 breeding lines were screened for RAB, YMV and BP at Pantnagar centre.
10.	The confirmation of resistance should be done under artificially inoculated conditions	Total ten entries which showed HR against Collar Rot at Jorhat centre, were screened for artificial condition and none of entry found resistance against Coll. R. PS 16-70 and PS 16-61 showed lowest AUDPC against Coll. R. JS 20-98 showed HR reaction against CR from 4 year of testing, that was also showed MR reaction against CR from Jabalpur isolate and showed S reaction from Indore isolate.
11.	Screening of soybean genotypes for resistance viz., in case of antixenosis, traits related to its resistance to be studied which will be a reckoner for breeders in using insect resistance breeding program as donors.	Two traits i.e. pubescence type and pubescence density are being recorded for correlating them with resistance.
12.	Efforts to be made to utilize wild species and wild relatives of soybean in insect screening trails.	Work was initiated and among 5 wild species (<i>Glycine latifolia</i>, <i>Glycine microphylla</i>, <i>Glycine tomentella</i>, <i>Glycine canescens</i> and <i>Glycine tabacina</i>) screened for antibiosis, <i>Glycine tomentella</i>, <i>Glycine canescens</i> and <i>Glycine tabacina</i> exhibited antibiosis against <i>Spodoptera litura</i>. Further 5 <i>Glycine soja</i> accessions were screened and PI 407170 showed antixenosis response against <i>Spodoptera litura</i>. Pre breeding (<i>Glycine max</i> × <i>Glycine soja</i>) for insect resistance against <i>Spodoptera litura</i> is

		being attempted. 9 Interspecific F1`s were screened for antixenosis
13.	To utilize the results of moisture stress tolerant rhizobia evaluated for three years under simulated stress conditions pots, for large scale utilization of soybean, the proposed field trial on field evaluation of <i>B. daqingense</i> at all the centres should be formulated from kharif 2021 (MB 2/21).	A new trial on <i>B. daqingense</i> has been formulated for its field evaluation
14.	Promotion of outcome of MB4/14 field trial of microbial combination should be attempted as package of practice for large scale application in soybean	The outcome of microbial consortia was identified and recommended as package of practice for soybean application
15.	FLD report should be made based on cost of cultivation and per day productivity as the present varieties have shorter days to maturity and the comparison with past decades would not be correct. A column of year of release of variety should also be there in the report	As per suggestion, economics, per day productivity of 40 soybean varieties calculated and in tabular form in the report.
16.	Under STC and TSP the list of beneficiaries' should separately indicate (i) under FLDs and (ii) under Training and Awareness Programmes	Recommendation has been complied
17.	Conduct a small study indicating realistic data on cost of cultivation based on which request for enhanced budget under FLD component may be requested from DAC.	The last five years (2017-2021) conducted (5865 trials in 118 locations across India) FLDs cost of cultivation (COC) under improved (IP) and farmers practices (FP) were taken to finalize cost of cultivation of soybean. The average cost of cultivation of soybean is 12589 Rs/acre under IP and 11045Rs/acre in FP. The change of soybean COC in 2021 over base year 2017 was 3438Rs/acre and 3239 Rs/acre, under IP and FP, respectively.
18.	Identify popular soy food products, characteristics of soybean for these products and initiation of programme on development of soy food indices.	Screening for food grade characteristics of new AVT entries against popular control varieties has been taken up to develop soy milk and tofu indices.

Multi-location Germplasm Evaluation

A set of 322 soybean germplasm lines including checks was evaluated under RBD at multi-locations (8 centers). This trial was conducted with the purpose of identification of superior germplasm lines for yield and associated traits as well as identification of diverse germplasm lines for suggesting best cross combinations for respective zones. This activity is basically designed for broadening the genetic base to evolve the best soybean genotypes at particular zone. Details of trials are given below:

Accessions: 322 (Table 1)

Design: RBD; Replication: 2; Row length: 1.5 m

Centres:

- NHZ: Palampur and Almora
- NPZ: Pantnagar
- NEHZ: Imphal
- Eastern Zone: Raipur
- Central Zone: Indore and Parbhani.
- Southern Zone: Pune

Traits:

1. Days to 50% flowering
2. Days to maturity
3. Plant height (cm)
4. Number of pods
5. Number of nodes
6. Seed yield per plant (g)
7. 100 seed weight (g)

Checks:

- NHZ: VLS 59, VLS 89, VLS 63, SL 1074, PS 1556, Palam Soya, Himso 1685, Harasoya
- NPZ: SL 1074, SL 955, PS 26, NRC 128
- NEHZ: MACS 1460, RKS 113, MACS 1407, KDS 753, JS 20-116, JS 97-52

- Eastern Zone: MACS 1460, RKS 113, MACS 1407, KDS 753, JS 20-116, NRC 128, RSC 10-52, AMS 2014-1, JS 97-52
- Central Zone: NRC 86, JS 20-116, JS 20-34, RSC 10-52, JS 20-69, NRC 130, NRC 138, RVSM 2011-35
- Southern Zone: Dsb 23, Dsb 34, KDS 753

Important descriptive statistics {(mean, range and CV (%)} of 322 germplasm lines over the 8 locations have been presented in Table 2. Top ten entries for yield per plant, early maturity and seed size are presented in Table 3.

Table 1: Details of soybean germplasm lines used in multi-location trails

S.No	Genotype	S.No	Genotype	S.No	Genotype	S.No	Genotype
1	IC 15089	82	JS335	163	IC 15759	244	TGX 239-6 D
2	CAT 47	83	EC 546882	164	BRAGG	245	MACS 13 (S)
3	NRC 12	84	EC 333901	165	EC 241715	246	AMSS 34
4	JS 20-34	85	JS 20-29	166	EC 39573	247	B 1667
5	KALITUR	86	EC 287754	167	TGX 824-35 E	248	EC 34060
6	AGS 153	87	EC 538807	168	TGX 328-049	249	EC 274701
7	EC 528623	88	TGX 849-309 F	169	PLSO 79	250	EC 100804
8	ICS 84/86-85B-41	89	TGX 825-3 D	170	TGX 802-265-D	251	EC 291453
9	JS 20-38	90	TGX 317-37 E	171	MACS 450	252	EC 76759
10	EC 390977	91	JSM 288	172	CAT 1258	253	EC 389173
11	NRC -7	92	JS(SH) 2001-64	173	RSC 10-52	254	EC 309529
12	EC 241756	93	JS 20-73	174	CAT 1341	255	EC 251416
13	TGX 854-42 D	94	PK 1284	175	EC 313974	256	TGX 863-26 F
14	TGX 854-429	95	PK 566	176	EC 291400	257	JS 98-02
15	TGX 825-17 E	96	PS 1029	177	EC 289099	258	T 49
16	PI 340900	97	K 53	178	EC 389391	259	WT 150
17	AMS-MB-5-18	98	MACS 708	179	TGX 849-47 F	260	NRC 1
18	AGS 142	99	PI 283327	180	HARDEE	261	AGS 193
19	BR 15	100	EC 456566	181	GC 12	262	DS 366
20	EC 291397	101	AGS 205	182	TAMS 38	263	EC 241761
21	NRC 2	102	EC 343310	183	EC 241712	264	EC 251388
22	EC 457464	103	MACS 1460	184	EC 581521	265	EC 287464
23	RVS 2001-18	104	CAT 1706	185	TGX 330-325 D	266	AGS 25
24	TGX 311-101 F	105	DS 97-12	186	PI 200465	267	EC 251456

25	JS 93-05	106	EC 389165	187	MAUS-61-2	268	TGX 996-5 F
26	B 160-3	107	TGX 825-1E	188	AGS 156	269	TGX 854-77 D
27	NRC 86	108	TGX 1016-19 F	189	ACC 1026	270	TGX 293-47 E
28	EC 457280	109	TGX 239-43 D	190	BR 10	271	V 55
29	TGX B 1435 E	110	TGX 854-4 F	191	EC 341822	272	EC 287457
30	TGX 780-5A	111	JS 79-82	192	EC 289091	273	EC 457305
31	PK 474	112	HIMSO 175	193	EC 251432	274	AGS 110
32	EC 457050	113	M 1052	194	EC 250591	275	B 471
33	BRG 1	114	PUSA 16	195	EC 251498	276	EC 39177
34	EC 547464	115	EC 341115	196	EC 291399	277	TGX 560-20D
35	EC 100778	116	EC 528622	197	EC 325113	278	VLS 75
36	EC 95815	117	EC 309537	198	EC 393231	279	EC 333870
37	EC 457052	118	TGX 984-18 E	199	EC 13054	280	EC 241310
38	EC 39376	119	TGX 311-59 E	200	TGX 86-24-6 E	281	EC 389154
39	EC 396067	120	JSM 302	201	SL 142	282	EC 389152
40	JS 20-76	121	JS 94-67	202	NRC 2007-1-3	283	EC 467282
41	JS 20-72	122	PS 1225	203	INDRA SOYA9	284	MACS 250
42	MAUS 47	123	LESOY 273	204	KHSB 2	285	SQL 5
43	RAUS -5	124	MACS 227	205	ADT-1	286	EC 251514
44	ALANKAR	125	PK 262	206	CO- soy-1	287	EC 390979
45	PALAM SOYA	126	MACS 58	207	EC 456613	288	EC 390981
46	IMP. PELICAN	127	CAT 1710	208	EC 457516	289	AKSS 143
47	PK 308	128	CAT 1149	209	B 252	290	N 298
48	ANKUR	129	CAT 2797	210	EC 274683	291	NRC 57
49	CO-SOYA-2	130	MACS 1520	211	EC 250577	292	EC 380522
50	GUJ. SOYBEEN-1	131	DS 321	212	EC 538802	293	EC 389179
51	SL-295	132	EC 274713	213	EC 389163	294	SQL 40
52	SHILAJEET	133	EC 309543	214	TGX 849-309 A	295	P 318
53	SHIVALIK	134	EC 589409	215	TGX 822-10 E	296	SQL 98
54	DURGA	135	EC 391181	216	TGX 302A-68 D	297	INDORE-2

55	PUSA 37	136	EC 542431	217	M 1085	298	NANKING
56	MAUS 71	137	TGX 298-7D	218	MAUS 142	299	JS 97-52
57	MAUS-1	138	TGX 803-99 E	219	LEE	300	JS 20-69
58	JS 75-46	139	CAT 660	220	EC 456620	301	PK 472
59	JS 20-98	140	TGX 312-012 E	221	AGS 128	302	NRC 37
60	DS 205	141	TGX 802-100 F	222	EC 287460	303	JS 71-05
61	TGX 860-11 D	142	TGX 573-209-23	223	EC 113770	304	NRC 128
62	TGX 855-44 G	143	IC 24532A	224	EC 103334	305	JS 20-116
63	JS 20-86	144	EC 357998	225	EC 18593	306	AMS 2014-1
64	NRC 2396	145	MACS 124	226	EC 15553	307	RSC 11-07
65	MACS 1034	146	EC 602288	227	TGX 854-60 A	308	SL 1074
66	MACS 1028	147	AGS 218	228	TGX 849-143 D	309	RKS 113
67	PUNJAB	148	EC 343312	229	JS 95-52	310	MACS 1407
68	EC 457475	149	EC 242003	230	GP 493	311	VLS 59
69	DSB 23	150	EC 550828	231	AGS 143	312	VLS 89
70	JS 90-41	151	EC 615187	232	AGS 105	313	VLS 63
71	Kaeri 651-6	152	EC 572160	233	EC 2579	314	RSC 10-52
72	EC 333859	153	TGX 702-4-8	234	EC 389167	315	PS 26
73	EC 274711	154	TGX 855-32 E	235	EC 389178	316	NRC 138
74	EC 93601	155	TGX 8116-21 D	236	TGX 802-150 D	317	NRC 130
75	EC 241995	156	TGX 86-24-1 D	237	TGX 539-2D-7	318	KDS 753
76	EC 391346	157	JS 20-37	238	TGX 885-44 E	319	DSB 34
77	EC 389148	158	JSM 245	239	TGX 814-148 F	320	Palam soya 1
78	EC 589400	159	KB 249	240	TGX 713-1 F	321	SL 955
79	ICAL 122	160	MAUS 41	241	TGX 573-219 D	322	RVSM 2011-35
80	PS 1024	161	IC 13051	242	TGX 297-16 F		
81	MACS 57	162	YOUNG	243	TGX 297		

Table 2: Mean, range and variance for yield attributing traits at different locations

Trait	Almora			Palampur			Parbhani			Indore		
	Mean	Range	CV	Mean	Range	CV	Mean	Range	CV	Mean	Range	CV
Days to 50% flowering	55.28	42.5-64	8.59	55.08	43-64	8.72	40.84	33.5-49.5	9.20	44.60	25.5-56	12.51
Days to maturity	111.80	96-125	4.12	124.48	114-129	1.63	100.37	92.5-111	3.92	105.59	86-121	5.68
Plant height (cm)	69.10	32.5-120	24.30	97.07	52.9-145.4	17.53	48.23	20.1-100.5	34.14	58.17	28.5-100	19.03
Number of pods	53.27	21.5-86.5	21.02	67.76	29.4-121.1	23.32	47.11	14.7-126.5	39.19	33.34	3.5-106	52.25
Number of nodes	13.37	8-18.5	15.35	12.05	5.5-17.6	18.44	23.47	8.9-28.4	41.16	8.71	4.5-15.5	22.85
100 seed weight (g)	11.06	5.48-17.42	19.80	13.62	9.1-21.9	16.36	12.57	7.17-18.26	13.95	6.81	1.02-18.45	46.12
Grain yield per plant (g)	13.52	4.2-31.54	35.63	14.43	6.7-22.3	19.36	6.06	3.28-11.47	18.61	4.34	0.14-13.57	60.78
Trait	Imphal			Raipur			Pune			Pantnagar		
	Mean	Range	CV	Mean	Range	CV	Mean	Range	CV	Mean	Range	CV
Days to 50% flowering	44.32	37-55.5	9.29	45.69	37-52	6.43	40.41	30-54	10.44	60.64	43.5-70.5	8.77
Days to maturity	99.78	89-109.5	4.33	96.00	83-110	5.11	93.17	81-106	5.21	119.44	111-127.5	2.77
Plant height (cm)	62.66	32.5-102.5	18.73	58.03	15.33-142.66	41.35	71.83	36-115	20.48	73.09	22-169.5	38.02
Number of pods	64.07	18.7-130.46	22.02	56.44	11.5-123.83	41.58	45.05	23.6-84.2	23.85	-	-	-
Number of nodes	11.99	7.8-16.3	12.50	-	-	-	11.12	7.4-19.6	14.89	18.74	10.5-34.5	23.66
100 seed weight (g)	12.35	6.31-18.27	18.19	10.30	6.0-16.0	19.87	11.86	7.85-16.15	11.95	-	-	-
grain yield per plant (g)	12.38	2.94-31.25	31.36	12.54	5.0-26.0	45.47	8.49	3.87-16.43	27.18	7.71	3.2-21	42.48

Table 3: Prominent germplasm lines for high yielding traits

	Palampur	Almora	Pantnagar	Imphal	Indore	Parbhani	Raipur	Pune
#Yield per plant	MACS 124, TGX 293-47 E, EC 357998 , SL 1074, ADT-1, LEE, EC 103334 , AGS 143 , EC 456620, TGX 984-18 E	P 318, NANKING , MACS 124, EC 343312, EC 274713, PK 472, MAUS 41, HIMSO 175, MACS 1407, JS335	T 49, DSB 34, EC 528623, ICAL 122, CAT 2797, JS 95-52, EC 357998 , HARDEE, CAT 660, TGX 312-012 E	EC 241995, EC 456613, EC 457475, EC 391346, EC 538807, TGX 854-4 F, EC 357998 , PUSA 16, EC 341115, TGX 298-7D, MAUS 41	TGX 825-3 D, JS 20-72, TGX 854-429, DS 321, NRC 7, EC 546882, JS 20-38, RSC 11-07, TGX 560-20D	Trait	TGX 8116-21 D, JS 75-46, MACS 450 , TGX 802-265-D, NRC 2396, GUJARAT SOYBEEN-1, TGX 824-35 E, EC 274713 , JS 20-37, DS 205	AGS 143 , M 1085, EC 287460, MAUS 142, MACS 1407, EC 2579, EC 103334 , EC 251416, EC 457305, CAT 47
#Seed size	MACS 58 , EC 241756, TGX 854-42 D, NRC 12 , NRC -7, TGX 854-429, MAUS 71, EC 547464 , BR 15, EC 113770	VLS 89 , PK 472, KDS 753, VLS 63 , PK 1284, VLS 59 , NRC 12 , WT 150, JS 79-82 , N 298	-	SQL 5, NRC 130 , VLS 63 , AGS 193, KDS 753, VLS 89 , JS 20-29, PS 1024, JS 79-82 , ICAL 122	RVS 2001-18, CAT 2797, HARDEE, EC 333901, EC 538807, EC 547464 , EC 528622, EC 287457, YOUNG, EC 457464	JS 79-82 , NRC 130 , EC 333901, ALANKAR, PK 472, TAMS 38, TGX 825-17 E, VLS 89, MACS 58 , NRC 12	NRC 12 , IMPROVED PLICAN, MAUS-61-2, EC 589400, AKSS 143, NRC 130 , EC 100778, EC 457052, PUSA 37, JS 75-46	JSM 245, MACS 1460, JS 79-82 , TGX 885-44 E, MACS 708, EC 274713, EC 389152, TGX 802-100 F, EC 251514, M 1052,
#Early maturity	JS 20-34 , KALITUR , JS 20-38 , ICS 84/86-85B-41 , TGX 825-17 E, EC 242003, INDRA SOYA9, NRC 12, TGX 854-429, EC 39376	JS 20-72 , JS 20-29, EC 333870, TGX 854-429, EC 457464 , TGX B 1435 E, EC 547464, JS(SH) 2001-64, SL 955, ICS 84/86-85B-41	EC390977 , B 160-3, DS 97-12, TGX 860-11 D, CAT 1706, EC 467282, PI 340900, EC 341115, EC 457516, EC 389154	JS 20-72 , EC 390977 , EC 457464 , ICS 84/86, JS 20-38 , TGX 825-3 D, EC 251514, RVVS 2001-18, EC 547464 , JS 20-76	CAT 47, AGS 153, EC 457464 , JS 20-34, ICS 84/86-85B-41 , TGX 573-209-23, NRC 130 , IC 24532A, NRC 138 , EC 390977	CAT 47, NRC 12, AGS 153, JS 20-38 , EC 251514, EC 528623, PS 1024, SL-295, SQL 5, VLS 59	JS 20-38 , EC 456566, EC 391346, NRC 130 , EC 547464, EC 546882, EC 341115, EC 528622, EC 343312, KALITUR	EC 538807, TGX 849-309 F, EC 467282, EC 251514, NRC 138 , NRC 130 , EC 457464, EC 547464, JS 20-72 , EC 389148

*Genotypes performing better at more than one zone for the trait depicted in bold.

Genetic diversity studies of germplasm accessions across multilocations

The quantitative assessment of genetic divergence was made by adopting D^2 statistic for yield and its component traits (Rao, 1952). For all the eight locations, genetic diversity studies were carried based on D^2 values such that the genotypes belonging to same cluster had smaller D^2 values when compared to the ones belonging to different clusters. It is assumed that maximum amount of heterosis will be manifested in cross combinations involving the parents belonging to most divergent clusters.

In the study 322 germplasm accessions were evaluated at 8 locations. For which genetic divergence studies were conducted and grouped germplasm accessions into different clusters based on D^2 values

Table Genetic divergence clusters of 8 locations

S. No	Centre	Number of clusters based on D^2 values
1	Almora	11
2	Palampur	12
3	Pantnagar	11
4	Imphal	7
5	Raipur	11
6	Indore	11
7	Parbhani	18
8	Pune	12

Table Contribution of traits for the diversity (In Percentage)

S.No	Trait	Almora	Palampur	Pantnagar	Imphal	Raipur	Indore	Parbhani	Pune
1	Days to 50% Flowering	42.56	13.76	13.22	54.23	5.58	27.61	4.58	46.03
2	Days to maturity	6.32	23.6	50.29	20.75	13.58	16.65	0.58	49.31
3	Plant Height	26.13	17.73	30.87	10	1.68	49.97	43.25	0.66
4	Number of nodes per plant	1.35	1.53	0.29	0.57	-	0.45	26.09	0.87
5	Number of pods per plant	4.15	3.27	-	2.66	0.26	0.38	24.1	0.94
6	100-seed weight	15.14	33.17	-	5.11	78.75	4.47	0.75	0.79
7	Seed yield per plant	4.35	6.94	5.33	6.68	0.15	0.47	0.65	1.4

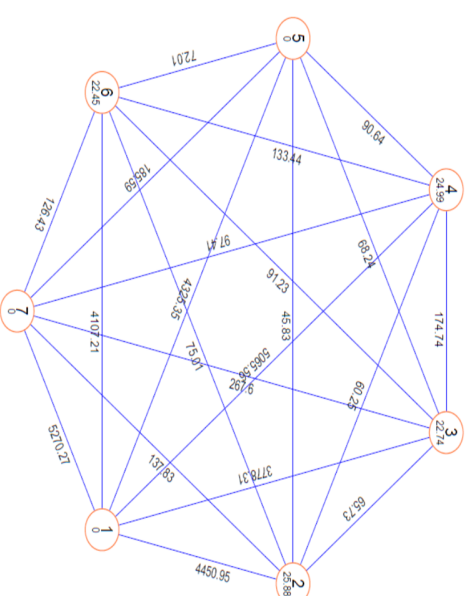
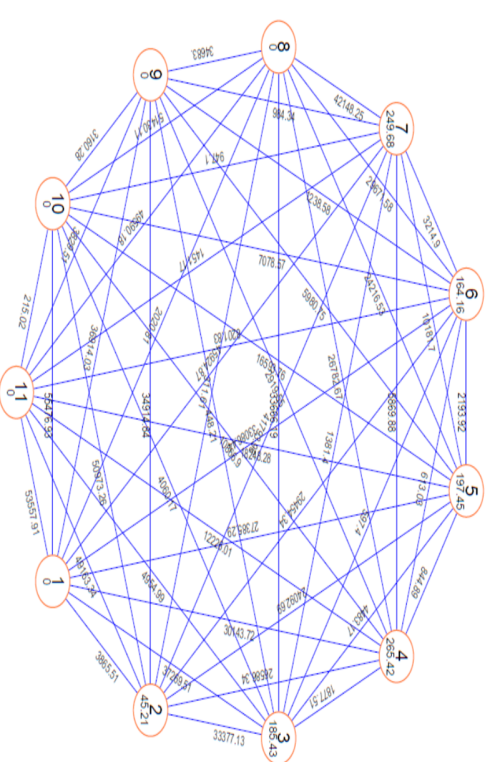
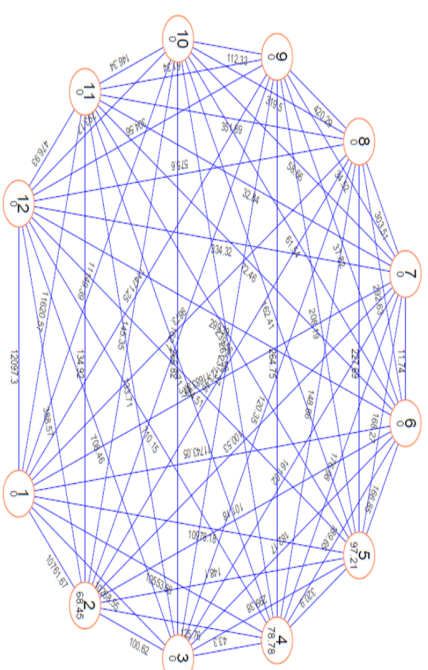
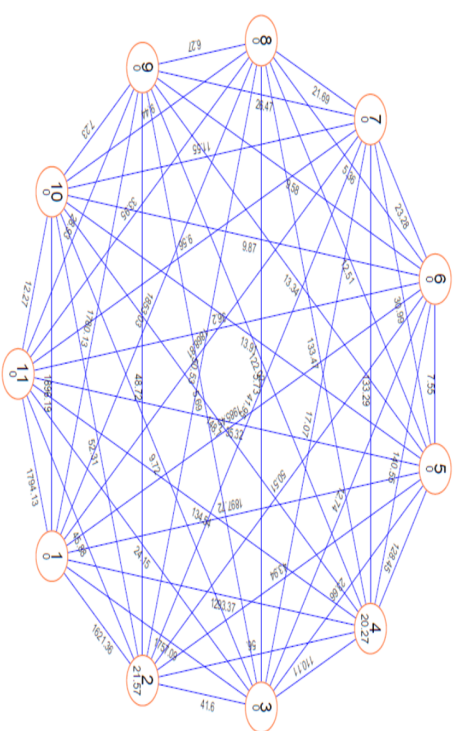
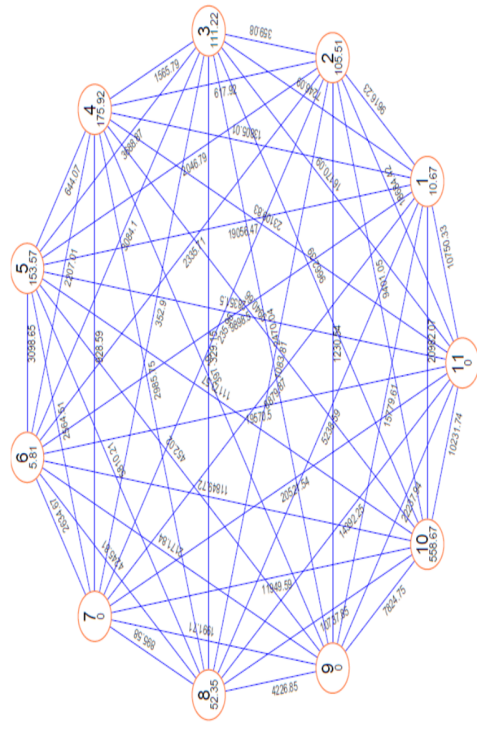
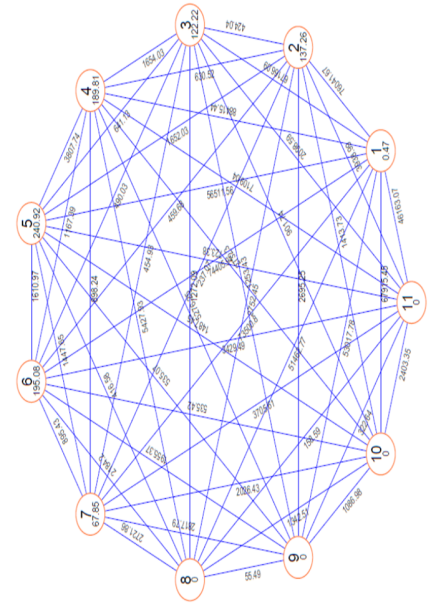


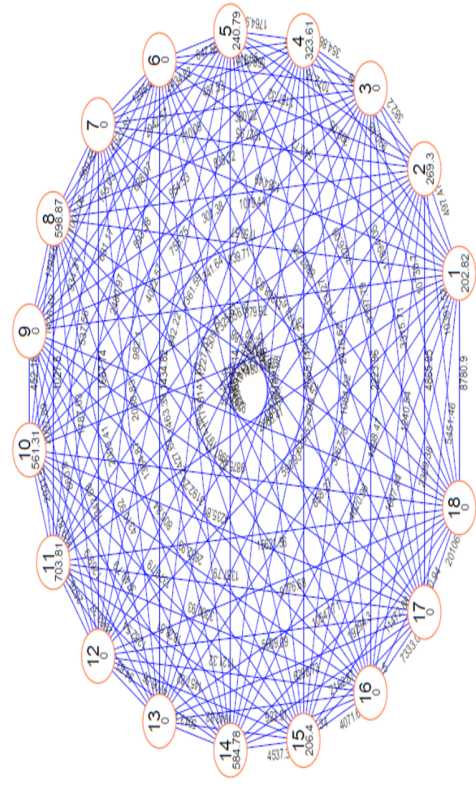
Fig Mahanobis Euclidean distance among 322 germplasm accessions across locations



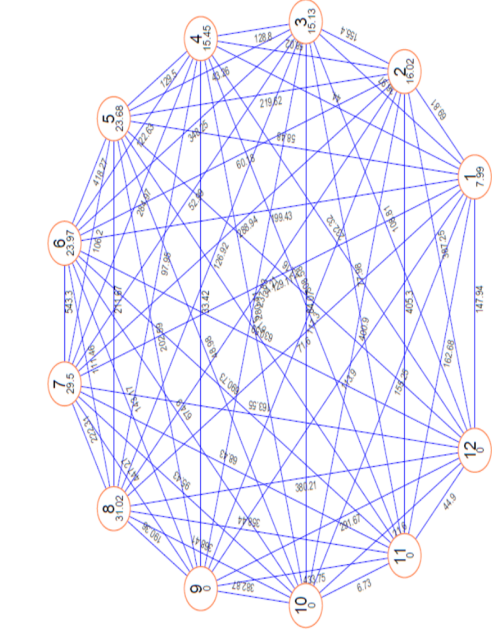
Raipur



Indore



Parbhani



Pune

Fig Mahalanobis Euclidean distance among 322 germplasm accessions across locations

Target Crosses for locations

Based on the genetic diversity, yield and yield component traits, the following crosses were suggested as per location.

Zone	Location	Cross
NHZ	Almora	1. VLS 63 × MCAS 124
		2. VLS 89 × P 318
		3. VLS 89 × NANKING
		4. VLS 89 × AGS 218
		5. VLS 63 × EC 274713
	Palampur	1. VLS 63 × MCAS 124
		2. VLS 89 × P 318
		3. VLS 89 × NANKING
		4. VLS 89 × AGS 218
		5. VLS 63 × EC 274713
	Pantnagar	1. SL 1074 × AGS 25
		2. PS 26 × AGS 25
	Imphal	1. MACS 1460 × EC 456613
		2. KDS 753 × EC 241995
		3. JS 20-116 × EC 391346
		4. MACS 1460 × EC 457475
		5. MACS 1460 × EC 538807
NPZ	Pantnagar	
NEHZ	Imphal	

Zone	Location	Cross
Eastern	Raipur	1. JS 97-52 × JS 75-46
		2. MACS 1460 × TGX 8116-21 D
		3. MACS 1460 × EC 274713
Central	Indore	1. NRC 130 × CAT 2797
		2. NRC 138 × CAT 2797
		3. JS 20-69 × EC 457464
		4. RSC 10-52 × TGX 854-429
		5. NRC 138 × EC 546882
	Parbhani	1. NRC 138 × EC 274713
		2. RSC 10-52 × EC 274213
		3. NRC 138 × NANKING
		4. NRC 130 × MACS 450
		5. JS 20-69 × MACS 450
Southern	Pune	1. KDS 753 × EC 2579
		2. Dsb 34 × EC 2579
		3. KDS 753 × EC 103334
		4. Dsb 34 × AGS 143
		5. Dsb 34 × Lee

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Evaluation of Soybean genotypes for water logging tolerance at AICRP centers

Water logging trails with a set of 17 soybean genotypes (elite breeding lines and germplasm lines) including 2 checks (JS 97-52 and JS 20-69), were conducted at two centres (Umiam and Jorhat) of NEHZ and three centres (Indore, Parbhani and Kasbedigraj) of CZ in RBD (two replicates). Trail at Parbhani centre was failed due to heavy rainfall just after sowing and trail at Kasbedigraj was successful only for control plot, although that plot was in low-lying field, so waterlogged situations maintained due excessive rainfall. However, trails at Indore, Umiam and Jorhat centres were successful in control and waterlogged plots both. The water logging conditions (stress) were provided in reproductive (R_1 - R_2) stages for 15 days up to 12-15 cm water level above the soil surface in stressed plot while counter control plot was maintained with normal irrigated conditions and yield traits were recorded from both plots. Foliar damage score (FDS) was recorded in water logged plot on 1(tolerant) - 9(susceptible) scale based on foliage chlorosis and necrosis. Based on yield data, water logging tolerance index (WLTI) was calculated with following formula.

$$WLTI = (Y_{WL}/Y_C)/(M_{WL}/M_C)$$

Where, Y_{WL} and Y_C are the genotype yield under waterlogged plot and control plot respectively and M_{WL} and M_C are the mean yields over all genotypes in the given treatment under waterlogged plot and control respectively.

Performances of genotypes including checks are given in Table. On the basis of water logging tolerance index (WLTI) and FDS, genotypes viz., NRC 186, NRC 192, NRC 189, JS 20-76 and Hardee found to better than best check JS 20-69 at Umiam center, while genotypes viz., NRC 186, NRC 192, EC 456556, EC 389148, JS 20-76, CAT 2797, EC 602288 and CAT 1341 found to better than best check JS 97-52 at Jorhat center. At Indore, genotypes viz., NRC 186, NRC 192, NRC 193, Sel 3-79, Sel 3-21, NRC 189, JS 20-76 and EC 602288 performed better than best check JS 97-52. Similarly, if waterlogged conditions assumed at Kasbedigraj center due to heavy rainfall in low-lying area, than genotypes viz., NRC 186, NRC 192, Sel 3-21, NRC 189, EC 389148 and Hardee found to be better than best check JS 20-69. In this MLT for waterlogging tolerance, some genotypes viz., NRC 186, NRC 192, NRC 189, JS 20-76 found to be better than best check in more than two locations.

Table : Performance of soybean genotypes for waterlogging tolerance in AICRP trails

Genotype	Umiam		Jorhat		Indore		Kasbedigraj
	FDS	WLTI	FDS	WLTI	FDS	WLTI	**Plot yield (Kg/ha)
NRC 186	4	1.26	3	1.15	3	1.40	3235.79
NRC 192	3	1.30	3	1.66	2	1.83	1902.59
NRC 193	5	0.56	5	0.72	3	1.21	749.93
NRC 146*							
Sel 3-79	5	1.00	4	0.86	3	1.29	1249.88
Sel 3-21	6	0.78	4	0.75	3	1.37	1610.95
NRC 189	4	1.24	4	0.83	5	1.48	2680.29
EC 456556	6	0.68	1	1.15	4	0.89	1152.66
EC 389148	4	1.02	5	1.07	-	-	2277.55
JS 20-76	3	2.26	1	1.45	4	1.33	1180.44
HARDEE	4	1.84	1	0.94	6	0.58	1680.39
CAT 1258	5	1.03	6	0.22	3	0.65	574.94
CAT 2797	3	1.09	2	1.19	5	0.52	1152.66
EC 602288	6	0.58	3	1.14	4	1.20	1208.21
CAT 1341	4	1.09	3	1.44	3	0.57	624.94
JS 97-52(Chk)	4	1.08	2	1.04	3	1.14	1138.78
JS 20-69(Chk)	3	1.23	4	0.648	3	0.91	1402.64

*Not germinated **calculated mean value

National Hybridization Programme

Following crosses were shared with co-operating centres in 2021

Centre	AICRPS code	Parents	Generation	Trait
Jabalpur	NHP1	JS20-94XJS95-60	F3	High yield, earliness, four seeded, YMV
	NHP2	JS20-98 XPUNJAB 1	F3	High yield, seed longevity, seed size, multiple resistant
	NHP3	JS20-116 XPUNJAB 1	F3	High yield, seed size, YMV resistance
	NHP4	JS20-116XJS 95-60	F3	High yield, earliness, four seeded, YMV resistance.
	NHP5	JS20-116 XAMSMB5-18	F3	High yield, seed longevity YMV and CR resistance
	NHP6	JS22-04XJS93-05	F3	High yield, earliness and four seeded
	NHP7	JS22-04 XPUNJAB 1	F3	High yield, earliness, longevity,
	NHP8	JS22-05XJS20-34	F3	Earliness, High yield,
	NHP9	SL738X JS 95-60	F3	High yield, earliness, YMV & insect resistance, four seeded
	NHP10	JS20-98xJS95-60	F4	Earliness, four seeded and CR resistance
	NHP11	JS21-17xPS1092	F4	High yield, CR and YMV resistance
	NHP12	CAT87xJS20-94	F4	High yield and YMV resistance
	NHP13	DS3105xJS20-69	F4	High yield, CR & YMV resistance
	NHP14	JS21-05xJS20-24	F5	High yield, resistance to YMV and CR
	NHP15	JSM128xPS1556	F5	High yield, resistance to YMV and CR
Pune	NHP16	MACS1460 xJSSH 93-37	F3	Yield
	NHP17	MACS1460 xTAMS9821	F3	Drought tolerance
	NHP18	MACS1460xRSC10-46	F3	Drought tolerance
	NHP19	MACS1460 xJS95-60	F3	Earliness
	NHP20	MACS450 xNRCSL1	F3	YMV resistance
	NHP21	MACS450 xDsb34	F3	Rust resistance
	NHP22	MACS1188x EC251396	F4	Earliness
Parbhani	NHP23	JS20-29 X AMS100-39	F3	High yield
	NHP24	JS20-69 XMAUS612	F3	Charcoal rot resistance
	NHP25	MAUS71XJS20-2	F3	High yield
	NHP26	MAUS71X JS20-69	F3	Charcoal rot resistance
	NHP27	MAUS71 XNRC130	F3	Earliness
	NHP28	MAUS162 XAMS100-39	F3	High yield
Sanosara	NHP29	Type49 xEC538828	F10	Earliness and diverse parents
	NHP30	JS335xEC538828	F10	Earliness, diversity and bold seed
Indore	NHP31	JS97-52xEC390977xJS 90-41	F3	Photo insensitivity, diversity
	NHP32	SL958xMACS450	F3	YMV resistance
	NHP33	PK416 xAGS25	F3	Long juvenility
	NHP34	(JS97-52xEC390977)x EC771112	F3	Earliness and photo insensitivity
	NHP35	RVS2012-1xJS95-60	F3	Earliness
	NHP36	[(JS97-52xAGS25)x ADT1]xNRC130	F3	Photo insensitivity and long juvenility
	NHP37	[SL958x(JS97-52xEC 390977)]xEC572154	F3	YMV resistance, earliness and photo insensitivity

	NHP38	JS20-34xEC771186	F3	Earliness and diverse parents
	NHP39	EC572154xDS3106	F3	Multiple disease resistance, earliness and diverse parents
	NHP40	EC572154 xEC538828	F3	Earliness, photo insensitivity
	NHP41	[(JS97-52xEC390977)x MACS450] xEC572086	F3	Earliness, photo insensitivity
	NHP42	(NRC37xJS97-52)xEC 572086	F3	Earliness and diverse parents
	NHP43	JS97-52xEC390977	F3	Photo insensitivity and earliness
	NHP44	RVS2001-18 xAK887	F3	High yield
	NHP45	(NRC37xJS335)xNRC 121	F3	Earliness
	NHP46	(Cat3293xJS9041)xF5 (JS 97-52 xMACS330)	F3	Drought tolerance and earliness
	NHP47	F5(JS97-52xNRC37)xF5 (JS97-52xJS90-41)	F3	Drought and waterlogging tolerance

Following F₁s are under generation advancement at UAS Bengaluru

List of Crosses (F₁s) received for Off season nursery – 2021-22

Centre	Cross (F ₁ s) details
Palampur	CAT 411A x NRCSL-1 GP-448 x H-330 JS335 x HIMSO-1685 HIMSO-1685 x JS335 (NRC-136 x EC-242105) x NRC-136
Parbhani	JS 20-116 x MAUS 612 MAUS 612 x KDS 992 JS 20-34 x KDS 992 NRC 136 x JS 95-60 NRC 136 x MAUS 71 NRC 136 x KDS 992 MAUS 612 x NRC 136
Amreli	JS 335 x Himso 1689 MACS 1520 x JS 20-34
Imphal	DSb 21 x Sikkim Block MACS 1460 x DSb 21

Following segregating material is under generation advancement at UAS Bengaluru

List of Segregating materials received for Off season nursery - 2021-22

Generation	Cross	No. of Progenies
F ₂	DSB 34 x EC242104 DLSB-1 x EC242104 DSB 39 x EC242104 DSB 39 x DSB-34 DSB 23 x JS 20-116 JS 335 x JS 2034	300
F ₃	DLSB-1 x JS 95-60 DSB-32 x DLSB -1 DLSB-1 x DSB 32 DSB 32 x DLSB -2 DSB23 x DLSB-2 DSB 23 x DLSB-1	300
F ₄	DLSB-1 x DSB 32 DSB 23 x DLSB-2 DSB 32 x DLSB-1	300

Compilation of Monitoring Report (Kharif -2021)

Team 1	Dr. Sanjay Gupta and Dr. M.P. Sharma
Canterers	Ludhiana, Palampur and Srinagar

Weather conditions at different centres during the season (Date of Monitoring):			
Parameters	Ludhiana	Palampur	Srinagar
Date of monitoring	01 & 02 October,2021	03-10-2021	05-10-2021
Onset of monsoon	02-06-2021	13-06-2021	21-07-2021
Date Of Sowing	08-06-2021	21-06-2021	01-07-2021
Rainfall Distribution	Erratic	Erratic	Erratic
Rainfall(mm)	759.4mm	2011.6mm	-
# Rainy Days	30	85	-

Conduct of Trails : (Allotted/Conducted)			
Discipline	Ludhiana	Palampur	Srinagar
Plant Breeding	3/3	4/4	1/1
Plant Pathology	4/4	8/8	Nil
Entomology	4/4	Nil	Nil
Agronomy	5/5	Nil	Nil
Microbiology	3/3	Nil	Nil

Germplasm :			
	Ludhiana	Palampur	Srinagar
Total Collection	683	250 from CSK HPKV, Palampur	5
# Acquired - From	53 from IISR , Indore	283 From IISR Indore	207 From IISR, Indore
For Traits	Photo Period Insensitivity	High seed yield, Earliness and Resistance to biotic stresses	Trait Specific
How used	Germplasm accession maintained and using in breeding programme	-	-

Cross made : (Parents/Pollinations)			
	Ludhiana	Palampur	Srinagar
# Crosses	10/ 30 Attempted, Pollination 1000	18/610	4/30
Trait	High yield, Earliness, resistance against YMV, SMV, Vegetable, null lox and null kti etc.	Higher yield, earliness, Vegetable type and resistance to FLD, Pod Blight and brown spot diseases.	Random Cross

Generation Advancement:			
	Ludhiana	Palampur	Srinagar
Generation Advanced	F-2 to F-7 and onward;89 Crosses; 742 Population	F-1 to F-9 , 132 Crosses, 635 Population	Nil
Advanced Generation received	Nil	42 F-3 Received From IISR Indore	Nil

Seed Production Programme : (Variety/Target/Expected in q)		
Ludhiana	Palampur	Srinagar
Breeder Seed:		
SL- 958 : 1/35	Hara Soya : -/13 Palam Soya : -/45 Him Soya : -/18 Shivalik : -/14 Himso -1685 : -/.70	Shalimar Soybean-1 : 1.5/3.0
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
SL-958 : 60/NA SL-979 : 15/NA SL-955 : 15/NA SL-688 : 15/NA SL-744 : 15/NA SL-525 : 15/NA SL-1028 : 15/NA SL-1074 : 15/NA	Hara Soya : -/400 Palam Soya : -/400 Him Soya : -/400 Shivalik : -/450 Himso-1685 : -/400	Nil

Front Line Demonstration : Alloted/Conducted)		
Ludhiana	Palampur	Srinagar
50/50	10/34	Nil

Budget Utilization : AUC submitted		
Ludhiana	Palampur	Srinagar
Yes	Yes	Under TSP

Comment of Monitoring Team:		
Ludhiana	Palampur	Srinagar
Outstanding	Very Good	Good

Team 2	Dr. B.S. Gill and Dr. Anirban Roy
Canter	Pantnagar, Almora, Majhera

Weather conditions at different centres during the season (Date of Monitoring):			
Parameters	Pantnagar	Almora	Majhera
Date of Monitoring	04-10-2021	06-10-2021	06-10-2021
Onset of monsoon	14-06-2021	NA	17-06-2021
Date Of Sowing	26-06-2021	NA	17-06-2021 & 23-06-21
Rainfall Distribution	Normal	NA	Normal
Rainfall(mm)	718.3	NA	NA
# Rainy Days	33	NA	55

Conduct of Trails /Allotted/Conducted)			
Discipline	Pantnagar	Almora	Majhera
Plant Breeding	4/4	3/3	3/3
Plant Pathology	8/8	4/4	-
Agronomy	5/5	1/1	-
Entomology	7/7	-	-
Microbiology	3/3	-	-

Germplasm :			
	Pantnagar	Almora	Majhera
Total Collection	2962	1100	NA
# Acquired - From	321	322, IISR Indore	NA
For Traits	Earliness, Diseases resistant and yield etc.	-	-
How used	-	-	-

Cross made : (Parents/Pollinations)			
	Pantnagar	Almora	Majhera
# Crosses	53/ 35 Crosses , 175 Pollinations for each crosses	24/ 49 combination,100 pollinations/cross combination	NA
Trait	High yield, earliness, Photo insensitivity and disease resistant(YMV,BP,RAB,BL B)	High yield, FLS & Pod Blight Resistance improved plant type of black soybean	

Generation Advancement:			
	Pantnagar	Almora	Majhera
Generation Advanced	F-1 to F-9;159 Crosses;	F-1 to F-6;145 crosses;269 progenies	NA
Advanced Generation received		46 from IISR Indore	NA

Seed Production Programme : (Variety/Target/Expected in q)		
Pantnagar	Almora	Majhera
Breeder Seed:		
PS-19: 7/8 q PS-21:12/12 PS-23:12/12 PS-24:7/8 PS-25:4/5 PS-26:25/29	Nil	Nil
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
PS-1225,PS-1092,PS-1042,PS-1347,PS-1029,PS-19, PS-20, PS-21, PS-22, PS-23, PS-24, PS-25, PS-26, PS-1241	Nil	Nil

Front Line Demonstration : (Alloted/Conducted)		
Pantnagar	Almora	Majhera
10/15	10/10	NA

Budget Utilization: AUC submitted		
Pantnagar	Almora	Majhera
Yes	No	No

Comment of Monitoring Team:		
Pantnagar	Almora	Majhera
Excellent & Outstanding	Satisfactory	Very Good

Team 3	Dr. Anita Rani and Dr. Lokesh Kumar Meena
Canter	Mandsaur, Kota, Morena

Weather conditions at different centers during the season (Date of Monitoring):			
Parameters	Mandsaur	Kota	Morena
Date of monitoring	05-10-2021	28-09-2021	01-10-2021
Onset of monsoon	20-06-2021	01-07-2021	21-06-2021
Date Of Sowing	23-06-2021	20 to 23 July 2021	06 & 09 July 2021
Rainfall Distribution	Uneven	Continuous	Discrete
Rainfall(mm)	918mm	1306mm	553mm
# Rainy Days	NA	36	28

Conduct of Trails ; (Allotted/Conducted)			
Discipline	Mandsaur	Kota	Morena
Plant Breeding	5/5	7/7	6/4
Entomology	-	7/7	-
Plant Pathology	-	2/2	-
Agronomy		6/6	

Germplasm :			
	Mandsaur	Kota	Morena
Total Collection	404	220	Nil
# Acquired - From	Nil	Nil	Nil
For Traits	-	-	-
How used	-	-	-

Cross made : (Parents/Pollinations)			
	Mandsaur	Kota	Morena
# Crosses	19/95, 95 Pollinations attempted	6/4 Crosses ; 850 Pollination	8/ Crosses attempted 5, Pollination attempted 245
Trait	Earliness, High yield, Disease tolerance, Drought and non-shattering	Earliness, High Yield, Pest and Disease tolerance, Drought and non-shattering	Earliness, High Yield , Pest and Disease tolerance, Drought and non-Shattering

Generation Advancement:			
	Mandsaur	Kota	Morena
Generation Advanced	F6 and F7;106 Crosses	F-2 To F-8;194 Crosses	F-1 to F-6; 109 Crosses
Advanced Generation Received	-	-	-

Seed Production Programme : (Variety/Target/Expected in q)		
Mandsaur	Kota	Morena
Breeder Seed:		
JS 20-34: 20/45 JS 20-116: 30/35	JS 20-34: 800/800 JS 20-29:50/50 JS 95-60:100/100 JS 20-98:100/100	RVSM 2011-35:75/75
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
Nil	RKS-18 : /30 RKS -24 :/30 RKS - 45 : /30 RKS -113 : /30	RVSM 2011-35 : 45/45

Front Line Demonstration : Allotted/Conducted)		
Mandsaur	Kota	Morena
NA	30/30	Nil

Budget Utilization: AUC submitted		
Mandsaur	Kota	Morena
NO	Yes	YES

Comment of Monitoring Team:		
Mandsaur	Kota	Morena
Very Good	Very Good	Good

Team 4	Dr. G.T. Basavaraj & Dr. Manoj Kumar Shrivastava
Canterers	Amravati, Nagpur, Raipur, & Bhawanipatna

Weather conditions at different centers during the season (Date of Monitoring):				
Parameters	Amravati	Nagpur	Raipur	Bhawanipatna
Date of monitoring	30-09-2021	29-09-2021	01-10-2021	02-10-2021
Onset of monsoon	09-06-2021	26-06-2021	10-06-2021	13-06-2021
Date Of Sowing	15-06-2021	29-07-2021	25-06-2021	16-07-2021
Rainfall Distribution	Normal	Erratic	Normal	Deficit
Rainfall(mm)	981.8mm	1389.2mm	1020.80mm	840.4mm
# Rainy Days	46	52	51	46

Conduct of Trails ; (Allotted/Conducted)				
Discipline	Amravati	Nagpur	Raipur	Bhawanipatna
Plant Breeding	6/6	2/6	03/03	3/3
Plant Pathology	6/6	Nil	03/03	-
Entomology	7/7	Nil	03/03	-
Plant Agronomy	6/6	Nil	04/04	2/2
Soil Microbiology	-	-	01/01	-

Germplasm :				
	Amravati	Nagpur	Raipur	Bhawanipatna
Total Collection	860	NA	322	Nil
# Acquired - From	Nil	NA	322 From IISR Indore	Nil
For Traits	Charcoal rot resistance, Earliness, Drought tolerance	NA	-	-
How used	12, accession used in breeding	NA	-	-

Cross made : (Parents/Pollinations)				
	Amravati	Nagpur	Raipur	Bhawanipatna
# Crosses	12/ 13 combination, 800 Pollinations attempted	NA	34/ 37 Crosses, 1480 Pollination	Nil
Trait	Charcoal rot resistance, Earliness, Drought tolerance, Trypsin Inhibitor, Drought tolerance, YMV Resistant, Mechanical Harvesting, Good Germinability.	-	High Yielding Goods germinations, Pod Bligh.High yielding, pod blight, RAB & Bud Blight	Nil

Generation Advancement:				
	Amravati	Nagpur	Raipur	Bhawanipatna
Generation Advanced	F-1 to F-7: 135 Crosses, 552 Populations	NA	F-2 To F-7: 616, Fresh Cross: 42	Nil
Advanced Generation Received	47 From IISR Indore	NA	High Yielding and Multiple Resistance(RAB, IBB,POD Blight)	Nil

Seed Production Programme : (Variety/Target/Expected in q)			
Amravati	Nagpur	Raipur	Bhawanipatna
Breeder Seed:			
AMS – 1001 : 225/940.50 AMS-MB-5-18 : 155/891 AMS-100-39 : 100/189 JS 20-34 : 150/369 JS-335 : 200/315 JS 93-05 : 150/567 MAUS-162 : 100/182 MAUS- 158 : 100/180 MAUS- 71 : 50/90	NA	JS 20-98 : 200/100 JS 20-69 : 200/210 CG Soy -1 : 38/50 JS 20-116 : 100/25 RSC 10-46 : 10/10 RSC 10-52 : 10/05	Nil
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in q)			
AMS- 1001 : NA/72 AMS-MB-5-18 : NA/144 AMS-100-39: NA/144 AMS 2014-1 : NA/36	NA	JS 20-69 : 100/120 CG Soy -1 : 500/620 RSC 10-46 : 100/120 RSC – 10-52 : 150/200 JS 20-69 : 1200/1500 CG SOYA – 1: 400/500	Nil

Front Line Demonstration : Allotted/Conducted)			
Amravati	Nagpur	Raipur	Bhawanipatna
20/20	NA	100/100	Nil

Budget Utilization: AUC submitted			
Amravati	Nagpur	Raipur	Bhawanipatna
Yes	NA	Yes	Nil

Comment of Monitoring Team:			
Amravati	Nagpur	Raipur	Bhawanipatna
Excellent	NA	Very Good	Excellent

Team 5	Dr. Rakesh Kumar Verma & Dr. Rajesh Vangala
Canter	Parbhani, Bidar, Adilabad

Weather conditions at different centers during the season (Date of Monitoring):			
Parameters	Parbhani	Bidar	Adilabad
Date of monitoring	29 & 30 ,09-2021	30-09-2021	28-09-201
Onset of monsoon	11-06-2021	02-06-2021	02-06-2021
Date Of Sowing	16-06 to 10-08-2021	05-06-2021	12-06-2021
Rainfall Distribution	Erratic with Uneven	Uneven	Even
Rainfall(mm)	1444mm	1103	1473.9
# Rainy Days	50	54	53

Conduct of Trails ; (Allotted/Conducted)			
Discipline	Parbhani	Bidar	Adilabad
Plant Breeding	8/8	2/2	3/3
Entomology	6/6	2/2	Nil
Agronomy	Nil	Nil	5/5

Germplasm :			
	Parbhani	Bidar	Adilabad
Total Collection	840	Nil	300
# Acquired - From	300 From IISR Indore	Nil	3 From IISR Indore
For Traits	High Yield, Earliness, non- Shattering, Biotic and Abiotic Stress Resistance	-	Pod Blight Resistance With high yielding.
How used	Promising accessions Identified and will be used in further breeding	-	-

Cross made : (Parents/Pollinations)			
	Parbhani	Bidar	Adilabad
# Crosses	14 : 40 Cross Attempted, 1775 pollination attempted	Nil	3 : Due to poor Germination Cross will be attempted during Summer,2021-22
Trait	High seed yield, Early to medium maturity, pest , disease and drought tolerance, non shattering		Pod blight resistance with high yielding

Generation Advancement:			
	Parbhani	Bidar	Adilabad
Generation Advanced	F-1 To F-7 ; 229 Crosses.	Nil	F-2 to F-7: 158 Crosses, 600 Population
Advanced Generation Received	DSR NHP F-3,F-5 & F-6; 122 Crosses	Nil	48- From IISR Indore, 9- ARI Parbhani

Seed Production Programme : (Variety/Target/Expected in q)		
Parbhani	Bidar	Adilabad
Breeder Seed:		
MAUS 71 : 320/400 MAUS 158 : 800/1000 MAUS 162 : 450/600 MAUS 612 : 250/400 JS 20-34 : 150/100 JS 20-116 : 200/60	Nil	A) Foundation/Certified Seed Basara : 75/75 JS 93-05 : 100/100 KDS – 726 : 40/45 MAus – 612 : 40/45 B) Breeder Seed JS-335 : 300/350
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
MAUS 71 : 00/2500 MAUS 158 : 00/7500 MAUS 162 : 00/4500 MAUS 612 :00/6000 MAIS 1 : 15 MAUS 2 : 10 MAUS 32 : 10 MAUS 61 : 10 MAUS 61-2 : 15 MAUS 81 : 20 JS-335 : 20 JS – 93-05 : 20 JS 97-52 : 20 JS 20-29 : 20	JS – 335: 00/1500 DSb-21 : 00/500	Basara : NA/6 AISb-50 : NA/10

Front Line Demonstration : Allotted/Conducted)		
Parbhani	Bidar	Adilabad
50/50	Nil	100/100

Budget Utilization: AUC submitted		
Parbhani	Bidar	Adilabad
Yes	No	Yes

Comment of Monitoring Team:		
Parbhani	Bidar	Adilabad
Excellent	Good	Good

Team 6	Dr. Shivkumar M. and Dr. Laxman Singh Rajput
Canterers	Pune, Sangli, Dharwad & Bengaluru

Weather conditions at different centers during the season (Date of Monitoring):				
Parameters	Pune	Sangli	Dharwad	Bengaluru
Date of monitoring	01-10-2021	30-09-2021	29-09-2021	27/09/2021
Onset of monsoon	03-06-2021	12-07-2021	07-06-2021	June
Date Of Sowing	26-06-2021	18-07-2021	22-06 & 14-07 -2021	16/07/2021
Rainfall Distribution	Uneven	Heavy in 08,09,10 -2021	Uneven	Uneven
Rainfall(mm)	244.5mm	650mm	754.1	686mm
# Rainy Days	20	58	52	46

Conduct of Trails ; (Allotted/Conducted)				
Discipline	Pune	Sangli	Dharwad	Bengaluru
Plant Breeding	3/3	2/2	2/2	2/2
Agronomy	2/2	Nil	5/5	Nil
Entomology	Nil	Nil	8/8	Nil
Plant Pathology	Nil	4/4	8/8	Nil
Soil Microbiology	Nil	Nil	2/2	Nil

Germplasm :				
	Pune	Sangli	Dharwad	Bengaluru
Total Collection	607	115	627	100
# Acquired - From	300 From IISR Indore	46 From IISR Indore	Nil	100 Fom IISR Indore
For Traits	Earliness, Yield	-	-	Bold Seed high Yield and Powdery Mildew
How used	Evaluation in progress in trail	-	-	3 Accession used in Breeding Programm

Cross made : (Parents/Pollinations)				
	Pune	Sangli	Dharwad	Bengaluru
# Crosses	20/ About 25 Cross Combination & 950 Pollination	NA	11/16-Combinations & 3120 Pollinations	Nil
Trait	Earliness ,High Yield, Null Trypsin, Null Lipoxygenase, Rust resistance, YMV resistance, Vegetable type, Long Juvenility and Charcoal rot resistance.	-	Resistance to Rust, YMV, Earliness and High Yield	-

Generation Advancement:				
	Pune	Sangli	Dharwad	Bengaluru
Generation Advanced	F-1 to F-6 : 184 Crosses, 2072 populations	F-1 to F-7 : 62 Crosses	F-1 to F-6: 47 Crosses,	F-2 To F-5: 11 Crosses , 250 Population
Advanced Generation Received	Nil	Nil	47 From Indore	Nil

Seed Production Programme : (Variety/Target/Expected in q)			
Pune	Sangli	Dharwad	Bengaluru
Breeder Seed:			
JS -335: 00/20 MACS-1281 : 12/20 MACS-1188 : 50/250 MACS-1460 : 10/20 MACS-1407 : 00/10 MACS-1520 : 10/10 MACSNRC-1667 : 00/04	JS 93-05: 156/ JS-335: 1230/ Phule Kalyani (DS-228) : 303/ Phule Sangam (KDS-726) : 393/ Phule Kimaya (KDS-753) : 180/	JS – 335 : 850/1000 JS 93-05 : 250/280 DSb-21 : 300/350 DSb-34 : 40/45	JS-335 :300/350
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)			
STAGE-I(Individual)	N-II	JS – 335 : 200/150 JS 93-05 : 100/100 DSb-21 : 200/150 DSb-23 : 100/100 DSb -34: 150/125	Karune : 0/100 KBS-23 : 0/50
JS-335: 50/50 MACS-1188 : 150/100 MACS-1281 : 50/70 MACS-1460 : 50/50 MACS-1407 : 30/30 Macs-1520 : 30/30	JS-335 : 200/1000 JS 93-05 : 1500/1500 Phule Kalyani (DS:228) : 1000/1000 Phule Kimaya(KDS-753) : 1500/2000		

STAGE_II (Bulks)	Phule Sangam (KDS-726) :		
JS-335 : 500/1000	2000/2000		
MACS-1188 : 1000/600	N-I		
MACS-1281 : 500/100	JS-335 : NA		
MACS-1460 : 100/100	JS 93-05 : NA		
	Phule Kalyani (DS:228) : NA		
	Phule Kimaya(KDS-753) : NA		
	Phule Sangam (KDS-726) : NA		

Front Line Demonstration : Allotted/Conducted)			
Pune	Sangli	Dharwad	Bengaluru
15/15	25/25	10/10	100/80

Budget Utilization: AUC submitted			
Pune	Sangli	Dharwad	Bengaluru
Yes	Yes	Yes	Yes

Comment of Monitoring Team:			
Pune	Sangli	Dharwad	Bengaluru
Very good	Very Good	Very good	Very Good

Team 7	Dr. Gyanesh Satpute & Dr. Subhash Chandra
Canterers	Jorhat, Imphal, Medziphema and Umiam(Barapani)

Weather conditions at different centers during the season (Date of Monitoring):				
Parameters	Jorhat	Imphal	Medziphema	Umiam
Date of monitoring	30-09-2021	26 to 28 th 09-2021	01-10-2021	29-09-2021
Onset of monsoon	05-05-2021	26-05-2021	03-06-2021	28-05-2021
Date Of Sowing	24-06 & 04-08-2021	02-06-2021	07-07-2021	17 & 19-09-2021
Rainfall Distribution	Uneven	Uneven	Uneven	Uneven
Rainfall(mm)	873.8mm	987.6mm	523.4mm	NA
# Rainy Days	63	94	30	NA

Conduct of Trails ; (Allotted/Conducted)				
Discipline	Jorhat	Imphal	Medziphema	Umium
Plant Breeding	2/2	3/3	3/2	2/2
Agronomy	Nil	3/2	4/4	Nil
Entomology	Nil	5/5	Nil	Nil
Plant Pathology	7/7	Nil	Nil	Nil
Food Technology	Nil	3/3	Nil	Nil

Germplasm :				
	Jorhat	Imphal	Medziphema	Umium
Total Collection	Nil	524	Nil	Nil
# Acquired - From	Nil	322	Nil	Nil
For Traits	-	-	-	Nil
How used	-	IISR Indore- Vegetable Purpose From ARS, Pune - Yield From UAS, Dharwad- Rust Resistant		-

Cross made : (Parents/Pollinations)				
	Jorhat	Imphal	Medziphema	Umium
# Crosses	Nil	4/218 Pollinations	Nil	Nil
Trait	-	Yield , Rust and Vegetable	-	-

Generation Advancement:				
	Jorhat	Imphal	Medziphema	Umium
Generation Advanced	F-3:51/51	F-1 To F-7 : 27 Crosses, 1- Mutant Line	Nil	In F-3 Generation 29 Out of 43 Germinated 52 Crosses in F-5 Generation
Advanced Generation Received	59	60 F-5 Segregating Lines From IISR Indore 50 segregating lines from Indore and other	Nil	Nil

Seed Production Programme : (Variety/Target/Expected in q)			
Jorhat	Imphal	Medziphema	Umium
Breeder Seed:			
Not Applicable	Nil	Nil	Nil
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)			
Not Applicable	Nil	Nil	Nil

Front Line Demonstration : Allotted/Conducted)			
Jorhat	Imphal	Medziphema	Umium
Nil	15/15	10/10	Nil

Budget Utilization: AUC submitted			
Jorhat	Imphal	Medziphema	Umium
Yes	Yes	Yes	Not

Comment of Monitoring Team:			
Jorhat	Imphal	Medziphema	Umium
Very Good	Excellent	Very Good	Very Good

Team -8	Dr. S. R. Ramgiri & Dr. S.P. Mehtre
Canterers	Amreli, Anand & Sanosara(Bhavnagar)

Weather conditions at different centres during the season (Date of Monitoring):			
Parameters	Amreli	Anand(Devgad)	Sanosara(Bhavnagar)
Date of monitoring	04-10-2021	06-10-2021	05-10-2021
Onset of monsoon	06-06-2021	17-05-2021	18-06-2021
Date Of Sowing	30-06-2021	23-06-2021	30-06-2021
Rainfall Distribution	Uneven	Normal	Normal
Rainfall(mm)	858.20	901mm	660mm
# Rainy Days	31	31	25

Conduct of Trails ; (Allotted/Conducted)			
Discipline	Amreli	Anand	Sanosara(Bhavnagar)
Plant Breeding	6/6	6/6	6/6
Agronomy	Nil	3/3	Nil

Germplasm :			
	Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
Total Collection	570	201	Nil
# Acquired - From	Nil	35	32
For Traits	-	High Yield and Resistance to YMV,CR and RAB	-
How used	-	8 Accession used in Breeding program	-

Cross made : (Parents/Pollinations)			
	Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
# Crosses	14: 8 Crosses , 691 Pollination	8: 8 Crosses and 1792 Pollinations	10: 8 Crosses, and 150 Pollination attempted
Trait	Earliness, High Yield, Drought resistance and disease resistance	Early maturity, High Yield , Non-shattering & Resistance to YMV,CR and RAB	Earliness, High Yield, pest and Disease resistance and Non Shattering.

Generation Advancement:			
	Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
Generation Advanced	F-1 To F-6: 129 Crosses, 453 populations	F-1 To F-5 : 103 Crosses,	F-1 To f-5 : 47 Crosses, 407 populations
Advanced Generation Received	NA	NA	NA

Seed Production Programme : (Variety/Target/Expected in q)		
Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
Breeder Seed:		
Nil	Nil	JS 20-29 : 100/110
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
Nil	Nil	JS 20-29 (Stage-2): 00/1500 JS 20-29 (Stage-1): 00/00

Front Line Demonstration : Allotted/Conducted)		
Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
NA	10/10	NA

Budget Utilization: AUC submitted		
Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
NA	Yes	NA

Comment of Monitoring Team:		
Amreli	Anand(Devgadh)	Sanosara(Bhavnagar)
Very Good	Very Good	Very Good

Team -9	Dr. V. Natraj & Dr. Raghvendra Madar
Centers	Sehore, Jabalpur & Ranchi

Weather conditions at different centres during the season (Date of Monitoring):			
Parameters	Sehore	Jabalpur	Ranchi
Date of monitoring	28-09-2021	27-09-2021	25-09-2021
Onset of monsoon	23-06-2021	17-06-2021	15-06-2021
Date Of Sowing	25-06-2021	26-06-2021	21-06-2021
Rainfall Distribution	Erratic	Erratic	Normal
Rainfall(mm)	1041.2 mm	646.6	1732.7
# Rainy Days	53	43	49

Conduct of Trails ; (Allotted/Conducted)			
Discipline	Sehore	Jabalpur	Ranchi
Plant Breeding	5/5	6/6	3/3
Agronomy	5/5	Nil	4/4
Plant Pathology	5/5	8/8	Nil
Entomology	6/7	Nil	Nil
Microbiology	3/3	Nil	Nil

Germplasm :			
	Sehore	Jabalpur	Ranchi
Total Collection	350	441	549
# Acquired - From	01	Nil	Nil
For Traits	Pest & Disease resistance	High yield , Earliness, Four Seededness , Resistance YMV, CR and RAB	-
How used	NA	22 Used For Breeding	-

Cross made : (Parents/Pollinations)			
	Sehore	Jabalpur	Ranchi
# Crosses	20: 30 Crosses, & 1035 Pollination	60: 30 Cross Attempted. & 1570 Pollinations	7:7 Crosses , 150 Pollination for each
Trait	For Yield Earliness & Disease Resistance	High yield , Earliness, Four Seededness , Resistance YMV, CR and RAB	Yield , adoptability & Earliness

Generation Advancement:			
	Sehore	Jabalpur	Ranchi
Generation Advanced	F-2 to F-8 : 116 Crosses	F-3 To F-12: 61 Crosses , 683 Pollinations	F-5 To F-7 79 Crosses
Advanced Generation Received	12 Crosses Received From IISR Indore	F-5 & F-6: 10 Crosses, 38 Pollinations	F-3 : 58 Crosses received from IISR Indore
		NHP, IISR Indore 40 Crosses: 40 Pollinations	

Seed Production Programme : (Variety/Target/Expected in q)		
Sehore	Jabalpur	Ranchi
Breeder Seed:		

RVS 2001-4:75/50 JS 95-60: 45/20 JS 93-05: 12/08 RVS 24:45/30 JS 20-34:45/20 JS 20-29:45/35 JS-335 : 30/04 RVS – 18 :45/30 JS 20-69:45/10 JS 20-98 : 30/26 JS 20-116:45/20 RVS-76:30/20	JS 20-116: 370/500 JS 20-94 : 200/220 JS 20-98 : 900/1300 JS 20-69 : 150/270 JS 20-34 ; 600/680	BSS-2: 200/250
Nucleus Seed : Stage I + Stage II (Variety/Target/Expected in Kg)		
RVS 2001-4:00/50q JS 95-60: 00/30q JS 93-05: 00/02q RVS 24:00/70q JS 20-34:00/20q JS 20-29:00/35q JS-335 : 00/02q RVS – 18 :00/10q JS 20-69:00/10q JS 20-98 : 00/60q JS 20-116:00/30q RVS-76:00/10q RVSM-35 : 00/20q	JS 20-98:NA JS 20-94 : NA JS 20-116 : NA JS 20-69 : NA JS 95-60 : NA JS 93-05: NA JS-335 : NA JS-20-29: NA JS 97-52: NA Js 20-34: NA JS 21-72: NA	BS-1 : 15/15 BSS-2 : 25/50 BS-3 : 30/30

Front Line Demonstration : Allotted/Conducted)		
Sehore	Jabalpur	Ranchi
10/10	NA	10/20

Budget Utilization: AUC submitted		
Sehore	Jabalpur	Ranchi
Yes	Yes	NA

Comment of Monitoring Team:		
Sehore	Jabalpur	Ranchi
Excellent	Excellent	Very Good

Pedigree of Entries Included in Coordinated Breeding Trails

Entry	Pedigree
Himso 1693	Pb-1 x Himsoya
Himso 1694	SL-679 x Harasoya
AS-24	JS 335 x GJ3
AS -40	G.Soy 1 x AMRS472
Dsb-39	JS 335 x EC 242104
DLsb-3	Dsb-23 x SL 958
DLsb-4	Dsb-21 x SL 958
PS 1682	PS 1583 x Bragg (F6-1)
PS 1689	JS 93-52 x PK 472 (F9-1)
PS 1674	PS 1042 x JS 95-69 (F5-1)
PS 1675	PS 1042 x JS 95-69 (F5-2)
PS 1660	JS 97-52 x JS 335
PS 1569	MACS 450 x PS 1347
JS 23-05	SL 738 x JS 95-60
JS 23-08	JS 20-29 x JS 93-05
JS 20-98	JS 97-52 x SL 710
JS 23-03	JS 20-53 x JS20-34
JS 23-09	JS 20-88 x JSM 196
JS 20-34	JS 98-63 x PK 768
RSC 11-42	JS 97-52 x JS 93-05
RSC 11-48	MAUS 504 x MACS 1336
RSC 11-60	JS 97-52 x JS 93-05
RVS 13-15	JS 20-88 x JSM 196
RVS 13-20	JS 20-29 x JS 93-05
RVS 13-7	JS 20-57 x JSM 259
VLS 102	VLS 74 x EC 361360
VLS 103	VLS 63 x VLS 2007-24
NRC- 192	JS 97-52 x JS 335
NRC -193	JS 97-52 x JS 88-66
NRC -191	NRC 7 x EC -538828
NRC -203	EC 538828 x NRC 7
NRC - 189	Davis x Kaeri 651-6
NRC - 190	JS97-52 X JS 335
NRC -186	JS 97-52 X JS 88-66
NRC-202	JS 97-60 X YOUNG
KDS-1149	KDS-228 X Type-49
KDS- 1187	KDS-344 X NRC-101

KDS-1175	KDS-344 X NRC-102
KDS-1169	KDS-344 X NRC-102
KDS -1172	KDS-344 X NRC-101
KDS-1194	KDS-344 X NRC-101
KDS-1201	KDS-344 X NRC-101
KDS-1173	KDS-344 X NRC-101
MACS-1672	Himso-1563 x Macs-450
MACS - 1735	Himso -1563 x SL-710
MACS - 1724	JS-335 x JS 20-34
DS - 3124	DS-2615 x DS-2709
DS-3163	DS-2205 x DS 12-13
DS -3168	DS-2210 x DS-2411
DS-3121	DS2911 x Pusa-9712
Ds-3122	DS-2712 x DS-2910
TS 21-1	SL 742 X TS 37 (Mutant of DSb-12)
TS 21-2	TS 80(Mutant Derivative of JS 80-21) X AMS 33B
SL 1230	SL 905 x {(G. soja x Ankur) x SL (E) 28}
SL 1282	(SL 525 x JS 335) x SL 525
LOKSOYA-1	Type 49 x EC 538836

Abbreviations for Dus Characters in IVT and AVT trails

SN	Characteristics	States	Abbreviations
1.	Hypocotyl : Anthocyanin pigmentation	(Absent)	A
2.	Plant : Growth type	(Present)	Pre.
		Determinate	D
		Semi-determinate	SD
		Indeterminate	Indter
3.	Plant : Days to 50% Flowering	Early (≤ 35 days)	E
		Medium (36 to 45 days)	M
		Late (>45 days)	L
4.	Leaf: Shape	Lanceolate	Lanceo.
		Pointed ovate	PO
		Rounded ovate	RO
5.	Leaf : Colour	Green	G
		Dark green	DG
6.	Plant: Growth habit	Erect	Er
		Semi-erect	Se-Er
7.	Flower: Colour	White	W
		Purple	P
8.	Plant: Height (cm)	Short (≤ 40)	Sh
		Medium (41-60)	M
		Tall (>60)	T
9.	Pod: Pubescence	Absent	A
		Present	P
10.	Pod: Pubescence colour	Grey	Gr
		Tawny (Brown)	(Taw)Br
11.	Pod: Colour	Yellow	Y
		Brown	Br
		Black	B
12.	Pod: Shattering	Shattering	Shatt.
		Non shattering (up to 10 days)	N-Shatt.
13.	Days to Maturity	Early	E
		Medium	M
		Late	L
14.	Seed: Size (100 Seed weight)	Small (≤ 10.0)	Sml
		Medium (10.1-13.0)	M
		Large (>13.0)	L
15.	Seed: Shape	Spherical	Sph
		Elliptical	Ellip.
16.	Seed: Colour	Yellow	Y
		Yellow Green	YG
		Green	G
		Black	B
17.	Seed: Hilum Colour	Yellow	Y
		Grey	G
		Brown	Br
		Black	B
		Variegated	Varieg.

18.	Seed: Lustre	Shiny	Sh
		Dull	Dull
19.	Seed: Colouration due to peroxidase activity in seed coat	Absent	A
		Present	P
20.	Seed: Cotyledon colour	Yellow	Y
		Green	G
21.	Seed: Oil content (%)	Low (≤ 15.0)	Low
		Average (15.1-18.0)	Avg
		Medium (18.1-20.0)	M
		High (> 20.0)	H
22.	Seed: Protein content (%)	Low (≤ 38.0)	Low
		Medium (38.1 – 40.0)	M
		High (>40.0)	H

IVT Early & IVT Normal DUS Characters

Character	NRC-197	NRC 196	NRC-198	NRC-201	NRC 186	NRC 195	NRC 203	NRC 191	NRC 192	NRC 193
Hypocotyls (Anthocyanine Pigmentation)	Absent	A	Pre	A	NA	A	Pre	NA	NA	NA
Plant growth Type	Determinant	SD	SD	D	SD	D	SD	SD	SD	SD
Days to 50% Flowering	Early	E	E	E	M	M	M	M	M	M
Leaf Shape	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
Leaf Colour	Green	G	G	G	G	G	DG	DG	DG	G
Green/Dark Green										
Plant Growth Habit	Semi/Erect	Er	Er	Er	Se Er	Er	SeEr	SeEr	SeEr	SeEr
Flower Colour	White	W	P	W	P	W	P	P	W	P
Plant Height	Medium	M	M	M	T	T	T	M	T	T
Pod : Pubescence	Present	Pre	Pre	Pre	NA	Pre	A	A	-	-
Pod : Pubescence Colour	Brown	Br	Br	Br	NA	Br				
Pod : Colour	Brown	Br	Br	Br	NA	Br	Br	Br	-	-
Pod : Shattering	Not	N	N	N	N	N	N	N	N	N
Days to Maturity	Early	E	E	E	E	M	M	M	M	M
Seed: Size	Medium	M	M	M	M	M	L	L	M	M
Seed: Shape	Elliptical	Ellip	Ellip	Ellip	Ellip	Ellip	Ellip	Sph	Ellip	Ellipi
Seed: Colour	Yellow	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	Black	B	B	B	B	B	B	Gr	B	B
Seed Lustre	Shiny	Sh	Sh	Sh	Sh	Sh	Sh	Sh	Sh	Sh
Seed : Cotyledon Colour	Yellow	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%		H	H			H				
Seed Protein Content %										

Character	JS 23-05	JS 23-08	JS 23-03	JS 23-09	RSC 11-42	RSC 11-48	RSC 11-60	RSC 11-35	AS-24	As-40
Hypocotyls (Anthocynine Pigmentation)	A	A	Pre	P	Pre	A	Pre	A	P	P
Plant growth Type	SD	SD	SD	SD	SD	SD	SD	SD	D	SD
Days to 50% Flowering	M	M	E	E	M	M	M	M	M	M
Leaf Shape	PO	Lanceo	PO	PO	Lanceo	PO	PO	PO	RO	PO
Leaf Colour Green/Dark Green	G	DG	DG	DG	G	G	G	G	G	G
Plant Growth Habit	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	Er
Flower Colour	W	W	P	P	P	W	P	W	P	W
Plant Height	M	M	M	M	M	T	T	T	M	T
Pod : Pubescence	Pre	Pre	Pre	Pre	A	A	A	A		
Pod : Pubescence Colour	Taw (Br)	Taw(Br)	Taw (Br)	Taw(Br)						
Pod : Colour	Br	Br	Br	-	Y	Y	Y	Br		
Pod : Shattering	N	N	N	N	N	N	N	N	N	N
Days to Maturity	M	M	E	E	M	M	M	M	M	M
Seed: Size	M	M	M	M	M	M	M	M	M	S
Seed: Shape	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph
Seed:Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	Gr	B	B	B	B	B	B	B	DBr	Br
Seed Lustre	Sh	Dul	Sh	Sh	Sh	Sh	Sh	Sh	Dul	Sh
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%										
Seed Protein Content %										

Character	RVS 2013-7	RVS 2013-15	RVS 2013-20	DSB 39	DL SB 3	DL SB 4	Macs- 1672	Macs- 1735	Macs- 1724	CAUMS 2
Hypocotyls (Anthocyanine Pigmentation)	A	A	A	Pre	A	A	P	P	G	A
Plant growth Type	SD	D	SD	SD	SD	SD	D	D	D	D
Days to 50%	E	M	L	M	M	M	E	E	M	M
Flowering										
Leaf Shape	PO	L	L	RO	PO	RO	PO	PO	PO	PO
Leaf Colour	G	G	G	DG	DG	DG	G	DG	G	DG
Green/Dark Green										
Plant Growth Habit	SeEr	Er	Er	SeEr	SeEr	SeEr	Er	Er	Er	SeEr
Flower Colour	W	P	W	P	W	W	P	P	W	W
Plant Height	M	M	M	M	T	T	T	T	T	T
Pod : Pubescence	A	A	Pre	A	A	A	A	A	A	Pre
Pod : Pubescence Colour			Gry							Taw(Br)
Pod : Colour	Br	Br	Br	Br	Br	Br	Taw(Br)	Br	Taw(Br)	Br
Pod : Shattering	N	N	N	N	N	N	N	N	N	Shattering
Days to Maturity	E	M	M	M	M	M	E	M	E	M
Seed: Size	S	M	M	L	M	M	M	L	M	M
Seed: Shape	Ellip	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph
Seed:Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	B	B	B	DBr	B	Br	Br	B	B	B
Seed Lustre	Sh	Sh	Sh	Dul	Dul	Sh	Sh	Sh	Dul	Sh
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%										
Seed Protein Content %										Low

Character	DS -3124	DS-3163	DS-3168	DS-3121	DS-3122	SL-1230	SL-1282	AUKS-224	ASB-15
Hypocotyls (Anthocynine Pigmentation)	P	P	P	A	A	A	A	A	Pre
Plant growth Type	D	D	D	D	D	SD	SD	D	SD
Days to 50% Flowering	L	L	L	L	L	L	L	M	M
Leaf Shape	PO	PO	PO	NA	NA	PO	Lanceo	PO	PO
Leaf Colour Green/Dark Green	DG	DG	DG	NA	NA	G	G	DG	G
Plant Growth Habit	Er	Er	Er	E	Er	Er	Er	SeEr	SeEr
Flower Colour	P	P	P	W	W	W	W	P	P
Plant Height	M	M	M	M	M	M	T	M	M
Pod : Pubescence	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	A
Pod : Pubescence Colour	Gry	Taw	Taw	Taw	Taw	Br	Br	Taw	-
Pod : Colour	Br	Br	Br	Br	Br	Br	Br	Br	Br
Pod : Shattering	N	N	N	N	N	N	N	N	N
Days to Maturity	L	L	L	L	L	L	L	M	M
Seed: Size	M	M	M	S	S	S	S	M	M
Seed: Shape	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph
Seed:Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	B	Gry	B	B	Gry	NA	NA	B	B
Seed Lustre	Dul	Dul	Sh	Sh	Dull	Sh	Sh	Sh	Sh
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	G	G	Y	Y
Seed : Oil Content %						Avg	Avg		17.3(Avg)
Seed Protein Content %						M	M		44.16(H)

Character	Himso-1693	Himso-1694	LOKSOY-1	MAUS-791	MAUS-818	MAUS-795	MAUS-819	SKAU-S-3
Hypocotyls (Anthocyanine Pigmentation)	Pre	A	Pre	Pre	Pre	Pre	Pre	A
Plant growth Type	SD	SD	D	SD	SD	SD	SD	SD
Days to 50% Flowering	L	L	M	M	M	E	E	M
Leaf Shape	PO	RO	PO	Lanceo	PO	RO	RO	RO
Leaf Colour	G	G	G	DG	DG	DG	DG	DG
Green/Dark Green								
Plant Growth Habit	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	SeEr	Er
Flower Colour	P	W	P	P	P	P	P	P
Plant Height	M	M	M	T	T	T	T	M
Pod : Pubescence	Pre	Pre	Pre	Pre	Pre(Sparce)	Pre(Sparce)	Pre(Sparce)	Pre
Pod : Pubescence Colour	TAW(Br)	TAW(Br)	G	G	G	G	G	Grey
Pod : Colour	Br	Br	Br	Br	B	B	B	Br
Pod : Shattering	N	N	N	N	N	N	N	N
Days to Maturity	M	M	M	M	M	E	E	M
Seed: Size	M	M	M	L	L	L	L	Large
Seed: Shape	Sph	Sph	Ellip	Ellip	Sph	Sph	Sph	Sph
Seed:Colour	YG	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	Br	B	Br	B	B	B	Light Br	Y
Seed Lustre	Sh	Sh	Sh	Dull	Dull	Dull	Dull	Sh
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%	NA	NA	NA	20.5(High)	20.4(H)	19.5(M)	20.0(M)	M(18.1)
Seed Protein Content %	NA	NA	NA	39.5(M)	40.2(H)	39.5(M)	40.5(H)	M(38.1)

Character	PS – 1569	PS - 1660	PS - 1675	PS - 1605	PS – 1682	PS-1689	AMS 19-01	AMS 115	AMS 83	AMS 77-3-6
Hypocotyls (Anthocynine Pigmentation)	A	A	A	Pre	Pre	A	Pre	Pre	A	A
Plant growth Type	D	D	D	D	D	D	D	D	D	SD
Days to 50% Flowering	M	L	L	L	L	L	M	M	M	M
Leaf Shape	Lanceo	PO	RO	RO	RO	PO	RO	Lanceo	RO	RO
Leaf Colour Green/Dark Green	G	G	G	DG	G	G	G	G	G	G
Plant Growth Habit	Er	Se-Er	Se-Er	Se-Er	Se-Er	Se-Er	Er	Se-Er	Se-Er	Se-Er
Flower Colour	W	W	W	P	W	W	P	P	W	P
Plant Height	T	T	T	T	T	T	M	M	M	M
Pod : Pubescence	Pre	Pre	Pre	Pre	P	Pre	Pre	A	Pre	A
Pod : Pubescence Colour	TAW(Br)	TAW(Br)	Taw(Br)	TAW(Br)	TAW(Br)	TAW(Br)	TAW(Br)	-	TAW(Br)	-
Pod : Colour	Br	Br	Br	Br	Br	Br	Br	Br	Br	Br
Pod : Shattering	N	N	N	N	N	N	N	N	N	N
Days to Maturity	E	L	L	M	L	L	M	M	E	E
Seed: Size	M	S	M	M	S	S	M	M	M	M
Seed: Shape	Sph	Ellip	Sph	Sph	Ellip	Ellip	Sph	Sph	Sph	Sph
Seed: Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	B	Br	Br	B	B	B	B	G	Br	B
Seed Lustre	Dull	Shiny	Shiny	Sh	Shiny	Shiny	Shiny	Shiny	Shiny	Shiny
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%	Avg	Avg	Avg	Avg	Avg	Avg	-	-	-	-
Seed Protein Content %	M	M	M	M	M	M	-	-	-	-

AVT-I DUS Characters

Character	NRC-181	NRC-150	NRC-188	JS 22-12	JS 22-16	JS 22-18	PS-1569
Hypocotyls (Anthocynine Pigmentation)	A	A	Pre (Purple)	Pre	A	Pre	A
Plant growth Type	D	D	D	SD	SD	SD	D
Days to 50% Flowering	E	E	M	E	E	E	M
Leaf Shape	PO	RO	PO	PO	PO	PO	Lanceo
Leaf Colour	G	G	G	DG	DG	DG	G
Green/Dark Green							
Plant Growth Habit	SeEr	Er	Er	SeEr	SeEr	SeEr	Er
Flower Colour	W	W	P	P	W	P	W
Plant Height	M	M	M	M	M	M	M
Pod : Pubescence	Pre	Pre	A	A	Pre	A	Pre
Pod : Pubescence Colour	-	Br	-	-	TAW(Br)	TAW(Br)	Taw(Br)
Pod : Colour	Br	Br	Br	Br	Br	Br	Br
Pod : Shattering	N	N	N	N	N	N	N
Days to Maturity	E	E	M	E	E	E	E
Seed: Size	M	M	L	M	M	M	M
Seed: Shape	Ellip	Ellip	Ellip	Sph	Sph	Sph	Sph
Seed:Colour	Y	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	Br	B	B	B	B	B	B
Seed Lustre	Sh	Sh	Sh	Sh	Sh	Sh	Dull
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y	Y
Seed : Oil Content%	M	H	-				Avg
Seed Protein Content %	M	-	-				M

AVT-II DUS Characters

Character	NRC-152	NRC-149	JS 21-72	VLS-99	Himso-1689	PS-1670
Hypocotyls (Anthocynine Pigmentation)	Pre	A	A	A	Pre	A
Plant growth Type	SD	SD	SD	D	SD	D
Days to 50% Flowering	E	L	M	L	L	L
Leaf Shape	PO	PO	PO	PO	RO	RO
Leaf Colour	G	G	G	G	G	G
Green/Dark Green						
Plant Growth Habit	Er	Er	SeEr	SeEr	SeEr	Se-Er
Flower Colour	P	W	W	W	P	W
Plant Height	M	T	M	T	M	T
Pod : Pubescence	Pre	Pre	Pre	Pre	Pre	Pre
Pod : Pubescence Colour	Br	Taw(Br)	TAW(Br)	TAW(Br)	TAW(Br)	Grey
Pod : Colour	Br	Br	Br	Br	Br	Y
Pod : Shattering	N	N	N	N	N	N
Days to Maturity	E	L	M	L	M	L
Seed: Size	Large	M	M	Large	M	M
Seed: Shape	Ellip	Ellip	Sph	Sph	Sph	NA
Seed:Colour	Y	Y	Y	Y	Y	Y
Seed: Hilum Colour	Br	Br	Br	B	B	B
Seed Lustre	Sh	Sh	Sh	Dul	Intermediate	Sh
Seed : Cotyledon Colour	Y	Y	Y	Y	Y	Y
Seed : Oil Content%		H	M(21.99%)			Avg
Seed Protein Content %		-				M

Appendix – VIII

STATEMENT SHOWING CONTACT PERSONS AT COORDINATING UNIT, IISR, INDORE AND STAFF POSITION OF AICRP ON SOYBEAN

A. Coordinating Unit

ICAR- Indian Institute of Soybean Research, Indore-452001

S.No.	Name	Designation	Contact No. & E-mail
1.	Dr. Nita Khandekar	Director	09303224211 (M) 0731-2760987(R) dsrdirector@gmail.com
2.	Dr. Sanjay Gupta	AICRP In-charge and PI- Plant Breeding	07415105890(M) sanitaishu@gmail.com
3.	Dr. M.P. Sharma	Principal Scientist and PI-Microbiology	09926012261(M) 0731-6562647(R) mahaveer620@gmail.com
4.	Dr. Rakesh Kumar Verma	Scientist and PI - Agronomy	09098318607 sherawat90rakesh@gmail.com
5.	Dr. Raghvendra Madar	Scientist and PI –FLD (Agronomy)	08700864155 raghavendra4449@gmail.com
6.	Dr. Laxman Singh Rajput	Scientist and PI- Plant Pathology	07974300933(M) laxman0742@gmail.com
7.	Dr. Lokesh Kumar Meena	Scientist and PI- Entomology	09753318347(M) lokesharsnagpur@gmail.com
8.	Dr. G.K. Satpute	Principal Scientist (Plat Breeding)	09425079866(M) gksatpute@yahoo.co.in
9.	Dr. Shivkumar M.	Senior Scientist (Plant Breeding)	07415746998(M) shivaiari9683@gmail.com
9.	Dr Neha Pandey	Scientist (Food Technology)	08319015924 nehapandey.ft06@gmail
10.	Dr. Mrinal K. Kuchlan	Senior Scientist (Seed Technology)	09009562694(M) mrinal.kk@gmail.com
11.	Mr. Ravindra Kumar	Finance and Account Officer	0731-2437946(O) raviazad1971@gmail.com

B. STAFF POSITION AICRP ON SOYBEAN

1. Institute: GBPUA & T, PANTNAGAR-263 145 (UTTARAKHAND) - MAIN CENTRE								
1	2	3	4	5	6	7	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on January 2022	Name (appointed / adjusted) AICRP soybean	Discipline/ subject	Date of joining the present post / project	Contact no. (Residence, office & Mobile, FAX & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and Email
Scientist								
Plant Breeder (S-2) (12000-18300)	Professor (37400-67000)+10000	1	227072.00	Dr. M.K. Nautiyal	Plant Breeding	03/12/2021	9412120767 hybridricebreeder@gmail.com	Dr. M. K. Karnwal SRO, G&PB, Co-PI, Soybean Breeding 9639778002 Karan.mk30@gmail.com
Agronomist (S-2) (12000-18300)	Professor (37400-67000)+10000	1	263588	Dr. D. C. Dimari	Agronomy	December, 2021	-	Dr. Ajay Kumar Srivastava, Assistant Professor, Agronomy 9412925737 drajavsrivastava@gmail.com
Microbiologist (S-2) (12000-18300)	Professor (37400-67000)+10000	1	227072	Dr. Naveet Pareek	Soil Science /Microbiology	June, 2018	941132050 pareeknav@gmail.com	Dr. K.P. Raverkar, Professor, Soil Science 9412364837 (M), kraverkar@gmail.com
Jr. Entomologist (S-1) (8000-13500)	Sr. Research Officer (37400-67000)+9000	1	183808	Dr. Neeta Gaur (Appointed)	Entomology	17.5.2006	9457407231 (O) 05944-233737 (R) Neetagaur_ento@rediffmail.com	Dr. K. P. Singh Professor, Plant Pathology 9412142537 (M), kpsingh.gbpuat@gmail.com
Jr. Plant Pathologist* (S-1) (8000-13500)	Waiting government clearance	1	-	-	Plant Pathology	-	Vacant	-

Technical Staff (T-4)		4					
Level 8	Technical Assistant (9300-34800)+4800		98420	Shri Sushil Kumar	-	20.09.2019	-
Level 9	Jr. Scientist (9300-34800)+5400		109632	Dr. H. R. Jaiswal	-	July 2017	9897165967
Level 7	STA (9300-34800)+4600		80076	Dr. M.K.Gupta	-	04.12.1992	9412120628
Level 9	PA II (9300-34800)+5400		109632	Shri A.K.Sani	-	September 2019	-

2. INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI – 110 012 (ICAR INSTITUTE BASED CENTER) –MAIN CENTRE									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on January, 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
-	Principal Scientist (37400-67000+ GP 8000 to 9000)		334280.00	Dr. S. K. Lal (Center I/c)	Genetics & Plant Breeding	01-01-2009	NA	9773911521 sklal@iari.res.in sklal68@gmail.com	Dr. A. Talukdar akshavassam@hotmail.com 09810879176 (M) (Plant Breeding)
-	(37400-67000+ GP 8000 to 9000)		190908.00	Dr. V.Govinda samy	Microbiology	20-04-2014	NA	9910133586 govindmic1980@gmail.com	Dr. A Rajendran (Plant Breeding) 9958682271 ra.rajendran@icar.gov.in rambikarajendran@gmail.com
	Principal Scientist (37400-67000+ GP 8000 to 9000)		235014.00	Dr. Anirban Roy	Plant Pathology	01-09-2015	NA	011-25848418 (O) 9560083999 anirbanroy75@yahoo.com	Dr. B.P. Mallikarjuna (Plant Breeding) 8185838253(M)
-	Principal Scientist (37400-67000+ GP 8000 to 9000)		281508.00	Dr. Anchal Dass	Agronomy	20-04-2015	NA	09999204817(M) 08527759564 (M) anchal_iari@rediffmail.com	Dr. Manisha Saini 9935164358(M)
	Scientist 15600-39100+6000		100828.00	Dr. Archana Anokhe	Entomology	04.01.2019	NA	8506978167(M) Anokhearchana12@gmail.com	NIL

**3) RAJMATA VIJAYARAJE SCINDIA KRISHI VISHWA VIDYALAYA, RAK COLLEGE OF AGRICULTURE, SEHORE-446 001 (M.P.)
MAIN CENTRE**

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col. 5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist									
Senior Scientist (Breeding) [37,400-67,000 + 9,000 ACP]	Principal Scientist	1	310971.00	Dr. S.R. Ramgiry (Center I/c)	Breeding	3.1.2006	--	08982305368 sr.ramgiry57@gmail.com	
Senior Scientist (Pathology) [37,400-67,000 + 9,000 ACP]	Principal Scientist	1	299909.00	Dr. M. Saxena	Pathology	4.9.2009	--	7000795962 molysaxena@gmail.com	
Senior Scientist (Agronomy) [37,400-67,000 + 9,000 ACP]	Principal Scientist	1	3036608.00	Dr. M.D. Vyas	Agronomy	22.7.2000	--	09425080108 vyasmd@rediffmail.com	
Senior Scientist	Principal	1	301909.00	Dr. N.	Entomol	5.8.2006	--	09826685106	

(Entomology) [37,400-67,000 + 9,000 AGP]	Scientist			Khandwe	ogy				nandakhandwe@rediffmail.com	
Senior Scientist (Microbiology) [37,400-67,000 + 9,000 AGP]	Principal Scientist	1	305759.00	Dr. R.C. Jain	Microbiology	21.8.2012	--		09826449874 rcj2011@gmail.com	
Technical Staff 5										
Tech. Asstt.	Tech. Asstt.	1	133122	Mr. P.K. Sharma		25.9.2014	--			
Tech. Asstt.	Tech. Asstt.	1	67281	Mr. Trilochal Singh		10.4.2001	--			
Tech. Asstt.	Tech. Asstt.	1	138982	Dr. A. K Saxena		-	-			
F.E.O.	F.E.O.	1	-	-		-	--			
F.E.O.	F.E.O.	1	65437	Mr. P.S. Maravi		8.9.2008	--			

4. AGRICULTURE UNIVERSITY, KOTA, BORKHERA FARM, BARAN ROAD KOTA-324001 Rajasthan

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	No. of posts	Existing post with pay scale and grade pay	Gross salary as on Jan, 2022 (Rs.)	Name	Discipline/subject	Date of joining the project and Post	If the post is vacant , date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail

Scientist

Senior Scientist (Agronomy)	1	Associate Professor [37,400-67,000]+ 9000 AGP]	2,40,366	Dr. D. S. Meena (I/C AICRPS)	Agronomy	22.08.2005	-	09414893694 (M) <u>ds.meena1967@gmail.com</u> maenads <u>1967@yahoo.co.in</u>	Dr. C.B. Meena, Assistant Professor, Plant Pathology <u>cbmeena76@yahoo.com</u> 09024617024(M)
Senior Scientist (Entomology)	1	Professor [37,400-67,000 + 9,000 AGP]	2,36,268/	Dr. B.K. Patidar	Entomology	01.10.2020	-	0744-2844306 (O) 09414885932 (M) bk_patidar@yahoo.co.in	

Scientist/Assistant Professor (Plant Breeding) [15600-39100 + 7,000 AGP]	1	Assistant Professor [15600-39100 + 6,000 AGP]	1,24,681/-	Dr. Bharat Lal Meena	Plant Breeding	10.08.2017	-	blmeena.ubi45@gmail.com 0744-2844306 (O) 08619771927	-
Technical Staff									
Tech. Asstt. (T4) (9300-34800) 4200	1	Tech. Asstt. (T4) (9300-34800) 4200 AGP	63,677/-	Miss Sushila Kalwaniya	-	01.10.2020	-	08742893315(M) susheelakalwaniya@gmail.com	-
Tech. Asstt. (T4)	1	Tech. Asstt. (T4) (9300-34800) 4200 AGP)	-	-	-	-	Vacant from 01..10.2021	-	-

**5. AICRP ON SOYBEAN DR.PDKV, REGIONAL RESEARCH CENTRE, MORSHI ROAD, AMRAVATI-444 603
(MAHARASHTRA) – MAIN CENTRE**

1	2	3	4	5	6	7	8	9	10	
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross Salary as on January 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. & Email ID	Dr. S.S. Munje, Jr. Entomologist, looking additionally the Entomological Research Trials. Mo.No.09423682629, E-mail: shyammunje@yahoo.com	
Scientists										
Jr. Plant Breeder (15600-39100) GP 6000	Sr. Plant Breeder (37400-67000) G.P.-9000	01	210000.00	Dr. Satish Nichal (Center I/c)	Plant Breeding	01.11.18	Nil	Mo. 9423473550, 09588414144 e-mail: nichal_satish@rediffmail.com		
Jr. Agronomist (15600-39100) GP 6000	Jr. Agronomist (15600-39100) G.P.-7000	01	200058.00	Shri. Mangesh S. Dandge	Agronomy	10.07.12	Nil	Mo. 09657725820 e-mail: msdandge@rediffmail.com		
Jr. Plant Pathologist (15600-39100) GP 6000	Jr. Plant Pathologist (15600-39100) G.P.-6000	01	107900.00	Shri. R.S. Ghawde	Plant Pathology	08.08.18	Nil	Mo. 09420841421 0876643864 e-mail: rajiv_ghawde@rediffmail.com		
Technical Staff										
Technical Assistant (9300-34800) GP -4200	Agriculture Assistant (5200-20200) G.P.-2400	01	50516.00	Mr. Umesh. S. Tarale	-	10.06.15	Nil	9890972278		
Technical Assistant (9300-34800) GP -4200	Agriculture Assistant (5200-20200) G.P.-2400	01	46254.00	Mr. Unkeshwar N. Shinde	-	01.07.18	Nil	9325575561		

6. MACS - AGHARKAR RESEARCH INSTITUTE, G.G. AGARKAR ROAD, PUNE- 411 004 (M.S.)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	No. of posts	Existing post with pay scale and grade pay	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5,
Scientist									
Scientist Junior Breeder (Plant Breeding) Level 10 of 7 th CPC (56100-177500)	1	Scientist B & Soybean Breeder Level 10 of 7 th CPC (56100-177500)	-	<u>Vacant</u>	Plant Breeding	To be filled soon	01.07.2020 -	020-25325036 (O), 020-25651542 (Fax),	Mr. S.A. Jaybhay, In charge, Soybean Improvement Program (Agronomist and Scientist) 7588559910 / 9284509057 santoshagricos@gmail.com sajaybhay@aripune.org
Technical Staff									
Fieldman (T1) Level 3 of 7 th CPC (35400-112400)	1	Technical Officer A Level 7 of 7 th CPC (44900 - 142400)	76,897	Mr. B.N. Waghmare	-	01.07.2014/ 25.04.1997	-	02112-282164 (O) 09762502294 (M) balasahebpujje@gmail.com	

**7. AICRP ON SOYBEAN, MAIN AGRICULTURAL RESEARCH STATION, KRISHI NAGAR, UNIVERSITY OF AGRICULTURAL SCIENCES DHARWAD-580
005 (KARNATAKA)**

1	2	3	4	5	6	7	8	9
Approved post by the council with pay scale	Existing post with pay scale and Academic level	No. of posts	Gross salary as on January 2022	Name	Discipline/subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. & Email ID
Scientist (4 Post)								
Scientist (Agronomy) (Rs.57,700-2,11,500+ AL 10-12)	Professor and Head (Rs. 1,44,200-2,18,200 + AL14)	1	Rs.2,18,789	Dr. Somanagouda	Agronomy	01.07.2019	-	9900213620 (M) sgouda111@gmail.com
Scientist (Plant Pathology) (Rs.57,700-2,11,500+ AL 10-12)	Associate Professor (Rs.1,31,400-2,17,100+ AL13A)	1	Rs.2,05,368	Dr. Shalini Huilgol	Plant Pathology	23.06.2017	-	9740264000 (M) sagarshalini@uasd.in
Senior Scientist (Plant Breeding)	Associate Professor (Breeder)	1	Rs.1,94,318	Dr. Gopalkrishna Naidu K.	Genetics and Plant Breeding	01.12.2021	-	9448829556 (M) naidug@uasd.in

(Rs.1,31,400-2,17,100+ AL 13A)	(Rs.1,31,400-2,17,100+ AL13A)								
Scientist (Entomology) (Rs.57,700-2,11,500+ AL 10-12)	Assistant Professor (Rs.68,900-2,05,500+ AL11)	1	Rs.1,19,803	Dr. R. Channakeshava	Agricultural Entomology	02.03.2017	-	9900934831 (M) channakeshavar@ uasd.in	
Technical Staff (3 Post)									
Technical Assistant (T4) (Rs.35400-112400)	Technical Officer (Rs.44,900-1,42,400)	1	Rs.68,364	Dr. (Smt.) Harshiya Banu	Genetics and Plant Breeding	09.03.2020	-	9513129166 (M) harshiyagpb@gm ail.com	
Field man (T1) (Rs. 5200-20200+ GP=2000)	Field Asst. (Rs. 37,900-70,850)	1	Rs.72,817	Mr. B.S. Shyagoti	-	01.04.2013	-	9480750602 (M)	
Field man (T1) (Rs. 5200-20200+ GP=2000)	Sr. Field Asst. (Rs. 37,900-70,850)	1	Rs. 72,817	Mr. S. M. Talawar	-	01.04.2021	-	8861594427 (M)	

8. UNIVERSITY OF AGRICULTURAL SCIENCES, GKVK, BENGALURU-560 065 (KARNATAKA)

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	No. of Posts	Existing post with pay scale and grade pay	Gross salary as on Jan 2022	Name	Discipline/ Subject	Date of joining the present Project/t pos	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, Fax) & Email ID	Name of the scientists with designation and discipline working on soybean other than mentioned in col.4 with phone(Office, residence, mobile) Fax and E-mail

Scientists

Plant Breeder (Sr. Scientist / Assoc. Prof.) Rs. 37400-67000+ ACP Rs. 8000-9000	Principal Scientist/ Professor (Plant Breeding) Rs. 37400-67000+ ACP Rs. 10000	1	300990.00	Dr. Onkarappa T.	Genetics & Plant Breeding	02-11-2018	-	Mob: 9590739123 Email ID: onkarappa.t@gmail.com	Nil

Technical staff

Tech. Asstt. (T5) 49000-142400 + GP 4600	Tech. Asstt. (T5) 49000-142400 + GP 4600	1	66640.00	Ms. Manasa N.	Agronomy	21-02-2022		961150399 manu.mancy@gmail.com	

9. CSKHPKIV, PALAMPUR, DISTRICT KANGRA (H.P.)

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on January, 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientists									
Assistant Soybean Breeder (15600-39100 + 6000 AGP)	Principal Scientist 37400-67000 + 10000 AGP (Pre-revised)	One	200758.00	Dr. Vedna Kumari	Plant Breeding & Genetics	8.1.2014	---	drvredna@gmail.com (M) 94181-12681 (O) 01894-230391	Dr. Janardan Singh Principal Scientist (Agronomy) singhjdtr@rediffmail.com (M)94189-27836 (O)1894-230392
Assistant Pathologist (15600-39100 + 6000 AGP)	Principal Scientist 37400-67000 + 10000 AGP (Pre-revised)	One	173426.00	Dr. Amar Singh	Plant Pathology	27.01.2011	---	singhamar008@gmail.com (M) 94181-49782 (O) 01894-230391	Dr. Surjeet Kumar Principal Scientist (Entomology) skumarhpau@gmail.com (M) 94181-53087 (O) 01894-230385

Technical Staff								
Technical Assistant-I								
(10300-34800 + 5000 AGP)	-	-	-	-	-	Post lying vacant w.e.f. May, 2021	-	---
Technical Assistant-I	Farm Manager							
(10300-34800 + 5000 AGP)	15600-39100	1	94951.00	Shri Mehar Chand	-	14.09.2017	---	--
	+ 7800 AGP						(M) -78076-00419 (O) 01894-230391	
	(Pre-revised)							

10. VIVEKANANDA PARATIYA KRISHI ANUSANDHAN SANSTHAN, ALMORA-263601 UTTARAKHAND (ICAR INSTITUTE BASED CENTER)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist									
-	Scientist (15,600-39,100 + 8,000)	-		Dr. Anuradha Bhartiya (Center I/c)	Plant Breeding	21.04.2009	-	05962-241005, Extn.219 (O) 05962-241250, 231539 (Fax) 7707911506(M) 09410560611 abhartiyaagpb@gmail.com anuradhagpb@gmail.com	
-	Sr. Scientist (15,600-39,100 + 8,000)	-	-	Dr. J.P.Aditya	Plant Breeding	07.01.2008	-	05962-241005, Extn.219 (O) 05962-241250, 231539 (Fax) 9410795850 (M) jay.aditya@icar.gov.in	
	Scientist (15,600-39,100 + 6,000)	-	-	Dr. Jeevan B	Plant Pathology	July, 2020		8638585958 (M) 05962-231539 (Fax) jeevan.bscag@gmail.com	

11. PUNJAB AGRICULTURAL UNIVERSITY LUDHIANA – 141004 (PUNJAB)

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail

Scientist

Asstt. Plant Breeder (15,600-39,100) + GP 6,000	Principal Soybean Breeder (37,400-67,000) + GP 10,000	1	2,04,735	Dr. B.S. Gill (Center I/c)	Plant Breeding	Joined as Asstt. Plant Breeder on 22.1.1997, promoted Principal Soybean Breeder 23.1.2012	-	09872163567 (M) gbalwinder@hotmail.com	Dr. (Mrs) Poonam Sharma (Microbiologist) 09915004976 (M) poonam1963in@yahoo.co.in
Asstt. Agronomist (15,600-39,100) +	Sr. Agronomist (15,600-39,100) +	1	1,39,525	Dr. Harpreet Kaur	Agronomy	Joined as Asstt. Agronomist on 28.01.2010, promoted to Sr. Agronomist	-	08146080300 (M) hkmand@rediffmail.com	Dr (Mrs) Asmita Sirari Asstt. Plant Pathologist 2401960-413(O) asmitasirari@gmail.com

12. CENTRAL AGRICULTURAL UNIVERSITY, IROISEMBA IMPHAL-795004 (MANIPUR)

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on January , 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail

Scientist

Jr. Plant Breeder (15600-39100 + 6000 GP)	Jr. Plant Breeder (15600-39100 + 6000 GP)	1	119766	Dr. H. Nanita Devi (Center I/c)	Plant Breeding	30 th August 2011	-	+917005702681 heisnamanita@rediffmail.com	-
Jr. Agronomist (15600-39100 + 6000 GP)	Jr. Agronomist (15600-39100 + 6000 GP)	1	130266	Dr. T. Sunanda Devi	Agronomy	30 th August 2011	-	+919856117141 sunandabckv@gmail.com	-
Jr. Entomologist (15600-39100 + 6000 GP)	Jr. Entomologist (15600-39100 + 6000 GP)	1	130266	Dr. Nilima Karam	Entomology	30 th August 2011	-	+917005112467 nilikaram@gmail.com	-
Jr. Food Scientist (15600-39100 + 6000 GP)	Jr. Food Scientist (15600-39100 + 6000 GP)	1	137766	Dr. L. Sophia Devi	Food Technology	30 th August 2011	-	09856939623, 08837223476 rush2sophia@gmail.com	-

Technical Staff

Fieldman (T1) (5200 – 20200+1900)	Fieldman (T2) (5200 – 20200+2400)	4	47208	H. Sarat Singh	-	19 th December 2012	-	+917085411341	-
Fieldman	Fieldman		47208	N. Daya	-	20 th	-	+919774941381	-

(T1) (5200 - 20200+1900)	(T2) (5200 - 20200+2400)		Singh		December 2012	ningthoujamdayaSingh@gmail.com	
Fieldman (T1) (5200 - 20200+1900)	Fieldman (T2) (5200 - 20200+2400)	45936	K. Lalit Singh	-	3 rd January 2014	+919436683166	-
Fieldman (T1) (5200 - 20200+1900)	Fieldman (T2) (5200 - 20200+2400)	45936	H. Subhas chandra Singh	-	12 th March 2014	+918787596910	-

13. ASSAM AGRICULTURAL UNIVERSITY, JORHAT -785013 (ASSAM)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay posts	No. of posts	Gross salary as on January, 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) &Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist (2 posts)									
Plant Breeder(Principal Scientist/Sr.Scientist)144200- 218200+GP-0	Plant Breeder (Principal)		241152		Plant	22/10/2020	Nil	Zafar.ullah300 @gmail.com	Nil

	Scientist) Mar-21 &- 205600/= Feb-22 & - 211800/=	1		Dr. Zafar Ullah	Breeding			M- 9435090889	
Plant Pathologist (Jr.Scientist)57700- 182400+GP-	Plant Pathologist (Jr. Scientist) Mar-21 &- 73000/= Feb-22 & - 75200/=	1	91850	Dr. Mummi. Borah	Plant Pathology	01/04/2018	-Nil	9127164720 (M) mborah56@gmail .com	Nil
Technical Staff (2 posts)									
Technical Assistant(111)14000- 49000+GP8700	Technical Assistant(G-111). Mar-21 &- 20970+8700(GP) Feb-22 & 21870+8700(GP)	1	37688	Mr. Diganta.Hazarika	Plant Breeding	11/12/2017	-Nil	9365543837(M)	Nil
Technical Assistant(111) 14000-49000+GP8700	Technical Assistant(G-111) Mar-21 &- 20970+8700(GP) Feb-22 & 21870+8700(GP)	1	35314	Mr. Bimal Deori	Plant Breeding	12/12/2017	-Nil	9613665059(M)	Nil

14. ICAR RESEARCH COMPLEX FOR NEH REGION, UMIAM – 793 103, MEGHALAYA (ICAR INSTITUTE BASED CENTER)

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist									
-	-	-	-	Dr. Amit Kumar (Center I/c)	Plant Breeding	-	-	amit4118@gmail.com 8974630789	-
-	-	-	-	Dr Philanim W.S.	Plant Breeding	-	-	9643198294 Philanim09@gmail.com	
-	-	-	-	Dr. P. Baiswar	Plant Pathologist	-	-	pbaiswar@yahoo.com 9436107733	-

**15. SCHOOL OF AGRICULTURAL SCIENCES AND RURAL DEVELOPMENT, NAGALAND
UNIVERSITY, MEDZIPHEMA – 797 106 (NAGALAND)**

1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, F&AX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist - 2									
Jr. Scientist (Plant Pathology)	Jr. Scientist Level: 10 Basic: 73000	1	137324.00	Dr. Pezangulie Chakruno	Plant Pathology	26.06.2018	-	08837367355 (M) pezangulie@gmail.com	Prof. Amarendra Kumar Singh (center i/c) 09436075153 (M) 08974055853 (O)
Jr. Scientist (Agronomy)	Jr. Scientist Level: 10 Basic: 82200	1	138843.00	Dr. Engrala Ao	Agronomy	20-03-2013		09436824141 (M) engraao@yahoo.in engraao@yahoo.com	aksingh_1967@yahoo.co.in
Technical Staff (T-4) – 2									
Technical Assistant	Technical Assistant 5200-20200)	1	Rs. 50866/-	Dr. Imliakum Ao	-	25-07-2012	-	08415991497 (M)	Prof. L. Tongpang Longkumer Programme Officer-TSP 09436061354 (M)
Technical Assistant	Technical Assistant 5200-20200)	1	-	-	-	-	Vacant from 10.06.2019	-	

*Recruitment under process delayed due to Covid pandemic

16 Birsa Agricultural University, Kanke, Ranchi, Jharkhand – 834006									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of post	Gross salary as on Jan 2022	Name	Discipline / subject	Date of joining the present post/project	If post is vacant, date from which it is lying vacant	Contact No.	Name of scientist with designation & discipline working on soybean other than mentioned in col. 5 with phone
Junior breeder, 15600-39100	Junior Scientist cum Assistant professor, 15600-39100 +	1	-	-	-	-	01/04/2016	-	Dr. Nutan Verma, Junior Scientist cum assistant professor, department of GPB I/C, AICRP on Soybean, BAU, Ranchi 9123485245(M) nvbau2012@gmail.com

Junior Agronomist, 15600-39100	Junior Scientist cum Assistant professor, 15600-39100 + 6000	1	11174 4	Dr. Arvi nd Kum ar Singh	Agronomy	24.07.2004	-	09431315705(M) aksbau@gmail.com	
Technical Staff									
Technical Asstt.	Field overseer(9300-34800)GP-2400/-	-	-	-	-	Vacant	--	-	-
STA	Technical assistant, 9300-34800 +4600	1	82482	Mr. C.S Topp o		01/04/2018		9973671186	

17. INDIRA GANDHI AGRICULTURAL UNIVERSITY, RAIPUR-492 012 (C.G.)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	No. of posts	Existing post with pay scale and grade pay	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present project and Post	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist (2Post)									
Scientist/Assistant Professor (Plant Breeding) [15600-39100 + 6,000 AGP]	01	Scientist [15600-39100 + 8,000 AGP]	1,16,815/-	Dr. Sunil Kumar Nag (I/c AICRPS)	Plant Breeding	2.11.2010	-	Phone- 0771-2442352 (O), Mobile- 9926159853, 08770981396 E-Mail- nagsk_igkv@yahoo.com	Dr. S. B Gupta Microbiologist Mobile- 78030-13547 ,Phone (O)- 0771-2442581 E-mail sbgupta_jgau2002@yahoo.co.in
Scientist (Agronomy) [15600-39100 + 6,000 AGP]	01	Scientist [15600-39100 + 6,000 AGP]	1,47,438/-	Dr. Arun Kumar Tripathi	Agronomy	29.12.2021	-	Mobile- 07587065514, 09753345714 aruntripathi847@gmail.com	Dr. R. K. Dantre (Plant Pathologist) Mobile- 94242-14723 ravikantdantre@yahoo.com
Technical Staff (2Post)									
Field Assistant (T1) (5,200-20,200) GP 2000	02	Field Assistant (Contractual)	14,200/-	Mr. Neeraj Kumar Thakur		29.08.2017		-	Dr. B.P. Katlam Entomologist Mobile: 06260854580 Email: katlambp1974@gmail.com
Field Assistant (T1) (5,200-20,200) GP 2000		Field Assistant (Contractual)	14,200/-	Mr. Deepak Kindo		31.08.2019		-	

18. JNKVV, KRISHINAGAR, ADHARTAL, JABALPUR-482 004 (M.P.)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	No. of Posts	Existing post with pay scale and grade pay	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present project and Post	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) &Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist (2 Post)									
Senior Scientist(Plant Breeding)37,400-67,000 + 9,000 AGP]	1	Principal Scientist (Level-14) 1,44,200	2,45,450	Dr. M.K. Shrivastava (Center I/c)	Plant Breeding	From 10-08-2017	Filled	M. 09827256494, 07987299126 shrivastava.manoj03@gmail.com	NIL
Scientist(Plant Pathology)15,600-39,100 + 6,000 AGP]	1	Scientist (Level-11) 68,900	1,14,074	Dr. P. K Amrate	Plant Pathology	19-05-2017	Filled	08224821863 pawanamrate@gmail.com	
Technical Staff (2 Post)									
Technical Assistant (T4)(Rs.9300-34800+ AGP 4200)	1	Tech.Officer (Level-10) 42,600	80753 (7th Pay)	Mr. GyanendraSingh-	Plant Pathology	20-03-2019	Filled	8839498002 singh.gyan14@gmail.com	
Technical Assistant (T4) (Rs.5200-20200+ GP 2000)	1	Vacant	-	-	-	-	3.10.2018	-	

19. AICRP ON SOYBEAN, VASANTRAO NAIK MARATHWADA AGRICULTURAL UNIVERSITY, PARBHANI-431 402 (MS.)									
1	2	3	4	5	6	7	9	10	
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name		Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.4, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist									
Soybean Breeder (37,400-67,000)	Soybean Breeder & Officer Incharge (37400-67000 + AGP 10,000) as pay 6 th pay	1	Rs. 2,31,430/-	Dr.S.P. Mehre (Center I/c)	Agri. Genetics & Plant Breeding	12/09/2014	--	09421462282, 07588156210 shivajimehre19@gmail.com Fax.- (02452)220121	NA
Jr.Entomologist (15,600-39,100)	Jr. Entomologist (Rs. 66,800 as pay 7 th pay	1	Rs. 92,716/-	Dr. R.S. Jadhav	Agri.Entomology	01.03.2018	--	7588053939 rsjadhav@gmail.com	
Technical Staff (T-4)									
Senior Research Assistant (Rs. 80,100/-)	Senior Research Assistant Rs. 80,100/- As pay 7 th pay	1	Rs. 1,10,337	Shri M.V. Kale	Agronomy	14/07/2021		8766533976 mvkale2015@rediffmail.com	NA
Senior Research Assistant (Rs. 43,100/-)	Senior Research Assistant Rs. 43,100 /- As pay 7 th pay	1	Rs. 59,647/-	Shri. D.V. Surnar	Shri. D.V. Surnar	05/04/2021	--	9403492371 datta.7387@gmail.com	NA

20. PJTSAU - AGRICULTURAL RESEARCH STATION, ADILABAD, TELANGANA STATE									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/ subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col. 5, with phone (Office, Residence, Mobile) Fax and E-mail
Scientists									
Scientist (CAS), (Agronomy) 144200 - 218200	Professor (CAS (Agronomy) 1,44,200 - 2,18,200 Acad. Level (14)/ 1,62,300/-	1	₹ 2,23,331.00	Dr. Sreedhar Chauhan	Agronomy	23.07.2013	-	08732-226863 (O) 094411 67821 (M) chauhan.sreedhar@gmail.com	Dr. K. Rajshekhar, Scientist (Entomology) Cotton Scheme, ARS, Adilabad, 9908556659(M) kanjarlarajashkar@gmail.com kanjarla28@yahoo.co.in
Scientist (Plant Breeding) 68900- 205500	Scientist (Plant Breeding) 68900- 205500 Acad. Level (11)/ 82,300/-I)	1	₹ 1,13,401.00	Dr. M. Rajendar Reddy	Plant Breeding	24.07.2017	-	08732-226863 (O) 09704134304(M) rajendar0536@gmail.com	
Technical Staff									
Technical Assistant 15030-46060/-	1 AEO Pay: 16,400.00	1	₹ 35,348.00	Sri J. Sumith Kumar	Intermediate	13.03.2018	-	08732-226863 (O) 079890 96665 (M)	
Technical Assistant 15030-46060/-	AEO 15030-46060/ 15000/-	1	₹ 26,060.00	Sri N. Arun Kumar	Diploma in Agriculture	05.01.2021	-	08732-226863 (O) 077027 96050 (M)	

21. RVSKV ZONAL AGRICULTURAL RESEARCH STATION MORENA – 476001 (M.P.)									
1	2	3	4	5	6	7	8	9	10
Approved post by the council with pay scale	Existing post with pay scale and grade pay	No. of posts	Gross salary as on Jan 2022	Name	Discipline/subject	Date of joining the present post / project	If the post is vacant, date from which it is lying vacant	Contact no. (Residence, Office & Mobile, FAX) & Email ID	Name of the scientists with designation & discipline working on soybean other than mentioned in col.4, with phone (Office, Residence, Mobile) Fax and E-mail
Scientist									
-	Jr. Scientist	-	94748.00	Dr. Jagendra Singh (Center I/c)	Genetics & Plant Breeding	23-1-2021	-	9893861622 jagendra.gwl@gmail.com	
Technical									
Tech. Asstt. (T-1) 5200-20200+1900	Vacant	-	-	-	-	-	-	-	

Statement of the Scientists working for AICRP on Soybean at need based testing Centre

1. GBPUA&T, Regional Research Station, Majhera, P.O. Garampani Dist- Nainital, Uttarakhand – 263135			
1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1	Dr. Anjuli Agrawal	Officer Incharge (Biochemistry)	(O) 05942-245538 (M) +917500241431 E-mail : oicmajhera@gmail.com

3. Rajendra Agricultural University, Tirhut College of Agriculture, Dholi-843 121, (Muzaffarpur) , Bihar			
1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1.	Dr. Anil Pandey	Univ. Prof.(Plant Breeding & Genetics) -cum-Chief Scientist & Team Leader (Oilseeds)	E-mail- aniltcadholi@gmail.com Mobile No. 09934019564 Fax: 06274-240266/24025
2.	Dr. Vikram Bharati	Jr. Agronomist (S.F.)	E-mail- vbharatiagro@gmail.com Mobile No.09471645321
3.	Dr. Ashim Kumar Mishra	Jr. Pathologist (Spices)	E-mail- ashim_sigatoka@yahoo.com Mobile No. 09973218436

4. OUA&T, Reginal Research and Technology Transfer Station , Bhawanipatna, Arkabahalipada Farm, Bhawanipatna – 766001, Kalahandi, Odisha			
1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No.
1	Dr. Susanta Kumar Mohanty	Junior Breeder (Plant Breeding and Genetics)	(O) 06670-230274 (M) 09437124090 E-mail : susantamohanty.2008@rediffmail.com
2	Dr. Anshuman Nayak	Jr. Scientist Agronomy	(O) 06670-230274 (M) 9438110299 E-mail : anshumanouat@gmail.com

5. PDKV, Department of Agricultural Botany, College of Agriculture, Nagpur-440001			
1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No.
1.	Dr. A.D. Banginwar	Asst. Professor (Plant Breeding)	8830646927,937307238(M) atulbanginwar@gmail.com

6. R & D Unit, The Ugar Sugar Woks Ltd., Ugar-khurd, Karnataka-591316			
1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1.	Mr.Jagadish S.Patwardhan	Deputy Manager R & D.	08339-272230 (Ext-214) (O), 9900559159 (M) Fax-08339-272232 jagadish.kulkarni@ugarsugar.com agdishpatwardhan@yahoo.com helpdesk@ugarsugar.com
2.	Mr. R.D.Patil	Agronomist	7259186041 (M) helpdesk@ugarsugar.com
3.	Mr.B.B.Patil	Circle Superintendent	7259020396 (M) helpdesk@ugarsugar.com

7. MPKV, Agricultural Research Station, Mahatma Phule Krishi Vidyapeeth, K. Digraj-416305 Distt. Sangli (M.S.)

1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1.	Dr. M.P. Deshmukh	Associate Prof. (Plant Breeding)	0233-2437288 (O), 0233-2437275 (Fax), 0233-2332886 (R), 09423185603 (M) 09422210476 (M) drmpdeshmukh@gmail.com
2.	Dr. S.B. Mahajan	Assistant Prof. (Plant Pathology)	sachinbm512@gmail.com

8. UAS, Raichur, ARS, Bidar-585401 Karnataka

1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1.	Dr. Sidramappa	Assistant professor (Plant Breeding)	09900875348 (M) E-mail- siddugpb@yahoo.co.in
2.	Dr. Shobharani M	Entomology	09740330194, E-mail: srani_ent@yahoo.co.in

9. TRIBAL RESEARCH CUM TRAINING CENTRE, ANAND AGRICULTURAL UNIVERSITY, DEVGADH BARIA – 389 380, DIST : DAHOD (GUJARAT)

1	2	3	4
Sr. No.	Name of the scientist	Designation with discipline	Telephone No. (Office, Residence, Mobile, Fax, E-mail)
1.	Dr. G. J. Patel	Unit head/ Res. Scientist (Agronomy)	9825930039 unitheaddb@aau.in girish_agri2005@yahoo.co.in
2.	Dr. Y.B. Chauhan	Asst. Professor (Plant Pathology)	9714888809 drybchauhan@aau.in
3	Dr.C.J. Patel	Asst. Professor Agronomy	9510135752 chiragjpatel@aau.im

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