



बीज अनुसंधान निदेशालय

DIRECTORATE OF SEED RESEARCH

DSR NEWSLETTER



VIII Annual Review Meeting of ICAR Seed Project – Seed Production in Agricultural Crops

Eighth Annual Review Meeting of ICAR Seed Project – Seed Production in Agricultural Crops was held during 26-27th August, 2013 at NBPGR auditorium, New Delhi under the chairmanship of Dr. S. Ayyappan, Hon'ble Secretary, DARE and DG, ICAR. Prof. Swapan K. Datta, Hon'ble DDG (CS) delivered keynote address for the meet. Dignitaries such as Dr. N. K. Krishna Kumar, DDG (Hort.), Dr. R. R. Hanchinal, Chairman, PPV & FRA, Dr. M. M. Pandey, CEO, Agri Innovative India Ltd., Dr. J. S. Chauhan, ADG (Seeds) and Dr. K. C. Bansal, Director NBPGR graced the dais. In toto 130 scientists from seed fraternity attended the meet and participated in deliberations. At the outset, Dr. S. Rajendra Prasad, Project Director, DSR, Mau has welcomed the dignitaries and briefed the gathering about progress made by varied cooperating centres under ICAR Seed Project. During the year 2012-13, total production of quality seed including all classes was 692754 quintals against the target of 457391 quintals. Production comprises 118352 quintals of breeder seed, 149836 quintals of foundation seed, 222807 quintals of certified seeds, 149386 quintals of truthfully labelled seed and 52371 quintals of planting material of field crops. In addition, 182.44 lakhs planting material and 3.70 lakh tissue culture plantlets of field crops were produced. Dr. S. Ayyappan, Hon'ble Secretary, DARE & DG, ICAR during inaugural address, appreciated DSR, Mau and all cooperating centres under this project for the good work being done. He exhorted that impact assessment may be made by third party agencies like NSAI and suggested for partnering with NSC and SFICI by MOUs for enhancing

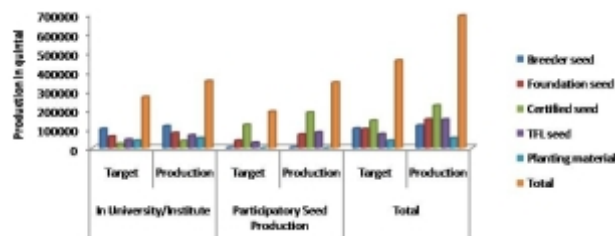
capacity build-up and for widening horizons of this project. He recommended to take 'Agri Innovative India Ltd' as partner in the aspect of seed business of high demand varieties. Prof. Swapan K. Datta, Hon'ble DDG (Crop Science), in keynote address congratulated ICAR Seed Project's team for the achievements. He informed the house that at global level, there is need to be competitive and to prove ourselves. In reference to this, he commended cooperating centres to explore the possibilities for export oriented seed production. He emphasized to have world class referral laboratories, which can analyze all the quality parameters including nutritional quality aspects. Dr. N.K. Krishna Kumar, Hon'ble DDG (Hort.) suggested to emphasize on horticulture component in ICAR Seed Project and informed the scientists to work on development of package of practices for seed production both in field and horticulture crops. He suggested to explore the possibility of production and marketing of vegetable seedlings and also emphasized on safe seed storage. Dr. J. S. Chauhan, ADG (Seeds) congratulated all the nodal officers of cooperating centres for the achievements made in quality seed domain through this project. He rendered valuable inputs in analysis of progress achieved and in preparation of action plan for the year 2013-14. Dr. S. Ayyappan, Hon'ble DG, ICAR, in his concluding remarks during plenary session appreciated scientific fraternity of NARS seed domain for the achievements made and suggested to work with a holistic approach for qualitative and quantitative improvement in basic input of agriculture i.e. Seed.

Network Projects

1. ICAR Seed Project - Seed Production in Agricultural Crops

During the year 2012-13, total production of quality seed including all classes was 692754 quintals against the target of 457391 quintals. Production comprises 118352 quintals of breeder seed, 149836 quintals of foundation seed, 222807 quintals of certified seeds, 149386 quintals of truthfully labelled seed and 52371 quintals of planting material of field crops. In addition, 182.44 lakhs planting material and 3.70 lakh tissue culture plantlets of field crops were produced against the targets of 98.12 and 2.10 lakhs.

Progress of ICAR Seed Project – Seed Production in Agricultural Crops during 2012-13



Human Resource Development

Various modules of trainings have been carried out by varied cooperating centres to cater the need of seed producing personnel including farmers, trainers and employees (field staff) of State Seed Certification Agency/ State Seed Corporation/ Seed Producer Companies and NGOs.

In-toto 249 trainings/field days were organized for varied stakeholders during the year 2012-13. Similarly 75 Exhibitions/ Kisan melas/Kisan Goshtis were organized on diverse themes related to seed by different cooperating centres across the country.



Women farmers training programme on seed production



Farmers training programme on seed production

2. AICRP-National Seed Project (Crops)

Monitoring under AICRP-NSP (Crops)

- S. Natarajan, Sr. Scientist, as a member of the Western Zone monitoring team, monitored the progress made in Breeder Seed Production (BSP) and Seed Technological Research (STR) under AICRP-NSP (Crops) encompassing AAU, Anand; NAU, Navsari and DGR, Junagadh during 01st -06th October, 2013.
- A.K. Mandal, Scientist as a member of the Eastern group-II monitoring team of AICRP-NSP (Crops) monitored CRIJAF, Barrackpore; BCKV, Mohanpur; BAU, Ranchi and RAU, Pusa during 18th -25th October, 2013.

- Chandu Singh, Scientist as a member of the North Eastern Region monitoring team, monitored BSP plots CAU, ICAR Research Complex NEH region, Imphal, Manipur and AAU Jorhat during 20th – 27th October, 2013.
- Madan Kumar, Scientist as a member of the Southern Zone monitoring team, monitored ICAR RC for Goa; UAS, Dharwad/ Raichur and ANGRAU, DRR, DSR, DOR, Hyderabad during 20th -25th October, 2013.
- Rajiv K. Singh, Senior Scientist as a member of AICRP-NSP (Crops) monitoring team for Central Zone -II, visited and reviewed progress made in reference to breeder seed production, seed technological research (STR) and ICAR Seed project in designated centres under referred zone.

Research Highlights

Seed Pathology

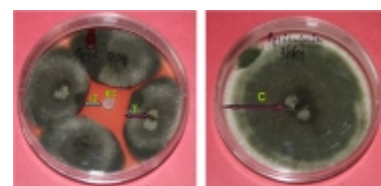
Beneficial traits of 15 potential bacterial isoates isolated from rice and chickpea rhizosphere of DSR¹ field, Mau (U.P.) and their molecular identification.

- Nine bacterial isolates were identified as *Bacillus methylotropicus* strain RRB-4, RRB-6, RRB-10, RRB-34; *Brevibacterium halotolerans* strain RRB-31, RRB-38, CRB-B; *Prolinoborus fasciculus* strain RRB-7 and *Bacillus aerophilus* strain RRB-3 on the basis of 16s rRNA sequences.
- Gram –ve, rod shaped *Prolinoborus fasciculus* strain RRB-7 is the novel strain having antifungal activities which is first time reported while *Bacillus aerophilus* strain RRB-3 having both P solubilization activities and antagonistic effect.

Isolated culture	16S rRNA identification (Closest relative)	16S rRNA Sequence similarity (%)	Antagonistic effect against fungal pathogens						P solubilization	IAA production	Cellulase activity	Compatibility with <i>Trichlerma</i> sp.
			MP	SS	RS	FoC	PO	UV				
RRB-3	<i>Bacillus aerophilus</i>	100	+++	++	+++	+	+++	++	+	+++	+	+
RRB-4	<i>B. methylotropicus</i>	100	+++	+++	+++	-	+++	++	-	++	-	+
RRB-6	<i>B. methylotropicus</i>	100	+++	++	+++	++	+++	++	-	++	-	+
RRB-7	<i>Prolinoborus fasciculus</i>	99.88	+++	++	++	++	+++	+	-	+++	+++	+
RRB-8	-	-	++	+	+++	++	++	++	-	+++	+++	+
RRB-10	<i>B. methylotropicus</i>	99.82	+++	++	+++	++	+++	++	-	+++	+++	+
RRB-26	-	-	+	+	+++	-	++	++	-	+++	-	+
RRB-31	<i>Brevibacterium halotolerans</i>	99.68	+++	++	+++	++	+++	+++	-	++	-	+
RRB-33	-	-	+++	++	++	++	+++	++	-	+++	-	+
RRB-34	<i>B. methylotropicus</i>	100	+++	++	+++	+	+++	++	-	++	-	+
RRB-36	-	-	+++	+	++	-	++	++	-	+++	-	+
RRB-38	<i>B. halotolerans</i>	99.52	+++	++	+++	-	+++	++	-	+++	-	+
RRB-BS-4	-	-	++	++	++	-	++	++	-	+	+++	+
CRB-B	<i>B. halotolerans</i>	100	++	++	++	-	++	++	-	+++	+++	+
CRB-B	-	-	-	-	-	-	-	-	+++	+++	-	+

Note: MP: *Macrophomina phaseolina*, SS: *Sclerotinia sclerotiorum*, RS: *Rhizoctonia solani*, FoC: *Pyricularia oryzae* f. sp. *civici*, PO: *Pyricularia oryzae*, UV: *Ustilago oryzae*.
Antagonistic effect against fungal pathogen: +++ = Inhibition zone (in mm) + % growth inhibition >50, ++ = Inhibition zone (in mm) + % growth inhibition 50 to 30, and + = Inhibition zone (in mm) + % growth inhibition < 30.
P solubilization: +++ = 10 mm halo zone, ++ = 5 mm halo zone around bacterial colony.
IAA production: +++ = >5 µg/ml, ++ = 3-5 µg/ml, + = <3 µg/ml.
Cellulase activity: +++ = >8 mm pink zone, ++ = <8 mm pink zone, + = 0 mm pink zone around bacterial colony.
Compatibility test with *Trichlerma* sp: + = compatible, - = incompatible.

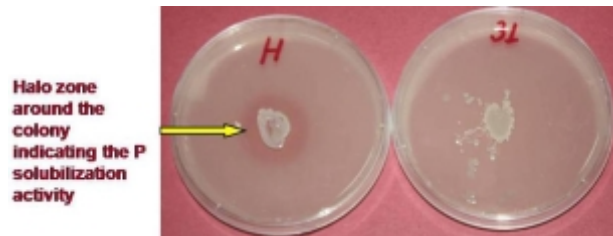
Calculation of percent growth inhibition of *Brevibacterium halotolerans* strain CRB-B against *Pyricularia oryzae* causing rice blast disease



$$i = \frac{C-T}{C} \times 100$$

- I = Percent growth inhibition
 C = Colony diameter of pathogen in control
 T = Colony diameter/radial growth of pathogen in treatment
 IZ = Inhibition zone
 BC = Bacterial colony

Phosphate solubilization test



A loop full bacterial culture was inoculated on centre of Petri plate containing Pikovskaya's agar media and incubated at 28°C for 6 days and halo zone around the bacterial colony was recorded as P solubilization activity.

Agro Techniques for Improved Seed Production

Integrated approach for maximization of seed yield in wheat.

Growth Parameters

The effect of fertilizer doses at different concentrations and their combination with micronutrients had statistically significant at all the four intervals viz., 30, 60, 90 and at harvest on both the characters i.e., plant height (12.4, 42.9, 90.1 & 92.5 cm) and number of tillers m⁻² (48.8, 152.2 & 89.0) in wheat. Current investigation revealed that, effect of fertilizer dose combination with micronutrient i.e. 100 % RDF + Zn + Mn, (highly significant) leads to increment in yield efficiency.

Seed yield and yield attributes

The planting method viz., Ridge and normal sowing had statistically significant effect on a seed yield and yield attributing characters viz., panicle length (9.5 cm), spike weight (2.5 g), spikelet/ spike (18.3) and number of seed/ spike (52.4). Further the traits like, seed weight/ spike, test weight (g), seed and straw yield (qt ha⁻¹), had showed statistically non significant results. The present study revealed that, the seed yield and yield attributing characters were showed higher in ridge sowing compared to normal sowing, hence the ridge sowing method has high efficiency in planting of wheat to get better yield in comparison to normal planting.

Optimization of seed production technology in mungbean for maximizing seed yield per unit area under North Indian conditions

Growth Parameters

Current study was aimed to decipher the response of cultivars; planting date and seed rate on traits viz. plant height, number of plants/m² & number of leaves/plant, yield & yield components traits and seed & seedling quality traits. Among the cultivars, Pusa Vishal had shown maximum

performance with traits like plant height (48.19 & 51.41 cm) & number of plants/m² (39.26 & 40.22) than the SML 668. The effect of genotypes at different dates of planting i.e. 26 March, 1 April & 9 April had shown statistically significant affect at both the intervals (45 DAS & at harvest) on characters like plant height, number of plants/m² and number of leaves/plant in a mungbean. Among the three planting intervals, 1st April sown crop shown maximum plant height (50.82 & 54.39) and number of leaves/plant (29.96 & 28.69) for both the cultivars than the 26th March & 9th April sown crop. The Response of genotypes at different seed rates i.e. 20, 25, 30 and 35 kg ha⁻¹ had shown statistically significant effect at both the intervals (45 DAS & at harvest) on all the traits under study viz., plant height, number of plants/m² & number of leaves/plant in the mungbean crop. The 20 kg ha⁻¹ seed rate had shown superiority over all the seed rates (followed by 25, 30 and 35 kg ha⁻¹) for all the traits under study (plant height, number of plants/m² & number of leaves/plant).

Seed yield and yield attributes

Among both genotypes, Pusa Vishal had shown higher number of pods / plant (27.51), number of seeds / pod (8.79), seed yield per plant (7.84 g) and seed yield (8.12 q ha⁻¹) in comparison to SML 668. The response of the cultivars, at different dates of planting (26 March, 1 April, & 9 April) and seed rate (20, 25, 30 & 35 kg ha⁻¹) had shown statistically significant effect on seed yield and yield attributing traits. Among different dates of sowing, 26th March sown crop had recorded higher values for all the seed yield and yield attributing traits viz., seed yield (8.52 q ha⁻¹), number of pods / plant (29.48), pod length (7.73 cm), number of seeds / pod (8.79) and seed yield per plant (8.77 g) followed by 1st April & 9th April and even normal sowing, hence 26th march sown crop might have availed better air and moisture regime due to congenial temperature and moisture, which leads to enhance the yield as well as high dry matter accumulation of mungbean. Similarly, the traits like number of pods / plant (28.37), pod length (7.76 cm), number of seeds / pod (8.88) and seed yield per plant (7.93 g) were recorded maximum at 25 kg ha⁻¹ seed rate; hence this seed rate has superior over the other seed rates (20, 30 and 35 kg ha⁻¹).

Seed Physiology

Effect of different bioactive chemicals on traits favouring out-crossing and their molecular characterization in hybrid Rice (*Oryza sativa* L.)

Seven hybrid parental lines (A, B and R) of rice has been screened for floral and floral contributing traits viz., percent panicle exertion, percent stigma exertion, spikelet opening angle, flag leaf angle, number of spikelets per panicle and high seed setting potential for out-crossing. The present investigation has revealed that four hybrids showed better performance viz. PRH10, KRH2, NDRH2 and CORH3 as compared to DRRH2, DRRH3 and PSD1. Further, Gibberellic acid (GA₃) application @ 50 ppm during 5-10 percent panicle emergence stage invariably increased the hybrid seed setting in all the hybrids by enhancing/ increasing the percentage panicle exertion (4-6%),



Field view for screening of hybrid parental lines

percentage stigma exertion (4-10%), spikelet opening angle (2-4°), plant height (8-15 cm) and flag leaf angle (2-5°). Apart from this biochemical test for pollen viability has been standardised.

Seed Quality Enhancement

One year old seeds of summer moong varieties (Samrat, Sulabh and SML 668) were primed with inorganic salts viz. Mg (NO₃)₂, MgSO₄, KNO₃ in 30 mM concentration for 12 h. Priming with Mg (NO₃)₂ resulted in maximum germination, seedling growth, vigour index, nitrate assimilatory enzymes activity and yield attributes (seed yield) followed by KNO₃ and MgSO₄ over unprimed control.

Seed Entomology

Biochemical characterization of insecticide resistance in major storage insect pests and their management

Insecticide bioassay was conducted with Deltamethrin to assess resistance level in collected insect population from different NSC godowns. It was recorded that all the insect populations have shown high level of resistance. Among which, NSC, Secunderabad population of *Rhizopertha dominica* and *Tribolium castaneum* recorded maximum resistance.

Synergistic property of plant extracts extorted in five different solvents.

Various plant extracts extorted in acetone, methanol, ethanol, petroleum ether, chloroform were evaluated for their synergistic property with deltamethrin against *Sitophilus oryzae*. Comparison of LC 50 values for deltamethrin with and without plant extracts were made to observe the synergistic effect. When plants were extracted in chloroform, seven out of 13 plants showed the synergistic property and toxicity of deltamethrin was increased in range of 1.09 to 13.9 fold. Similar to chloroform, Petroleum etheric extract of 07 plants showed synergistic effect. But the range of increase in toxicity of deltamethrin was only 1.2 to 3.4 fold. Four and five plants out of all tested showed synergism when extracted with ethanol and acetone, respectively. Minimum (03) plants were observed as synergist when extracted with methanol. Interestingly, in all solvents, *H. R. Sinensis* produced

maximum increase in toxicity of deltamethrin ranging from 2.4 to 13.9 fold.

Seed Molecular Biology

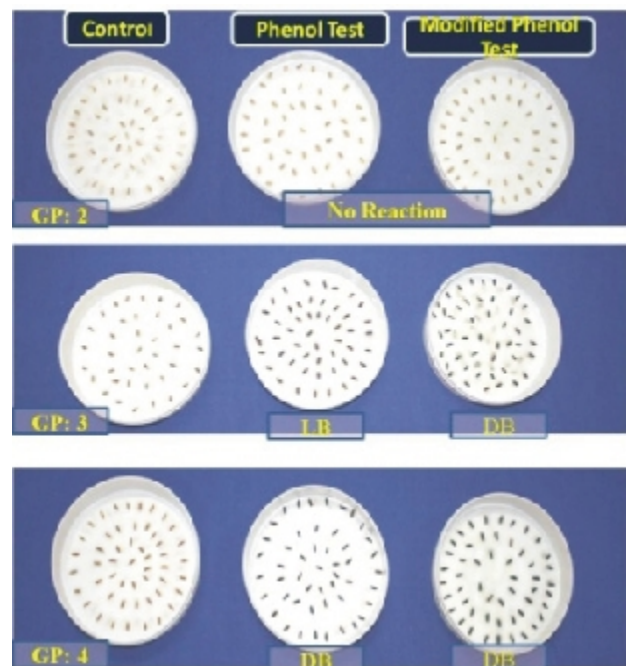
“QTL Mapping for Seed Vigor in Rice (*Oryza sativa* L.)”

Under this project germination test of 155 rice germplasm lines were conducted at different interval (3 months, 6 months and 9 months old seeds) during 2013-14. Screening and multiplications of 155 rice germplasm lines were carried out during *Kharif 2013*, at DSR Mau. The present investigation has revealed that, variance due to genotype was significant for vigour traits. Out of 155 germplasm only two germplasm lines (Fig. 1) viz., Acc. No: 3118 (GP-100) and Acc. No: 2693 (GP-74) were identified for low to medium variance for vigour traits. These lines will be used for revalidation and crossing programme.



Low vigour rice germplasm lines

Under Chemical test-Phenol / Modified phenol were carried out in varietal characterization of 155 rice germplasms (the germplasm accessions were classified into five group's viz., light brown (LB), brown (BR), dark brown (DB), black (B) and no reaction on the basis of color)



Chemical test-Phenol/ Modified phenol

“Comparative Study of Floral Biology in CMS, Chemically Induced Male Sterile and Protogynous (Self Incompatible) Lines of Indian mustard (*Brassica juncea*)”

The observation on different floral morphological traits were recorded and bio-chemical tests on pollen viability & stigma receptivity were conducted in different lines of mustard. The results showed that, the flowering in plants treated with 3, 5 and 8% surf-excel was delayed by 3, 4, and 6 days, respectively compared to control plants where floral bud initiation occurred 35 days after sowing (Figure 1a). All the treatments with surf excel were found to be quite effective in inducing pollen sterility. However, the expression male sterility was not uniform in the all the plants. It was interesting to note that stylar length in the buds of treated plants increased with the increase in concentration of surf-excel. Due to the increase in the size of the style, the stigma protruded out of all the buds of an inflorescence (Figure 1c). The treatments with different concentrations of surf-excel caused a slight reduction in total yield/plant and is largely because of the reduction in the seed size, seed weight and delay in recovery of plant growth after scorching effect (Figure 1b).

In case of Protogynous lines (Pg) the stigma exertion is prominent than induced male sterile flowers. Further, results indicated that the protogynous interval extended up to 8-10 days and stigma remained receptive up to 3-4 days from its protusion (Figure 2).

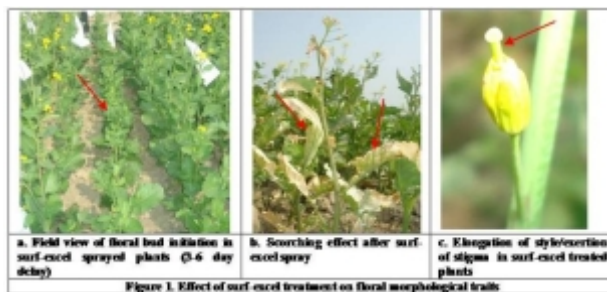


Figure 1. Effect of surf-excel treatment on floral morphological traits

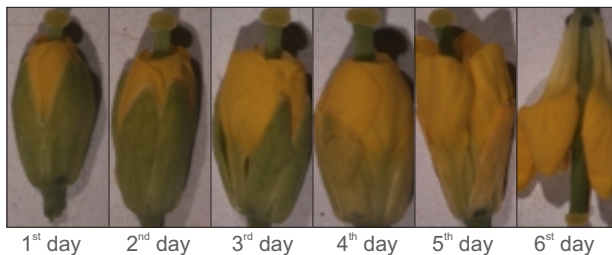


Figure 2. Elongation of style or stigma exertion at different stages in protogynous lines

Seed Economics

- Farmers were asked to rank the reasons for adoption of wheat seed production and the same were analysed using Garrett's ranking technique. It was revealed that higher yield and profitability were the top most reason for adopting wheat seed production, followed by increased return to labour. Availability of high quality seed and easy marketability of produce

were ranked third and fourth important reasons respectively for adoption of wheat seed production. Cost of cultivation was the top most reason for non-adopting wheat seed production followed by lack of awareness. Lack of experience, maintenance of isolation distance, non-availability of seed in time and lack of skilled labour were ranked third, fourth, fifth and sixth important reasons respectively for non-adoption of wheat seed production.

Meetings/Trainings

Organized

- Organized five days national training programme on “Varietal purity testing through conventional and biotechnological tools” from 15.10.2013 to 19.10.2013 at DSR, Mau in collaboration with NSRTC, DAC, GOI, Varanasi. Dhandapani R., Scientist co-ordinated this event.



- Organized five days training programme on “Advanced training on Fodder Seed Production Technology” at DSR, Mau from 21-25 Oct. 2013. Dr. S. Natarajan, Senior Scientist coordinated this event.



- Training programme on “Requisites of seed production, testing & quality assurance” was organized by Directorate of Seed Research (DSR), Mau, UP from November 27 to 28, 2013 at Agartala, Tripura. Dr. S. Rajendra Prasad, Project Director coordinated this event.



- One day (19.09.2013) awareness Training programme on “Protection of Plant Variety and Farmers' Right” at Directorate of Seed Research, Mau in collaboration with PPVFRA, New Delhi. Dr. Arvind N. Singh, Senior Scientist coordinated this event.

Attended

- Dhandapani R. participated in 21 days CAFT training in “Advanced “Omics” Techniques for Improvements in Plant and Human Health” at Biochemistry Division, Indian Agricultural Research Institute New Delhi from 15/11/2013 to 05/12/2013.
- Devarmane Raghavendra, Scientist attended 10 days training programme on “Detection and measurement of Insecticide resistance including molecular aspects in insect pests” at NBAII, Bangalore from 02-11 September, 2013.
- Dhandapani R. attended the short course on “Recent Advances in Proteomics for Biomarker Discovery” Sponsored by Indian Council of Agricultural Research organized by animal biotechnology centre, National Dairy Research Institute Karnal (Haryana)-132001 from July 08 – July 17, 2013
- A.K. Mandal, Scientist attended the training on “Advanced training on Seed Pathology for Capacity Building” from 23.09.13 to 30.09.13 at Department of Plant Pathology, B. A. College of Agriculture, AAU, Anand, Gujarat.
- Umesh R. Kamble, Scientist attended Brainstorming session on - Marketing of Breeder Seeds – Role of Agrinnovate India Ltd. organized under the chairmanship of Hon'ble Dr. S. Ayyappan, Secretary, DARE & Director General, ICAR and Dr. M.M. Pandey, CEO, Agrinnovate India Ltd. on 08.11.2013 at NASC, New Delhi.
- A.K. Sinha, Senior Scientist, Attended 52nd All India Wheat and Barley Research Workers Meet at CSAU&T, Kanpur w.e.f. Sept. 1 – 4, 2013.
- Ramesh K.V., Scientist attended professional attachment training of Scientist on probation under FOCARS from 10th June – 13th September, 2013 at Division of Plant Physiology, IARI, New Delhi.
- Chandu Singh, Scientist attended the “4th Workshop cum SAS Installation Training” on 20-21 September, 2013 under NAIP Project at IVRI, Izatnagar (UP)

- Chandu Singh, and Ramesh K.V., Scientist participated two days (6-7th December, 2013) Kisan Mela at ICAR, Research Complex for Eastern Region, Patna, Bihar.
- Arvind N. Singh, Senior Scientist participated in RFD (2013-14) Midterm Review Meeting held on 29th October 2013 at ICAR, Krishi Bhawan, New Delhi.
- Govind Pal, Senior Scientist participated in the training programme on Consultancy Project Management at NAARM, Hyderabad during August 1-7, 2013.

Kisan Mela/ Ghosti

Participation in Kisan Mela/ Ghosti

- DSR Participated in two days Kisan Mahotsava organised by Agriculture Department, Mau on 06 to 07th Dec., 2013 by positioning the stall with models and other displays to showcase latest technologies to farmers.
- DSR participated two days Kisan Mela during 06 to 07th December, 2013 at ICAR, Research Complex for Eastern Region, Patna (Bihar). The Kisan Mela was organized jointly by ICAR, Research Complex for Eastern Region, Patna and Directorate of Knowledge Management in Agriculture, New Delhi under the theme of Showcasing of Agricultural Technologies under NAIP project “Mobilization of mass media support for sharing Agro-informatics”. During the Mela DSR showcased its premier technologies. The DSR stall was visited and appreciated by Dr. Mangala Rai, Agriculture Advisor to Chief Minister of Bihar and former Secretary, DARE and Director General, ICAR, and accompanied by Dr. B.P. Bhatt, Director, ICAR, Research Complex for Eastern Region, Patna, Farmers, Students, Scientists and Extension Functionaries visited in large numbers. The Kisan Mela was co-ordinated by Dr. Ujjwal Kumar.
- Conducted Field Day on Paddy (19.10.2013) at Directorate of Seed Research, Mau about 100 farmers participated in this programme. Dr. Arvind N. Singh, Senior Scientist, coordinated this event.
- One day (01.08.2013) training programme was organized on “Improved Cultivation of Paddy” at Directorate of Seed Research, Mau, about 30 participants from different part of District attended the programme. Dr. Arvind N. Singh, Senior Scientist conducted this event.

Publications

Articles

- Dnagarale, D. T., Borkar, S. G., Gawande, S. P., Mandal, A. K. and Raut, S. A. (2013). Characterization of a bacterial collar and rhizome rot of banana (*Musa paradisiaca*). *Journal of Applied and Natural Science*. 5 (2): 435-441.
- Chandrakala, J. U., Ashish K. Chaturvedi, Ramesh, K. V., Rai, P., Khetarpal, S. and Madan Pal (2013).

Acclimation response of signalling molecules for high temperature stress on photosynthetic characteristics in rice genotypes. *Indian Journal of Plant Physiology*, 18(2): 142-150.

- Singh, Arvind. N; Singh, R.K, Singh, Chandan and Prasad, S. Rajendra. 2013. Screening of various plant extracts for repellency against *Tribolium castaneum* (Herbst). *Progressive Agriculture*. 13 (2): 203-206.
- Singh Arvind. N; Rajan, Soumya ; Raghavendra, D and Prasad, S. Rajendra. 2013. Effect of Various Plant Extracts as Repellents against Adults of *Tribolium castaneum* (Herbst), *Rhyzopertha dominica* (F.) and *Sitophilus oryzae* (L.). *Indian Journal of Plant Protection*. 41 (4): 296-300.
- Singh, Dinesh, Tripathi, Varsha, Beg, Mirza Jaish and Singh, Rajiv K. (2013), Variability characterization of *Bipolaris sorokiniana* populations causing black point disease in wheat, *Indian Phytopath*, Vol. 66 (1): 72-76.

Abstracts / Summary

- Devaramane Raghavendra, M. Loganathan, Rana Salva, M. Vetriventhan and S. Rajendra Prasad (2013). Effect of pulse beetle (*Callosobruchus maculatus*) infestation on quality of pigeonpea seed. *Sixth National seed congress on advancement in agriculture through quality seeds* held from 12-14 September, 2013.
- Chandu Singh, Umesh R Kamble, Boraiah, K.M., M. Vetriventhan, Madan Kumar and S. Rajendra Prasad (2013). "Screening of rice germplasms for seedling vigor and to asses' germination potential using α -amylase activity. *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.
- Chandu Singh, Manoj Yadav, Umesh R Kamble, Sunil Kannujiya, T. N. Tiwari and S. Rajendra Prasad (2013). "Characterization and Identification of rice germplasms through Biochemical Tests. *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.
- K. M. Boraiah, Neha Kausar, M. Vetriventhan, A. K. Sinha, Chandu Singh, T. N. Tiwari and S. Rajendra Prasad (2013). Effect of thermal hardening on seed germination and vigour in rice (*Oryza sativa* L.). *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.
- Rajiv K. Singh, Hardev Ram, Govind Pal, A. N. Singh, S. Rajendra Prasad and R.K. Chauhan (2013). Evaluation of growth, yield attributing character and quality parameter under system of rice intensification of hybrid paddy seed production in Eastern UP. *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.
- Singh Arvind Nath; Prasad, S. Rajendra; Pandey, Swapnil and Raghavendra, D. (2013). Status of insect infestation of farmers' saved wheat seed in

Mau district of eastern U.P. *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.

- K. M. Boraiah, Neha Kausar, M. Vetriventhan, A. K. Sinha, Umesh R. Kamble and S. Rajendra Prasad (2013). Effect of accelerating ageing on seed germination and biochemical parameters in rice (*Oryza sativa* L.). *Sixth National seed congress on advancement in agriculture through quality seeds* held at Lucknow.
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- Narayan Bhat, Vilas A. Tonapi, Rajendra Prasad S., Udaya Bhaskar K., Umesh R. Kamble, S. Natarajan and J.V. Patil (2013). Stewardship Management to

ensure seed quality and product integrity *Pub: Project Director, Directorate of Research (DSR), Kushmaur, Mau, UP.*, India, 85pp. ISBN:978-81-925128-2-2.

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- S. Rajendra Prasad, Uday Bhaskar K., Umesh R. Kamble and Jitendra Kumar (2013). Advances in Seed Quality Enhancement and Vigour Assessment. *Proceedings of 6th National Seed Congress, September 12-14, 2013* jointly organized by National Seed Research and Training Centre, Varanasi and Uttar Pradesh Beej Vikas Nigam, Lucknow.

Lectures & Talks

- Elayaraja K., Scientist delivered lecture on "Quality seed production in Maize" under seed village scheme, at Kureji, Rasadha, Ballia on 9th, July, 2013.
- S. Natarajan, Senior Scientist delivered lecture on "Seed Processing, packaging, Treatment for quality maintenance" and "Seed germination, and seedling evaluation" during training programme "Requisites of seed production, testing and quality assurance" at Agartala, Tripura jointly organized by Directorate of Seed Research, Mau and Department of Agriculture, Govt. of Tripura. from 27.11.2013 to 28.11.2013.
- Hardev Ram, Scientist delivered TV talk on "Torai Kheti" at Krishi Darshan, Varanasi on 11.09.2013.
- Umesh R. Kamble, Scientist, delivered lecture on "Seed viability and vigour testing – concept & methodology" under national training programme "Requisites of seed production, testing & quality assurance" at Agartala, Tripura organized by Directorate of Seed Research, Mau and Department of Agriculture, Tripura on 28.11.2013.
- Arvind N. Singh, Senior Scientist delivered lecture on Pest Management in Paddy and Pigeonpea in farmers training organized under Seed Village Programme at KVK, Ghazipur on 14.08.2013.
- Govind Pal, Senior Scientist delivered TV talk on "Beejotpadan Ke Arthik Pahal" at DSR, Mau on 10.07.2013.
- Arvind N. Singh, Senior Scientist delivered two lectures entitled "Seed Quality Enhancement: Emphasis on Seed Protection" and "Integrated Insect Pest Management to Ensure Seed Quality during storage" during training programme on "Requisites of seed production, testing and quality assurance" at Agartala, Tripura from 27.11.2013 to 28.11.2013.

- Govind Pal, Senior Scientist delivered TV talk on "Gunavattayukta Beej Utpadan Ka Mahatva Va Isme Aay Vyay" at DSR, Mau on 11.09.2013.

Awards

- Dr. S. Rajendra Prasad, Project Director, DSR, Mau has received Krishak Mitra Samman Award at Rabi Kisan Mela 2013-14 by NEFORD, Mau.

Personnel

Staff	Scientific	Date of Relieving
Dr. Dinesh Kumar Singh	Sr. Scientist	05.08.2013
Dr. Vetrieventhan M.	Scientist	08.11.2013
	Technical	Date of Relieving
Sh. Abubaker	T2	06.07.2013

Success Stories of DSR, Mau

Seed Village Scheme

The Directorate of Seed Research (DSR), Mau has initiated a Project on Seed Village Scheme under "Assistance for development and strengthening of infrastructure facilities for production and distribution of quality seeds under Department of Agriculture & Cooperation (DAC), Government of India.

- No. of districts covered : Mau, Ballia, Ghazipur, Varanasi and Chandauli
- No. of villages covered : 375 Villages
- Area covered : 6787 Acres
- Seeds distributed : 651.08 quintals
- No. of farmers benefited : 4141 farmers
- Crops : Paddy (MTU 7029, MTU 1010, Sarju-52, PR-113, PR-118, CSR-36, IR-36, Kalanamak, BPT-5204, IPB-1, Pusa Sugandh-3, Pusa Sugandh-5 and Malviya Sugandha-105) Pigeonpea (Narendra Dev Arhar-1 & Narendra Dev Arhar-2)



हिन्दी प्रभाग | जुलाई-दिसम्बर 2013

आई.सी.ए.आर. बीज परियोजना

आई.सी.ए.आर. बीज परियोजना की 8वीं वार्षिक समीक्षा बैठक 26-27 अगस्त 2013 को माननीय सचिव, डी.ए.आर.ई. और महानिदेशक भारतीय कृषि अनुसंधान परिषद की अध्यक्षता में एन. बी.पी.जी.आर. सभागृह, नई दिल्ली में सम्पन्न हुई। प्रो. स्वपन कुमार दत्ता माननीय उपमहानिदेशक (फसल विज्ञान) ने इस बैठक के महत्वपूर्ण विषय पर प्रकाश डाला। इस बैठक में भा.कृ.अनु.प. के अनेक गणमान्य व्यक्तियों जिसमें डा. एन.के. कृष्ण कुमार, उपमहानिदेशक (बागवानी), डा. आर.आर. हंचिनाल, अध्यक्ष, पी.पी.

वी. एवं एफ.आर.ए., डा. एम.एम. पाण्डेय, सी.ई.ओ., एग्री इनोवेटिव इंण्डिया लि., डा. जे.एस. चौहान, सहायक महानिदेशक (बीज) और डा. के.सी. बंसल, निदेशक, एन.बी.पी.जी.आर. उपस्थित हुए। इस बैठक में कुल 130 बीज सम्बन्धित वैज्ञानिकों ने विचार विमर्श में भाग लिया। डा. राजेन्द्र प्रसाद, परियोजना निदेशक, बीज अनुसंधान निदेशालय, मऊ ने सभी गणमान्य व्यक्तियों का स्वागत किया तथा इस योजना के अर्न्तगत विभिन्न सहयोगी केन्द्रों द्वारा की गयी प्रगती पर प्रकाश डाला।

इस योजना के अन्तर्गत वर्ष 2012-13 में कुल 692754 क्विंटल प्रजनक बीज, 149836 क्विंटल आधारीय बीज, 222807 क्विंटल प्रमाणीत बीज, 149386 क्विंटल सत्यापित बीज और 52371 क्विंटल बीज रोपण सामग्री का उत्पादन हुआ। इसके अलावा, 182.44 लाख रोपण सामग्री और 3.7 लाख टिशू कल्चर पौधे तैयार किये गये। डा. एस. अय्यप्पन माननीय सचिव, डेयर और महानिदेशक भा.कृ.अनु.प. ने अपने उद्घाटन भाषण के दौरान डी. एस.आर., मऊ और इस योजना के अन्तर्गत सभी केन्द्रों को उनके अच्छे कार्यों के लिए बधाई दिया। उन्होंने इस परियोजना के क्षमता विस्तार को बढ़ाने के लिए इसकी साझेदारी समझौता ज्ञापनों द्वारा एन.एस.सी. और एस.एफ.सी.आई. के साथ करने का सुझाव दिया तथा इसका प्रभाव आकलन किसी तीसरे पक्ष एजेन्सी जैसे एन. एस.ए.आई. द्वारा किये जाने का आह्वान किया। उन्होंने एग्री. इनोवेटिव इंडिया लिमिटेड को उच्चमांग वाली किस्मों के बीज व्यापार के पहलू में भागीदार के रूप में लेने के सिफारीस की।

प्रो. स्वपन कुमार दत्ता माननीय उपमहानिदेशक (फसल विज्ञान) ने अपने मुख्य भाषण में भा.कृ.अनु.प. बीज परियोजना की टीम को उनकी उपलब्धियों के लिए बधाई दी। उन्होंने कहा कि वैश्विक स्तर पर प्रतिस्पर्धी होने के लिये हमें खुद को साबित करने की जरूरत है।

इस संदर्भ में उन्होंने निर्यात उन्मुख बीज उत्पादन की सम्भावनाओं का पता लगाने के लिए केन्द्रों के सहयोग की सराहना की। उन्होंने वर्ल्ड क्लास रेफरल प्रयोगशालाओं, जो पोषण गुणवत्ता पहलुओं सहित गुणवत्ता मानकों का विश्लेषण कर सके की स्थापना पर जोर दिया। डा. एन.के. कृष्ण कुमार, उपमहानिदेशक (बागवानी) ने इस परियोजना में बागवानी घटक पर जोर देने का सुझाव दिया और वैज्ञानिकों को सूचित किया कि वे प्रक्षेत्र एवम् बागवानी दोनों फसलों के बीज उत्पादन के लिए पैकेज व प्रैक्टिस के विकास पर काम करें। उन्होंने वेजिटेबल सीडलिंग के उत्पादन एवम् विपणन की सम्भावना तलाशने का सुझाव दिया और सुरक्षित

बीज भण्डारण पर भी जोर दिया।

डा. जे.एस. चौहान, सहायक महानिदेशक (बीज) ने इस परियोजना के माध्यम से गुणवत्तायुक्त बीज क्षेत्र में अर्जित उपलब्धियों के लिये सभी नोडल अधिकारियों को बधाई दी। डा. एस. अय्यप्पन माननीय सचिव डेयर और महानिदेशक भा.कृ.अनु. प. ने पूर्ण अधिवेशन के दौरान अपने समापन भाषण में अर्जित उपलब्धियों के लिये एन.ए.आर.एस. बीज डोमेनके वैज्ञानिक भाईचारे की सराहना की और कृषि यानी की मूल इनपुट बीज में गुणात्मक एवं मात्रात्मक सुधार के लिये एक समग्र दृष्टिकोण के साथ काम करने का सुझाव दिया।

शोध उपलब्धियाँ

गेंहूँ की अधिकतम बीज उपज के लिए समन्वित दृष्टिकोण

- वर्तमान अध्ययन से पता चला है की, उर्वरक की अनुशंसित मात्रा के साथ सूक्ष्म पोषक तत्व जैसे जिंक तथा मैगनेज का प्रयोग करने से अप्रत्यक्ष रूप से गेंहूँ की उपज दक्षता में सुधार लाया जा सकता है। अतः खेती के स्तर तक इसके उपयोग के लिए सुझाव देने की आवश्यकता है।
- गेंहूँ के बीज की बेहतर उपज के लिए सामान्य बुवाई और रिज बुवाई के तुलनात्मक अध्ययन में रिज बुवाई प्रभावशाली पाया गया।
- उत्तर भारतीय परिस्थितियों में प्रति इकाई क्षेत्र बीज उपज अधिकतम करने के लिए मूंग की किस्मों में बीज उत्पादन तकनीक का अध्ययन रोपण तिथि और बीज दर की प्रतिक्रिया को समझने के लिए किया गया, जिसमें रोपण तिथि 1 अप्रैल तथा बीज दर 20 किग्रा प्रति हेक्टेयर की दर से लगाने से पौधों की ऊँचाई, पौधों की संख्या/मी.² और पत्तियों की संख्या में वृद्धि पायी गयी साथ ही साथ उपज क्षमता में भी बढ़ोत्तरी हुई।

संकर धान में विभिन्न जैव सक्रिय रसायनों के द्वारा संकरण दक्षता बढ़ाना

- संकर धान के छः विभिन्न पैतृक लाइनों का संकरण दक्षता को प्रभावित करने वाले विभिन्न गुणों का अध्ययन किया गया। इसके आधार पर लाइन पी.आर.एच. 10, के.आर.एच. 2, एन.डी.आर.एच. 2 एवं सी.ओ.आर.एच. 3 लाइन डी.आर. आर.एच. 2 एवं डी.आर.आर.एच. 3 की तुलना में बेहतर पाये गये।

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