ICAR-DIRECTORATE OF SOYBEAN RESEARCH
KHANDWA ROAD, INDORE- 452 001

Proceedings of 29th Annual Institute Research Council Meeting
(2-3 June 2015)

The 29th Annual Institute Research Council Meeting of the Directorate was held on June 2 and 3, 2015. The meeting was chaired by the Director, Dr. V.S. Bhatia and was attended by the members as listed in *Annexure I.*

At the outset, Dr. S. D. Billore, Secretary, IRC welcomed the Chairman and all the members of IRC. In his welcome remarks, he requested all the members to participate in the discussion and offer constructive suggestions for strengthening of the ongoing and newly proposed research programmes. He also requested that all PI's should present their last year's achievements of the research projects along with proposed technical programme for the year 2015-16.

Dr. V.S.Bhatia, Chairman IRC and Director in his opening address, expressed his concern over the planning and execution of research programmes and emphasized that all the suggestions made by the RAC, QRT and other higher authorities of ICAR should be included in the formulation of the research programmes. Chairman, IRC further emphasized that the research project should be problem oriented and focused. He also suggested that scientists should first identify the problems responsible for low productivity of soybean and prepare the new project proposals in order to address the constraints therrein. He further stressed upon that, all the scientists should carry out research work in scientific harmony. The emphasis should be given to collaborative projects with other ICAR institutions using interdisciplinary and multidisciplinary approach for better scientific research work. Chairman also showed his concern about the forecasting of rainfall and its effects on soybean and looking to the situation a sound preparedness is required like weekly advisory and continent planning so that farmers will able to mitigate adverse situations.

Dr. S.D. Billore, Secretary, IRC presented the action taken report on the decisions of the 28th IRC held during 11-13, June 2014. He informed the members that the majority of the recommendations have been implemented in letter and spirit. During the discussion on ATR, it was instructed that the action taken should be in quantifiable manner rather than casual. After ATR presentation, the RAC recommendations were also presented by Dr S M Hussain, RAC secretary.

This was followed by the project-wise presentations of research work done along with envisaged programmes for *kharif* 2014. The project-wise details and recommendations made are given below.

	Project No.	**Compl-etion year**	**Project Title**
	02.06.2015		**CROP IMPROVEMENT**
1.			***Soybean genetic resource management- Acquisition, conservation, characterization, documentation and utilization (Dr Dinesh K Agarwal)***
1.1.	**NRCS 1.1/87**	**LT**	**Augmentation, management and documentation of soybean germplasm (Dr G Satpute)**
1.1.1.			The results were presented by Dr G Satpute
1.1.2.			Dr Dr G Satpute to function as PI of this project.
1.1.3.			Dr Anes K M and Dr Mamta Arya will be CO-PI in this project.
1.1.4.			Disease resistance screening in field conditions, grow susceptible lines every after 5-6 lines, than conclude it.
1.1.5.			There is urgent need to streamline the germplasm.
1.1.6.			All the information (pass port data) regarding germplasm accession

			should be uploaded on web site so that information should be available to breeders within two months. The same may be circulated among the scientists of DSR.
1.1.7.			The technical programme approved for the year 2015-16 shall be as:
			Rejuvenation, multiplication and conservation of accessions
			Multiplication of trait specific germplasm
			Evaluation of new accessions in augmented RBD for yield and associated traits
			Multilocation testing of accessions in 6 locations
			Testing of accessions for YMV, rust, and insect-pest at hot-spots
			Molecular diversity analysis
			Generation advancement in interspecific crosess – prebreeding
			Generation advancement of single crosses for NAM development
			Testing of new version of prototype software – GIS
			Development of new module for multiple frequency calculation
			New module for germplasm accession report in different formats (xls, doc, pdf)
			Assessment of natural cyst population in germplasm accession
2.			***Genetic amelioration of soybean for yield, wide adaptability. nutrient use efficiency, resistance to biotic and abiotic stresses and improvement in quality of soybean seed (Dr SM Husain)***
2.1.	**NRCS 1.6/92**	**LT**	**Genetic improvement for yields and associated characters in soybean (Dr SM Husain)**
2.1.1.			Dr A N Sharma will be Co-PI in this project.
2.1.2.			Yield potential of varieties should be evaluated under best management conditions.
2.1.3.			The technical programme approved for the year 2015-16 shall be as:
			Hybridization of source germplasm for earliness, drought tolerance, insect resistance, high yield etc. with popular varieties and other lines.
			Generation advancement and selection in segregating generations
			Evaluation of advance breeding lines for yield and other traits in replicated trial
			Evaluation of early progenies (F4,F5) for yield and other traits
			Distribution of breeding material to AICRPS centres
			Multiplication and maintenance of DSR entries
			Diversity analysis of breeding lines from AICRPS centres
2.2.	**DSR1.18/10**	**2017**	**Breeding soybean for wider adaptability using photoperiod response and growth habits (Dr Sanjay Gupta)**
2.2.1.			High yielding and ruling old varieties should be used in breeding programme for wider adaptability.
2.2.2.			The technical programme approved for the year 2015-16 shall be as:
			Genetic analysis of photoperiod, long juvenility and growth habit traits
			Genotyping of soybean varieties and genotypes for photoperiod and growth habit traits
			Hybridization and backcrossing for photoinsensitivity, long juvenility and growth habit
			Generation advancement with selection for photoinsensitivity and long juvenility

2.3.	**DSR1.19/10**	**2015**	**Breeding soybean for improved phosphorus uptake efficiency (Dr Sanjay Gupta)**
2.3.1.			The project is going to be completed and RPF III is to be submitted.
2.3.2.			The technical programme approved for the year 2015-16 shall be as:
			Standardization of organic acid efflux in hydroponic cultures
			Root architecture studies through winrhizo
2.4.	**DSR 5.6b/09**	**2019**	**Breeding for drought resistance / tolerance varieties in soybean (Dr GK Satpute)**
2.4.1.			Project 5.6.a and 5.6.b. merged in to one.
2.4.2.			Drought resistant lines should be tested at Morena centre or at Bagli where shallow soils are present.
2.4.3.			Concentrate only on root parameters for drought resistance
2.4.4.			Off season drought resistance screening should be carried out for delayed wilting.
2.4.5.			Dr S V Ramesh and Dr Mamta Arya will be Co-PI in this project
2.4.6.			The technical programme approved for the year 2015-16 shall be as:
			Off-season screening of $386F_4$, $122F_5$, $174F_6$ and $46F_7$ high yielding progenies for terminal drought tolerance
			Evaluation of 129 F_7 breeding lines in RBD with three replications in sets of irrigated and water-stress conditions
			Evaluation of promising advanced breeding lines for root traits using cylindrical PVC pipes
			Generation advancement of $36F_6$ and 38 F_4 crosses through Single pod descent and bulk methods
			Generation advancement of high yielding drought responsive progenies from F_5, F_6 and F_7 to their next generations
			Evaluation of drought stress responsive selections from F_7 generation for yield and associated traits
			Initiation of fresh crosses and one BC_2 and three BC_1s and two crosses *viz.* Young x Benning and EC 538828 x Young for RILs enhancement
			Development of two RILs populations in F_5 and one in F_6 generations
2.5.	**DSR 5.6.c**		**Breeding for Waterlogging Tolerance in Soybean (Dr Mamta Arya)**
2.5.1.			Standardize the screening method
2.5.2.			More emphasis should be given to traits associated with water logging conditions
2.5.3.			In addition of flood, one treatment of soil saturated conditions should include in the study
2.5.4.			Screening should be carried out at Biswnathchariali centre for this purposes.
2.5.5.			The technical programme approved for the year 2015-16 shall be as:
			Screening of RILs for water logging tolerance
			Maintenance and advancement of crosses made during previous years
			Screening germplasm lines for WL tolerance using quantitative, biochemical, root and nodule studies
2.6.	**NRCS 1.9/99**	**LT**	**Breeding for resistance to rust and YMV (Dr R Ramteke)**
2.6.1.			Dr B S Gill at Ludhiana and Dr Shyamrao Jagirdar at Dharwad will be Co-PI in this project
2.6.2.			Maintain differential lines for further research

			Explore the availability of differentials at DSR
2.6.3.			The technical programme approved for the year 2015-16 shall be as:
			Generation advancement
			Crosses with EC 241780 (rust resistant) with JS 335 (agronomical superior) and PS 416 (YMV resistant) and amongst as a part of gene pyramiding
2.7.	**DSR 1.25/13**	**2020**	**Development of multiparent intercross population for quantitative traits improvement in soybean (Dr Shivakumar M)**
2.7.1.			Dr G Kumawat will be Co-PI.
2.7.2.			The technical programme approved for the year 2014-15 shall be as:
			Generation advancement of several single crosses including the inter-specific crosses
			Development of 8-way intercrossed hybrids
2.8.	**DSR 1.26/13**	**2017**	**Studies on impact of field weathering on soybean seed quality and its management (Dr P Kuchlan)**
2.8.1.			Identify the most critical stage for salicylic acid spray
2.8.2.			The technical programme approved for the year 2015-16 shall be as:
			Estimation of incorporation of boron into seed due to foliar application and pre-sowing seed treatment
			Application of ABA on plant to induce partial dormancy to seeds to protect from vivipary due to untimely rain and high humidity at the time of seed maturity
			To study the biochemical degradation into the seed due to field weathering
			Revalidation of present finding in Kharif 2015
2.9.	**DSR 1.27/14**	**2017**	**Application of nano particlesto soybean seed to improve germination (Dr M Kuchlan)**
2.9.1.			Activity: Study of effect of seed dryness on germination is approved by the house
2.9.2.			The technical programme approved for the year 2015-16 shall be as:
			Experiment on higher doses of nano particles on seed germination and seedling growth
			Study of enzymes activity to find out target site of nano particles
			As per RAC recommendation , Nano-Rock phosphate to be tested for seed treatment and its effect on seedling and plant growth
2.10.	DSR 1.29/14	2019	**Breeding for increased nitrogen fixation efficiency in soybean (Dr Mamta Arya)**
2.10.1.			The technical programme approved for the year 2015-16 shall be as:
			Same 40 varieties will be repeated at the same field to validate the result
			ARA and LegHb will be performed with the varieties
3.0			***Molecular breeding and transgenic approaches for soybean improvement (Dr Anita Rani)***
3.1.	**DSR 1.22/11**	**2015**	**Validation of yield QTLs for marker assisted breeding in soybean (Dr G Kumawat)**
3.1.1.			The project is concluded and RPF III is to be submitted
3.2.	**DSR 1.23/12**	**2017**	**Molecular mapping and genomics-assisted breeding for disease resistance in soybean** (Dr Milind Ratnaparkhe)
3.2.1.			The technical programme approved for the year 2015-16 shall be as:
			Phenotyping of F2 population for rust

			Bulked segregant analysis (BSA) using resistant and suceptible bulk
			Identification and validation of SNP and SSR
			Development of linkage map
			Gene expression studies
			Genetic variability studies using ITS
			Phenotyping for rust at IARI Regional Station
3.3.	**DSR 1.24/12**	**2016**	**RNAi mediated viral gene silencing of *Yellow mosaic virus* (YMV) for development of transgenic resistance in soybean (Dr SV Ramesh)**
3.3.1.			Dr Anil Bhandari, IARI will be Co-PI.
3.3.2.			The technical programme approved for the year 2015-16 shall be as:
			To study the efficiency of sncRNA based gene construct(s) through transient gene silencing assays
			Exploration of host (*Glycine max*) derived miRNAs and its role in *Begomovirus* resistance
4.0	**03.06.2015**		***Development of specialty soybean varieties for secondary agriculture and industrial uses (Dr Vineet Kumar)***
4.1.	**NRCS 1.12/02**	**LT**	**Breeding for food grade characters and high oil content (Dr. Anita Rani)**
4.1.1.			Protein content and yield should also be studied in addition to oil content
4.1.2.			Cookability related other characters should also be studied.
4.1.3.			Register (Protect) these lines through DUS testing
4.1.4.			Find out the ways to release the specialty soybean and try to popularize among the farmers in addition to its commercialization.
4.1.5.			AVT II entries should be tested for oil and protein content at DSR for their identification purposes
4.1.6.			Dr Neha Pandey will be Co-PI.
4.1.7.			The technical programme approved for the year 2015-16 shall be as:
			To attempt fresh crosses for introgression of null alleles of lipoxygenase and kunitz trypsin inhibitor into high yielding and vegetable type genotypes and to develop high oil content genotypes
			To confirm trueness to hybridity of the crosses attempted using morphological and moleculars markers
			To analyse segregating populations for presence/absence of kunitz trypsin inhibitor peptide using SDS PAGE and PCR amplification of gene specific primers
			To analyse segregating populations for presence/absence of lipoxygenase activity using and PCR amplification of gene specific primersand rapid bleaching test
			To test oil content in segregating and advanced populations developed for generation of high oil soybean varieties
			To screen varieties and developed lines in this project for cookability
4.2.	**DSR 1.28/14**	**2021**	**Mapping and pyramiding QTLS for high oleic acid soybean (Dr Vineet)**
4.2.1.			The technical programme approved for the year 2015-16 shall be as:
			Genotyping of 108 recombinant inbred lines derived from LSb1 xNRC7 and estimation of fatty acid composition of 108 RIL lines grown in 2015
			Identification of genomic regions associated with oleic acid trait

			Confirmation of crosses effected in 2014 and effecting new cross combination from diverse sources for high oleic acid
	03.06.2015		**CROP PRODUCTION**
5.0			***Managing the impact of current and future climate variability in soybean (Dr VS Bhatia)***
5.1.	**DSR 5.6/09**	**2008**	**Genetic and physiological enhancement for abiotic stresses**
5.2.	**DSR 5.6a/09**	**2017**	**Physiological basis of tolerance/ resistance to abiotic stresses in soybean (Dr V S Bhatia)**
			The project merged in 5.6.b.Dr Satpute will be PI
6.0			***Development of technologies for soybean based cropping system efficiency enhancement through resource conservation technologies, nutrient management. plant growth promoting microbes and farm machineries (Dr S D Billore)***
6.1.	**DSR 4.10/09**	**2020**	**System efficiency enhancement through resource conservation technologies (Dr S D Billore)**
6.1.1.			The technical programme approved for the year 2015-16 shall be as:
			To optimize the tillage requirement of soybean based cropping systems
			To study the impact of frequencies of tillage and crop rotations on soil physical, chemical and biological properties
			To assess the impact of frequency of tillage and crop rotations on system efficiency in terms of Production, Economics and Energy
			To study the effect of tillage on nutrient uptake by the crops in the system and nutrient budget
6.2.	**DSR 4.11/10**	**2013**	**Growth, rhizosphere properties, P acquisition and mobilization of intercropped soybean and maize in soil amended with phosphate (Dr A Ramesh)**
6.2.1.			The technical programme approved for the year 2015-16 shall be as:
			Competition behavior between component crops in soybean/maize intercropping system for system efficiency, phosphorus use and examining appropriate and optimum P fertilizer for the system based on competition so that nutrient requirement of each crop in the system is met .
			To assess as to whether rhizosphere interactions affect phosphorus mobilization and acquisition with regard to complementary and competitive interactions between soybean and maize plants.
6.3.	**DSR 6.8/13**	**2018**	**Inoculum development of niche AM fungi for application in soybean-based cropping system (Dr M P Sharma)**
6.3.1.			The common substrates like vermicompost and FYM should also be tested in addition to soy wastes.
6.3.2.			The technical programme approved for the year 2014-15 shall be as:
			Selection of host for higher production of AMF in optimized soil-waste mix (substrate)
			Development of Amaranthus hairy root cultures *Agrobacterium rhizogenes* (MTCC two strains) under in vitro
			Continuance of ASP-3 Long-term field trial-approved
6.5.	**DSR 9.8/13**	**2016**	**Design and development and validation of tractor operated disc harrow and rotary weeder for soybean (Dr D V Singh)**
6.5.1.			The technical programme approved for the year 2015-16 shall be as:
			A. Preparation of bill of materials for Tractor operated disc harrow for tillage for soybean in vertisols.

			Manufacturing of prototype of the machine for testing
			B. Preparation of bill of materials for Tractor operated rotary weeder for Soybeans. Manufacturing of prototype of the machine for testing
	03.06.2015		**CROP PROTECTION**
7.0			***Surveillance, forecasting and control strategies for insect pest complex in soybean (Dr A N Sharma)***
7.1.	**DSR 2.10/13**	**2016**	**Conservation and Enhancement of Natural Enemies of Insect Pests of Soybean (Dr Y Sridhar/ Dr AN Sharma)**
7.1.1.			The technical programme approved for the year 2015-16 shall be as:
			Optimization of Soybean +*Anethum graveolens* (Suva) combinations for effective and economical management of defoliators
7.1.2.			**Activity:** Field Screening of soybean genotypes for insect resistance / tolerance (3rd year) by Maximin-minimax method and AICRPS method- approved
7.1.3.			**Activity:** Identification of defoliator resistant / non-preferred soybean genotypes - approved
8.0			***Developing plant protection modules for mitigating adverse effect of plant diseases in soybean (Dr. MM Ansari)***
8.1.	**DSR 3.10/12**	**2017**	**Biology Epidemiology and Management of stem blight disease in soybean (Dr MM Ansari)**
8.1.1.			The technical programme approved for the year 2015-16 shall be as:
8.1.2.			Collection of more isolates
			Strain variation and grouping of isolates
			Molecular characterization of pathogen
			Epidemiological studies (Viability and survival)
			Screening of germplasm
			Integrated Management of disease
			Confirmation of resistance status in previous year lines
8.2.	**DSR 3.11/12**	**2015**	**Studies on distribution of plant parasitic and entomopathogenic (EPN) nematodes associated with soybean cultivation and utilization of EPN for the management of major insect pests of soybean (Dr K M Anes)**
8.2.1.			The project is concluded and RPF III is to be submitted.
	03.06.2015		**EXTENSION**
9.0			***Information digitization, technology dissemination, impact analysis and socio-economic research for soybean (Dr BU Dupare)***
9.1.	**DSR 8.9/11**	**2015**	**Assessment of interaction of technological adoption and climatic variation with soybean yield (Dr B U Dupare)**
9.1.1.			The project is concluded and RPF III is to be submitted
9.2.	**DSR 8.11/11**		**Developing maps on GIS platform for area, production and productivity changes in soybean vis-a vis other crops (Dr R M Patel)**
9.2.1.			The project is concluded and RPF III is to be submitted
9.3.	**DSR 7.4/12**		**On-line data entry system for AICRPS agronomy trials data (Dr Savita Kolhe)**
9.3.1.			The project is concluded and RPF III is to be submitted
9.4.	**DSR 8.12/13**	**2015**	**Socio-Economics of Soybean Crop Productivity Enhancement in Madhya Pradesh (Dr P Sharma)**

9.4.1.			The project is concluded and RPF III is to be submitted
	03.06.2015		**NEW PROJECTS 2015-16**
NP1.	**DSR New/15**		**Identification of QTLs for 100 seed weight in genotype EC 538828 (Dr G Kumawat)**
			As an activity is approved under the Project DSR 1.6/92.
NP 2.	**DSR New/15**		**Quality and self life enhancement of selected soy foods through protein polysaccharide interaction (Dr Neha Pandey)**
			The project is approved
			The technical programme approved for the year 2015-16 shall be as:
			To develop the suitable protein-polysaccharide blend with enhanced functional properties
			To incorporate optimized protein-polysaccharide blend in different soy foods
			To assess improved soy foods for sensory, nutritional and shelf life evaluation
NP 3.	**DSR New/15**		**Development of high yielding soybean genotypes for mechanical harvest (Dr R Ramteke)**
			Activity: Assessment of soybean yield losses through mechanical harvest- approved
NP 4.	**DSR New/15**		**Determinants of farm level soybean yield variability and technical efficiency in Madhya Pradesh (Dr P Sharma)**
			The project is approved
			The technical programme approved for the year 2015-16 shall be as:
			To examine the level of soybean yield variation at farmers field and factors determining the farm level yield variation
			To examine the economics of production and input use pattern in soybean across different category of farmers
			To analyse technical efficiency and scale efficiency in soybean
			To identify the productivity, human and institutional factors which determine the technical efficiency of soybean production
NP 5.	**DSR New/15**		**Climate effect and forecasting of soybean production- A spatio-temporal analysis (Dr RM Patel)**
			The project is not approved
NP 6	**DSR New/15**		**Spatial market integration and price transmission in soybean of India (Dr RM Patel)**
			The project is not approved
NP 7.	**DSR New/15**		**Decision support system for identification of soybean insects and their management (Dr Savita Kolhe)**
			The project is approved
			The technical programme approved for the year 2015-16 shall be as:
			To collect and compile the information on soybean insects from different sources
			To develop database of soybean insects
			To digitize the data on different aspects of soybean insects
			To develop a Decision Support System for identification of Soybean Insects and their Management
NP 8.	**DSR New/15**		**Studies on economically important plant parasitic nematodes associated with soybean cultivation (Dr KM Anes)**
			The project is approved

			The technical programme approved for the year 2015-16 shall be as:
			To study the distribution and species of cyst nematodes associated with soybean growing areas of India
			To understand the importance of *H. cajani* and *R. reniform* nematodes in soybean cultivation
			To screen soybean varieties for resistance/tolerance to *H. cajani* and reniform nematodes
			To study the association of important PPN in different soybean cropping sequences
03.06.15			**EXTERNAL FUNDED PROJECTS**
			C-sequestration through AMF & Agricultural Practices in Soybean-Based Cropping system (Dr MP Sharma)
ICAR Network Proj			Dust Project (Dr M Kuchlan)

In concluding remarks, the chairman thanked all the scientists for nice presentations. He also emphasized to incorporate all the suggestions in programmes which were made during the deliberations. He also suggested that each and every scientist must be prepared for implementation and execution of programme in true spirit. The chairman also stressed upon the meticulously and judicious management of resources during the crop period and follow the best crop management practices. He also narrated that the list of publication must be a part of presentation of each and every scientist during the coming IRCs. All the software's developed at ICAR-DSR must be open for all so that everyone is benefited. He also emphasized that plant breeders should prepare a conceptual soybean ideal plant type zone wise. The recent recommendations should be demonstrated at DSR field

He also requested all the PIs to submit RPF I, II and III before 30th July 2015.

The meeting ended with the vote of thanks to the chair and all concerned proposed by Dr. A N Sharma.

Dated: 4th June 2015

(S. D. Billore)
Secretary, IRC

List of participating members in the SRC Meeting held on 2-3,June 2015

Name	Designation	
Dr. V S Bhatia	Director	Chairman
Dr. S. M. Husain	Pr. Scientist (Plant Breeding)	Member
Dr. M. M. Ansari	Pr. Scientist (Plant Path.)	Member
Dr. A. N. Sharma	Pr. Scientist (Agril Ento.)	Member
Dr. Sanjay Gupta	Pr. Scientist (Pl.Breeding)	Member
Dr. (Mrs.) Anita Rani	Pr. Scientist (Pl. Breeding)	Member
Dr. M.P.Sharma	Pr. Scientist (Microbiol.)	Member
Dr. Vineet Kumar	Pr. Scientist (Biochem)	Member
Dr. B. U. Dupare	Pr. Scientist (Agric. Ext.)	Member
Er. D. V. Singh	Sr. Scientist (Farm & Power)	Member
Dr. A Ramesh	Sr. Scientist (Soil Sci)	Member
Dr. Savita Kolhe	Sr.Scientist, (Comp. Application)	Member
Dr. Milind Ratnaparkhe	Sr. Scientist (Biotechnology)	Member
Dr G. Satpute	Sr. Scientist (Pl.Breeding)	Member
Dr P Sharma	Sr. Scientist, (Agril. Economics)	Member
Dr. Rajkumar Ramteke	Scientist Sr. Scale (Genetics)	Member
Dr (Mrs) Punam Kuchlan	Scientist (Seed Tech)	Member
Dr. M.K. Kuchlan	Scientist, (Seed Technology)	Member
Dr. Giriraj Kumawat	Scientist, (Bio Technology)	Member
Dr Ramesh SV	Scientist, (Bio Technology)	Member
Dr Anes K M	Scientist, (Nematology)	Member
DR RM Patel	Scientist, (Agril. Statistics)	Member
Dr Mamta Arya	Scientist, (Pl. Breeding)	Member
Dr Shivakumar M	Scientist, (Pl. Breeding)	Member
Dr Neha Pandey	Scientist (Food science)	Member
Dr. S. D. Billore	Pr. Scientist (Agronomy)	Member Secretary