

प्रकाशन के लिए नहीं
केवल कार्यालय उपयोग हेतु

**54 वीं वार्षिक समूह बैठक
मार्च 13-14, 2024**

**All India Coordinated Research Project on Soybean
(Indian Council of Agricultural Research)**



**54th Annual Group Meeting
March 13-14, 2024**

**कार्यवाही एवं तकनीकी कार्यक्रम (2024-25)
Proceedings and Technical Programme (2024-25)**

**54th Annual Soybean Group Meet
(AICRP on Soybean, 2024)
Venue: University of Agricultural Sciences, Dharwad
Date: March 13-14, 2024**

March 13, 2024 (Wednesday)	:	Programme
09:00 to 10:00 hrs	:	Registration
10:00 to 11:00 hrs	:	Inaugral Session
Chairman	:	Dr T. R. Sharma, Deputy Director General, (CS), ICAR, New Delhi
Chief Guest	:	Dr P L Patil, Vice Chancellor, UAS, Dharwad
Rapporteur	:	Dr Prince Choyal and Dr Raghvendra N
Welcome	:	Dr B D Biradar, Director of Research, UAS, Dharwad
Introductory Remark	:	Dr Sanjeev Gupta, ADG (O&P), ICAR, New Delhi
R&D Activities on Soybean in India and Project Coordinator's report	:	Dr K H Singh, Director, ICAR-IISR, Indore
Address by Chief Guest	:	Dr P L Patil, Vice Chancellor, UAS, Dharwad
Chairman's Remark	:	Dr T. R. Sharma, Deputy Director General(CS), ICAR, New Delhi
Vote of Thanks	:	Dr Sanjay Gupta, Principal Scientist, ICAR-IISR, Indore
11:00 to 11:15 Hrs	:	Tea

11.15-13.00 hrs	Programme Review and Technical Programme Formulation: Plant Breeding and Genetic Resources	
	Chairman	Dr T. R. Sharma, Deputy Director General, (CS), ICAR, New Delhi
	Co-chairman	Dr. R K Mathur, Director, ICAR-IIOR, Hyderabad
	Rapporteurs	Dr G K Naidu, Senior Scientist, UAS Dharwad Dr Natraj V, Scientist, ICAR-IISR, Indore
11.15-12.00 hrs	Annual Progress Report of Plant Breeding 2022	Dr Sanjay Gupta, PI-Plant Breeding, ICAR-IISR Indore
12.00-12.30 hrs	Technical Programme Presentation	
12.30-13.00 hrs	Session concluding remarks	Dr T R Sharma and Dr. R K Mathur
13.00-14.00 hrs	Lunch Break	
14.00-15.00 hrs	Meeting of the Varietal Identification Committee	
14.00-15.15 hrs	Concurrent Session: Programme Review and Technical Programme Formulation: Transfer of Technology	
	Chairman	Dr S S Dolli, Professor and Head (Ag Extension), UAS, Dharwad
	Expert	Dr S K Jha, Principal Scientist, ICAR, New Delhi

	Rapporteur	Dr Raghvendra N, Scientist, ICAR-IISR Indore Dr R K Verma, Scientist, ICAR-IISR Indore
14.00-14.45	Annual Progress Report FLD	Dr B U Dupare, Principal Scientist, Agril Extension, ICAR-IISR Indore
	Allotment of FLDs	All concerned centres
14.45-15.00	Tribal Sub Plan Activities	Dr Gyanesh Satpute, Principal Scientist, ICAR-IISR, Indore
15.00-15.15	Session concluding remarks	Dr S S Dholi
15.15-18.30 hrs	Programme Review and Technical Programme Formulation: Plant Pathology and Entomology	
	Chairman	Dr P V Patil, Professor and University HOD (Pathology), UAS Dharwad
	Co-chairman	Dr Shekarappa, Professor and University HOD (Entomology), UAS, Dharwad
	Experts	Dr Ashwani Basandrai, Plant Pathologist, CSK HPKV, Palampur, Himachal Pradesh
	Rapporteurs	Dr Shalini Huilgol, Associate Professor (Plant Pathology), UAS Dharwad Dr R S Jadhav, Jr Entomologist, MAU Parbhani
15.15-16.00 hrs	Annual Progress Report Plant Pathology	Dr Sanjeev Kumar, Scientist, ICAR-IISR, Indore
16.00-16.45 hrs	Technical Programme Presentation - Plant Pathology	
16.45-17.30 hrs	Annual Progress Report Entomology	Dr Lokesh Kumar Meena, Scientist & PI- Entomology, ICAR-IISR, Indore
17.30-18.00 hrs	Technical Programme Presentation - Entomology	
18.00-18.30	Session concluding remarks	Dr P V Patil and Dr Shekarappa
18.30-18.45 hrs	Tea Break	
18.45-19.25 hrs	Programme Review: Breeder Seed Production	
	Chairman	Dr. B.D. Biradar, Director Research, UAS, Dharwad
	Rapporteurs	Dr Punam Kuchlan, Scientist, ICAR-IISR, Indore
18.45-19.15 hrs	Scenario of breeder seed production at various centres	Dr Mrinal Kuchlan, Senior Scientist, Seed Technology, ICAR-IISR, Indore
19.15-19.30	Session concluding remarks	Dr. B.D. Biradar
14th March 2024 (Thursday):		
09.00-10.00	Centre Wise Presentation: Pune, Dharwad, Kota, Parbhani, Palampur, Ludhiana, Raipur, Jorhat, Jabalpur	
	Chairman	Dr K H Singh, Director, ICAR-IISR Indore
	Experts	Dr Yashvir Shivay, Principal Scientist, ICAR-IARI New Delhi Dr Ashwani Basandrai, Plant Pathologist, CSKHPKV,

		Palampur, Himachal Pradesh
	Rapporteur	Dr G D Chandankar, Dr Amar Singh, Dr R S Jadhav
09.00-09.15	Presentation of Pune Centre	
09.15-09.30	Presentation of Dharwad centre	
09.30-09.45	Presentation of Kota Centre	
09.45-10.00	Presentation of Parbhani Centre	
10.00-10.15 hrs	Presentation of Palampur centre	
10.15-10.30 hrs	Presentation of Ludhiana centre	
10.30-11.00 hrs	Presentation of Raipur centre	
11.00-11.15 hrs	Presentation of Jorhat centre	
11.15-11.25 hrs	Presentation of Jabalpur centre	
11.25-11.35 hrs	Chairman's Remark	
11.35-11.45	Tea Break	
11.45-13.30 hrs	Programme Review and Technical Programme Formulation: Agronomy	
	Chairman	Dr. S.S. Angadi, Director of Extension & HOD Agronomy, UAS, Dharwad
	Co-Chairman	Dr. S A Gaddanakeri, Associate Director of Extension, UAS, Dharwad
	Experts	Dr Yashvir Shivay, Principal Scientist, ICAR-IARI New Delhi
	Rapporteurs	Dr D S Meena, Associate Professor, AU, Kota Dr T Sunanda Devi, Jr Agronomist, CAU, Imphal
11.45-12.30 hrs	Annual Progress Report Agronomy	Dr R. K. Verma, PI-Agronomy, ICAR-IISR, Indore
12.30-1315 hrs	Technical Programme Presentation - Agronomy	
13.15-13.30 hrs	Session concluding remarks	Dr. S.S. Angadi and Dr S A Gaddanakeri
13.30-14.15 hrs	Lunch	
14.15-15.30 hrs	Programme Review and Technical Programme Formulation: Microbiology	
	Chairman	Dr C R Patil, Head Agril Microbiology, UAS Dharwad
	Co-chairman	Dr. P U Krishnaraj, Professor (Microbiology), UAS, Dharwad
	Experts	Dr Ashwani Basandrai, Plant Pathologist, CSKHPKV, Palampur, Himachal Pradesh
	Rapporteurs	Dr P. Jones Nirmalnath, Scientist (Microbiologist), UAS, Dharwad Dr Sanjeev Kumar, ICAR-IISR Indore
14.15-14.50 hrs	Annual Progress Report Microbiology	Dr M.P. Sharma, PS& PI-Microbiology, ICAR-IISR, Indore
14.50-15.15 hrs	Technical Programme & Presentation of	

	Microbiology	
15.15-15.30 hrs	Session concluding remarks	Dr C R Patil and Dr. P U Krishnaraj
15.30-15.45 hrs	Tea Break	
15.45-17.00	Programme Review and Technical Programme Formulation: Food Technology	
	Chairman	Dr. Sarojini Karakannavar, Director of Students Welfare, UAS, Dharwad
	Co-chairman	Dr Hemalatha S, Professor and Head, Food Processing Technology, UAS, Dharwad
	Rapporteurs	Dr. Uma L A, Professor of Food Science and Nutrition, UAS, Dharwad
15.45-16.15 hrs	Results of Food Technology Experiments	Dr L Sophia Devi, Jr Food Technologist, CAU, Imphal
16.15-16.45 hrs	Technical Programme Presentation	
16.45-17.00 hrs	Session concluding remarks	Dr. Sarojini Karakannavar and Dr Hemalatha S
17.00-18.00	Break (General Body Meeting of Society for Soybean Research & Development)	
18.00-20.00	Plenary Session	
	Chairman	Dr K H Singh, Director, ICAR- IISR, Indore
	Chief Guest	Dr B D Biradar, Director of Research, UAS, Dharwad
18.00-18.10hrs	Welcome and Remarks	Dr K H Singh, Director, ICAR-IISR Indore
18.10-19.00 hrs	Presentation of summary recommendations and highlights of deliberations	Principal Investigators of different disciplines.
	Plant Breeding & Genetic Resources	Dr Sanjay Gupta, Principal Scientist, ICAR-IISR Indore
	Plant Pathology	Dr Sanjeev Kumar, Scientist, ICAR-IISR, Indore
	Entomology	Dr Lokesh Meena, Scientist, ICAR-IISR, Indore
	Breeder Seed Production	Dr Mrinal Kuchlan, Senior Scientist, ICAR-IISR Indore
	Agronomy	Dr Rakesh Kumar, Scientist, ICAR-IISR, Indore
	Microbiology	Dr Mahaveer P Sharma, Principal Scientist, ICAR-IISR, Indore
	Transfer of Technology	Dr B U Dupare, Principal Scientist, ICAR-IISR Indore
	Food Technology	Dr. Sophia, Scientist, CAU Imphal
19.00-19.20 hrs	Remarks by Chief Guest	Dr P. L. Patil, Vice Chancellor, UAS Dharwad
19.20-19.30 hrs	Remarks by Chairman	Dr K H Singh, Director, ICAR-IISR Indore
19.30-19.40 hrs	Vote of thanks	Dr G Somanagouda, Head (agronomy) and I/c AICRPS Dharwad Centre

INAUGURAL SESSION

- Chairman** : Dr T. R. Sharma, Deputy Director General, (CS), ICAR, New Delhi
- Chief Guest** : Dr B D Biradar, Director of Research, UAS, Dharwad
- Rapporteurs** : Dr Raghavendra Nargund (Agronomy), ICAR-IISR, Indore
: Dr Prince Choyal, Scientist (Plant Physiology), ICAR-IISR, Indore

The inaugural session commenced with welcome remarks by Dr. Shekarappa, Professor and Head of the Department of Entomology, UAS Dharwad. Following this, Dr. R. K. Mathur, Director of ICAR-IIR, Hyderabad, addressed the AICRP on soybean and emphasized the importance of concentrating cropping system-based research within the R&D program for soybean. The director ICAR-IISR, Indore Dr K H Singh presented the AICRP and action taken report for the year 2023-24 and same was approved by DDG (CS), New Delhi. The chairman of the inaugural session Dr T. R. Sharma, Deputy Director General, (CS), ICAR, New Delhi addressed the gathering and emphasized to include product profile of the soybean crop with 12 specific traits:

1. yield improvement
2. early maturity,
3. disease resistance (Anthracnose, Pod blight and YMV),
4. insect resistance (Stem fly and semilooper),
5. varieties for abiotic stress tolerance (Water logging, drought & salinity),
6. identification of high phosphorus use efficient genotypes,
7. ideotype development for mechanical harvesting,
8. high oil content,
9. oil quality (High oleic acid content),
10. food grade soybean with null KTI & LOX,
11. pod shattering free,
12. varieties suitable for intercropping.

In addition he suggested for widening the genetic base of soybean using pre-breeding and use of speed breeding for rapid product development. He emphasized on the use of GWAS/Genome assisted breeding/Haplotype breeding in soybean and suggested for organization of a lecture on genome editing from speakers who have successfully developed genome edited crops. He also

called upon the scientists to develop soybean protein hydrolysate and conduct industry meet every year. For crop production and protection he suggested for standardization of fertilizer and other inputs application with modern IOT's and sensor-based tools efficient weed management weed practices, IPM, IDM models and biocontrol agents for insect pest & disease management, differential host and shift in race flora for insects and pathogens, Post-harvest value addition and processing and product for food purpose and protein rich products in collaboration with industry and market linkage. Dr. B. D. Biradar, Director of Research at UAS Dharwad, highlighted and commended the speech delivered by the DDG and urged everyone to proceed in accordance with the directions provided by the DDG (Crop Science), New Delhi.

The inaugural session ended with vote of thanks by Dr Sanjay Gupta (Pr Scientist), I/C AICRP Soybean, ICAR-IISR, Indore.

Proceedings of Plant Breeding and Genetic Resources Session

- Chairman** : Dr T. R. Sharma, Deputy Director General, (CS), ICAR, New Delhi
Co-chairman : Dr. R K Mathur, Director, ICAR-IIOR, Hyderabad
Rapporteurs : Dr. G.K Naidu, Senior Scientist, UAS Dharwad
: Dr. V. Nataraj, Scientist (SS), ICAR-IISR, Indore

At the outset, Dr. K.H Singh, Director, ICAR-IISR, Indore, welcomed the Chairman and Co-Chairman of the Session. Dr. Sanjay Gupta, Principal Investigator (Plant Breeding) presented the results of breeding trials conducted during kharif, 2023. He presented the details of different experiments viz., Pre-breeding, Multi-location Germplasm Evaluation, National Hybridization Program, Breeder Seed Production, Co-ordinated breeding trials and Off-season generation advancement at GKVK Bengaluru. During the session entries being promoted to next stage of various AICRP trials were finalized. It was suggested that field-based YMV resistance in *G. soja* accessions should be re-assessed for the virus load through qPCR, to check for the latent infection, if any. Chairman suggested for inclusion of plant architecture-related traits like first pod insertion height and resistance / tolerance against different biotic and abiotic stresses in multi-location germplasm evaluation trials. Chairman also suggested that since there is a high pressure of several diseases at Jabalpur center, there should be extensive genotype screening every year from different AICRP centers and a technical program in this regard should be formulated. It was suggested that sick plot facilities should be developed at hot spot centres under AICRP to evaluate advanced breeding lines for resistance against major diseases. The crosses suggested in National Hybridization Program (NHP) should be communicated to all the centres for effective hybridization. Varietal replacement rate in case of soybean since last 10 years should be assessed. Dr B S Gill PI PAU Ludhiana raised the issue of renaming NRC 149 as NRCSL to acknowledge the contribution of Ludhiana centre in the development of the entry. Four centers viz., Adilabad, Delhi, Pune and Kota shall be involved in the pre-breeding program. In addition, Adilabad center shall be involved in multi-location germplasm evaluation program also. In Southern Zone, Ugarkhurd centre was excluded from the conduct of coordinated breeding trials due to trial failure and improper handling for 2 years in a row. Request of TNAU, Coimbatore for becoming the voluntary centre of AICRPS was accepted. There have been frequent trial failures

in NEHZ and EZ and data from minimum 3 centres was not obtained. It was recommended that these zones including Raipur, Ranchi, Bhawanipatna, Jorhat, Medziphema and Imphal may be merged and the new zone may be designated as North Eastern Zone. Umiam was excluded from the conduct of coordinated breeding trials due to frequent failure of trials and improper handling of material. It was decided that all the locations (including above three centres) where mean maturity duration of early maturing checks is >95 days would be excluded from mean calculations. After in depth discussion following recommendations were made.

Recommendations

1. Eastern and North Eastern zone shall be merged as North Eastern Zone.
2. It was decided to repeat those entries which excelled the best check by 5-10% for seed / oil yields and fulfilling all other prescribed criteria at IVT and AVT I stage
3. In case of rejection of trials on the basis of lower grand mean for seed / oil yield than the state average, it was decided that this criteria shall not be applicable on Delhi, Ludhiana and Jabalpur centres considering the severe disease incidences leading to non survival of susceptible entries. However, mean of entries across the locations shall be on the basis of yield realized.

In Early Maturity Trials “All the locations, where mean maturity duration of checks (average of all early maturing checks) exceeds 95 days, would be excluded from zonal mean calculations. Based on this decision the data of three centres viz Lokbharti, Amreli and Morena shall be excluded from estimation of mean and on the basis of re-estimation, entries shall be promoted to AVTI (Early) in Central Zone during 2023-24. Calculations for IVT Early 2023 are summarized below:

Table . 2.18a Seed Yield of Soybean Strains in IVT Early, Zone : CZ

S.N.	Code	Strain	AMV	AND	INR	JBR	KOT	MND	NAG	PRB	SEH	Mean
			1	3	4	5	6	8	10	11	12	1-12
1	SEM-23-44	NRC 266	2500	2176	1682	741	679	2765	-	2639	1900	1885
2	SEM-23-45	NRC 138 (c)	1466	2006	1512	1512	1975	2593	2623	2670	1520	1986
3	SEM-23-46	DS 1480	2963	2809	1404	1636	2546	3753	3040	2870	2280	2589
4	SEM-23-47	NRC 264	2778	2840	1929	1358	2099	2642	2315	2747	2170	2320
5	SEM-23-48	AUKS 21-5	2515	2577	1790	926	2006	2469	2222	2639	1800	2105
6	SEM-23-49	NRC 150 (c)	1929	1883	2006	1682	2037	3457	1975	2793	2450	2246
7	SEM-23-50	KDS 1193	262	1852	1620	0	772	2790	324	1914	1330	1207
8	SEM-23-51	MACS 1834	108	2469	1096	0	216	2099	-	3364	1970	1415
9	SEM-23-52	JS 25-03	2361	2701	2145	2546	2469	3457	3750	2778	2230	2715*
10	SEM-23-53	JS 25-06	2593	2222	2269	1960	2639	3037	2809	3395	2430	2595*
11	SEM-23-54	NRC 267	2546	2299	1867	2515	2191	2716	2546	2778	2100	2395
12	SEM-23-55	MAUS 787	2052	1559	1960	1497	1497	3160	2037	2870	1900	2059
13	SEM-23-56	NRC 265	2207	1759	1836	1049	556	3383	-	2855	2070	1964
14	SEM-23-57	JS 20-34 (c)	1049	2191	1759	1559	864	3383	1157	2269	1670	1767
15	SEM-23-58	Pusa Sipani 33	1049	2392	1404	0	648	3457	664	3086	1870	1619
16	SEM-23-59	KDS 1201	571	2423	2469	1265	772	3951	262	2238	1570	1725
Mean			1809	2260	1797	1557	1498	3070	1979	2744	1954	
N.P.S.(Sqm)			6.48	6.48	6.48	6.48	6.48	4.05	6.48	6.48	10.00	
DOS			07/07/ 2023	07/08/ 2023	30/06/ 2023	05/07/ 2023	05/07/ 2023	03/07/ 2023	07/07/ 2023	30/06/ 2023	02/07/ 2023	
CD			262.35	277.7	108.0	401.2	246.9	716.0	339.5	339.5	420.0	
CV (5%)			8.57	7.3	3.5	19.3	9.8	14.0	12.6	7.4	13.0	

*Strain out yielding the best check on the basis of 10% superiority for seed and oil yield along with days to maturity numerically on par best check NRC 150

Table . 2.18b Oil content and oil yield of Soybean Strains in IVT Early, Zone : CZ

S.N.	Code	Strain	AMV	INR	JBR	KOT	MND	NAG	PRB	SEH	Mean	Oil Yield (kg/ha)
			1	4	5	6	8	10	11	12	1-12	
1	SEM-23-44	NRC 266	20.0	20.3	18.6	18.5	20.4	-	19.4	20.0	19.6	370
2	SEM-23-45	NRC 138 (c)	20.3	20.2	20.0	19.8	19.7	20.4	19.8	19.3	19.9	396
3	SEM-23-46	DS 1480	20.4	20.8	19.2	18.2	19.4	20.6	18.3	20.1	19.6	508
4	SEM-23-47	NRC 264	20.3	20.0	19.0	18.4	19.7	20.0	19.3	19.4	19.5	453
5	SEM-23-48	AUKS 21-5	19.5	25.8	19.7	18.0	19.7	19.0	19.2	19.4	20.0	422
6	SEM-23-49	NRC 150 (c)	20.0	20.0	19.5	18.2	19.8	20.5	19.3	20.2	19.7	442
7	SEM-23-50	KDS 1193	19.7	20.9	-	18.6	20.1	20.0	19.2	19.6	19.7	238
8	SEM-23-51	MACS 1834	19.9	20.7	-	18.2	19.9	-	20.0	19.8	19.8	280
9	SEM-23-52	JS 25-03	19.7	21.2	20.2	19.8	20.2	20.2	19.9	19.9	20.1	547*
10	SEM-23-53	JS 25-06	19.5	19.5	18.1	18.9	19.7	19.8	19.6	20.4	19.4	504*
11	SEM-23-54	NRC 267	20.2	20.3	18.9	18.4	20.2	20.9	20.2	18.9	19.8	473
12	SEM-23-55	MAUS 787	19.9	19.6	18.9	19.4	19.5	19.8	19.9	20.7	19.7	406
13	SEM-23-56	NRC 265	19.6	20.9	19.0	17.9	19.3	-	19.1	21.8	19.7	386
14	SEM-23-57	JS 20-34 (c)	19.8	19.2	19.2	18.2	20.0	19.5	19.0	20.5	19.4	343
15	SEM-23-58	Pusa Sipani 33	19.7	20.7	-	18.6	20.2	19.8	20.7	19.0	19.8	321
16	SEM-23-59	KDS 1201	19.6	20.8	18.6	18.5	19.9	20.1	20.0	19.6	19.6	339

*Strain out yielding the best check on the basis of 10% superiority for seed and oil yield along with days to maturity numerically on par best check NRC 150

Table . 2.18e Days to Maturity of Soybean Strains in IVT Early, Zone : CZ

S.N.	Code	Strain	AMV	AND	INR	JBR	KOT	MND	NAG	PRB	SEH	Mean
			1	3	4	5	6	8	10	11	12	1-12
1	SEM-23-44	NRC 266	85	89	91	92	91	85	-	96	91	90
2	SEM-23-45	NRC 138 (c)	86	94	96	93	92	86	82	92	94	91
3	SEM-23-46	DS 1480	94	97	106	94	98	84	88	97	99	95
4	SEM-23-47	NRC 264	84	88	95	91	93	90	83	95	92	90
5	SEM-23-48	AUKS 21-5	85	94	103	94	96	91	87	93	92	93
6	SEM-23-49	NRC 150 (c)	80	85	92	92	92	84	82	90	91	88
7	SEM-23-50	KDS 1193	95	97	106	97	102	80	98	95	101	97
8	SEM-23-51	MACS 1834	96	103	103	93	102	89	-	101	99	98
9	SEM-23-52	JS 25-03	84	96	91	89	90	84	80	95	90	89
10	SEM-23-53	JS 25-06	90	90	99	90	91	91	83	91	93	91
11	SEM-23-54	NRC 267	96	88	93	90	90	84	84	97	93	91
12	SEM-23-55	MAUS 787	95	94	96	93	96	84	88	96	97	93
13	SEM-23-56	NRC 265	95	91	92	93	92	90	-	95	92	93
14	SEM-23-57	JS 20-34 (c)	83	86	94	90	90	92	87	93	91	91
15	SEM-23-58	Pusa Sipani 33	94	95	108	97	96	94	97	96	101	100
16	SEM-23-59	KDS 1201	95	97	106	101	97	84	98	99	100	100

TECHNICAL PROGRAMME OF PLANT BREEDING FOR KHARIF 2024

1. CO-ORDINATED VARIETAL TRIALS

A. NORTHERN Hill ZONE (NHZ):

Advanced Varietal Trial I (AVT I)

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)
REPLICATION	Four
LOCATIONS	Palampur, Almora, Majhera
ENTRIES	VLS 106
CHECKS	VLS 89, VLS 63, VLS 99, Him Palam Hara Soya 1 (Himso 1685), NRC 197
SEED	1.250 kg/entry/location

B. NORTH EASTERN HILL ZONE (NEHZ):

Advanced Varietal Trial I (AVT I)

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)
REPLICATION	Four
LOCATIONS	Raipur, Ranchi, Bhawanipatna
ENTRIES	NRC 190, AMS 2021-4, KDS 1188, MAUS 824, PusaSipani 433, RSC 1172, SL 1315,AMS 2021-3
CHECKS	MACS 1407, JS 20-116, KDS 753, DSb 32, NRC 142
SEED	1.250 kg/entry/location

C. EASTERN ZONE (EZ):

Advanced Varietal Trial I (AVT I) Normal Maturity

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)
REPLICATION	Four
LOCATIONS	Raipur, Ranchi, Bhawanipatna
ENTRIES	DS 1547, NRC 268
CHECKS	NRC 128, RSC 11-07, RSC 10-46, NRC 142, RSC 11-42
SEED	1.250 kg/entry/location

D. Central ZONE (CZ):**Advanced Varietal Trial I (AVT I) Normal Maturity**

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)

REPLICATION	Four
LOCATIONS	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore,
ENTRIES	NRC 270, DS 1547, JS 25-08, NRC 268
CHECKS	JS 20-98, RSC 10-46 , NRC 142, JS 21-72,
SEED	1.250 kg/entry/location

E. Central ZONE (CZ):**Advanced Varietal Trial I (AVT I) Early Maturity**

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)
REPLICATION	Four
LOCATIONS	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore,
ENTRIES	JS 25-03and JS 25-06
CHECKS	JS 20-34, NRC 150, NRC 138 and JS 22-12
SEED	1.250 kg/entry/location

Advanced Varietal Trial II (AVT II) Early Maturity

DESIGN	R.B.D.
GROSS PLOT SIZE	8 rows, 5m long (3.6 x 5 m sq)
NET PLOT SIZE	6 rows, 4.8m long (2.7 x 4.8 m sq)
REPLICATION	Four
LOCATIONS	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore,
ENTRIES	JS 24-33
CHECKS	JS 20-34, NRC 152, NRC 138
SEED	1.250 kg/entry/location

**F. INITIAL VARIETAL TRIAL (IVT) Normal Maturity (ACROSS ZONES):
Centre wise entries for IVT Trial across zones. (Grain Yield)**

S. No.	Entry	Pedigree	Contributing Centre
1.	KBSL 24-1	JS24-34 x RVS2001-18	UAS Bengaluru
2.	MACS 1859	DS 9814 x JS 93-05	ARI Pune
3.	MACS 1831	JS(SH) 93-37 x MACS 330	
4.	RVS 23-23	JS 20-63×JS 95-60	Sehore
5.	RVS 23-22	JS 335×PK 1042	
6.	RSC 12-05	CG Soya 11-15 x IS-9	IGKV, Raipur
7.	RSC 12-11	RSC 10-46 x JS 20-34	
8.	JS 25-55	DS 3105 x JS 20-69	JNKVV, Jabalpur
9.	AMS 22-14	JS 97-52 xSL 688	RRS, Amrawati
10.	AMS 06	Bragg x JS 93-05	
11.	AMS 2022-1	AMS 100-39 x JS 93-05	
12.	ASb 185	RVS 2001-18 x EC 572154	ARS, Adilabad
13.	ASb114	Magic population	
14.	SL 1431	BC1 (SL 958 x NRC 94) x NRC 94	PAU, Ludhiana
15.	SL 1441	SL 958 x JS 335	
16.	DLSb 6	DSb 23 x SL 958	UAS, Dharwad
17.	DSb 33-09	DSb 21 x JS 95-60	
18.	AUKS 22-1	JS 20-87 x PS 1450	Kota
19.	AUKS 22-10	JS 20-69 x MAUS 612	
20.	VLS 107	VLS 75 x JS 95-60	Almora
21.	VLS 108	VLS 63 x VLS 59	
22.	MAUS 817	JS 335 X EC 538828-6	Parbhani
23.	MAUS 793	JS 20-29 X JS 95-60- 3	
24.	Himso 1697	SL-679 x Pb-1	Palampur
25.	NRC 290	JS 95-60 × SL 525 × NRC 142 (Double Null KTi & Lox 2)	Indore
26.	NRC 291	AMS 100-39 × NRC 142 (Lox 2 Free)	
27.	NRC 292	JS 95-60 × SL 525 × NRC 142 (High oil 21% wet chemistry)	
28.	NRC 293	Hardee × NRC 7	
29.	NRC 294	Hardee × NRC 7	
30.	NRC 295	JS 93-05 x JS 97-52	
31.	DS1455	DS 3109 X SL 958	Delhi
32.	DS1350	DS 3105 X DS 2709	
33.	DS 1480	NRC 37 X JS 97-52	
34.	TS 105	S-100 (mutant of JS20-116) x Dsb-32	Trombay
35.	CAUMS 4	JS 20 - 71 x JS 20 – 22	Imphal

36.	KSS 394	JS-9305 X Gline (JS-335 X MAUS -71)	Basant Agro
37.	AS 90	(JS 335 x EC838858)-K12-2-B-B-7-99-B-1-1-B	Amreli
38.	KDS 1198	KDS 344 x NRC 102	Kasbe Digraj
39.	PusaSipani 438	JS 335 x JS 95-60	Mandsaur
40.	RCS 1-10	JS 80-21 x PK 416	Umiam
41.	BAU(M)-6	Mutant of BSS 2	Ranchi
42.	TS 101 (Repeat)	TS 100 (Mutant of JS 20-116) x T-99-76	BARC Mumbai
43.	NRC 269 (Repeat)	NRC 128 x JS 95-60	Indore
44.	JS 25-08 (Repeat)	JS 20-71x JS 20-87	Jabalpur

Design	Alpha Lattice Design (See Layout Below)			
GROSS PLOT SIZE	5 rows, 5 m long (2.25 x 5 m sq)			
NET PLOT SIZE	3 rows, 4.8 m long (1.35 x 4.8 m sq)			
Plant to Plant Distance	5-10 cm			
Plant Population	450-550 plants / plot			
Cut off Sowing Date	10 July			
Observations	Days to Flower, Plant Height, Days to Maturity, 100 Seed Weight, Grain Yield, Plant Population at maturity			
Zone	Centre			
NHZ	Almora, Palampur, Majhera ,			
NPZ	Pantnagar, Delhi, Ludhiana			
NEZ	Ranchi, Raipur, Bhawanipatna, Imphal and Jorhat			
CZ	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore,			
SZ	Pune, K. Digraj, Bengaluru, Dharwad, Adilabad, Bidar			
SEED Requirement	16 kg/entry			
CHECKS:There will be following checks in each zone:				
Zones	National Check	Zonal Check	Latest Release	Food Grade
NHZ	JS 335	VLS 89	VLS 99	NRC 197
NPZ	JS 335	NRCSL 3 (NRC 149)	PS 1670	NRC 142
NEZ	JS 335	JS 20-116	RSC 11-42	NRC 142
CZ	JS 335	JS 20-98	JS 21-72	NRC 142
SZ	JS 335	DSb 34	KDS 992	NRC 142

Lay out plan for ALPHA DESIGN for the conduct of Soybean IVT (Normal Maturity)

REPLICATION 1								
Block 1	29	35	11	5	47	17	41	23
Block 2	9	27	45	21	33	39	15	3
Block 3	14	32	2	8	20	38	44	26
Block 4	31	25	19	7	43	1	13	37
Block 5	34	46	28	16	22	10	4	40
Block 6	6	30	24	42	48	36	18	12

REPLICATION 2								
Block 1	43	36	38	4	13	26	23	9
Block 2	17	30	47	34	42	7	21	2
Block 3	41	1	29	20	33	12	46	16
Block 4	45	15	19	11	32	6	28	40
Block 5	48	8	22	35	37	25	18	3
Block 6	10	14	5	31	24	27	44	39

REPLICATION 3								
Block 1	14	35	4	11	20	42	45	25
Block 2	33	29	24	9	43	2	18	40
Block 3	32	48	28	17	23	8	1	39
Block 4	3	30	19	41	44	34	13	10
Block 5	31	7	6	27	47	22	38	16
Block 6	37	21	46	12	15	36	5	26

G. INITIAL VARIETAL TRIAL-EARLY (IVT-EARLY) CENTRAL ZONE

S.No.	Entry	Pedigree	Contributing Centre
1.	RVS 23-17	JS 20-29×JS 20-22	Sehore
2.	RVS 23-21	JS 20-57×JSM259	
3.	MACS 1884	MACS 1259 x JS 93-05	Pune
4.	JS 25-50	JS 21-17 x PS 1092	Jabalpur
5.	JS 25-52	JS 21-05 x JS 20-24	
6.	AMS 24-12	JS 21-08 x NRC 121	Amrawati
7.	ASb 107	[EC 546882x NRC 37] X [EC 333901x NRC 86] X [EC 572109 x JS 95-60] X [EC 572136 x JS 335]	Adilabad
8.	ASb 114		
9.	DSb 33-09	DSb 21 x JS 95-60	Dharwad
10.	NRC 286	EC 457254 × JS 95-60	

11.	NRC 287	JS 20-69 × EC 538828	Indore
12.	NRC 288	JS 95-60 × AGS 25	
13.	NRC 289	EC 457254 × JS 20-34	
14.	DS 1831E	DS 3105 X DS 2911	Delhi
15.	DS 1935E	PS 1347 X JS 20-34	
16.	MAUS 770	Selection from NRC 2012 -F-25-4	Parbhani
17.	AS 27	(GJS 3 x JS 75-10)-K13-1-B-5-2-1-B	Amreli
18.	AS 30	(GJS 3 x JS 75-10)-K13-1-B-8-3-2-B	
19.	Lok Soya 04	JS 20-34 x AK 887	Lokbharti
20.	Lok Soya 05	JS 21-08 x NRC 121	
21.	AUKS 21-5	JS 20-53 x JS 20-34-3-1	Kota
22.	Pusa Sipani 409	JS 95-60 x SKF 148	Mandsaur

DESIGN	R.B.D.
GROSS PLOT SIZE	5 rows, 5 m long (2.25 x 5 m sq)
NET PLOT SIZE	3 rows, 4.8 m long (1.35 x 4.8 m sq)
REPLICATION	Three
LOCATIONS	Jabalpur, Sehore, Parbhani, Amrawati, Kota, Morena, Anand, Amreli, Indore, LokBharti and Nagpur, Mandsaur
SEED	6 kg/entry
CHECKS	JS 20-34, NRC 150, JS 22-12 and NRC 165

Layout Plan for IVT (Early Maturity)

Block 1	Block 2	Block 3
Treatment Number		
7	10	3
12	18	13
3	7	1
19	21	11
10	5	4
22	8	20
14	13	6
18	15	18
1	6	16
6	14	9
20	9	5
16	20	10
21	3	15
8	2	21
5	1	19
9	22	8
4	17	14
13	12	22

2	4	7
11	19	12
15	16	17
17	11	2
7	10	3
12	18	13
3	7	1
19	21	11

H. Mega-environment Trial (All centres except Delhi):

S.No	Last Year IVT code	Genotype
1	SNM-23-2	AMS 22-16
2	SNM-23-4	MAUS 816
3	SNM-23-7	DS 1589
4	SNM-23-8	RSC 11-95
5	SNM-23-12	KBSL 23-36
6	SNM-23-16	THPS 6
7	SNM-23-19	Lok Soya 03
8	SNM-23-20	KSS 225
9	SNM-23-22	MACS 1810
10	SNM-23-24	ASb 101
11	SNM-23-26	DLSb 5

Design	Randomized Block Design
GROSS PLOT SIZE	5 rows, 5 m long (2.25 x 5 m sq)
NET PLOT SIZE	3 rows, 4.8 m long (1.35 x 4.8 m sq)
Centres	All centers except Delhi
Plant to Plant Distance	5-10 cm cm
Plant Population	450-550 plants / plot
Observations	Days to Flower, Plant Height (cm), Days to Maturity, 100 Seed Weight (g), Grain Yield/plot (g)

Promotion Criteria up to 2023:

1. Under the normal maturity group entry shall be promoted on the basis of 10 percent superiority of candidate entry over the best check for grain/oil yield. However, under the early maturity group, entry would be promoted on the basis of numerically at par or less maturity duration than the early maturity check and 10 percent higher grain/oil yield over the best check. It was decided that there would not be extra early trial only early trial would be there.
2. Under the food grade category, entry shall be promoted on the basis of at par (numerically) grain yield with the best check and 5 percent superiority over the best food grade variety

check for grain yield. Food grade quality for KTi, Lox II (3) shall be determined on the basis of biochemical analysis for these need to be verified from any referral lab.

3. Entries with high oleic acid content shall be promoted on the basis of at par (numerically) grain/oil yield with the best check and 5 percent superiority over the best oleic acid content check for grain/oil yield. Oleic acid content shall be determined on the basis of biochemical analysis from at least two different labs.
4. Vegetable soybean trial will continue but collaboration with ICAR-IIVR would be taken and parameters for vegetable type shall be decided. There should be at least 3 participating institutions for contributing entries for constitution of trials for vegetable type.
5. Rejection criteria of trial was discussed and **it was decided that trials with more than 20% CV and less than state average (previous three year average) would be rejected.**
6. There will be no separate drought, water logging, salinity. For entries having drought, salinity tolerance and water logging trait will be tested initially in IVT separately in hot spot or for specific traits imposing the stress and entries performed better than best check for those traits for which they are tested will be directly included in AVT-I. All the entries with special traits (salinity & drought tolerance and waterlogging) will be tested in regular yield trials during AVT-I and AVT-II.

2. Pre-Breeding

- A. Fresh hybridizations, back crossing and generation advancement of *G max* x *G soja*.
- B. Second year evaluation of 25 of the recently introduced *G soja* accessions at hot spots of diseases like Jabalpur (Charcoal Rot), Indore (Anthracnose), Pantnagar (RAB), Almora and Palampur (FLS), Rust (Dharwad), YMV (Ludhiana), Indian Bud Blight (Raipur), Adilabad and Pune

EC1165891, EC1165824, EC1165933, EC1165787, EC1165790, EC11655850, EC1165879, EC1165842, EC1165822, EC1165791, EC1165914, EC1165863, EC1165789, EC1165820, EC1165892, EC1165826, EC1165813, EC1165849, EC1165808, EC1165807, EC1165839, EC1165814, EC1165897, EC1165923, EC1165928,

Important Instructions for Evaluation of *G soja* accessions:

Sowing is to be taken up in petri plates with moist germination paper. A cut in seed coat is required to be made. An online demonstration would be arranged by ICAR-IISR Indore. After germination plants are to be transferred in pots. Scoring to be done for diseases and observations on plant height, growth habit (determinate, semi-determinate, indeterminate), days to 50% flower, days to maturity, maturity habit (Synchronous or not), 100 seed weight, seed yield / plant, number of pods / plant to be recorded. If possible create artificial epiphytotic conditions. It is a very precious material so utmost care is required

3. Multi-location Germplasm Evaluation Trial:

Accessions	Checks	Duration	Design & Replications	Row Length
200	3 zonal and one national	2 years	RBD with 2 Replications	1 meter row length

Name of Zone	Name of Checks
Northern Hill Zone	Harasoya, VLS 99, VLS 89, VLS 59, JS 335

Northern Plain Zone	NRC SL 3 (NRC 149), PS 1670, SL 958, JS 335
North Eastern Zone	JS 20-116, RSC 11-42, MACS 1460, JS 335
Central Zone	JS 20-94, JS 20-98, JS 22-12, JS JS 335
Southern Zone	DSb 34, KDS 992, NRC 142, JS 335

Characters:

1. Daysto 50 % flowering	2. Days to 90% maturity	3. Plant height (cm)
4. Number of nodes/plant	5. Number of pods/plant	6. First Pod height (cm)
7. Stem girth (cm)	8. No. of plants in row	9. 100 seed weight (g)
10. Grain yield/plant (g)	11. Row yield (g)	12. Internodal length

***First Pod Insertion height (cm): Height from soil at the base of plant to the first pod.**

*** Stem girth (cm): Data to be recorded at base of the stem**

Centres:

NHZ	NEZ	CZ	NPZ	SZ
Almora, Palampur	Raipur, Imphal	Indore, Parbhani	Pantnagar	Pune, Adilabad

4. National Hybridization Programme:

(A) Followin segregating generation (F3) of 63 crosses (NHP 2024-200 to NHP 2024-262) developed by by Dr Sanjay Gupta and Dr Vangala Rajesh, co-PIs of the NASF Project “Marker assisting stacking of yellow mosaic disease resistance, null Kunitz trypsin inhibitor, null lipoxygenase-2 genes, and broadening the genetic base of soybean” would be contributed to AICRP centres in kharif 2024.

Dr Sanjay Gupta and Dr Rajesh Vangala (NASF Project)					
1	NHP 2024-200	MACS-1460 x AGS 25	33	NHP 2024-232	NRC 130 X NRC-136
2	NHP 2024-201	MACS-1460 X TGX-8116-21 D	34	NHP 2024-233	NRC-225 X NRC -131
3	NHP 2024-202	MACS-1460 X EC 274713	35	NHP 2024-234	KDS-753 X EC 10334
4	NHP 2024-203	MACS-1460 X EC 456613	36	NHP 2024-235	KDS-753 X EC 241995
5	NHP 2024-204	MACS-1460 X EC 457475	37	NHP 2024-236	CAT 2797 X NRC-130
6	NHP 2024-205	NRC149 X RSC-10-46	38	NHP 2024-237	JS 20-116 X EC-391346
7	NHP 2024-206	NRC149 X DS3105	39	NHP 2024-238	JS 20-34 X NRC-158
8	NHP 2024-207	NRC149 X NRC-204	40	NHP 2024-239	JS 20-34 X RSC-10-46
9	NHP 2024-208	PS-1347 X AGS 25	41	NHP 2024-240	JS 97-52 X JS 75-46
10	NHP 2024-209	NRC 138 X EC 546882	42	NHP 2024-241	NRC-128 X RSC- 10-46
11	NHP 2024-210	NRC 138 X AGS 25	43	NHP 2024-242	VLS-63 X EC-274713
12	NHP 2024-211	NRC 138 X CAT2797	44	NHP 2024-243	EC-274713 X VLS-63
13	NHP 2024-212	NRC 138 X NRC 131	45	NHP 2024-244	EC-546882 X NRC-138
14	NHP 2024-213	NRC 138 X NANKING	46	NHP 2024-245	EC-538828 X NRC-158
15	NHP 2024-214	NRC 138 X NRC130	47	NHP 2024-246	RSC- 10-52 X TGX-854-429
16	NHP 2024-215	DSB 34 x AGS143	48	NHP 2024-247	TGX-854-429 X RSC-10-52
17	NHP 2024-216	DSB 34 X LEE	49	NHP 2024-248	JS 20-69 X MACS 450
18	NHP 2024-217	AGS 25 X NRC 149	50	NHP 2024-249	JS 20-98 X NRC-256
19	NHP 2024-218	AGS 25 X KDS 753	51	NHP 2024-250	NRC-256 X JS 20-98
20	NHP 2024-219	AGS 25 X RSC 1046	52	NHP 2024-251	NRC-256 X NRC-128
21	NHP 2024-220	AGS 25 X MACS 1460	53	NHP 2024-252	NRC-256 X RSC-10-46
22	NHP 2024-221	NRC 131 X NRC 225	54	NHP 2024-253	NRC-256 X NRC-149
23	NHP 2024-222	NRC 131X NRC 136	55	NHP 2024-254	NRC-256 X DSB 21
24	NHP 2024-223	RSC 10-46 X AGS 25	56	NHP 2024-255	NRC-189 XNRC 128

25	NHP 2024-224	RSC 10-46 X NRC 128	57	NHP 2024-256	NRC-189 X DSB 21
26	NHP 2024-225	RSC 10-46 X NRC 149	58	NHP 2024-257	NRC-189 X RSC-10-46
27	NHP 2024-226	LEE X Dsb 34	59	NHP 2024-258	NRC-189 X JS 20-116
28	NHP 2024-227	VLS-89 X AGS 218	60	NHP 2024-259	NRC-192 X RSC-10-46
29	NHP 2024-228	VLS-89 X NAN KING	61	NHP 2024-260	NRC-192 X JS 20-116
30	NHP 2024-229	SL 1074 X AGS 25	62	NHP 2024-261	NRC-192 X NRC-128
31	NHP 2024-230	NRC 130 X CAT 2797	63	NHP 2024-262	NRC-192 X DSB 21
32	NHP 2024-231	NRC 130 X EC-34372			

(B) Crosses Contributed by other scientists from their institute / AICRP Projects

MACS ARI, PUNE (64-72)					
64	NHP 2024-263	MACS 1460 X EC 241780	69	NHP 2024-268	MACS 1460 X AVKS 71
65	NHP 2024-264	MACS 1460 X Harasoya	70	NHP 2024-269	MACS 1460 X JS SH 93-37
66	NHP 2024-265	MACS 1460 X AMS-MB-5-18	71	NHP 2024-270	MACS 1460 X MACS 450
67	NHP 2024-266	MACS 1460 X SL 958	72	NHP 2024-271	MACS 450 X Dsb 23
68	NHP 2024-267	MACS 1460 X TAMS 9821			
Dr V.Nataraj (73-77)					
73	NHP 2024-272	JS 20-98 X JS 9560	76	NHP 2024-275	JS 20-34 X JS 9560 (F4)
74	NHP 2024-273	JS 20-98 X JS 9560 (F4)	77	NHP 2024-276	EC 457254 X JS 9560
75	NHP 2024-274	JS 20-34 X JS 9560			
Dr Vangala Rajesh (78-106,122)					
78	NHP 2024-277	JS 20-69 X VLS 59	93	NHP 2024-292	F4P21 X LINE 202
79	NHP 2024-278	Basara X Karune	94	NHP 2024-293	AGS 155 X (JS 20-34 X Line 220)
80	NHP 2024-279	JS 9305 X AGS 25	95	NHP 2024-294	F3P18 X LINE 202
81	NHP 2024-280	Basara x VLS 63	96	NHP 2024-295	Basara X (F4P21 X Line 220)
82	NHP 2024-281	RKS 113 X SL 1104	97	NHP 2024-296	F3P18 X Line 220
83	NHP 2024-282	Harasoya X EC 915908	98	NHP 2024-297	JS 20-34 X Line 220
84	NHP 2024-283	AMS-MB-5-18 X EC 915908	99	NHP 2024-298	JS 9560 X Line 220
85	NHP 2024-284	JS 20-34 X Hardee	100	NHP 2024-299	JS 20-34 X EC 481369
86	NHP 2024-285	JS 20-98 X G5P22	101	NHP 2024-300	JS 97-52 X EC 481369
87	NHP 2024-286	F3P18 X JS 9305	102	NHP 2024-301	F4P21 X EC 481369
88	NHP 2024-287	JS 9560 X (AKSS 67 X G5P22)	103	NHP 2024-302	Harasoya X JS 9305
89	NHP 2024-288	Harasoya x (F4P21 X Line 220)	104	NHP 2024-303	Basara x EC 481369
90	NHP 2024-289	F3P18 X JS 335	105	NHP 2024-304	RSC 10-46 X EC 481369
91	NHP 2024-290	G5P22 X JS 335	106	NHP 2024-305	Basara X NRC 130
92	NHP 2024-291	F4P21 X RSC 10-46			
Dr Gyanesh Satpute (108-123)					
107	NHP 2024-306	(AMS MB 5-18 x JS 95-60) X (PI 159923 x JS71-05)	114	NHP 2024-313	[(JS71-05 x NRC 37) X Drt2 (TGX 328-049)] X [(AMS MB 5-18 x JS 95-60) X (PI 159923 x JS 95-60)]
108	NHP 2024-307	(38-11-265 x JS 95-60) X (JS71-05 x NRC 37)	115	NHP 2024-314	NRC 137 X GKS 20-5 (F4)
109	NHP 2024-308	GKS 20-7 X NRC 137	116	NHP 2024-315	JS 71-05 X NRC 37 (F4)

110	NHP 2024-309	(AMS MB 5-18 X JS 95-60) X (PI 159923 X JS 95-60)	117	NHP 2024-316	NRC 136 X GKS 21-3 (F4)
111	NHP 2024-310	(JS 71-05 X NRC 37) X (AMS MB 5 18 X JS 95-60)	118	NHP 2024-317	GKS 20-7 x NRC 137 (F4)
112	NHP 2024-311	(JS 71-05 X NRC 37) X EC 602288	119	NHP 2024-318	PI 159923 X JS 95-60 (F4)
113	NHP 2024-312	(AMS MB 5-18 x JS 95-60) X (PI 159923 x JS71-05) x (38-11-265 x JS 95-60) X (JS71-05 x NRC 37)	120	NHP 2024-319	38-11-265 X JS 95-60 (F4)
			121	NHP 2024-320	PI 159923 X NRC 37 (F4)
Dr Vangala Rajesh (122)					
122	NHP 2024-321	Hardee X Karune			

Suggested Crossing Programme to Centres in National Hybridization Programme

Zone	Cross	Centres
NHZ	1. Palam Early soya x EC 287456 2. VLS 89 x IC 0117914	Palampur, Almora
NPZ	1. PS 1670 x EC 69729 2. PS 1347 x EC 172654	Ludhiana, Pantnagar
CZ	1. JS 20-34 x IC 0243043 2. PS 1347 x EC 915908 3. JS 9560 x IC 0501967 4. NRC 130 x EC 0456620 5. NRC 138 x EC 0016729 6. RVSM 11-35 x EC 0241920 7. NRC 150 x IC 0118614	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore,
NEZ	1. JS 20-116 x IC 0243043 2. Dsb 21 x IC 0243565 3. JS 20-116 x IC 0501196 4. NRC 128 x EC 76755	Raipur, Ranchi, Imphal
SZ	1. Dsb 34 x EC 0241848 2. KDS 992 x IC 328971	Pune, K. Digraj, Bengaluru, Dharwad, Adilabad, Bidar

Important Notes:

1. Seed of entries must reach by 30 April at
Dr Sanjay Gupta, Principal Scientist (Plant Breeding),
ICAR-Indian Institute of Soybean Research
Indore, 452001 (M P)
2. Seed of checks by the developing breeder should also reach by 15 April at the above address.
3. Cut-off date for conduct (sowing) of all trials is 10th July. Trials sown later than this date would not be considered.
4. Report must reach to Director IISR and PI Plant Breeding by 30 November.

5. Data entry for all trials is to be done on-line. Guidelines for the same are given below:
 1. On the desktop click the Internet explorer icon.
 2. In the internet explorer type <http://www.nrcsoya.nic.in> and open this website.
 3. In the home page of the official website, click on the hyperlink “AICRPS Data entry” available at the bottom.
 4. Enter the username and the password as informed to you.
 5. Now select the trial, character and start entering the final data for each and save every time by clicking the save button provided on the screen at the bottom.
 6. Using the 5th – step, repeat the data- entry for all the trials and characters and save it every time.
 7. At last, view the data-entered and recheck it.
 8. Details of entries to be included in next year’s IVT must reach to the PI (Plant Breeding) in following format by 10 February

Name of Centre	Name of Entry	Name of Trial	Pedigree	Station Trial Data

In case of any contact Mrs. Savita Kolhe, Scientist(Computer Application) at e-mail savitasoham@gmail.com or savita_kolhe@rediffmail.com

6. Data entry of Grain Yield in IVT (NM) is to be done in the format given below:

rep	block	treatment	Seed yield (Kg/ha)	rep	block	treatment	Seed yield (Kg/ha)	rep	block	treatment
1	1	29		2	1	43		3	1	14
1	1	35		2	1	36		3	1	35
1	1	11		2	1	38		3	1	4
1	1	5		2	1	4		3	1	11
1	1	47		2	1	13		3	1	20
1	1	17		2	1	26		3	1	42
1	1	41		2	1	23		3	1	45
1	1	23		2	1	9		3	1	25
1	2	9		2	2	17		3	2	33
1	2	27		2	2	30		3	2	29
1	2	45		2	2	47		3	2	24
1	2	21		2	2	34		3	2	9
1	2	33		2	2	42		3	2	43
1	2	39		2	2	7		3	2	2
1	2	15		2	2	21		3	2	18
1	2	3		2	2	2		3	2	40
1	3	14		2	3	41		3	3	32
1	3	32		2	3	1		3	3	48
1	3	2		2	3	29		3	3	28
1	3	8		2	3	20		3	3	17
1	3	20		2	3	33		3	3	23
1	3	38		2	3	12		3	3	8
1	3	44		2	3	46		3	3	1
1	3	26		2	3	16		3	3	39
1	4	31		2	4	45		3	4	3
1	4	25		2	4	15		3	4	30
1	4	19		2	4	19		3	4	19
1	4	7		2	4	11		3	4	41
1	4	43		2	4	32		3	4	44
1	4	1		2	4	6		3	4	34
1	4	13		2	4	28		3	4	13
1	4	37		2	4	40		3	4	10
1	5	34		2	5	48		3	5	31
1	5	46		2	5	8		3	5	7
1	5	28		2	5	22		3	5	6
1	5	16		2	5	35		3	5	27
1	5	22		2	5	37		3	5	47
1	5	10		2	5	25		3	5	22
1	5	4		2	5	18		3	5	38
1	5	40		2	5	3		3	5	16
1	6	6		2	6	10		3	6	37
1	6	30		2	6	14		3	6	21
1	6	24		2	6	5		3	6	46
1	6	42		2	6	31		3	6	12
1	6	48		2	6	24		3	6	15
1	6	36		2	6	27		3	6	36
1	6	18		2	6	44		3	6	5
1	6	12		2	6	39		3	6	26

Proceedings of the Technical Session on Transfer of Technology

Chairman: Dr S. S.Dolli, Professor and Head (Ag Extension), UAS, Dharwad

Expert : Dr S.K. Jha, Pr. Scientist, ICAR, New Delhi

Rapporteurs : Dr Raghavendra Nargund (Agronomy), ICAR-IISR, Indore

Dr R. K. Verma, Scientist (Agronomy), ICAR-IISR, Indore

The Nodal Officer (FLD) Dr B U Dupare, Principal Scientist, ICAR-IISR, Indore, presented the progress of the results of the FLDs conducted by different FLD centers spread across the country during *Kharif* 2023. He also presented the technical programme which includes allotment of FLDs for the year 2024. Dr Sanjay Gupta narrated the progress of the TSP and NEH activities under AICRPS. It was suggested that farmers should be educated through organization of Field Days wherever the yield gap is high by involving state department of agriculture. Results of frontline demonstration should be brought to public domain in terms of publications. Under TSP activities video must be recorded and Adilabad center may be included in TSP programme.

Based on the deliberations the following recommendations emerged:

1. Inclusion of incremental benefit-cost ratio analysis to different components of FLD.

Technical Programme for the year 2024-25

Table-1: Summary of the centre-wise FLDs allotted to different centres during kharif 2024

S. No.	Centres	Zone	State	Tentative No. of FLDs allotted
1	ICAR-IISR Indore	Central zone	Madhya Pradesh	250
2	CoA, Sehore	Central zone	Madhya Pradesh	10
3	MAU, Parbhani	Central zone	Maharashtra	50
4	PDKV, Amravati	Central zone	Maharashtra	20
5	KVK Karda	Central zone	Maharashtra	100
6	AU, Kota	Central zone	Rajasthan	30
7	KVK Bharuch	Central zone	Gujrat	15
8	DevgrahBaria	Central zone	Gujrat	30
9	Raipur	Eastern zone	Chhattisgarh	100
10	BAU, Ranchi	Eastern zone	Jharkhand	10
11	CAU, Imphal	North Eastern hill Zone	Manipur	10
12	Medziphema	North Eastern hill Zone	Nagaland	10
13	Almora	Northern hill Zone	Uttarakhand	10
14	Palampur	Northern hill Zone	Himachal Pradesh	10
15	Pantnagar	Northern Plain Zone	Uttarakhand	25
16	PAU, Ludhiana	Northern Plain Zone	Punjab	50
17	ARI, Pune	Southern Zone	Maharashtra	15
18	KVK, Kaneri Math, Kolhapur-II	Southern Zone	Maharashtra	75
19	MPKV, Sangli	Southern Zone	Maharashtra	25
20	UAS Dharwad	Southern Zone	Karnataka	25
21	Ugarkhurd Sugar	Southern Zone	Karnataka	50
22	ICAR-KLE-KVK, Belagavi	Southern Zone	Karnataka	100
23	Bangalore	Southern Zone	Karnataka	10
24	PJTSAU, Adilabad	Southern Zone	Telangana	15
25	KVK, Begusarai	Eastern zone	Bihar	30
26	Sipani farm, Mandsaur	Central zone	Madhya Pradesh	50
27	RLBCAU	Central Zone	Uttar Pradesh	10
Grand total				1135

In addition, 3 training programmes for extension officers of line departments and input dealers and 3 farmers training programmes are also proposed. The break-up of component wise FLDs allotted to different FLD Centres along with package of practices is given in the Table-2

Table 2: Component wise Frontline demonstrations on soybean proposed during *kharif* 2024

S. No.	Centres	Zone	State	No. of FLDs allotted	Varieties (subjected to seed availability)	Component wise (tentative)						
						WP	IWM	INM	IPM	IC	FGV	Org. F.
1	ICAR-IISR Indore	CZ	MP	250	NRC 150, NRC 142, NRC 181, NRC 136, NRC 138, NRC 130, RVSM 2011-35, JS 21-72	125	-	-	-	-	125	-
2	CoA, Sehore	CZ	MP	10	RVSM 2011-35, RVS 24, NRC 150, NRC 142, NRC 181, NRC 136, NRC 138, NRC 130,	10	-	-	-	-	-	-
3	VNMAU, Parbhani	CZ	MH	50	MAUS 612, MAUS 725, MAUS 162, MAUS 158, AMS 100-39	40	-	-	-	10	-	-
4	PDKV, Amravati	CZ	MH	20	AMS-100-39, AMS-MB-5-I8 MAUS 612, NRC 142, NRC 127, NRC 138 , NRC 142 , MACS 1520	10	-	-	-	10	-	-
5	KVK Karda	CZ	MH	100	AMS-100-39, AMS-MB-5-I8 MAUS 612, NRC 142, NRC 127, NRC 138 , NRC 142 , MACS 1520	50	-	-	-	50	-	-
6	AU, Kota	CZ	RJ	30	NRC 138 , JS 2034, JS 20-34, RKS 45, PK 113, NRC 130, RSC 10-46, NRC 127, NRC 138 , NRC 142	20	-	-	10	-	-	-
7	KVK Bharuch	CZ	GJ	15	KDS 726, NRC 142, NRC 450, NRC 127, RVS 24, JS 21-72, RVSM 2011-35 , AMS 100-39 , JS 20-98	10	-	-	-	5	-	-
8	Devgrah Baria	CZ	GJ	30	NRC 37, NRC 127, NRC 150, NRC 142, NRC 181, NRC 136, NRC 138, NRC 130	30	-	-	-	-	-	-
9	Raipur	EZ	CG	100	CG Soya-1, RSC 10-46, RSC 11-07 RSC 10-52 , NRC 132, NRC 147, NRC 128, NRC 136, NRCSL 1	50	30	10	10	-	-	-
10	BAU, Ranchi	EZ	JK	10	CG SOYA 1, RSC 10-52 & RSC 10-46, NRC 132, MACS 1407, MACS 1460, NRC 147, NRC 128, NRC 136, NRCSL 1, RSC 11-07, AMS 2014-I (PDKV Purva), JS 20-116	10	-	-	-	-	-	-
11	CAU, Imphal	NEHZ	MN	10	MACS 1460, DSb 32, DSb 19, JS 20-116, RKS 113, MACS 1460,	5	-	-	-	-	-	5
12	Medziphema	NEHZ	NL	10	MACS 1460, DSb 19, DSb 32, JS 20-116, RKS 113, MACS 1460	5	-	-	-	-	-	5
13	Almora	NHZ	UK	10	PS 1347, PS 1225, PS 25 & PS 26, VLS 89, PS 1556	5	-	5	-	-	-	-
14	Palampur	NHZ	HP	10	Him Soya, Palam Soya, Himso 1685, VLS 59, VLS 63, VLS 89, VLS 89, PS 1556	10	-	-	-	-	-	-
15	Pantnagar	NPZ	UK	25	PS 27 (PS-1670), PS 25, PS 24, PS 26, SL 958 NRC SL 1074, SL 955, SL 979	15	5	-	-	-	-	5
16	PAU, Ludhiana	NPZ	PB	50	SL 958, SL 979, NRC 128, SL 1028 , SL 1074, SL 955,	50	-	-	-	-	-	-
17	ARI, Pune	SZ	MH	15	MACS 1460, MACS 1407, MACS 1281, MACS 1188, MACSNRC 1667	10	-	-	-	5	-	-
18	KVK, Kaneri Math, Kolhapur-II	SZ	MH	75	KDS- 753, KSD- 992, AMS-MB-5-18, KLDS 334, JS 20-69, MACS 1460, NRC132, NRC147, DSb 34	50	-	-	-	25	-	-
19	MPKV, Sangli	SZ	MH	25	KDS 992, KDS 726, KDS 753, KDS 344, MACS 1460, NRC132, NRC147 DSb 34, DSb23, KS 103, NRC 142, Karune , MACSNRC 1667	15	-	-	-	10	-	-

20	UAS Dharwad	SZ	KA	25	Dsb-34 Dsb-21 DSb 21, DSb 23, DSb 34, KSB 23, Karune, MACS 1460, NRC132, NRC147, RSC 11-07, KS 103, KDS 726, NRC 142, KDS 992 , MACSNRC 1667	15	5	5	-	-	-	-
21	Ugarkhurd Sugar	SZ	KA	50	DSb 21, DSb 23, DSb 34, KSB 23, Karune, MACS 1460, NRC132, NRC147, RSC 11-07	25	-	-	-	25	-	-
22	ICAR-KLE-KVK, Belagavi	SZ	KA	100	Dsb-21, Dsb-34, KDS-726, MACS-1460, KDS-753, KDS-992, MACSNRC 1667	50	-	-	-	50	-	-
23	Bangalore	SZ	KA	10	DSb 21, DSb 23, DSb 34, KSB 23, Karune, MACS 1460, NRC132, NRC147, KDS 726, NRC 142, KDS 992 , MACSNRC 1667	10	-	-	-	-	-	-
24	PJTSAU, Adilabad	SZ	TS	15	AISB-50, BASARA, MAUS 158, MACS 1188, NRC132, NRC147, RSC 11-07, DSb 34, DSb23, NRC 142, MACSNRC 1667	15	-	-	-			-
25	KVK, Begusarai	EZ	BR	30	NRC 128, SL 958, NRCSL-1, MACS 1407, MACS 1460, NRC 147, NRC 136, RSC 11-07, RSC 10-46, JS 20-116	20	5	5	-	-	-	-
26	RLBCAU, Jhansi	CZ	MP	10	NRC 150, NRC 142, NRC 181, NRC 136, NRC 138, NRC 130, RVSM 2011-35, JS 21-72NRC 130, JS 20-34, IS 20-69, JS 20-116, RSC 10-52, RSC 10-46	10	-	-	-	-	-	-
27	Sipani farm, Mandsaur	CZ	MP	50	JS 20-116, JS 20-34,NRC 150, NRC 142, NRC 181, NRC 136, NRC 138, NRC 130, RVSM 2011-35, JS 21-72IS 93-05	50	-	-	-	-	-	-
				1135		715	45	25	20	180	125	15

- ✓ All the centers are requested to follow the location/zone specific recommended soybean production technology capsule as given below.
- ✓ FLDs should be conducted in one cluster (10 FLDs) and that is to be in one village for consecutive two years.
- ✓ If more than 10 FLDs allotted to any centre, they may increase the number of clusters in multiples of 10 FLDs.
- ✓ More than 10 years old varieties should be avoided in FLDs. Preference should be given to recently released 5 years old varieties to conduct under FLDs.
- ✓ All centers are requested to record Geo-referencing of the FLD/Geo tagging invariable.
- ✓ The Pantnagar center is also requested to cover adjoining places such as Pilibhit, Varanasi (FAARD) etc of Uttar Pradesh statefor conduct of FLDs to expand soybean area under non traditional areas by providing technical support and required critical inputs.

The session ended by felicitation with memento to Chairman, expert and rapporteurs.

Proceedings of the Technical Session on Plant Pathology

Chairman	: Dr. P.V. Patil, Professor and HOD (Plant Pathology), UAS Dharwad
Co-Chair	: Dr. Shekarappa, Professor (Entomology) and ADR (HQ), UAS Dharwad
Expert	: Dr Ashwani Basandrai, Ex-Dean, CSKHPKV, Palampur
Rapporteurs	: Dr. Shalini N. Huilgol, Professor (Plant Pathology), UAS Dharwad : Dr. R. S. Jadhav, Jr. Entomologist, VNMKV, Parbhani

At the outset, the session began with the presentation of Dr Sanjeev Kumar, PI-Plant Pathology. He presented salient findings of trials conducted during kharif 2023. During the presentation, Chairman suggested for survey and tracking of diseases using GPS technology to identify disease-free areas. The co- chairman suggested that minimum ten years of weather data should be considered for developing forewarning models for the disease. Dr. Ashwani, suggested for screening of more number of germplasm including pre-breeding material, land races & wild relatives to identify efficient, durable and stable sources of resistance. He further suggested for organizing one training programme for the exact detection, diagnosis and data recording of soybean diseases. After the presentation, following recommendations emerged:

- In PP2 (Trap nursery trial for disease incidence), two more entries with long duration type should be included, which will help to record many diseases.
- In PP4 (Performance of the previous years' resistant entries), screening under artificial epiphytotic condition should be done for individual diseases for the further confirmation of the resistance. For soil borne disease, instead of AUDPC, percent disease incidence should be taken into consideration.

The session ended with vote of thanks to the Chairman and Expert.

TECHNICAL PROGRAMME OF PLANT PATHOLOGY FOR 2024

PP-1: Survey and surveillance for soybean diseases

Centres: Almora, Amravati, Dharwad, Jabalpur, Jorhat, Kasbe Digraj, Medziphema, Pantnagar, Palampur, Ludhaina, Raipur, Indore and Sehore.

Note:

1. Disease score 0-9, and procedure given for calculating disease severity index (DSI) at should strictly be followed.
2. Date of the appearance of disease and period of its rapid spread should be mentioned.
3. Previous crops to be recorded before soybean cropping.
4. Prepare disease map with help of GPS locations.
5. Probable yield loss due to disease in the region should also be mentioned based on survey.
6. Disease images appearing in the field is to be sent in jpg format, not to be pasted in MS-word.

PP-2: Trap nursery trial for disease incidence

Centres : Almora, Amravati, Dharwad, Delhi, Indore, Jabalpur, Jorhat, Medziphema, Pantnagar, Palampur and Sehore

Plot size : Three rows of 3 m length

Design : R.B.D.

Replications: Two

Treatments: Varieties listed below

- | | | | | | |
|-------------|------------|-------------|-------------|-------------|--------------|
| 1. JS 95-60 | 2. JS 335 | 3. Shivalik | 4. JS 93-05 | 5. Punjab 1 | 6. PK 472 |
| 7. Bragg | 8. Monetta | 9. NRC 7 | 10. PK 262 | 11. Gaurav | 12. JS 90-41 |

Observations:

1. For root rot diseases exact value of % mortality should be mentioned. Additionally, % mortality should also be reflected in terms of 0-9 score to calculate per cent disease index mentioned at the end of the technical programme.
2. For diseases (foliar, cotyledonary spot (CS), PSS and viral diseases), scoring should be made in 0-9 scale. Disease severity index should also be calculated. For foliar diseases observation is to be made on 10 plants/plot selected at random ignoring top 3 leaves.
3. Pathogen of every disease should clearly be spelt out.
4. Date of sowing, observations of diseases will be recorded at initiation and at weekly interval and used for forecasting model development.
5. Correlation with weather parameters and develop correlation coefficient and regression equations for various observed diseases.

PP-3: Evaluation of breeding materials for resistant donor(s).

Centres: Almora, Amravati, Dharwad, Delhi, Indore, Jabalpur, Jorhat, Kasbe Digraj, Kota, Ludhiana, Medziphema, Pantnagar, Palampur, Raipur Sehore and UgarKhurd (Glasshouse screening of AVT II entries for rust through artificial inoculation will be taken up at Dharwad center).

- a. IVT& IVT (early)
- b. AVT-I & AVT I (early)
- c. AVT-II

For a to c - Replicated 2 rows x 3 m (2 replications) under RBD.

Note 1: Seeds for the IVT trial will be supplied by the ICAR-IISR, Indore

Note 2: All the centres will evaluate the AVT-I & II entries of all the zones. Seeds of previous year IVT and AVT I can be utilized.

Note 3: Photograph of susceptible variety should be submitted along the report

Note 4: AVT II entries will be evaluated under artificially inoculated conditions/hot spot locations for centre specific diseases as given below:

S.N.	Centre	Disease (s)
1.	RVSKVV, Sehore	TLS, RAB, Anthracnose (Anth.), YMV and CR
2.	GBPU&T, Pantnagar	RAB and YMV
3.	VPKAS, Almora	FLS and Anth.
4.	UAS, Dharwad	Rust, CLS/PSS and Anth.
5.	K.Digraj	Rust and Anth.
6.	JNKVV, Jabalpur	CR, YMV, Anth.and RAB
7.	AAU, Jorhat	Coll R and Anth.
8.	IGKVV, Raipur	IBB and Anth.
9.	CSKHPKVV, Palampur	Anth. and FLS
10.	Medziphema	Rust, Anth. and RAB
11.	Ludhiana	YMV and SMV
12.	UgarKhurd	Rust, CLS/PSS and Anth.
14.	Amravati	CR, Anth. and YMV
15.	Indore	Anth and RAB

Note: Pathologists will include susceptible checks for each disease as given below and more than one susceptible check will be used for each disease.

Zone	Disease	Susceptible checks	Resistant checks	Early checks
NHZ	FLS	Shivalik	VLS 99	JS 22-12
NPZ	YMV	JS 335	NRC 149	
NEHZ	Coll R, PB (Ct)	JS 93-05	JS 20-116	
EZ	IBB,	JS 95-60	NRC 128	JS 21-16
SZ	Rust, PSS	JS 335	Dsb 34	
CZ	RAB, CR, PB (Ct)	JS 95-60	JS 20-98	

”

Note: For IVT, AVT-I and AVT II, the disease reaction should be given on 0-9 scale only. Classify the entries based on 0-9 scale. For virus disease (s) screening follow instruction given in note 9.

PP-4: Performance of the previous year's resistant entries

	Centres	Diseases
1.	RVSKVV, Sehore	TLS, Anth. and CR
2.	GBPUA&T, Pantnagar	RAB and YMV
3.	VPKAS, Almora	FLS
4.	UAS, Dharwad	Rust and PSS
5.	JNKVV, Jabalpur	CR, YMV and RAB
6.	Ugarkhurd	Rust and Anth.
7.	IGKV, Raipur	IBB and Anth.
8.	Amravati	CR and YMV
9.	Palampur	FLS and Anth.
10.	Ludhiana	YMV
11.	K. Digraj	Rust and Anth.

Table: List of resistant entries for the evaluation against diseases of respective zones.

RAB	
Pantnagar	SL-1068, SL-1123, DS-3108, PS-1613, SL-688, SL-1028, SL-1074, MACS-1460, DS-3101, MACS-1407, DS-2705, PS-1540, PS-1611, NRC-137, SL-1213, VLS-63, SL-1234, VLS-89, NRC-128, SL-979
Jabalpur	JS 20-98, JS 20-20, JS 21-05, JS 21-72, NRC 166, JS 22-01, JS 22-12, JS 22-18, KDS 1073, NRC 186, PS 1661, RVS 2011-10, JS 23-09, JS 23-03, NRC 196, NRC 181, RVS 13-7, NRC 189, NRC 192, NRC 190, AS 26, AS 47, DS 1510, JS 24-25, JS 24-26, JS 24-33, NRC 196, NRC 256, NRC 257, NRC 259, NRC SL – 5, NRC SL – 7, NRC SL – 8, PS 1693, PS 1696, RSC 11-75, RVS 15-1, RVSM 2012-4
CR	
Jabalpur	JS 20-98, JS 20-20, JS 21-05, JS 21-72, NRC 166, JS 22-01, JS 22-12, JS 22-18, KDS 1073, NRC 186, PS 1661, RVS 2011-10, JS 23-09, JS 23-03, NRC 196, NRC 181, RVS 13-7, NRC 189, NRC 192, NRC 190, AS 26, AS 47, DS 1510, JS 24-25, JS 24-26, JS 24-33, NRC 196, NRC 256, NRC 257, NRC 259, NRC SL – 5, NRC SL – 7, NRC SL – 8, PS 1693, PS 1696, RSC 11-75, RVS 15-1, RVSM 2012-4
Amravati	AS-40, AMS-115, AMS-1901, DLSb-4, Dsb-39, DS-3168, DS-3124, JS-2034, JS-2303, JS-2309, JS-2308, HIMSO-1694, HIMSO-1693, JS-2305, KDS-1201, KDS-1173, KDS-1169, KDS-21-1, MAUS-819, MAUS-818, NRC-186, PS-1660, RVS-13-7, RVS-13-15
YMD	
Jabalpur	JS 20-69, JS 20-98, JS 20-20, JS 21-05, PS 1611, DS 3106, DS 3109, JS 21-72, JS 21-75, JS 22-03, NRC SL 1, RVS 2011-76, SL 955, JS 22-12, JS 22-18, PS 1670, RVSM 2012-11, NRC 196, NRC 201, NRC 202, PS 1689, PS 1682, SL 1282, RVS 2011-76, NRC 189, DS 1510, DS 1547, DS 1550, JS 23-03, JS 23-09, JS 24-25, JS 24-26, JS 24-33, JS 24-34, NRC 256, NRC 257, NRC 259, NRC SL - 5
Ludhiana	DSB 38, JS22-14, NRC-28, NRC 109, JS20-98, Pusa 97-12, NRC 149, VLS 99, SL 1213
SMD	
Pantnagar	SL-1068, SL-1123, DS-3108, PS-1613, SL-688, SL-1028, SL-1074, MACS-1460, DS-3101, MACS-1407, DS-2705, PS-1540, PS-1611, NRC-137, SL-1213, VLS-63, SL-1234, VLS-89, NRC-128, SL-979
Ludhiana	DSB 38, JS22-14, NRC-28, NRC 109, JS20-98, Pusa 97-12, NRC 149, VLS 99, SL 1213
PB(Ct)	
Palampur	KDS 1169, KDS 1201, EC 350664, EC 280129, EC 308312, EC 291401, EC 393153, EC 393153, EC 390981A, PK 25, UGM 77, EC 391181, Hardy, ASb 50, ASb 51, EC 241778, Cat 411A, SKF 6029, MACS 1566, Himso 1685, JS 20-116
Dharwad	DSb 21, DSb 23, DSb 34, DSb 40, DLSb 1, DLSb 2, DLSb 4, DLSb 5, EC 242104, EC 251409, JS 335, JS 95 60, KDS 726
Rust	
Dharwad	DSb 21, DSb 23, DSb 34, DSb 40, DLSb 1, DLSb 2, DLSb 4, DLSb 5, EC 242104, EC 251409, JS 335, JS 95 60, KDS 726
Ugarkhurd	DSb 23, DSb 34, DSb 21, KDS 753, EC 242104, EC 241780, EC 241778, EC 251409, DLSb-1, DLSb -2, DSb 40, KDS 726, JS 335

PSS	
Dharwad	DSb 21,DSb 23,DSb 34,DSb 40,DLSb 1,DLSb 2,DLSb 4,DLSb 5,EC 242104,EC 251409,JS 335,JS 95 60,KDS 726
Ugarkhurd	DSb 23,DSb 34,DSb 21,KDS 753,EC 242104,EC 241780,EC 241778,EC 251409,DLSb-1,DLSb -2,DSb 40,KDS 726,JS 335
FLS	
Palampur	KDS 1169,KDS 1201,EC 350664,EC 280129,EC 308312,EC 291401,EC 393153,EC 393153,EC 390981,APK 25,UGM 77,EC 391181,Hardee,ASb 50,ASb 51,EC 241778,Cat 411A,SKF 6029,MACS 1566,Himso 1685,JS 20-116
MLS	
Sehore	AMS 475,RVS 2002-4,RVS 2001-4,KDS 1169,PS 1675,NRC 181,NRC 165,AS 40,BAUS (M) 3

Plot size should be maintained uniformly as 3 rows of 3 meter length at all centers (non-replicated). The disease reaction should be given on 0-9 scale only. Classify the entries based on 0-9 scale. Each centre will identify HR, R entries (MR, where HR or R entries are not available) for the diseases as given above and maintain nursery under inoculated conditions. Each year variety identified as R or HR in PP 3 (a,b,c) and germplasm trial material will be added to this nursery. Entry should be rejected after showing susceptibility with year of testing. **{Note: Year of testing of the entry must be shown in bracket with the entry. The exchange of resistant material for YMV, Anth., Rust, FLS, RAB and CR be taken up among the centers with intimation to PI (Plant Pathology). Also, mention if resistance breakdown of any entry is there.**

PP 5: Evaluation of germplasm lines for identification of multiple disease resistant sources

Centers: Dharwad (Rust, PSS and Anth.), Jabalpur (YMV, CR, RAB and Anth), Indore (Anth., RAB), Palampur (FLS, Anth. and BS), Pantnagar (YMV, RAB and Anth.), Ludhiana (YMV, SMV)

Design: Augmented (1 lines x 1 m), 2 replication

No. of germplasm: 200

Observations: The disease reaction should be given on 0-9 scale only. Classify the entries based on 0-9 scale.

Note: Seeds will be supplied from Germplasm Centre of ICAR-IISR, Indore

Zone	Disease	Susceptible checks	Resistant checks	Early checks
NHZ	FLS	Shivalik	VLS 99	JS 22-12
NPZ	YMV	JS 335	NRC 149	
NEHZ	Coll R, PB (Ct)	JS 93-05	JS 20-116	
EZ	IBB,	JS 95-60	NRC 128	JS 21-16
SZ	Rust, PSS	JS 335	Dsb 34	
CZ	RAB, CR, PB (Ct)	JS 95-60	JS 20-98	

PP 6 (2022): Biological management of major diseases of soybean

Locations: Amravati, Dharwad, Indore, Jabalpur, Jorhat, Pantnagar, Palampur and Sehore Target Disease: Amravati (CR), Dharwad (Rust and Anth), Indore (Anth) Jabalpur (CR and RAB), Jorhat (Coll R, Anth), Pantnagar (RAB), Palampur (FLS and Anth) and Sehore (TLS)

Objective: To develop integrated disease management strategies against major diseases of soybean

Layout:

Variety: JS 335, Design: RBD, Plot size: 6 rows of 3 m length, Replications: Three

Treatment Details:

Treat ments	Bioagents	Seed treatment dosage (g/kg seed)	Foliar application dosage (g/l of water)
T1	Seed application of <i>Bacillus amyloliquefaciens</i>	5	-
T2	Foliar application of <i>Bacillus subtilis</i>	-	10
T3	Seed application of <i>Bacillus amyloliquefaciens</i>	5	-
T4	Foliar application of <i>Bacillus subtilis</i>	-	10
T5	Seed application of local strain of <i>Trichoderma</i>	5	-
T6	Foliar application of local strain of <i>Trichoderma</i>	-	10
T7	Seed application of local strain of <i>Pseudomonas fluorescence</i>	5	-
T8	Foliar application of local strain of <i>Pseudomonas fluorescence</i>	-	10
T9	Control	-	-

Note:

- Foliar application will be done after 40 DAS and 55 DAS
- Spraying with chlorantrione 0.2ml/L at 15 and 35 DAS and other pest will be control as per recommendation of ICAR IISR, Inodre.

Observations to be recorded: 1) % Field Stand, 2) % Disease severity at 45 DAS, 60 DAS, 75 DAS, 3) AUDPC, 4) Plant ht (cm), 5) No. of branches per plant, 6) No. of pods per plant, 7) 100 seed weight (g), 8) Seed yield (q/ha)

PP 7: Development of forewarning systems against major diseases ofsoybean.

Source: Trap nursery data at weekly interval

Source: Disease data generated at these centers Weather data of respective centers.

Modules: Correlation & Regression

PP 8/ENT 8: Integrated management of major pests & diseases of soybean

Target disease and location

S.N.	Centre	Respective Disease (s) of the centre particularly	Insects
1.	Indore	ANTH, YMV	White fly & stem fly population @ 30, 45, 60 DAS
2.	RVSKVV, Sehore	TLS, CR, YMV	White fly & stem fly population @ 30, 45, 60 DAS
3.	UAS, Dharwad	Rust, ANTH, YMV	White fly & stem fly population @ 30, 45, 60 DAS
4.	JNKVV, Jabalpur	CR, FLS, RAB, YMV	White fly & stem fly population @ 30, 45, 60 DAS
5.	GBPUA&T, Pantnagar	RAB, YMV	White fly & stem fly population @ 30, 45, 60 DAS

6.	PAU, Ludhiana	YMV	White fly & stem fly population @ 30, 45, 60 DAS
7.	CSKHPKV, Palampur	ANTH, FLS, YMV	White fly & stem fly population @ 30, 45, 60 DAS
8.	AAU, Jorhat	Coll Rot, ANTH, YMV	White fly & stem fly population @ 30, 45, 60 DAS
9.	Medziphema	ANTH, RAB, YMV	White fly & stem fly population @ 30, 45, 60 DAS
10.	IGKV, Raipur	IBB, ANTH, YMV	White fly & stem fly population @ 30, 45, 60 DAS
11.	IARI, New Delhi	YMV, IBB	White fly & stem fly population @ 30, 45, 60 DAS
12.	R & D Center, Ugarkhurd	Rust, YMV	White fly & stem fly population @ 30, 45, 60 DAS
13.	ICAR-VPKAS, Almora	FLS, YMV	White fly & stem fly population @ 30, 45, 60 DAS
14.	ARS, Amarvati	CR, YMV	White fly & stem fly population @ 30, 45, 60 DAS
15.	Parbhani	YMV	White fly & stem fly population @ 30, 45, 60 DAS
16.	Kota	YMV	White fly & stem fly population @ 30, 45, 60 DAS

Layout:

Variety: JS 335

Design: RBD

Plot size: 5 rows of 3 m length

Replications: Three

Treatments:

T1	ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Fluxapyroxad 167 g/l + Pyraclostrobin 333 g/l SC @ 300 g/ha
T2	ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Pyraclostrobin 133 g/l + Epoxiconazole 50g/l SE @ 750 ml/ha
T3	ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Carbendazim 12% + Mancozeb 63%WP @ 1250 g/ha
T4	ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Tebuconazole 25.9%EC @ 625 ml/ha
T5	ST with Thiomethoxam 30 FS @ 10ml/kg seed + spray of Thiomethoxam 70 WS @ 100g/ha
T6	ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed
T7	ST with Thiomethoxam 30 FS @ 10ml/kg seed
T8	Untreated (No ST, No spray)

*** Spray of fungicides and insecticides at 30, 45, 60 DAS**

Observations to be recorded:

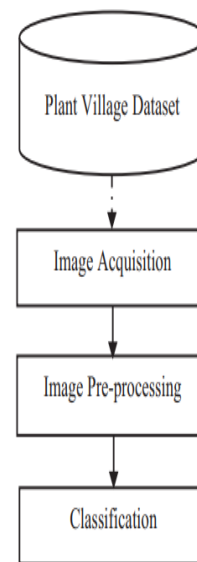
1) % Field Stand, 2) Disease severity/Disease incidence at 45 DAS, 60 DAS, 75 DAS 3) AUDPC 4) 100 seed weight (g) 5) Seed yield (q/ha) 6) White fly & stem fly population @ 30, 45, 60 DAS (Pre and post application of insecticide)

PP-9: Image-based identification of soybean diseases

Centres : Indore, Jabalpur, Pantnagar,

The prime aim is to build a model that can classify the input images of a plant as healthy or diseased.

1. Collection of Dataset- Images of healthy plant leaves infected with the diseases, will be collected throughout disease cycle.
2. Image pre-processing and augmentation- Labelling or classification of images.
3. Model establishment- Model training, testing and validation
4. Result and evaluation



leaf
and
the

Note: The image dataset of leaves infected with diseases should be large (>1000 images)

Methodology for recording disease severity.

Uniform method of disease rating

Point scale (0 to 9) divided into 6 categories should be followed. General interpretation of the scale is as follows:

0 = Highly resistant
1 = Resistant
3 = Moderately resistant
5 = Moderately susceptible
7 = Susceptible
9 = Highly susceptible

Rating scales for different diseases

A. Charcoal rot/Collar rot/Rhizoctonia rot

Rating Description

0: No mortality
1: 1% mortality
3: 1.1 to 10% mortality
5: 10.1-25% mortality
7 : 25.1-50% mortality
9: >50% mortality

B. Bacterial pustule/Rhizoctonia aerial blight/Cercospora leaf spot/Alternaria leaf spot/rust/Myrothecium leaf spot/Target leaf spot/Frogeye leaf spot

Rating Description

0: No lesions/spots
1: 1% leaf area covered with lesions/spots
3: 1.1-10% leaf area covered with lesions/spots, no spots on stem. 5: 10.1-

25% of the leaf area covered, no defoliation; little damage.

7: 25.1-50% leaf area covered; some leaves drop; death of a Few plants; damage conspicuous.

9 : > 50% area covered, lesions/spot very common on All plants, defoliation common; death of plants common; Damage more than 50%.

C. Cotyledonary spot/Purple seed stain/ Pod blight

Rating Description

0: No lesions/spots/discoloration

1: 1% area covered with lesions/spots/discoloration

3: 1.1-10% area covered with lesions/spots/discoloration

5: 10.1-25% area covered with lesions/spots/discoloration

7: 25.1-50% area covered with lesions/spots/discoloration

9: > 50% area covered with lesions/spots/discoloration

D. Viral diseases: Yellow mosaic/ Indian bud blight/Green or soybean mosaic

Rating Description

0: No symptoms on any plant

1: Yellow mottle or necrotic mottle in up to 1% plants

3: Yellow mottle or necrotic mottle in traces on 1.1-10% plants

5: Necrotic mottle/mild mottle/ Mild symptoms; 10.1-25% plants; no reduction in plant growth; no yield loss.

7: Yellow mottle symptoms not covering the whole leaf lamina on 25.1-50% plants; reduction in leaf and plant growth.

9: Yellow mottle symptoms on more than 50% plants; severe reduction in leaf and plant growth as well as pod formation and death of plant.

Scale for classifying reaction of viral diseases under field conditions.

- The percent disease incidence (percentage of number of infected plants over total number of plants in a given accession) and disease severity (number of leaves having symptom over total number of leaves in a single plant and averaged from 10 such plants).
- Based on the disease severity, symptom severity grades, designated with numerical values of 0-4 and a scale of response value (0-1) corresponding to such grades, the coefficient of infection (CI) will be calculated by multiplying the percent disease incidence to the response value assigned for each severity grade following standard methodology.

Symptoms	Severity grade	Response value ^b	Coefficient of infection (CI) ^a	Disease reaction
Symptoms absent	0	0	0-4	Highly resistant
Very mild symptoms upto 25% leaves	1	0.25	5-9	Resistant
Appearance of symptoms in 26-50% leaves	2	0.50	10-19	Moderately resistant
Appearance of symptoms in 51-75% leaves	3	0.75	20-39	Moderately susceptible
Severe disease infection in symptoms (>75% leaves)	4	1.00	40-69	Susceptible
			70-100	Highly susceptible

^a CI $\frac{1}{4}$ Percent disease incidence (any value between 0 and 100) _ Response value.

^b Response value is based on disease severity which is calculated on the basis of number of leaves showing symptoms in a single plant, not based on the types of symptoms or area covered by the symptoms.

(Singh, A.K. and Singh K.P., 2000, Screening for disease incidence of YVMV in Okra treated with gamma rays and EMS. *Veg. Sci.*, 27:72-75).

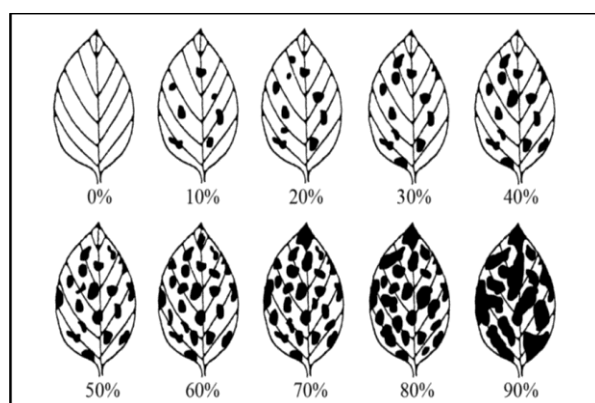
Calculation of Percent Disease Index (PDI)

The above rating scales or grades are utilized for the calculation of PDI using the following formula of wheeler.

*Percent disease index (PDI) = (Sum of individual rating *100) / (No. of leaves (plants) examined Maximum disease rating x maximum grade)

*Statistical analysis will be performed after converting the PDI values by arc sine or angular transformations, if, required.

*On the basis of PDI, the entry/variety can be classified as follows:



Reference: Kentucky Integrated Crop Manual for Soybeans, IPM-3. 2009. pg.3

Infective Index	Resistant category
0	Highly resistant (HR)
0.01 – 11.11	Resistant (R)
11.12 – 33.33	Moderately resistant (MR)
33.34 – 55.55	Moderately susceptible (MS)
55.56 – 77.77	Susceptible (S)
77.78 – 100.00	Highly susceptible (HS)

Important notes

1. Weather data of entire crop season should be supplied with trial data.
2. Survey: Mention date of the appearance of disease and period of its rapid spread, probable yield loss, variety name, DOS, DOG and dates of observations. Collecting disease image with latitude and longitude data is must.
3. Disease images appearing in the field is to be sent in jpg format, not to be pasted in MS-word.
4. For trap nursery trial (PP2) date of sowing should be clearly given, observations of diseases should be recorded at initiation and at weekly interval
5. For IVT, AVT-I and AVT II, the disease reaction should be given on 0-9 scale only. Classify the entries based on 0-9 scale. The data in any other format will not be accepted.
6. For trial performance of the previous year's resistant entries, year of testing of the entry must be shown in bracket with the entry. Also, clearly mention if resistance breakdown of any entry is there.
7. Only replication data of the trial, biological management of major diseases of soybean (PP6) and Integrated management of major pests & diseases of soybean (PP8) will be accepted.
8. Summary: A brief summary of results may be given for each trial. Please try to analyze the results critically and give your valuable interpretations. In case of unexpected results, please try to find out the possible reasons.
9. Report must reach to the Director IISR and PI Plant Pathology by 30th November.

Proceedings of Entomology technical session

Chairman: Dr. P V Patil, Professor and University HOD (Plant Pathology), UAS, Dharwad

Co-Chairman: Dr. Shekharappa, Professor and University HOD (Entomology), UAS, Dharwad

Rapporteurs: 1. Dr. Shalini Huilgol, Associate Professor (Plant Pathology), UAS, Dharwad

2. Dr. R. S. Jadhav, Jr. Entomologist, VNMKV, Parbhani

The technical session started with welcome address by the Chairman, Dr. P V Patil, Professor and University HOD (Plant Pathology) & Dean (Community Science), UAS, Dharwad and Co-Chairman, Dr. Shekarappa, Professor and University HOD (Entomology) & Associate Director of Research, UAS, Dharwad. Dr Lokesh Kumar Meena, Principal Investigator (Entomology), ICAR-IISR, Indore presented the Annual progress report of six entomological experiments which were conducted at 9 coordinated centers across the country in different four zones.

The first trial on seasonal incidence of insect-pests of soybean recorded 21 insect species from different zones. In North plain zone, whitefly, *Spodoptera litura*, stem fly and aphids, in North eastern hill zone, Bihar hairy caterpillar, leaf webber, aphids, in Central zone, stem fly, semiloopers, tobacco caterpillar and girdle beetle and in southern zone, pink pod borer and leaf folder were the major pests of concern. He also reported the potential of natural bio-control agents Entomopathogenic fungi, *B. bassiana* and *N. rileyi*) in suppression of insect-pests population in the coordinated centres.

Dr. Meena informed that emphasis was given on identification of insect resistant/tolerant genotypes through field and laboratory screening by employing different methods. Genetic material under different trials viz., IVT (E), IVT (N), AVT - I & II were tested under natural infestations at hot spots. Potential sources of resistance identified in field screening trials and AVT-II entries were further tested under laboratory condition using antixenosis and antibiosis criteria. Dr. Meena mentioned several promising genotypes for insect resistance/tolerance. Antixenosis and Antibiosis studies were taken up with AVT-II entries. None of the genotypes were found to exhibit strong antixenosis reaction against test insect i.e. *Spodoptera litura*. On the basis of various digestibility indices viz. Approximate digestibility (AD), Efficiency of conversion of ingested food (ECI) and Efficiency of conversion of digested food (ECD), entries NRC 138, NRC 152 and JS 23-03 were showed good amount of antibiosis reaction.

In the first year of the trial on evaluation of “Management of major defoliators of soybean through intercropping with Suva, *Anethum graveolens*” in different rows combinations of soybean with suva was conducted in three centres and it was found that intercropping Soybean and Suva at (15: 2) rows combination was found be significantly superior by recording lower larval population of defoliators viz., tobacco caterpillar (*S. litura*), Semiloopers, Bihar hairy caterpillar (*Spilosoma oblique*) except at Indore where

in Soybean and Suva at 18:2 rows combination was found be significantly superior by recording lower larval population of *S. litura*.

Recommendations:

- It was suggested to prepare one collaborative trial of Entomology and Plant Pathology for integrated management of insect-pests and diseases of soybean
- Observation on natural enemies should be recorded in ENT 6 “Management of major defoliators of soybean through intercropping with Suva, *Anethum graveolens*”

The session ended with thanks to the Chairman, Co-chairman and Rapporteurs.

TECHNICAL PROGRAMME OF ENTOMOLOGY FOR KHARIF 2024

A list of major insect-pests occurring at different centers' is given below and entomologists should report data of different experiments against these insect pests:

Zone	Centre	Major insect-pests
NEHZ	Imphal	Bihar hairy caterpillar, leaf webber, tobacco caterpillar, aphid and stem fly
NPZ	Pantnagar	Defoliators, girdle beetle, white fly and aphid
	Ludhiana	White fly
	Delhi	white fly/YMV and stem fly
CZ	Kota	Girdle beetle and defoliators
	Parbhani	Stem fly, girdle beetle and defoliators
	Amrawati	Stem fly, girdle beetle and defoliators
	Indore	Stem fly, girdle beetle and defoliators
SZ	Dharwad	Pod borers and defoliators
	Bidar	Pod borers and defoliators

ENT 1. Seasonal incidence of insect-pests and their bio-control agents

- i) **Fixed plot survey:** At research station, for Central, Sothern zone and Northeastern hill zone JS335 and for North plain zone Bragg susceptible variety will be planted in 100 sq m area, to record seasonal incidence of both major and minor insect-pests and report it SMW wise with dates.
- ii) **Production oriented survey:** At farmers' fields. Information on previous crop and farmers practices adopted should be recorded.

Centres : Pantnagar, Parbhani, Kota, Amrawati, Dharwad and Imphal.

Sampling/observation procedures: Observations should be recorded at 7 days intervals starting from 7 days after germination (DAG) following a uniform procedure as described below for different insect pests:

- i) **Leaf damage:** Calculate leaf damage in 5 randomly selected plants on the basis of visual observations at flowering and at peak incidence of larvae.

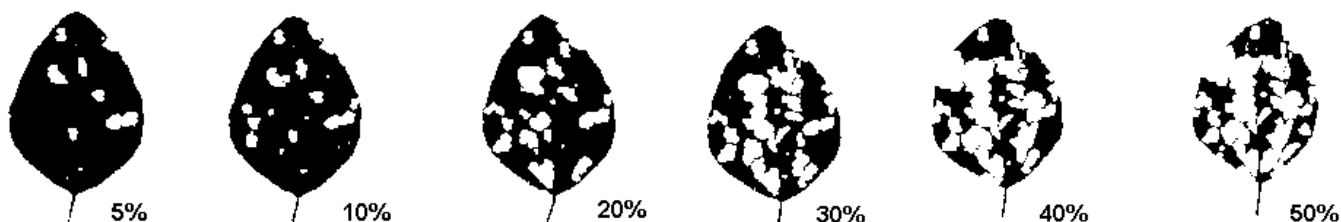
Example: Leaf damage in a plant having 10 leaves will be calculated as follows -

3 leaves with 10 percent damage (3×10) = 30

5 leaves with 30 percent damage (5×30) = 150

2 leaves with 50 percent damage (2×50) = 100

Average damage = $(30+150+100)/10$ leaves = **28% Leaf damage**



Defoliation	Resistance level
< 25 %	Least Susceptible
25-50 %	Moderately Susceptible
50-75 %	Susceptible
> 75 %	Highly Susceptible

- ii) **Defoliators and Bugs** : No. of larvae (**Spp. wise**) and bugs/m. Observations should be recorded at three places and mean should be reported in Nos. per meter. Dominant defoliators should be reported separately. Calculate the extent of defoliation as above.
- iii) **Leaf miner** : No. of larvae/plant in 10 plants. No. of leaflets and damaged leaflets be recorded and presented in percentage.
- iv) **Stem fly**: Seedling mortality - total number of plants and number of plants succumbed to stem fly infestation / m at 3 places per plot on 7-10 DAG. Express seedling mortality in per cent and give the mean. Stem tunnelling - Plant height and length of stem tunnelled in 10 plants at physiological maturity. Express stem tunnelling in per cent.
- v) **Whitefly, Aphids, Leaf hoppers and Mites**: No. of insects (nymphs and adults) on 3 leaves/plant (upper, middle and lower leaf) in 10 plants each.
- vi) **Girdle beetle** : Mark 1 meter area atleast at 3-5 places, depending upon the plot size and record number of total plants and girdled plants and present the data in per cent plant infestation. Label all the infested plants with date, in earmarked area and record number of plants showing typical 'cut-off' symptoms. Calculate percent damage out of total plants per meter (in earmarked area).
- vii) **Bio-control agents** : Collect 20 lepidopteran larvae from untreated soybean field at the interval of 10 days from their appearance. Put them in petri-dishes and report mortality (%) due to different bio-control agents (e.g. parasitoids and insect pathogens). Incidence of predators should also be recorded.

Note: Incidence of minor insects should also be mentioned. Variety used for this trial, date of sowing, date of germination and dates of observation should be indicated in the report. Meteorological data (on SMW basis) should be essentially appended.

IMPORTANT:

1. Submission of Weekly pest-status report

Besides fixed plot survey and production oriented survey, the weekly pest status should also be recorded by keeping close liaison with Department of Agriculture officials and the farmers of the region. As per the instructions of ADG (PP), ICAR the **weekly pest status report** should be invariably E-mailed to PI (Entomology), ICAR-IISR, Indore (lokesharsnagpur@gmail.com) in following format:

Name of AICRPS Centre:							Date:			
Crop	Crop stage	Location	Major Insect-pests		Major Plant diseases		Other pests (Nematodes, Rats etc)	Data collected by	Data checked by	Pest Advisories
			Name	Status (Low, Medium, Severe)	Name	Status (Low, Medium, Severe)				

ENT 2. Field screening of AVT-I & II entries for resistance to major insect-pests (Normal)

Centres : Parbhani, Kota, Amravati, Pantnagar, Ludhiana, Dharwad, Imphal and Bidar

Entries : Test entries of all zones with respective zonal checks, as per the technical programme of Plant Breeding. All entries should be grown in two sets, one with complete plant protection measures and other with no plant protection measures. All AVT test entries should be in alphabetical order followed by checks followed by entries found highly resistant, resistant, R-HY and S-HY (T) in previous years in alphabetical order. (List of entries is attached as **Annexure-I**)

Replications : Two

Design : RBD

Plot size : 2 rows of 3 m length each

Entomological checks: Resistant check- G5P22 and Susceptible check- JS335 for all the insect-pests

Observations : Incidence of major insect-pests be recorded only from unprotected set of entries, at their peak incidence. Grain yield (kg/plot) should be recorded from both treated and untreated sets of entries for analysis by **Maximin-Minimax method**. For defoliators, entries should be rated based on defoliation ALSO as per the procedure given in Ent. 1.

Data analysis: Categorize the entries as per AICRP method to identify resistant sources against specific insect-pests. Replace mean (X) with 26 % for stem fly. Entries with traces of insect population or very less damage need not be categorized. Categorize the entries into resistant groups against prevailing insect pest-complex according to the **maximin-minimax method** (Odulaja, A. and S. Nokoe.1993. A maximin-minimax approach for classifying crop varieties into resistant groups based on yield potential and loss. Intl J. Pest Mgmt., 39:64-67)

IMPORTANT:

1. Entries categorized as highly resistant (HR) / resistant (R) during last two seasons against the major pests of the centre/zone must be included in AVT trial of 2024 and be reported with separate identity.
2. In case of non availability of any entry, concerned breeder should be requested timely to send the seed.

ENT 3. Field screening of AVT-I & II entries for resistance to major insect-pests (Early)

Centres : Parbhani, Kota and Amrawati.

Entries : Test entries of all zones with respective zonal checks, as per the technical programme of Plant Breeding. All entries should be grown in two sets, one with complete plant protection measures and other with no plant protection measures. All AVT test entries should be in alphabetical order followed by checks followed by entries found highly resistant, resistant, R-HY and S-HY (T) in previous years in alphabetical order. (List of entries is attached as **Annexure-II**)

Replications : Two

Design : RBD

Plot size : 2 rows of 3 m length each

Entomological checks: Resistant check- CAT146 and Susceptible check- JS560 for all the insect-pests

Observations : Incidence of major insect-pests be recorded only from unprotected set of entries, at their peak incidence. Grain yield (kg/plot) should be recorded from both treated and untreated sets of entries for analysis by **Maximin-Minimax method**. For defoliators, entries should be rated based on defoliation ALSO as per the procedure given in Ent. 1.

Data analysis: Categorize the entries as per AICRP method to identify resistant sources against specific insect-pests. Replace mean (X) with 26 % for stem fly. Entries with traces of insect population or very less damage need not be categorized. Categorize the entries into resistant groups against prevailing insect pest-complex according to the **maximin-minimax method** (Odulaja, A. and S. Nokoe.1993. A maximin-minimax approach for classifying crop varieties into resistant groups based on yield potential and loss. Intl J. Pest Mgmt., 39:64-67)

IMPORTANT:

3. Entries categorized as highly resistant (HR) / resistant (R) during last two seasons against the major pests of the centre/zone must be included in AVT trial of 2024 and be reported with separate identity.
4. In case of non availability of any entry, concerned breeder should be requested timely to send the seed.

ENT 4: Status of AVT-II entries for antixenosis and antibiosis against *S. litura*

Centres: Pantnagar and Indore

Test Entries: AVT-II entries of **ALL ZONES**.

Check: JS 335 and sow JS 335 in about 100 sq m area so that its leaves can be used for rearing of larvae for lab studies.

Objective: To assess the effect of selected soybean genotypes on the food consumption and its utilization by *Spodoptera litura* larvae and antixenosis response exerted by genotypes. Rationale of this study is that when larvae are exposed to resistant genotypes, their feeding capacity is adversely affected, which is ultimately reflected in their growth and development. Three utilization indices [Waldbauer (1968); Jacob and Chippendale (1971); Brewer and King (1978)] will be used as the indicators of response of *Spodoptera litura* larvae exposed to soybean genotypes : (i) the Approximate Digestibility (AD) is the measure of approximate percentage of food consumed that is utilized by the larvae; (ii) the Efficiency of Conversion Index (ECI) is an overall measure of ability of larvae to utilize the ingested food for their growth; (iii) the Efficiency of Conversion of Digested food (ECD) is the percentage of digested food that contributes to weight gain

of the larvae. These three indices will be calculated as follows:

$$AD = [(Fi - Wf) / Fi] \times 100 ; ECI = (Wg / Fi) \times 100 ; ECD = [Wg / (Fi - Wf)] \times 100$$

where, Fi is weight of food ingested, Wf is weight of frass, and Wg is weight gain by larvae.

Antixenosis response exerted by the genotypes on defoliating larvae will be assessed by calculating the **Preference Index** (Kogan and Goeden, 1970).

Preference Index, C = $2A / M + A$, where, A = Dry weight of leaves of test genotypes eaten by larvae and M = Dry weight of leaves of susceptible check eaten by larvae.

Methodology

Test Insect: *Spodoptera litura* larvae. Culture maintenance should be initiated well in advance so that sufficient larvae are available for the study. Pupae or egg masses of *S. litura* can be obtained on payment basis by sending a request to the Director, National Bureau of Agricultural Insect Resources (formerly PDBC), Pox Bag No. 2491, H.A. Farm Post Bellary Road, Bengaluru, Karnataka 560024. Price list is available at Bureau's web site <http://www.nbair.res.in>. E-mail: nbair@icar.gov.in / nbair@icar.gov.in.

mail: nbair@icar.gov.in / nbair@icar.gov.in.

Working conditions: Preferably $27 \pm 1^{\circ} \text{C}$, $80 \pm 5\% \text{RH}$

Replications: Three

Dry weight of leaves: Take fresh weight of 10 leaflets/genotype. Oven dry at 50°C for 15 minutes and weigh. Use this relation between fresh and dry weight of leaves for calculating **Fi** (i.e. food ingested).

Dry weight of larvae: Take fresh weight of twenty 3rd instar *S. litura* larvae. Oven dry at 50°C for 15 minutes and weigh. Use this relation between fresh and dry weight of larvae for calculating **Wg** (i.e. weight gain by larvae).

Dry weight of frass: Collect frass from each individual petri plate. Oven dry at 50°C for 15 minutes and weigh. Use the frass dry weight for calculating **Wf**.

Antibiosis Studies:

Release FIVE 3rd instar, pre-weighed larvae in petri plates and provide pre-weighed leaves of soybean genotypes. After every 24 hr, remove the left over leaves and frass from the petri plates, oven dry them at 50°C for 15 minutes and weigh. Record the larval weight daily. Record the larval mortality, if any. Continue this process up to pupation. Record larval duration in days. Observe the pupae and report if there is any deformity. Record pupal duration in days. Place the pupae (genotype and replication wise separately) in oviposition jars, observe adult emergence and report deformities in adults, if any.

Antixenosis Studies:

Place one pre weighed leaf (or a portion of leaf) of all the genotypes in circular manner in a petri plate having thin thermocol sheet at the base. Fix all the leaves with pin to ensure that they do not touch each other and are not displaced. Release TEN 3rd instar *S. litura* larvae at the centre of petri plate. After 8 hrs, remove the left over leaves of all the genotypes, oven dry at 50°C for 15 minutes and weigh. Calculate the weight of leaves eaten by larvae for all the genotypes. Use the fresh and dry weight relationship as described above. Maintain 5 replications in the experiment. Calculate the **Preference Index (C)** and classify the genotypes as follows:

C value	Antixenosis response
0.10 to 0.25	Extreme antixenosis
0.26 to 0.50	Strong antixenosis
0.51 to 0.75	Moderate antixenosis
0.76 to 0.99	Slight antixenosis
1.00 or > 1.00	Preferred host

References:

- Brewer F D and E G King. 1978. Effects of parasitization by a tachinid, *Lixophaga diatraeae*, on the growth and food consumption of sugarcane borer larvae. *Ann. Entomol. Soc. Am.*, **71**: 19-22.
- Jacob D and Chippendale G M. 1971. Growth and Development of the southwestern corn borer, *Diatraea grandiosella* on a meridic diet. *Ann. Entomol. Soc. Am.*, **64**: 485-488.
- Kogan, M and Goeden, RD. 1970. The host plant range of *Lema trilineata daturaphila* (Coleoptera: Chrysomelidae). *Ann. Entom. Soc. Amer.*, **63**(4):1175-1180.
- Waldbauer G P. 1968. The consumption and utilization of food by insects. *Adv. Insect Physiol.*, **5**: 229-288.

ENT 5: Field screening of IVT (Normal) entries for resistance to major insect-pests

Centres : Parbhani, Kota, Amravati, Pantnagar, Ludhiana, Dharwad, Imphal and Bidar
Entries : Test entries as per breeding programme. (List of entries is attached as **Annexure-III**)
Replications : Two
Design : RBD
Plot size : 3 rows of 3 m length each
Entomological checks: Resistant check- G5P22 and Susceptible check- JS335 for all the insect-pests
Observations : On major insects as mentioned above + Grain yield (kg/ha). **For defoliators, entries should be rated based on defoliation ALSO in a separate column as per the procedure given in Ent. 1.**

NOTE: PI (Plant Breeding), IISR, Indore will arrange to send 200 g seed of each IVT entry to each entomologist / centre **separately.**

AICRPS method of Categorization:

HR = values < mean – CD at 1%.
R = values between mean – CD at 1% & mean – CD at 5%.
MR = values between mean – CD at 5% & mean
LR = values between mean & mean + CD at 5%
S = values between mean + CD at 5% and mean + CD at 1%
HS = values > mean + CD at 1%.

NOTE: Centres must retain all IVT entries for further use in AVT next year.

ENT 6: Field screening of IVT (Early) entries for resistance to major insect-pests

Centres : Parbhani, Kota and Amravati
Treatment : Test entries as per breeding programme. (List of entries is attached as **Annexure-IV**)
Replications : Two
Design : RBD
Plot size : 3 rows of 3 m length each
Entomological checks: Resistant check- CAT146 and Susceptible check- JS560 for all the insect-pests
Observations : On major insects as mentioned above + Grain yield (kg/ha). **For defoliators, entries should be rated based on defoliation ALSO in a separate column as per the procedure given in Ent. 1.**

NOTE: PI (Plant Breeding), IISR, Indore will arrange to send 200 g seed of each IVT entry to each entomologist / centre **separately.**

AICRPS method of Categorization:

HR = values < mean – CD at 1%.
R = values between mean – CD at 1% & mean – CD at 5%.
MR = values between mean – CD at 5% & mean
LR = values between mean & mean + CD at 5%
S = values between mean + CD at 5% and mean + CD at 1%
HS = values > mean + CD at 1%.

NOTE: Centres must retain all IVT entries for further use in AVT next year.

ENT 7: Evaluation of germplasm lines at hot spots for resistance against major insect-pests

Hot spots	Major insect-pests
Imphal	Bihar Hairy Caterpillar, leaf webber, <i>Spodoptera litura</i> , Aphids
Ludhiana	White fly/YMV
Kota	Defoliators, girdle beetle
Dharwad	Defoliators, pod borers
Indore	Stem fly, girdle beetle, defoliators

No. of lines : 210 lines (List of germplasm lines is attached as **Annexure-V**)
Checks : Resistant check- G5P22 and Susceptible check- JS335 for all the insect-pests

Plot size : Single row of 1 m length

Replication : Two

Observations : On insects as specified above at peak incidence / infestation, date of germination, days to flowering, flower colour, days to maturity, hilum colour and grain yield. Date of observation and crop age should be mentioned in the report. Screening procedure should be same as in case of IVT and AVT entries.

NOTE: Centres must retain all germplasm lines for further use.

ENT 8. Management of major defoliators of soybean through intercropping with suva, *Anethum graveolens*

Centers: Pantnagar, Kota, Parbhani, Indore and Dharwad.

Layout of the experiment: Intercropping of suva, *Anethum graveolens* with soybean in different rows combinations as given below:

Variety : JS 335

Treatment : five (5)

Replications : four (4)

Design : RBD with five treatments and four replications

Row length : 5m

Sowing : Sowing of soybean and suva must be done simultaneously.

Treatments details: Intercropping of suva, *Anethum graveolens* with soybean in different rows combinations as given below:

1. Sole Soybean (18 rows)
2. Soybean + Suva (15 soybean: 1 suva rows combinations)
3. Soybean + Suva (18 soybean: 1 suva rows combinations)
4. Soybean + Suva (15 soybean: 2 suva rows combinations)
5. Soybean + Suva (18 soybean: 2 suva rows combinations)

Observations: 1. **Defoliators population:** 1. Number of larvae per meter crop row at three random points per plot.

2. Number of eggs laying on suva and soybean species wise

3. Number of larva on suva and soybean species wise and present them in percent form like 5% *Spodoptera*, 50% semiloopers species etc.

4. Record the observations on natural enemies will be must.

ENT 9. Integrated management of major pests & diseases of soybean

Centers: Pantnagar, Kota, Parbhani, Indore and Dharwad.

Layout of the experiment:

Variety : JS 335

Treatment : Eight (8)

Replications : Three (3)

Design : RBD with eight treatments and three replications

Plot size : 5 rows of 3m row length

Treatments details:

T1: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Fluxapyroxad 167 g/l + Pyraclostrobin 333 g/l SC @ 300 g/ha

T2: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Pyraclostrobin 133 g/l + Epoxiconazole 50g/l SE @ 750 ml/ha

T3: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Carbendazim 12% + Mancozeb 63%WP @ 1250 g/ha

T4: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Tebuconazole 25.9% EC @ 625 ml/ha

T5: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Pyraclostrobin 20% WG @ 400 g/ha

T6: ST with Thiophanate methyl + Azoxystrobin + Thiomethoxam @ 10ml/kg seed + spray of Picoxystrobin 22.52% w/w SC @ 400 ml/ha

T7: ST with Thiomethoxam 30 FS @ 10ml/kg seed + spray of Thiomethoxam 70 WS @ 100g/ha

T8: Untreated (No ST, No spray)

*** Spray of fungicides and insecticides at 30, 45, 60 DAS**

Observations: White fly & stem fly data at 30, 45, 60 DAS (Pre and post application of insecticide)

Annexure-I: List of AVT I & II entries (Normal)

1. NRC 190	4. MAUS 824,	7. SL 1315
2. AMS 2021-4	5. PusaSipani-433	8. AMS 2021-3
3. KDS 1188	6. RSC 1172	9. JS 24-33

Annexure-II: List of AVT I & II entries (Early)

1. JS 25-03	2. JS 25-06
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Annexure-III: List of IVT entries (Normal)

KBSL 24-1	11. AMS 2022-1	21. VLS 108	32. DS1350	43. NRC 269
2. MACS 1859	12. ASb 185	22. MAUS 817	33. DS 1480	42. JS 25-08
3. MACS 1831	13. ASb114	23. MAUS 793	34. TS 105	
4. RVS 23-23	14. SL 1431	24. Himso 1697	35. CAUMS 4	
5. RVS 23-22	15. SL 1441	25. NRC 290	36. KSS 394	
6. RSC 12-05	16. DLSb 6	26. NRC 291	37. AS 90	
7. RSC 12-11	17. DSb 33-09	27. NRC 292	38. KDS 1198	
8. JS 25-55	18. AUKS 22-1	28. NRC 293	39. PusaSipani 438	
9. AMS 22-14	19. AUKS 22-10	29. NRC 294	40. RCS 1-10	
		30. NRC 295	41. BAU(M)-6	
10. AMS 06	20. VLS 107	31. DS1455	42. TS 101.	

Annexure-IV: List of IVT entries (Early)

1. RVS 23-17	6. AMS 24-12	11. NRC 287	16. MAUS 770	21. AUKS 21-5
2. RVS 23-21	7. ASb 107	12. NRC 288	17. AS 27	22. Pusa Sipani 409
3. MACS 1884	8. ASb 114	13. NRC 289	18. AS 30	
4. JS 25-50	9. DSb 33-09	14. DS 1831E	19. Lok Soya 04	
5. JS 25-52	10. NRC 286	15. DS 1935E	20. Lok Soya 05	

Important notes

10. **Weather data** of entire crop season should be supplied with trial data.
11. **Survey:** Mention variety name, DOS, DOG and dates of observations. Data on major and minor insects should be submitted in the **format** given in Summary Tables of Experiments. In case of defoliators, larval population and extent of defoliation (%) at flowering and at peak incidence should be given. Observations on BCAs, both in field as well as under lab conditions should be reported. Associate with Agronomists for Field surveys and report insect situation in the region.
12. **Screening:** While reporting screening data of AVT entries, sort the test entries in alphabetical order followed by zonal checks as given in Technical Programme. Previous years' resistant entries should also be sorted alphabetically **but** should appear after zonal checks. **Use all zonal checks** also and indicate them with (C). Transformed values and the resistance categories may be given in the **same column** below the original values. In case of defoliators, larval population and extent of defoliation (%) should be reported.

13. Seeds of all IVT entries should be **retained**, so that they can be used next year if some of them get promoted to AVT or found resistant to insect(s).
14. **Summary:** A brief summary of results may be given for each trial. Please try to analyze the results critically and give your valuable interpretations. In case of unexpected results, please try to find out the possible reasons.
15. **For lab experiment (ENT. 3) on “Status of AVT-II entries for antixenosis and antibiosis against *S. litura*”:** Take timely action for procurement of *Spodoptera litura* pupae or egg masses from NBAIR, Bangalore (if required).
8. Report must reach to Director IISR and PI Entomology by 30th November.

Proceeding of the review of breeder seed production

Chairman: Dr. B.D. Biradar, Director Research, UAS, Dharwad

Rapporteur: Dr. Punam Kuchlan, Principal scientist Seed Technology, IISR, Indore

The status of soybean breeder seed production during kharif 2023 was presented by Dr. M.K. Kuchlan, Senior Scientist, Seed Technology, IISR, Indore. The total breeder production was 21103.9q which is 7522 q (55%) more than DA&FW indent. In seed indent less than 10 years old varieties had share of 85% i.e. VRR is 85%. JS 335 a landmark but old variety had been domination in indent but with introduction of high yielding new varieties the position was dropped to 4th number. Though there was overall surplus in production but few major new varieties failed to produce indented quantity (a deficit of 2188q). 64% varieties produced more than indent. Production in AU, Kota, UAS, Bengaluru failed severely due to drought followed by excessive rains. PDKV, Akola produced manifold of the target of production. Off season production was taken for JS 21-72, JS 20-94, JS 20-98, JS20-69, JS 20-34, NRC 150, NRC 142, RSC 10-52 to make up deficit in production

Chairman, Dr B D Birader, Director Research, UAS, Dharwad in his remark expressed his concern over the failure of new varieties during kharif 2023. He urged the AICRP centres to take special care to safeguard Breeder Seed production of newly released varieties so that new varieties reach to farming community in time.

The breeder seed indent is still not finalized. Therefore, the allotment is to be done in future. The SATHI Portal is launched for seed authentication, traceability and holistic inventory. The target allotment will be made online through SATHI Portal.

Proceedings of the Agronomy Session

Chairman: Dr S. S. Angadi, Director of Extension and HOD Agronomy, UAS Dharwad

Co-Chairman: Dr S. A. Gaddanakeri, Associate Director of Extension, UAS Dharwad

Expert: Dr Yashbir Singh Shivay, Principal Scientist, ICAR-IARI, New Delhi

Rapporteurs: Dr D. S. Meena, Associate Prof., AU, Kota, Rajasthan

Dr T. Sunanda Devi, Jr. Agronomist, CAU, Imphal

Principal Investigator (Agronomy) Dr R. K. Verma, Scientist, ICAR-IISR, Indore, presented the results of four agronomical trials conducted during *Kharif* season 2023 at all the coordinating centers. The PI also presented the tentative technical program for forthcoming Kharif season-2024. The chairman suggested that each center should develop the package and practices for rabi/summer soybean production. Therefore, centre should initiated the experiment on Irrigation scheduling in rabi/summer with different date of sowing as a station trails based on the need of the respective centers.

Based on the results of agronomy trails and technical program-2024, the following suggestions were made by chairman and expert of the agronomy session.

1. Include 3 treatments (1. 75% RDF + Mo + Zn + Fe foliar spray with lime, 2. Boron as foliar spray at flowering and 3. 100% RDF+ Microbial consortia) in newly formulated experiment.
2. Include protection scientists in sustainable agronomic management practices (Natural/organic/ICM) experiment and record observations related to insect pests and diseases dynamics.
3. In the experiment “Assessing the impact of herbicides and microbial strains on soybean productivity” (AGRON-2/23) modify the treatment: pre-emergence Diclosulum @ 26 g/ha + hand weeding at 40 DAS to pre-emergence Diclosulum @ 26 g/ha + Post emergence: Propaquizafop 2.5% + Imazethapyr 3.75% @ 2.0 litre/ha

The following recommendation was made:

The basal application of 75 % RDF (recommended dose of N, P and K) with seed inoculation of Rhizobium + MDSR14 + 12c (12c= *Burkholderia arboris*- high P solubilizing) in central and eastern zone is recommended for sustainable soybean production by reducing 25% RDF. Similarly, Bio-NPK or Bio- NPK + Bio-Zn or Rhizobium + MDSR14 + 12c in combination with 75 % RDF is recommended at southern, north eastern hill and northern plain zone to enhance soybean productivity by curtailing 25% RDF.

The session ended by felicitation with memento to chairman, expert and rapporteurs.

TECHNICAL PROGRAMME OF AGRONOMY, 2024

A. Evaluation of new entries

AGRON-1/24: Evaluation of AVT-II entries under different row spacing

Zone	Centre
Central	Sehore, Kota, Amravati

Treatment:

(A) Main plot: Row spacing (2)

1. 30 cm
2. 45 cm

(B) Sub plot: Entries

Zone	Entries
Central Zone	JS 24-33; Checks = JS 22-12, NRC 138, NRC 150, NRC 157

**kindly use the seed rate according to the row spacing*

Design: Split plot, **Replication:** 3, **Plot Size:** 3.6 x 6 m

Observations: Branches per plant, pods per plant, seed index, dry weight per plant 30, 45 and 60 DAS, CGR, RGR, seed yield kg/ha, straw yield kg/ha, harvest index, grain production efficiency (kg/ha/day) and RUE

Note: Concerned breeder will provide 4 kg seed of each entry up to 15 April, 2024 to IISR Indore and trial would be constituted at ICAR-IISR Indore and sent to centers.

AGRON-2/23: Assessing the impact of herbicides and microbial strains on soybean productivity (All centres)

(A) Main plot: weed management

1. Pre-emergence: Diclosulam @ 26 g/ha
2. Pre-emergence: Diclosulam @ 26 g/ha + Post emergence: Propaquizafop 2.5% + Imazethapyr 3.75% @ 2.0 litre/ha
3. Post emergence (15-20 DAS): Propaquizafop 2.5% + Imazethapyr 3.75% @ 2.0 litre/ha
4. Weedy check
5. Weed-free check (2 hand weeding at 20 and 40 DAS)

(B) Sub plot: Microbial strains:

1. *B. daqingense* (Rhizobial strain) @ 10 g/kg seed
2. *Bacillus aryabhataii* (Zn & P-solubilizing bacteria) @ 10 g/kg seed
3. *B. daqingense* @ 10 g/kg seed + *Bacillus aryabhataii* @ 10 g/kg seed (Consortia)
4. Uninoculated

Design: Split plot design

Replications: 03

Plot size: 6 m x 3.6 m

* 500 L water will be used/ha for all the herbicides

Centres:

Zone	Centre	RDF (N: P ₂ O ₅ :K ₂ O:S kg/ha)
North plain	Pantnagar, Ludhiana, Delhi	As per zonal recommendations
Central	Sehore, Kota, Amravati, Devgarh Baria	

North Eastern	Raipur, Ranchi
Southern	Dharwad, Adilabad, Pune
North Eastern Hill	Imphal, Medziphema

Observation to be recorded:

1. Growth parameters: Plant dry matter 30 DAS, 60 DAS, and at harvest
2. Nodulation (nodule dry weight), chlorophyll content (SPAD meter) at R5 stage
3. Yield attributes (No. of pods/plant, seed index)
4. Seed yield, biological yield (kg/ha) and harvest index
5. Cost of cultivation, Gross returns, net returns and net B: C ratio
6. Soil data: Initial N, P, K, Zn and Fe; At harvest: NPK, Zn and Fe

7. Crop uptake data: N, P, K, Zn and Fe at harvest
8. Weed density, weed dry matter at 30 and 60 DAS
9. Weed control efficiency at 30 and 60 DAS and weed index

AGRON-3/24: Yield maximization through improved nutrient management practices

Centres:

Zone	Centre	RDF (N: P ₂ O ₅ :K ₂ O:S kg/ha)
North plain	Pantnagar, Ludhiana, Delhi	As per zonal recommendations
Central	Sehore, Kota, Amravati, Devgarh Baria	
North Eastern	Raipur, Ranchi	
Southern	Dharwad, Adilabad, Pune	
North Eastern Hill	Imphal, Medziphema	

Treatment Details:

1. 100% RDF (NPKS)
2. 125% RDF
3. 150% RDF
4. 100% + 25% split N application at 45 DAS
5. 100% RDF + Mo seed treatment + Zn & Fe soil application
6. 100% RDF + Mo seed treatment + Zn & Fe foliar application at 45 DAS
7. 75% RDF + Mo seed treatment + Zn & Fe foliar application with lime
8. 100% RDF + Boron as foliar spray at flowering
9. 100% RDF + Microbial consortia (Rhizobium + MDSR14 + 12c (12c= *Burkholderia arboris*-High solubilizing))

No. of replication = 03

Design= RBD

Plot size: 6 m x 3.6 m

Variety: As per zonal recommendation better performing variety. Use only single variety in particular zone across different centres

Zn source = ZnSO₄ @ 25 kg/ha as soil application (foliar application = 0.5%); Fe Source= FeSO₄ @ 50 kg/ha as soil application (foliar application = 1.0%)

*Lime @ 0.025% for ZnSO₄ 7H₂O foliar spray and 0.2% for FeSO₄ 7H₂O foliar spray.

* RDF includes nitrogen, phosphorous, potassium and sulphur.

Common improved agronomic management practices must be followed.

- ✓ Seed Treatment (FIR)
- ✓ BBF Sowing
- ✓ Weed management (Pre emergence + Post emergence)
- ✓ Need based plant protection measures (IPM/IDM)
- ✓ Lifesaving irrigation with sprinkler during dry spell
- ✓ Timely harvesting

Observation to be recorded:

1. Growth parameters: Plant dry matter 30 DAS, 60 DAS, and at harvest
2. Nodulation (nodule dry weight), chlorophyll content (SPAD meter) at R5 stage
3. Yield attributes (No. of pods/plant, seed index)
4. Seed yield, biological yield (kg/ha) and harvest index
5. Cost of cultivation, Gross returns, net returns and net B: C ratio
6. Soil data: Initial N, P, K, Zn, Mo, B and Fe; At harvest: N, P, K, Zn, Mo, B and Fe
7. Crop uptake data: N, P, K, Zn, Mo, B and Fe at harvest

AGRON-4/23: Standardization of sustainable management practices (Natural/organic/integrated crop management) for soybean-based cropping systems (2023-2033)
(A) Main plot treatment (cropping systems)

(A) Main plot treatment (cropping systems)				
North Plain (Pantnagar, Ludhiana)	Central (Kota, Amravati, Sehore Devgadhbaria)	Southern (Dharwad, Adilabad, Pune)	Eastern (Raipur, Ranchi)	North Eastern Hill (Imphal, Medziphema)
CS1- Soybean- wheat CS-2 Soybean- chickpea	CS1- Soybean- wheat CS-2 Soybean- chickpea	CS1- Soybean- wheat CS-2 Soybean- chickpea	CS1- Soybean- wheat CS-2 Soybean- maize	CS1- Soybean- Mustard (rape seed) CS-2 Soybean- maize

(B) Sub plot treatment

1. **Organic farming (OF)***
2. **Natural farming (NF)**
3. **Integrated crop management (ICM)**

Replication= 3**Design= Split plot design*****At least 2 years' old organic field required (2 years' conversion period).****Plot size: 8 m x 3.6 m (fixed site)**

CS1			CS2		
OF	NF	ICM	OF	NF	ICM
R1 (8 x 3.6m)	R1 (8 x 3.6m)	R1 (8 x 3.6m)	R1 (8 x 3.6m)	R1 (8 x 3.6m)	R1 (8 x 3.6m)
R2 (8 x 3.6m)	R2 (8 x 3.6m)	R2 (8 x 3.6m)	R2 (8 x 3.6m)	R2 (8 x 3.6m)	R2 (8 x 3.6m)
R3 (8 x 3.6m)	R3 (8 x 3.6m)	R3 (8 x 3.6m)	R3 (8 x 3.6m)	R3 (8 x 3.6m)	R3 (8 x 3.6m)

Observations: Seed yield, straw yield, HI, SEY, Net Return, B:C ratio, initial N, P, K in soil and N, P, K uptake, the balance sheet of N, P, K, Organic carbon, soil pH, microbial count, and physical properties (Initial and completion= bulk density)

Note: Data related to insect-pests (Insect incidence) and disease dynamics (Disease scoring) should be noted with the help of Entomologist and Pathologist at 15 days' intervals across the treatments.

Operations	NF	OF	ICM
Land preparation	Tillage operations (need based) which involved less cost.	One deep ploughing once in 3-4 years, otherwise one normal ploughing in summer followed by 2 criss-cross harrowings.	One deep ploughing once in 3-4 years, otherwise one normal ploughing in summer followed by 2 criss-cross harrowings.
Seed treatment	Beejamritha @ 50-100 ml/kg seed or 20 lit/acre (Seed soaking-Shade dry-sowing, for legumes: Dip in beejamritha-shade dry and sowing).	Soybean seed inoculated with biofertilizers such as rhizobium culture, phosphate solubilizing micro-organisms and vesicular arbuscular mycorrhizal (VAM) fungi @ 5-10 g kg ⁻¹ seed before sowing (Biofertilizers can be procured from recognized govt. agencies such as NAFED/ICAR Institutes).	Thiophanate-methyl + Pyraclostrobin (45% +5%) @ 3 ml kg ⁻¹ seed. Thiamethoxam (70 WS) (3 ml/kg of seed). <i>Bradyrhizobium</i> @ 10 g/kg and MDSR 14 @ 10g/kg seed
Sowing	Sowing with normal seed drill	Sowing is done with a normal seed cum fertilizer drill.	Sowing is done with a normal seed cum fertilizer drill.
Nutrient management	1. Jeevamritha (200 lit/acre or 10% foliar spray at 15, 30 and 45 days after sowing). 2. Ghanajeevamritha (200 kg/acre at sowing, 30 and 45 days after sowing) 3. Crop residue mulching <i>Note: use one component among Jeevamritha/Ghanajeevamritha based on resource availability</i>	Well-decomposed FYM @ 10 t ha ⁻¹ must be applied/incorporated to soil 20-25 days before kharif and rabi crops sowing. Additional P requirements can be supplied through rock phosphate (As per the P ₂ O ₅ content of RP).	Nutrients are supplied through inorganic and organic sources: 1. 50% nutrient through inorganic sources (50% of the RDF- NPK) 2. 50% nutrient through organic sources (FYM)
Water management	Maintain 50% moisture + 50% air in the root zone of all crops. (Whaphasa: Alternate furrow irrigation).	Irrigation is applied as per the standard practices of respective crops.	Irrigation is applied as per the standard practices of respective crops.
Weed management	1. Crop residue mulching. 2. Need-based hand weeding	Two-hand weeding at 20 and 40 days after sowing. Hoeing	Pre-emergence herbicide (Diclosulum

		of the field with bullocks/tractor Dora between 15-25 DAS.	@ 26 g/ha) + one hand weeding at 40 DAS or Dora at 20-25 DAS.
Plant protection	5% spray Agniastra (Pod borers, fruit bores, sucking pests and leaf-eating caterpillars), 5% bramhastra (Sucking pests and leaf-eating caterpillars) and 5% neemastra (Aphids, jassid, whitefly) @ 6-8lit/acre at 7-10 days' intervalsb.)	Fungal Diseases: Seed treatment with <i>Trichoderma viride</i> @ 5 g kg⁻¹ seed, <i>Pseudomonas syringae/fluorescens</i> @ 5 g kg⁻¹ seed. <i>Pseudomonas syringae</i> is also used as foliar spray @ 10 g per litre of water at the initiation of fungal diseases. Insect pest control: a) <i>Bacillus thuringiensis</i> (Dipel) @ 1.0 l ha⁻¹, <i>Nomuriya rileyi</i> @ 1 kg ha⁻¹, <i>Beauveria bassiana</i> @ 1 kg ha⁻¹ and nuclear polyhedrosis virus (NPV) @ 250 larval equivalent per hectare. b) Trap/border crops such as Suva (<i>Anethum graveolens</i>), Marigold (<i>Tagetes patula</i>), cowpea (<i>Vigna unguiculata</i>), and Dhaincha (<i>Sesbania rostrata</i> or <i>Sesbania aculeata</i>). c) Physical method includes yellow sticky trap and pheromone traps @ 5-10 ha⁻¹ for monitoring purposes, 20-25 ha⁻¹ for mass trapping, and 80-100 ha⁻¹ for mating disruption	Need-based application of chemical pesticide + bio pesticide as per zonal recommendation.

Formulae

1. **Crop growth rate (CGR)** = $1/p \times (W2 - W1) / T2 - T1$ (g/m²/day)

2. **Relative crop growth rate (RGR)** = $(\log W2 - \log W1) / T2 - T1$ (g/g/day)

3. **Rainfall use efficiency** (RUE kg/ha-mm) = grain yield (kg/ha) / rainfall (mm) received during the crop growing period.

3. Soybean equivalent yield= [(rabi crop yield x Price of rabi crop)/ Price of soybean] + soybean yield

Important Notes:

1. Seed (4.5 kg seed of each entry) of entries (AVT –II trail under Agronomy) must reach by 15 April at Dr Rakesh Kumar Verma Scientist (Agronomy), ICAR-Indian Institute of Soybean Research Indore, 452001 (M P)
2. Cut-off date for conduct (sowing) of all trials is 10th July. Trials sown later than this date would not be considered.
3. Fill-up the statistically analyzed data in the sheet provided at the time of data submission.
4. This is most important to **provide the excel sheet of replicated data of all the field experiments in excel sheet.**
5. Kindly use the seed rate according to the row spacing.
6. AGRON-3/24 experiment: Yield maximization through improved nutrient management practices. As per zonal recommendation better performing variety. Use only single variety in particular zone across different centres.
7. B:C ratio should be calculated on the basis of Gross Returns only.
8. **Dead line for data submission 15.12.2024.**

PROCEEDINGS OF MICROBIOLOGY SESSION

Chairman : Dr. C R Patil, Head Agri Microbiology, UAS Dharwad

Co-Chair : Dr P U Krishnaraj, Professor (Microbiology), UAS Dharwad

Expert : Dr Ashwani Basandrai, Ex Plant Pathologist, CSKHPKV, Palampur

Rapporteurs : Dr. P. Jones Nirmalnath, Professor (Agri. Microbiology), UAS Dharwad

: Dr Sanjeev Kumar, Scientist, ICAR-IISR, Indore

At the outset, the session began with the presentation of Dr M.P. Sharma, PI-Microbiology. He presented salient findings of trials conducted during kharif 2023.

During presentation Dr Y.S. Shivay suggested correcting the forms of P fertilizer doses used in the treatment of MB2 trial. The chairman suggested to screen the consortium at limited locations prior to validation at the national level and also suggested to ensure the supply of the consortium by the respective center before the release as technology. It was also suggested to nominate more number of microbiologists in the AGM for having effective discussions to formulate strong technical programme and conduct of the microbiology trials. After the presentation, following suggestions were emerged out:

- In MB 1/23, screening and selection of the native bradyrhizobial isolates should be done based on their N-fixing ability under microcosms for the further validation in the field.
- In MB 3/21, the chairman suggested to include the mycorrhizal (UASDAMF) consortium developed at UAS Dharwad for conferring the moisture stress in soybean in addition to other microbial consortia. Further, he suggested including one more strain in IISR consortia preferably a K-solubilizing strain in order to make it a complete consortium.

The session ended with vote of thanks to the Chairman and Expert.

TECHNICAL PROGRAMME OF AICRP SOYBEAN MICROBIOLOGY FOR 2024

MB 1/23: Isolation and functional characterization of selected rhizobia for high N-fixing abilities in soybean

Centre: Pantnagar, Delhi, Indore & Ludhiana

Isolation: soybean rhizobia should be recovered from root nodules of soybean varieties which are currently in seed chain. The rhizobial isolation and characterization will be carried out by following standard methods (**Annexure 1**).

MB 2/21: Response of N-fixing rhizobia and P solubilizing bacteria with RDF/farmers practice and with reduction of fertilization on latest release variety of soybean of a zone (Ludhiana, Delhi, Pantnagar, Indore, Sehore, Raipur and Dharwad)

Treatments-

- T1=RDF (100% recommended dose of NPK fertilizers in the zone; example for central zone the recommended dose of NPK is 25 Kg N/ha, 60 Kg P₂O₅/ha and 40 Kg/ha K₂O)
- T2=75% of recommended N and 100% of recommended P₂O₅ and K₂O
- T3=75% of recommended P₂O₅ and 100% of recommended N and K₂O
- T4=75% of recommended N & P₂O₅ and 100% of recommended K₂O.
- T5= 75% of recommended N and 100% of recommended P₂O₅ and K₂O+ *Bradyrhizobium daqingense*
- T6=75% of recommended N and 100% of recommended P₂O₅ and K₂O +Commercial/local rhizobial strain available in the zone/market
- T7=75% of recommended P₂O₅ and 100% of recommended N and K₂O+ *Bacillus aryabhataii*
- T8=75% of recommended N & P₂O₅ and 100% of recommended K₂O+ *B. daqingense*+*Bacillus aryabhataii*
- T9=75% of recommended N & P₂O₅ and 100% of recommended K₂O+*Bacillus aryabhataii*
- RDF+ Commercial/local rhizobial strain available in the zone/market

Treatments and design: 9 (RBD with 3 replications); Plot size: 3.6 × 5

Parameters:

- At R5 stage-Nodules per plant, nodule dry weight, Leghaemoglobin, chlorophyll content
- At harvest: Grain yield, cost benefit ratio, savings of NPK inputs

***Cultures of *B. daqingense* and *Bacillus aryabhataii* will be supplied by the Indore centre**

MB 3/23: Evaluation of promising consortia for conferring drought tolerance in soybean under pot conditions (Ludhiana, Delhi, Pantnagar, Indore, Sehore, Raipur and Dharwad)

This trial would be conducted in unsterilized soil in 10 Kg plastic black gusseted/pots.

Following treatments will be tested-

Treatments: 12 (6×2)

Inoculations: 05

1. Un-inoculated control
2. ICAR-IISR, Indore Consortia
3. ICAR-DGR endophyte consortia
4. ICAR-CRIDA drought tolerant microbial consortia
5. ICAR-NBAIM Archaea formulation/consortia
6. UAS-AM consortia

Stress level: 02

1. No moisture stress

2. Stress at R5 stage for 10 days (by stopping irrigation) or until plants started showing wilting symptoms whichever is earlier

Design: Factorial CRD (5×2); replications 4

Observations:

After stress (7-10 days of imposing stress treatments at R5 stage)

1. Nodule dry weight
2. Leghaemoglobin in nodules
3. Relative water content
4. Chlorophyll content in leaves
5. Shoot and root dry weight
6. N and P uptake in roots and shoots

Note: Microbial consortia will be supplied by the respective institute. The sampling will be done before irrigation (after stress treatment at R5 stage).

MB 4/13: Nodulation ability of AVT-II entries of respective centres

Centres: Indore, Sehore

Zone	AVT II Entries
CZ	JS 24-33, Checks (NRC 138, NRC 150, NRC 157, JS 22-12)*

*Seeds of soybean (250 g each entry/variety in coded form will be sent)

Experimental design and replication: RBD with 3 replications; each plot (2.25 x 3 meter) should have 5 rows of soybean each 3 m length.

Observations:

1. Nodule number and nodule dry weight
2. Leghaemoglobin content in nodules at 50 % flowering stage
3. Plot yield

Important Notes:

- The experiments should be conducted strictly as per the technical programme (mention the name variety, date of sowing etc for each experiment).
- All the data should be recorded in uniform units e.g., yield in Kg/ha, leghaemoglobin in µg/g fresh nodules, nodule dry weight in mg/g nodules, all nutrient uptake values in seeds/shoots in mg/kg and content in %.
- All the data of kharif 2024 trials, statistically analysed should be submitted to IISR in tabular form maximum by 15th Dec 2024.
- Source of commercial strain/name of local strain used in the MB/21 should be clearly mentioned

Proceedings of Food Technology Session

Chairman: Dr. Sarojini Karakannavar, Director of Students Welfare, UAS, Dharwad

Co-chairman: Dr. Hemalatha S, Professor and Head, Food Processing Technology, UAS, Dharwad

Rapporteurs : Dr. Uma L A, Professor of Food Science and Nutrition, UAS, Dharwad

Principal Investigator (Food Technology) Dr. L Sophia Devi, Jr. Food Scientist, CAU-Imphal, presented the results of Multi-location analysis for food grade characteristics of AVT II entries grown in three different zones-NHZ, CZ, EZ conducted during *Kharif* season 2023. The PI also presented the tentative technical program for forthcoming *Kharif* season-2024. Based on the results of food technology trials and technical program-2024, the following discussion and recommendations were made by chairman and expert of the food technology session

- Only AVT II entries will be evaluated
- Research emphasis must be given on new product development using soyflour and green vegetables soybean
- It was also suggested that some parameters like swelling percentage of the soaked beans should be included
- Product profiling of the fermented product developed
- Lastly, Director, ICAR-IISR, Indore also suggested to work on standards of varieties for major soybean base products by collaborating with ICAR-CIAE, Bhopal.

The following recommendation was made from previously conducted experiments:

- Entries : VLS 99(C), NRC 197, VLS 63(C) of NHZ

NRC 262, NRC 130, NRC 138(C) of CZ

JS 20-116(C) of EZ AVT II were all acceptable for milk and tofu sensory.

TECHNICAL PROGRAMME OF FOOD TECHNOLOGY FOR 2024

Programme I: Multi-location analysis of food grade characteristics of AVT II entries of Central Zone

Locations	Amreli, Amravati, Anand, Indore, Jabalpur, Kota, Morena, Nagpur, Mandsaur, Parbhani, Sanosara, Sehore
Entries	JS 24-33
Checks	JS 20-34, NRC 152, NRC 138

1. To analyse soybean varieties in different zones for physical characteristics of seed

Parameter to be analysed	Instrument/ method used
100 seed weight	Weighing balance
Seed colour	Lab hunter colour/ horticulture colour chart
Hilum colour	Horticulture colour chart
Seed dimension	Vernier calipers
Seed lustre	Lab hunter colour
Protein content	

2. To analyse soybean entries sown in different zones for cooking 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 10g seed
Sensory of cooked bean	Parameters: Softness/ Mouth feel, Beaniness, Overall acceptability
Milk yield	• Weigh 5g seed blanch for 2 minutes and soak in water overnight • Grind imbibed seed in pestal mortar • Add 50ml hot water and cook for one minute • Sieve through muslin cloth • Measure volume in measuring cylinder • Measure TSS
Tofu yield	• Take hot milk (80°C) 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 • Protein content of tofu
Sensory of milk and tofu	Colour, texture/consistency, beaniness/ flavour, overall acceptability

Programme II: To develop fermented soybean product- *Hawaijar* by using different varieties (Small seeded local varieties and null Kunitz trypsin inhibitor and lipoxygenase-2 free soybean-NRC 142)

Method/Treatment to be used

- 1) Traditional method
- 2) Non-traditional method (Using starter culture)

Replication: 3

Observation:

- 1) Total crude protein
- 2) Total fat
- 3) Total carbohydrate
- 4) Total crude fibre

Proceedings of Center wise presentation

Chairman: Dr. K. H.Singh, Director, ICAR-IISR, Indore

Experts: Dr.Ashwani Basandrai, Plant Pathologist,CSKHPKV,Palampur(HP)

Rapporteurs: 1.Dr.G.D.Chandankar,Soybean Breeder,AICRP On Soybean Amravati(M.S.)

2. Dr. Amar Singh, Principal Scientist, CSKHPKV, Palampur

3. Dr. R.S.Jadhav, Jr. Entomologist, AICRP Soybean,VNMKV, Parbhani (M.S.)

At the outset, the session started with the welcome address by respected Dr. K.H.Singh, Director, ICAR-IISR, Indore. The centre wise presentation of Pune, Dharwad, Kota, Parbhani, Palampur, Ludhiana, Raipur, Jorhat and Jabalpur was presented by the respective Soybean Breeder/Officer In-charge of the respective centre. At the beginning Dr. P. G. Suresha, Soybean breeder, Agharkar Research Institute Pune presented the Centers progress report and he told that total 625 germplasm lines were maintained during *kharif* 2023-24 and total 222 fresh crosses were attempted.

Dr. G.K Naidu, Soybean Breeder, AICRP on Soybean, UAS, Dharwad presented the progress report of Dharwad centre. He informed the house that till date centre has developed five rust resistant varieties and among those DSB 34 is the recently released variety. Further he mentioned that during Kharif 2023 lower incidence of rust disease was observed due to dry spell. He told that total 385 germplasm lines were maintained specially to identify the rust resistance during Kharif 2023.He informed that all the AICRP trials of Plant Breeding, Agronomy, Pathology, Entomology and Microbiology were conducted as per the technical programme given by IISR, Indore. Chairman, suggested to focus on strengthening rust resistance breeding programme specially through gene pyramiding. Expert suggested to preserve the valuable breeding material in liquid Nitrogen.

Dr. B.L.Meena, Soybean Breeder presented the report of Kota centre . He informed the house that five varieties and five recommendations are developed till date. He further mentioned that 175 germplasm lines were evaluated during Kharif 2023. The Chairman, suggested to strengthen the breeding programme and advised to demand for supply of germplasm lines from IISR Indore and thus to increase the germplasm lines up to 500 from next year.

Dr. S P Mehtre, Soybean Breeder and O/I AICRP on Soybean,Parbhani presented the report. He informed the house that till date 13 soybean varieties are developed by the centre out of which three were developed recently viz., MAUS 612, MAUS 725 and MAUS 731. Total 30 crosses were attempted during the season. Total 1000 germplasm lines are maintained at the centre. The Chairman expressed satisfactory remarks about performance of the centre and advised to continue the same.

Dr. Vedna Kumari Soybean Breeder, CSK HPKV, Palampur presented centre report. She explained objective of the centre and told that 225 germplasm lines are maintained at the centre. She also informed that 14 crosses were attempted during this season. The Chairman suggested to focus on the need based objectives breeding programme and expressed satisfactory remarks about performance of the centre.

Dr. B. S Gill, Soybean Breeder, PAU Ludhiana presented centre report. He informed the house that five

varieties are developed till date at this centre. Further he reported that the centre has developed YMV resistant version of JS 335. He reported that 22 crosses were attempted and 426 germplasm lines are maintained at the centre. New initiative has been taken and screened 30 advanced breeding lines for Soymilk and Tofu parameters. The Chairman expressed the satisfactory remarks about performance of the centre. Further suggested to submit the details of YMV resistant JS 335 version to the Director IISR, Indore.

Dr Sunil Kumar Nag, Soybean Breeder and O/I AICRP on Soybean, IGKV, Raipur presented the centre report. He explained the objectives of the centre and informed the house that till date 7 varieties are developed by the centre. Total 26 fresh crosses were attempted at this centre during the season. The Chairman expressed satisfactory remarks about the performance of the centre.

Dr. I A. Sheikh, Soybean breeder, AAU Jorhat, explained major constraints in soybean cultivation in Assam State. He reported the centre achievements. Total six crosses were made during Kharif 2023 at this center. All the Plant Pathology trials were conducted as per the allotment from IISR, Indore at this center. The Chairman suggested to strengthen the need based breeding programme and suggested to increase the germplasm lines collections with the centre and to undertake the programme of evaluation of already released soybean varieties and to increase the FLDs in the state and to popularize the soybean crop among the farmers of the region.

Dr. M. K. Srivastava, Soybean Breeder JNKVV, Jabalpur, presented the centre report. He informed the house that 24 crosses were attempted during the Kharif 2023 season. All the AICRP trials under Plant Pathology discipline were conducted as per allotment. He further reported that 327 germ plasm lines are maintained at the centre. The Chairman expressed satisfactory remarks about performance of the centre and advised to continue the same.

The session ended with vote of thanks to chair.

Proceedings of Valedictory Session

Valedictory function of the Annual Group Meeting was chaired by Director, IISR Indore and Director Research, UAS Dharwad was the chief guest. Dr Sanjay Gupta presented the proceedings and recommendations of Plant Breeding session. He also informed the house about the decision of Varietal Identification Committee meeting and identification of four entries (JS 23-03, JS 23-09, RSC 11-72 and NRC 197) for release for cultivation in different zones. Principal investigators Dr B U Dupare, Dr Rakesh Kumar Verma, Dr Lokesh Kumar Meena, Dr Sanjeev Kumar, Dr Sophia Devi, Dr Mahaveer P Sharma presented the recommendations and highlights of the deliberations of Technology Transfer, Agronomy, Entomology, Plant Pathology, Food Technology and Microbiology disciplines, respectively. Director ICAR-IISR Indore expressed his gratitude to the university for hosting the annual group meeting. He also requested the AICRP scientists for laying out the experiments in a scientific way so as to reach a valid conclusion. Dr B D Biradar, Director Research, congratulated the scientists for the release of 4 soybean varieties. Dr Somangowda, organizing secretary of the annual group meeting felicitated the Principal Investigator of Plant Breeding and offered the vote of thanks.

54th Annual Group Meet of AICRP on Soybean at University of Agricultural Sciences Dharwad**13-14 March, 2024****Proceedings of the Varietal Identification Committee (VIC) meeting**

The Varietal Identification Committee meeting of AICRP on Soybean was held under the Chairmanship of Dr. T. R. Sharma Deputy Director General (Crop), ICAR, New Delhi on 13th March, 2024 at UAS Dharwad. Dr K H Singh, Director ICAR-IISR, Indore was the Member-Secretary of the Varietal Identification Committee. Following were present in the meeting:

- 1 Dr. T. R. Sharma, Deputy Director General(CS), ICAR, New Delhi
- 2 Dr. D. K. Yadava, Asstt. Director General (Seed), ICAR, KrishiBhavan, New Delhi.
- 3 Dr Sanjay Singh, Director, ICAR-Indian Institute of Seed Science, Mau
- 4 Dr B D Biradar, Director Research, UAS Dharwad
- 5 Dr Y S Shivay, Principal Scientist (Agronomy) ICAR-IARI New Delhi
- 6 Dr AshwaniBasandrai, Ex-Professor, Plant Pathology, CSKHPKV, Palampur
- 7 Dr Jagdish Kumar, Vice President (R&D), Ruchi Hi Rich Seeds Pvt Ltd, Indore
- 8 Dr ShamaraoJahagirdar, Professor, Plant Pathology UAS Dharwad
- 9 Dr C P Mallapur, Professor, Agricultural Entomology, UAS Dharwad
- 10 Dr V S Sangam, Head (R&D), Karnataka State Seed Corporation, Dharwad
- 11 Dr. Sanjay Gupta, Principal Investigator (Plant Breeding), ICAR-IISR, Indore
- 12 Dr. K. H. Singh, Director, IISR, Indore

Dr D K Yadava, ADG (Seed) and Dr Sanjay Singh, Director, IISR Mau attended the meeting in virtual mode. Varietal identification committee considered 4 varietal identification proposals. The proceedings of the meeting are reported here.

JS 23-03: The proposal of the JS23-03 was submitted by JNKVV, Jabalpur. The entry was evaluated in 32 breeding trials during 2021 to 2023 in early maturity trials of Central Zone. The mean grain yield of the entry (2167 kg/ha) was 27% higher than the best check NRC 138 (1702 kg/ha) with a maturity duration of 93 days. It was equivalent to the check in grain yield in agronomical trials. It has shown moderate level of resistance to charcoal rot, anthracnose, RAB and YMV. Oil content of the entry is equivalent to the best check NRC 138. The committee identified JS 23-03 for release in Central Zone including Madhya Pradesh, Marathwada and Vidarbha region of Maharashtra, Gujarat, Bundelkhand region of Uttar Pradesh and Rajasthan.

JS 23-09: The proposal of the JS23-09 was submitted by JNKVV, Jabalpur. The entry was evaluated in 32 breeding trials during 2021 to 2023 in early maturity trials of Central Zone. The mean grain yield of the entry (2104 kg/ha) was 24% higher than the best check NRC 138 (1702 kg/ha) with a maturity duration of 92 days. It was equivalent to the check in grain yield in agronomical trials. The entry is MR to AR for charcoal rot, HR for YMV disease, moderate resistance to anthracnose and RAB. Oil content of the entry (20.2%) is equivalent to the best check NRC 138 (20.0%). The committee identified JS 23-09 for release in Central Zone including Madhya Pradesh, Marathwada and Vidarbha region of Maharashtra, Gujarat, Bundelkhand region of Uttar Pradesh and Rajasthan.

RSC 11-42: The proposal of RSC 11-42 was submitted by IGKV Raipur. The entry was evaluated in 9 trials during 2021 to 2023 in Eastern Zone. The grain yield of the entry (2299 Kg/ha) was 27% higher than the best check JS 20-116 (1806 kg/ha). RSC 11-42 secured first rank in all the trials. Entry had 6% higher grain yield over

the best check NRC 128 in agronomical trials. Entry is moderately resistant to Indian Bud Blight. The committee identified RSC11-42 for release in Eastern Zone including Chhattisgarh, Jharkhand and Odisha.

NRC 197:The proposal of NRC 197 was submitted by IISR, Indore. Entry was evaluated in 7 trials during 2021 to 2023. It is the first entry with null KTi developed for Northern Hill Zone. The entry has been developed using marker assisted selection. Considering the first KTi entry and early maturity as compared to other checks the entry was identified for release in Himachal Pradesh and hill districts of Uttarakhand.

The meeting ended with Vote of Thanks to Chair.

MONITORING PROFORMA-2024

Objectives Assigned to Centre:

Centre	
Date of monitoring	

1. Weather conditions

Location	June 2022	July 2022	Aug. 2022	Sep. 2022	Oct. 2022	Nov. 2022
Max. Temp. (°C)						
Min. Temp. (°C)						
Rainfall (mm) (Rainy Days)						
Max.R.H. (%)						
Min. R.H. (%)						
Sunshine (Hours/Day)						

2. Germplasm Activities**(a) List of Germplasm Available**

Name of Germplasm	Total Number

(b) Germplasm under evaluation

Name of Germplasm	Total Number

3. Multi-location Germplasm Evaluation

Only for Palampur, Almora, Pantnagar, Raipur, Imphal, Indore, Parbhani, Pune and Adilabad Centres

No	Number of Germplasm Under Evaluation	Number of Blocks	Number of Checks / block and their name	Germplasm line with less population and name of their adjacent germplasm	Comments of team: Is the trial worth accepting, if not give reasons

4. Hybridization Programme of the Centre**(a) Hybridizations conducted in 2024**

Pedigree	Hybridizations Attempted	Purpose

(b) Evaluation of F1s

Pedigree	Total Number of Plants	Number of True Plants
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(b) Segregating Populations

Generations	Pedigree	Number of Selected Plants	Number of Bulks
F2			
F3			
F4			
F5			
F6			

F7			
Advanced Generations			

5. National Hybridization Programme

NHP Number	Pedigree	Generation	Comment of the team

6. Station Trials

(a) First Year of Station Trial

S. No	Entry and checks	Pedigree	Comments of monitoring team
1.			

(b) Second Year of Station Trial

S. No	Entry and checks	Pedigree	Performance of First Year Station Trial			
			Maturity (Days)	Grain Yield (Kg/ha)	% increase over best check	Comments of monitoring team
1.						

7. Evaluation of AICRPS Trials

Discipline	No. of trials allotted	No. of trials conducted	General maintenance	Specific comments of team
1. Plant breeding				
2. Agronomy				
3. Entomology				
4. Plant pathology				
5. Microbiology				
6. Food Technology				

(a) Discipline-wise evaluation

Name of discipline

Trial / experiment	Crop stage	Comments of Team		
		Deviation from Technical Programme	Whether Trial is worth cosidering	Report reason for not considering the trial

8. Seed Production Programme:

Breeder seed						
Variety	Target (q)	Area sown (ha)	Date of sowing	Expected production	Crop stage	Specific comments of team

Nucleus seed						
Variety stage I /stage II	Target (q)	Area sown (ha)	Date of sowing	Expected production	Crop stage	Specific comments of team

5. Front Line Demonstrations:

	FLD allotted	Number of FLD conducted	Number of FLD visited	General condition of FLDs	Specific comments of team
Full package					

9. Manpower (For regular centres)

Manpower Sanctioned	Manpower in Position

S. No	Name of the Scientist / Technical	Designation

7. Overall Specific comments of the monitoring team about the performance of the centre

AICRPS I/c

Monitoring team member

MONITORING TEAMS FOR KHARIF 2024

Team	Zone	Centre	Team Leader	Team Members
1.	NHZ and NPZ	Ludhiana, Delhi, Palampur	Dr Gyanesh Kumar Satpute, Principal Scientist (Plant Breeding), ICAR-IISR Indore	• Dr Rakesh Kumar Verma, Scientist (Agronomy), ICAR-IISR, Indore • Dr Pawan Kumar Amrate, Scientist (Plant Pathologist), JNKVV, Jabalpur
2.	NPZ and NHZ	Pantnagar, Almora, Majhera	Dr Rajesh Vangala, Scientist, ICAR-IISR, Indore	• Dr. M.S. Dange, Jr Agronomist, PDKV Amrawati • Dr K P Singh, Plant Pathologist, GBPUA&T Pantnagar
3.	NEZ	Ranchi, Jorhat, Imphal, Medziphema	Dr V Natraj, Scientist (Plant Breeding), ICAR-IISR Indore	• Dr Raghvendra N, Scientist (Agronomy) ICAR-IISR Indore • Dr Munmi Borah (Ranchi and Imphal) • Dr Pezanguli Chakruno (Jorhat)
4.	CZ and NEZ	Amravati, Nagpur, Raipur, Bhanupatna	Dr Anita Rani, Principal Scientist (Plant Breeding), ICAR-IISR Indore	• Dr D S Meena,, Soybean Agronomist, Kota • Dr. R.S. Ghawde, Plant Pathologist, PDKV Amrawati
5.	CZ	Mandsaur, Kota, Sehore, Morena	Dr Lokesh Kumar Meena, Scientist & PI, Entomology, ICAR-IISR, Indore	• Dr Sunil Kumar, Plant Breeder, IGKV, Raipur
6.	CZ	Amreli, Devgarh Baria and Sanosara (Lokbharti)	Dr B S Gill, Soybean Breeder, PAU, Ludhiana	• Dr Santosh Jaybhay, Agronomist, ARI, Pune
7.	CZ and SZ	Parbhani, Bidar, Adialbad, Pune	Dr Sanjay Gupta, Principal Scientist & AICRP In-charge, ICAR-IISR Indore	• Dr Mahaveer Sharma, Principal Scientist & PI Microbiology, ICAR-IISR Indore • Dr Somanagowda, Professor (Agronomy), UAS Dharwad
8.	SZ	Dharwad, Bengaluru, Kasbe Digraj, Ugarkhurd	Dr B U Dupare, Principal Scientist (Ag Extension) and Nodal Officer, FLD, ICAR-IISR Indore	• Dr Shivkumar M, Senior Scientist, (Plant Breeding), ICAR-IISR Indore • Dr Sanjeev Kumar, Scientist & PI Plant Pathology, ICAR-IISR Indore

Note:

1. **Monitoring to be Conducted in September 2024 (Preferably at R5 to R6 stage)**
2. Monitoring teams shall use the proforma given in Appendix-II for monitoring report in Technical Programme of AICRP on Soybean 2023-24.