



# बीज अनुसंधान निदेशालय

# DIRECTORATE OF SEED RESEARCH

## DSR NEWSLETTER



### XXVIII Annual Group Meeting of AICRP – National Seed Project (Crops)

The XXVIII Annual Group Meeting of AICRP-NSP (Crops) was convened at Punjab Agricultural University, Ludhiana during 27-29 April, 2013 under the chairmanship of Dr. B.S. Dhillon, Vice Chancellor, PAU, Ludhiana to contemplate upon progress made under Breeder Seed Production (BSP) and Seed Technology Research (STR) during 2012-13 and to finalise the work plan for 2013-14. All India Coordinated Research Project – National Seed Project (Crops) was launched during 1979 and is being operated in 35 Breeder Seed Production (BSP) centres and 23 Seed Technology Research (STR) centres across the country to produce and supply adequate quantity of breeder seeds and to conduct research on various aspects of seed science. The breeder seed production under this project has touched a level of 117826.88 quintals during 2011-12 from a meager quantity of 391 tonnes during 1981-82.

About 150 scientists from various ICAR Institutes / State Agricultural Universities / Private Seed Industry across the country were participated. Dr. S.S. Gosal, Director of Research, PAU, Ludhiana mentioned about the introduction of three new colleges in PAU, Ludhiana in addition to present seven colleges. Dr. Rajendra Prasad, Project Director, DSR, Mau while presenting achievements of this project, highlighted the country's record food grain production of 257 million tonnes during 2011-12 and emphasized the role of seed security vis- a-vis food security. He also pointed out that breeder seed production surpassed the indents received both from Govt. of India and State Govts.

Dr. B.S. Dhillon welcomed the guests while thanking the ICAR for selecting PAU as the venue for this meeting. He



said that the production of breeder seed needs sincere efforts of the scientists, due to which scientists involved in seed production may not end up with many publications. Hence, suggested to reward such scientists (may be like royalty on seed produced and sold). He also expressed that system may be developed for better use of public funds for public research. If hybrid research has to only provide input to the private agencies and not for direct use by the public sector, then the aspect may be further analysed & debated for the need of public research. The meet ended on a positive note by chalking out an action plan for XII plan period.

### Network Projects

#### 1. AICRP-National Seed Project (Crops)

- The cooperating centres have produced 117827 quintals of breeder seed of field crops against the indent of 90577 quintals. This includes 62823 quintal seeds of cereal crops against the indent of 46698 quintals, 14279 quintal seeds of pulse crops against the indent of 12591 quintals, 38708 quintal seeds of oilseed crops against the indent of 30134 quintals, 514.13 quintal seeds of fibre crops against the indent of 28.88 quintals and 1502 quintal seeds of forage crops against the indent of 1115 quintals.

#### 2. ICAR Seed Project - Seed Production in Agricultural Crops

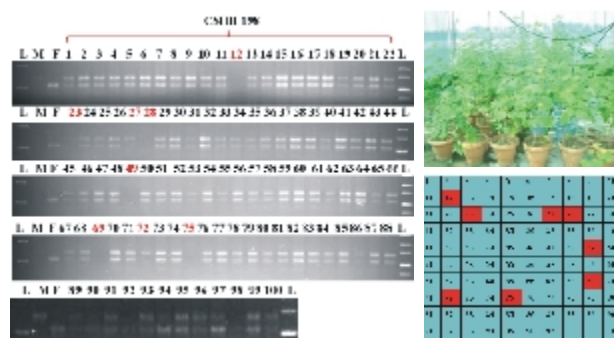
- Under ICAR Seed Project, an amount of Rs. 208.66 lakh was released to 56 cooperating centres, for continuation of seed production activities, technology dissemination and human resource development in seed domain at different cooperating centres.

### Research Highlights

#### Seed Biotechnology

##### Genetic Purity Assessment of CSHH 198 Cotton Hybrid Using Microsatellite Markers

- Assessment of genetic purity is one of the most important quality control components in cotton hybrid seed production. Traditionally, it has been the practice to carry out grow-out test (GOT), based on morphological traits for assessment of purity of seeds. GOT is time consuming (takes one full growing season for completion), space demanding and often does not allow the unequivocal identification of genotypes. Here we report the use of molecular marker (Simple sequence repeat (SSR)



Genetic purity testing of CSHH 198 cotton hybrid using SSR marker

microsatellite markers) for rapid testing of genetic purity of cotton hybrid (CSHH 198) and its parental line.

- Molecular characterization of CSHH 198 cotton hybrids along with their parents was done using breeder seed to assess the genetic purity by using microsatellite SSR marker at genomic level. Out of sixty cotton SSR markers analyzed, 15 markers were found to produce polymorphism ranging 20-33%, amplifying a total of 29 alleles, with an average of  $\pm 1.9$  allelic variants per SSR locus. Most of the bands are found to be monomorphic across the genotypes tested, indicating substantial homogeneity in respect to the cotton genome.
- Thus, these cotton SSR markers are found to be effective and alternative tool against the conventional Grow Out Test (GOT) and prospects immensely to reduce the cost and time required for estimation of genetic purity in cotton hybrids. Using cotton specific and trait specific SSR molecular markers, hybrid purity and genetic purity in the commercial seed lots of CSHH 198 cotton hybrid was estimated. It is also mentionable that there is ample scope to identify more cotton hybrids through use of cotton specific SSR markers.

#### Seed Molecular Biology

##### QTL mapping for seed vigor in rice (*Oryza sativa* L.)

The observations on ten quantitative traits (days to 50 % flowering, plant height, length of uppermost internodes, panicle length, number of spikelets per panicle, flag leaf length, flag leaf width, number of panicles per plant, number of tillers per plant and test weight) were recorded in 155 germplasm lines of rice. The present investigation revealed that, variance due to genotype was significant for all the quantitative traits studied indicating the presence of larger variations in the germplasm. Test weight was ranged from 9.7 to 33.8 g with the mean of 22.2 g. Correlation of test weight with plant height, panicle length and flag leaf length was positive and significant, and negatively correlated with number of panicles and number of tillers.

#### Seed Quality Enhancement

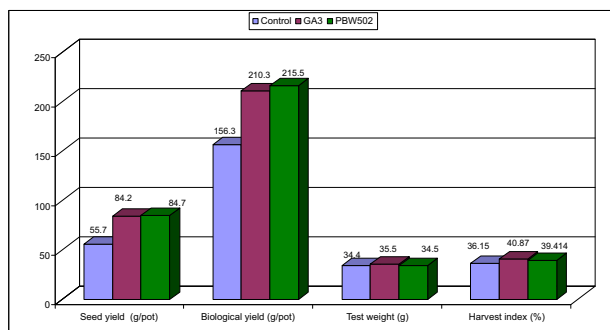
- Seed priming of one year old pigeonpea seeds with different osmotica viz. PGR ( $GA_3$ ), inorganic salt ( $KNO_3$ ) and tap water for 12 h showed significant improvement in seed germination, seedling length, seedling dry weight and vigour index over unprimed control. Among the treatments,  $GA_3$  (100 ppm) recorded significantly higher values for seed germination (90.66 %), seedling length (42.49 cm), seedling dry weight (375 mg), vigour index I (3869) and vigour index II (34308), whereas  $KNO_3$  enhanced activity of catalase, peroxidase and super oxide dismutase over unprimed control.

#### Agro-techniques for improved seed production

##### Devising agro-techniques for reducing the seed rate of wheat

- Results indicated that  $GA_3$ , IAA, Kinetin have favorable effect on spike length, spike weight and number of seed spike-1 of wheat seed. However, no significant variation in increase the spike length, spike weight and number of seed spike-1 were

observed between individual seed treatment of GA<sub>3</sub>, IAA and Kinetin. Among growth regulators, GA<sub>3</sub> recorded maximum spike length (9.36 cm), spike weight (2.24 g), number of seed spike-1 (44.3), test weight (35.5 g), seed yield (84.2 g pot<sup>-1</sup>) and biological yield (210.3 g pot<sup>-1</sup>). The seed treatment with growth regulators increased the harvest index and highest harvest index was associated with GA<sub>3</sub> (40.87) application. Among the varieties PBW 502 recorded significantly higher values of spike length (9.59 cm), spike weight (2.22 g), number of seed spike-1 (45.4), test weight (34.5 g), seed yield (84.7 g pot<sup>-1</sup>), biological yield (215.5 g pot<sup>-1</sup>) and harvest index (39.414 %) as compared to PBW 550 and HD 2733.

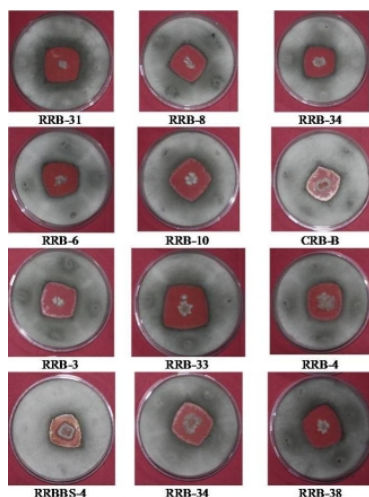


### Impact of genotypes and conservation tillage on seed quality and productivity of wheat in the eastern-UP.

Zero tillage system is seen as an alternative to conventional system and in niches of water shortage, FIRB system is viewed as feasible option for sustained quality seed production in wheat. However, present study revealed that wheat crop did not perform well in FIRB system with respect to seed yield but secured better seed quality parameters.

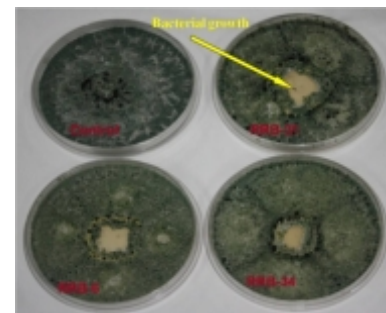
### Seed Pathology

- Fifty six bacterial isolates have been isolated using serial dilution technique from healthy rice and chickpea rhizosphere of DSR's field, Mau (U.P.) for evaluation of seed borne disease management and seed quality enhancement of rice and chickpea.



Antagonistic effect of isolated potential bacteria on *Macrophomina phaseolina* causing root rot of chickpea.

- Evaluated the antagonistic effect of 56 isolated bacterial cultures against *Macrophomina phaseolina* causing root rot of chickpea using dual culture technique. 14 bacterial isolates were found effective having antagonistic effect on fungal pathogens of chickpea.
- Among these 14 antifungal bacterial isolates, 12 bacterial isolates did not show any antifungal activities against *Trichoderma sp.* that means they are compatible with fungal bio-control agent.
- The potential bacterial colonies morphology were recorded on the basis of different colony characteristics like shape, colour, texture of the colony on culture plate and 13 biochemical tests were conducted.



Compatibility test of bacterial isolates with *Trichoderma sp.* Using dual culture technique.

### Seed Entomology

#### Effect of extraction solvents on repellent property of various plant extracts against major storage insect pests:

Different solvents viz., acetone, methanol, ethanol, petroleum ether, chloroform were used to mine various plant extracts. The plant extracts were tested against major storage insect pests viz., *Tribolium castaneum*, *Sitophilus oryzae* and *Rhyzopertha dominica* for repellency.

#### Repellent activity of various plant extracts against *Sitophilus oryzae*:

In case of plant extracts extorted in acetone, *Adhatoda vasica* and *Mentha arvensis* were found most effective repellents by showing the mean percent repellency 43.33 and 22.22, respectively, against *S. oryzae*. The other plant extracts i.e *Argemone maxicana*, *Calotropis procera*, *Citrus-limon*, *Datura stramonium*, *Hibiscus rosa sinensis*, *Melia azadirach* (leaf), *Melia azadirach* (pod), *Ocimum tenuiflorum*, *Parthenium hysterophorus*, showed moderate repellent activity between 10.00 to 16.66. Ethanolic extract of *Argemone maxicana*, *Melia azadirach* (leaf), *Parthenium hysterophorus* and *P. emblica* imparted 53.33% repellency to *S. oryzae*. Again *A. vasica* (45.35) showed maximum repellency among methanolic extracts of plants. *C. procera*, *A. vasica*, *Datura* and *Melia* (leaf) extracted in petroleum ether caused 30 to 40% repellency. While chloroformic extract of *M. arvensis* produced 55% repellency to adults of *S. oryzae*.

#### Repellent activity of various Plant extracts against *Tribolium castaneum*.

Acetone extracted *M. arvensis*, *A. maxicana* and *Melia* (leaf) caused maximum 64, 48 and 35 % repellency,



respectively, against *T. castaneum*. *M. arvensis* extract was also effective against *S. oryzae*. Against both insects, almost all the plants extracted in acetone caused low to high repellency. *Ocimum*, *Adhotoda* and *Melia* (pod) extracted in ethanol proved to be most effective in causing repellency. The peak of activity was observed after 4 hrs and repellency decreased significantly after 24 hrs. In case of methanolic extract, the activity peak was observed after 16 hrs and effective plants were *Ocimum*, *Melia* (pod) and *Adhotoda*. *Argemone maxiicana*, *Calotropis procera*, *Datura stramonium* were effective repellent against *T. castaneum*, when extracted with petroleum ether. Peak of activity of plant extracted with petroleum ether was 16 hrs after treatment. Chloroformic extracts of *Ocimum*, *Mentha* and *Adhotoda* were effective repellents and the peak of activity was after 16 hrs.

#### **Repellent activity of various Plant extracts against *Rhizopertha dominica***

In general low repellency was observed against *R. dominica* in comparison to other test insects. Among the ethanolic plant extracts, *C. procera*, *Calotropis* and *Adhotoda* proved to be effective. The mean repellency was observed at peak only after 24 hrs. At 2, 4, 8 and 16 hours very less activity was observed. Low to medium level of repellency was achieved when extracted in acetone against *R. dominica*. Plants viz. *Calotropis*, *Melia* (pod) and *P. emblica* are highest in repellency in comparison to all other plants extracted in acetone. *Adhotoda* and *Mentha arvensis* were most effective among all the methanolic extracts of tested plants. In case of plants extracted in petroleum ether *Adhotoda*, *Datura*, *C. procera* were found repellent to test insect.

#### **Seed Economics**

Primary data has been collected from Ghazipur district of Eastern Uttar Pradesh during the year 2012-13. Tabular analysis was used to compare different values of farm economy and other aspects of farm business and weighted average was used for average analysis. The analysis of data shows that net return was 37 per cent higher in certified seed production of wheat (33100/ha) than the grain production (24100/ha). Higher return in seed production is mainly due to increased productivity and better price realization of output. The cost of cultivation is around 30 per cent higher in the seed production of wheat because of high labour requirement, foundation seed cost, seed certification charges and higher level of other input use.

#### **Meetings/Trainings**

##### **Organised**

- Organized five days training programme on "Essentials of seed production, processing, testing & quality assurance" from 18th – 22nd March, 2013 at DSR, Mau. A total of 30 participants' right from scientist cadre to research scholars and personnel from state agricultural department attended the training programme, out of which 15 participants hailed from North-East region. Dr. S Rajendra Prasad, Dr. Udaya Bhaskar K and Umesh R. Kamble coordinated this event.

##### **Attended**

- Devaramane Raghavendra, Scientist attended 21

days Advanced Training Course on "Infochemicals for Ecofriendly Insect Pest Management" at TNAU, Coimbatore, from 6 to 26 February, 2013.

- Udaya bhaskar K., Scientist attended ICAR sponsored short course on Nanotechnology and Plant Disease Management, which was held from June 18- 27, 2013 at Department of Nano Science & Technology, TNAU, Coimbatore.
- Arvind N. Singh, Senior Scientist attended International Conference on Impact of Technological tools on Food Security under Global Warming Scenario organized by Hi-Tech Horticultural Society during 11-12 May 2013. Meerut, U.P, India.
- S. Natrajan, Senior Scientist attended the Principal Investigator's meeting of AICRP- NSP (Crops) held on 13 March 2013 at DSST, IARI, New Delhi.
- Devaramane Raghavendra, Scientist attended training programme on "Capacity building in taxonomy of insects and mites" at UAS, Bangalore from 18-22<sup>nd</sup> June, 2013.
- A.N. Singh, Senior Scientist attended Awareness cum Training Programme on Plant Variety Protection and DUS Testing at Directorate of Sorghum Research, Hyderabad on 22<sup>nd</sup> March, 2013.
- Chandu Singh, Scientist attended "3<sup>rd</sup> Installation Training cum workshop under NAIP Project at IVRI, Izatnagar, UP on 28<sup>th</sup> June, 2013.
- Arvind N. Singh, Senior Scientist attended Annual Group Meet of All India Coordinated Research Project on Biological Control of Crop Pest and Weeds during 24-25 May, 2013. Formulated and presented the technical programme of an experiment entitled "Evaluation of *Uscana* sp. (Trichogrammatidae) against *Callosobruchus* sp. on storability of pigeonpea seed"
- Govind Pal, Senior Scientist participated in the one day Zonal Workshop (Eastern Zone) on Financial, accounting and auditing matter at NBSLUP, Kolkata on 24th January, 2013.
- Govind Pal, Senior Scientist participated in National Seminar 2013 on Social Dimensions of Extension education in Holistic development of Rural livelihood at CBGAPG College, Lucknow, UP during 26-27 April, 2013.
- Govind Pal, Senior Scientist participated in National Seed Seminar 2013 on Innovations in Seed Research and Development jointly organized by ISST, New Delhi and UAS, Bengaluru during June 08-10, 2013 at UAS, Bengaluru.
- Dhandapani, Scientist attended the National workshop on "Foresight and future pathways of agricultural Research through Youth in India" at NASC Complex, DPS Marg, New Delhi organized by ICAR and APAARI, Bangkok & TAAS, New Delhi during 1-2, March, 2013.

##### **Symposia / Conference**

- Dhandapani, Scientist delivered an oral presentation on "Cellular Mechanism of Salicylic Acid Induced Salt Tolerance in Chickpea (*Cicer arietinum* L.) Seeds



during Germination” at XIII ISST National Seed Seminar on Innovations in Seed Research and development jointly organized by ISST, New Delhi and GKVK, UAS, Bangalore from 8-10 June, 2013.

### **Kisan Mela / Ghosti**

Directorate of Seed Research (DSR), Kushmaur, Mau, organized *Rashtriya Kisan Mela* on 27<sup>th</sup> Feb, 2013. *Kisan Mela* was inaugurated by Dr. T. P. Rajendran, ADG (Plant Protection), ICAR, New Delhi. Whereas, as special invitees Dr. A. K. Sharma, Director, NBAIM, Mau; Prof. D. J. Bhagyaraj, UAS, Bangalore; Dr. Appa Rao P., Dr. R. K. Singh, Director, NEFORD were present and graced the occasion. A number of dignitaries including consultants of private industry, experts from ICAR Institutes, personnel from Department of Agriculture and Banaras Hindu University (BHU) actively participated in deliberations of *Kisan Mela*.

Various ICAR Institutes, KVKs, State Govt. Departments, private firms and different banks *viz.*, State Bank of India (SBI), Punjab National Bank (PNB), Bank of Baroda (BOB) and NGOs exhibited respective products/services in the *Mela*. SBI Branch Manager, Mau explained National insurance scheme, and weather based insurance scheme. On this occasion, field visit was organized where, farmers interacted with scientists and discussed diverse problems related agriculture. About 5000 farmers of Uttar Pradesh and students from different colleges were benefited through this mela.

Dr. S. Rajendra Prasad, Projector Director, DSR welcomed the Chief Guest, dignitaries, farmers and students and highlighted about major achievements of the Institute. He emphasized that, technologies developed by the institute are performing very well in the eastern Uttar Pradesh and explained about varied technologies popularized by the institute for cultivation of wheat and rice, *viz.*, direct seeded rice, zero tillage etc. In his address, chief guest Dr. T.P. Rajendran highlighted the significant contribution made by DSR to protect the interests of the farmers. He highlighted about need for innovative technologies in present era of agriculture and emphasized about *Kisan Melas*, as effective medium for spreading latest technologies among farmers.

### **Publications**

#### **Articles**

- Singh, R. K., Singh, A. N., Ram, hardev, Prasad, S. Rajendra and Manoj. 2013. Growth, seed yield and quality of summer green gram (*Vigna radiata* L.) influenced by nitrogen and irrigation. *Progressive Agriculture* 13(1): 217-219.
- Singh, Rajiv K., Singh, A. N., Ram, Hardev, Prasad, S. Rajendra and Chauhan, Rajesh K. 2013. Response of basmati (*Oryza Sativa* L.) rice varieties to system of rice intensification (SRI) and conventional methods of rice cultivation. *Annals of Agril. Research*, 34 (1): 50-56.
- Chandusingh P.R., Singh N.K., Prabhu K.V., Vinod K.K. and Singh A.K. 2013. Molecular mapping of quantitative trait loci for grain chalkiness in rice (*Oryza sativa* L.). *Indian J Genet*, 73: 244-251.
- Mandal, A. K., Sinha, P. & Banik, S. (2013). Modeling of root anatomical parameters for identification of Fusarium wilt resistant and susceptible line of pigeonpea. *Indian Phytopath.* 66 (4) : 361-365.
- Manoj, Singh, Rajiv K. Singh, A. N. Ram, Hardev and Prasad S. Rajendra (2013) Growth, yield attributes and quality of summer green gram (*Vigna radiata* L.) as influenced by nitrogen and irrigation levels, *Annals of Agri. Res.* 35 (1): 47-53
- Hardev Ram., D. S. Yadav and R. D. Jat (2013) Effect of nutrient management on growth, yield attributes and yield of Indian Mustard (*Brassica juncea*). *Annals of Agri-Bio Research.* 18(2): 132-134.

#### **Abstracts / Summary**

- S. Rajendra Prasad, Umesh R. Kamble and Udaya Bhaskar, Vilas A. Tonapi, Manjunthprasad and Sandeep Lal (2013). Potential contribution of AICRP – NSP (Crops) & ICAR Seed Project : Strategies to build a secure seed system across dryland ecosystems. Indian Seed Congress, 2013, 8-9 Feb., 2013, pp 13-17.
- S. Rajendra Prasad, K. Bhojaraja Naik, K. Udaya Bhaskar and D.P. Singh (2013). Interface of seed with abiotic and biotic stresses : emphasis on vegetable crops. National Symposium on Abiotic and Biotic stress management in vegetable crops, April 12-14, 2013, IIVR, pp : 104-110.
- Singh, Arvind N., Kumar, Jitendra; Pandey, S. K and Singh, R. K. (2013). Coating: An effective technique for value addition of Seed. National seminar on Value added functional foods: Prospects and future challenges, at Itawah, U.P, India. Pp:112.
- Hardev Ram, Singh, Rajiv. Kumar, Singh Arvind N. and Prasad, S. Rajendra. (2013). Role of value addition in cereals: nutria-cereals. National Seminar on “Value added functional foods: prospective & future challenges” at Janta College, Bakewar, Etawah (U.P.), C.S.J.M. Univ., Kanpur .
- Pal Govind, Singh R. K. and Ram Hardev (2013). Social Dimensions of Extension Education in Holistic Development of Rural Livelihood. National Seminar on 'Improving socio-economic status of farmers through participatory quality seed production programme in Eastern Uttar Pradesh' at Chandra Bhanu Gupta Agriculture P. G. College, Lucknow (U.P.).
- Rajiv K. Singh, Hardev Ram, Govind Pal, S. Rajendra Prasad and Rajesh Kumar Chauhan (2013). Evaluation of system of rice intensification (SRI) for enhanced seed yield and quality hybrid rice. XIII National Seed Seminar on 'Innovations in seed research and development' jointly organized by ISST, New Delhi and UAS, Bengaluru.
- Govind Pal (2013) Role of lac seed 'broodlac' in lac production and livelihood security. In: Souvenir of National Seminar on Value added functional foods: Prospects and Future Challenges at Janta College, Bakewar, Etawah .
- Govind Pal, and R.K. Yogi (2013). Socio-economic status of lac growers in Korba district of Chhattisgarh. In: Seminar proceedings of ISEE National Seminar 2013 on Social Dimensions of Extension Education in



Holistic Development of Rural Livelihood at CBGAPG College, Lucknow, U.P. Pp:55.

- Govind Pal, R.K. Singh and Hardev Ram (2013). Improving Socio-economic status of farmers through participatory quality seed production programme in Eastern Uttar Pradesh. In: Seminar proceedings of ISEE National Seminar 2013 on Social Dimensions of Extension Education in Holistic Development of Rural Livelihood at CBGAPG College, Lucknow, U.P. Pp:86.
- Govind Pal (2013). Importance and Economics of Lac Seed (Broodlac) Production-A Case Study in Chhattisgarh. Abstracts XIII National Seed Seminar by ISST, New Delhi and UAS, Bengaluru. Pp: 176-177.

#### **Leaflet/Pamphlet/Booklet**

##### **Popular Article**

- Pal, G., Chaturbedi, A. K., Tripathi, J. K., Mandal, A. K. and Chauhan, R. (2013). Kam lagat me gehu ka adheek beej utpadan hetu shunya bhu-parishakaran (Zeero tillage) teknik. *Beej*. Pp 12-14.
- Madan Kumar, Chandu Singh, Mandal, A. K., Dhandapani, R., Kamble, U. R. and Ramesh, K. V. (2013). Poudha ke bikash me shukhsma poshok ka mohatya. *Beej*. Pp 1:46-48.
- Madan Kumar, Chandu Singh, Mandal, A. K., and Dhandapani, R. (2013). Sankar dhan ki beej utpadan prodhigyogiki (Hybrid Seed Production technique in Rice), published in souvenir /SMARIKA during *Kissan mela* organized by DSR Mau, on Feb. 27<sup>th</sup> 2013.
- Boraiah, K.M., Sinha, A.K., Vetriventham, M., Raghavendra, D., Chandu Singh and Rajendra Prasad, S. "Uttar Pradesh ke liye saraso ki anukool prajatiya aur sankar kisme" published at *Kissan Mela* organized by DSR, Mau on 14.03.2013.
- Sinha, A.K, Singh, A.N; Singh, R.K, Kamar, Madan, Abubaker and Chaturvedi, A.K. 2013. Uttar purvi maidani kshetron ke liye gehun ke gunvktayukt unnatisheel prabhed: Visheshstayan evam beejotpadan. Smarika, Kisan mela-2013, Pp 6-13.
- Kumar, Jitendra; Singh, A.N; Singh, R.K; Sinha, A. K and Abubaker. 2013. Padap Kism Sanrakhan aur kisan adhikar. Smarika, Kisan mela-2013, Pp 17-19.
- Singh, R.K; Ram, hardev; Chodhury, P.R; Sinha, A.K, Singh, A.N and Chaturvedi, A.K. (2013). Mung evam urd ka beej utpadan taqniki. Smarika, Kisan mela-2013, Pp 20-27.
- Singh, U. B; Singh, D.P; Renu; sahu, Asha; Singh, B.P; Singh, A.N and Sharma, A.K. (2013). *Jaiv urvarak: Prakriti Ka Amulya Uphar*. Smarika, Kisan mela-2013, Pp 47-49.
- Singh. U.P and Singh, A.N. (2013). *Jayad fasalotpadan hetu kaise Karen daksha poshak tatva prabandhan*. Smarika, Kisan mela-2013, Pp 50-53.
- Singh, B.K; Singh, N.K; Pandey, P.S and Singh, A.N. (2013). *Javik kheti me kenchua khad*. Smarika, Kisan mela-2013, Pp 69-72.

- Singh, B.K; Singh, N.K; Pandey, P.S and Singh, A.N. (2013). *Krishi utpadan me jaiv urvarakon ki mahattva evan upyog*. Smarika, Kisan mela-2013, Pp 73-76.
- Singh, D; Vishwakarma, A.; Dubey, A.K and Singh, A.N. (2013). *Purvanchal ki drishtikon se nakadi fasalon me dhingari mashroom ki kheti ka mahatva*. Smarika, Kisan mela-2013, Pp 81-84.
- Ditt, S; Singh, V; Chodhury, P.R; Singh, A.K, Singh, A.N and Singh, R.K. (2013). *Padap aanuvanshik sanshadhano ke sanrakshan me mahatvapurn adhiniyamon ki bhumika* Smarika, Kisan mela-2013, 93-97.
- Chodhury, P.R, Dutt, S; Singh, V; Singh, A.N and Singh, R.K. (2013). *Bharatiya beej Kshetra- Ek sadharan paridrishya*. Smarika, Kisan mela-2013, Pp 98-100.
- Madan Kumar, Chandusingh P.R., Mandal A.K., Dhandapani R., Umesh R.K and Ramesh K.V. (2013). Importance of micronutrients in plant development. *Beej* (published by DSR, Mau). 1:46-48.
- Madan Kumar, Chandusingh P.R., Mandal A.K., Dhandapani R. and Sinha A.K. (2013). Hybrid rice seed production technology. Souvenir (published by DSR, Mau). Pp: 85-92.
- Madan Kumar, Chandu Singh, Mandal, A. K., Dhandapani, R., Kamble, U. R. and Ramesh, K. V. (2013). Importance of micronutrients in plant development. *Beej* (published by DSR, Mau). 1: 46-48.

##### **Books and Compendiums**

- Annual Report 2012-13 of All India Co-ordinated Research Project- National Seed Project (Crops) Pub: Project Director, Directorate of Seed Research (DSR), Kushmaur, Mau, Uttar Pradesh.
- Rajendra Prasad, S., Vilas A. Tonapi, Sharma, S.N., Karuna Vishnavat, Amit Bera, R.T.Kausal, S.Natarajan, M.Vetriventhan, Sandeep K.Lal, R.Dhandapani, K.Udaya Bhaskar, Umesh R.Kamble, D.Raghavendra and Arun Kumar (2013). AICRP-National Seed Project (Crops) XI Five Year plan accomplishment (2007-2012) ISBN: 9788192512815.
- Jitendra Kumar, Arvind N. Singh and S. Rajendra Prasad. 2013. Agri-Informatics: Role of Intellectual Property Rights. *BIOLOGIX*, II (I), Jan-Apr 2013, 86-91.

##### **Lecture & Talks**

- Singh R. K. delivered a TV talk on "seed production technology in wheat" at Krishi Darshan, Varanasi on 13.02.2013.
- Arvind N. Singh, Senior Scientist delivered lecture on "Integrated Pest Management in *Kharif* crops" during one day District level *gosthi* organized by Agriculture Department on 13.06.13 at Mau.
- Hardevram, R., Delivered a TV talk on "seed production technology in wheat" at Krishi Darshan, Varanasi on 13.02.2013.

## Awards

- Govind Pal, Senior Scientist received 'Special Achievement Award- Agriculture' by EET CRS, Noida, Uttar Pradesh under Science and Technology Award – 2013.
- Govind Pal, Senior Scientist received 'Best Paper Presentation Award' in the national seminar 2013 on Social Dimensions of Extension Education in Holistic Development of Rural Livelihood during April 26-27, 2013 at Lucknow by Indian Society of Extension Education, New Delhi.
- Dr. Rajiv K. Singh, Senior Scientist (Agronomy), DSR, Mau has received Krishak Mittra Samman Award at Nanad Kharif Kisan Mela 2013 on 17.05.2013 by NEFORD, Mau.

## IPR Issues

- Dr Arvind N. Singh, Senior Scientist organized one day "Sensitization programme on IPR". Dr. Harikesh Bahadur Singh, Department of Mycology & Plant Pathology was Chief guest. He delivered the lecture on Intellectual property Right. About 30 participants were present during the programme.
- Dr Arvind N. Singh, Senior Scientist organized one day training "Protection of plant variety and farmers right" on 05.03.2013 at DSR, Mau in collaboration with NEFORD, Mau. About 100 farmers attended the training programme.
- Dr Arvind N. Singh, Senior Scientist organized one day Poster exhibition on IPR during 15.05.2013 at DSR, Mau about 120 students participated in this event.

## Quality Seed Production

### Seed Production at DSR, Mau

3.50 q foundation seed of Mustard variety viz. Pusa Tarak; 10.60 q foundation seed of Chickpea and Field pea varieties viz. Avarodhi & KPMR 400; 16.0 q breeder seed of wheat variety viz. HD 2733; 66.80 q foundation seed of wheat varieties viz. DBW-39, PBW-621, HD-2967, KRL-213, Unnat Halna, HI 1563 and PBW 154; 3.46 q



foundation seed of summer mungbean varieties viz. Pusa Vishal and SML 668; 1171.62 q quality seed of wheat varieties viz. PBW 502, PBW 550, PBW 343, KRL-213, PBW 154, WR 544; 14.75 q quality seed of barley variety viz. Gitanjali; 28.85 q of quality seed of chickpea varieties viz. Pusa 362 and Avarodhi were produced during rabi 2012-13 at farm DSR, Mau.

## Personnel

Staff	Scientific	Date of Joining
Sh. Ramesh K.V.	Scientist	30.04.2013

हिन्दी प्रभाग | जनवरी-जून 2013

## अखिल भारतीय शमन्वित अनुसंधान परियोजना- राष्ट्रीय बीज परियोजना (फसल)

ए.आई.सी.आर.पी.-राष्ट्रीय बीज परियोजना (फसल) की कार्मिक सामूहिक बैठक डा. बी.एस. दिल्ली, कुलपति, पंजाब कृषि विश्वविद्यालय, लुधियाना, पंजाब की अध्यक्षता में 27-29 अप्रैल 2013 को पंजाब कृषि विश्वविद्यालय, लुधियाना, पंजाब में सम्पन्न हुई। इस बैठक में वर्ष 2012-13 के दौरान प्रजनक बीज उत्पादन और बीज प्रौद्योगिकी अनुसंधान के तहत हुई प्रगति पर विचार विमर्श हुआ तथा वर्ष 2013-14 के लिए कार्य योजना को अन्तिम रूप दिया गया। ए.आई.सी.आर.पी.-राष्ट्रीय बीज परियोजना (फसल) को देश भर में सन् 1979 में शुरू किया गया, जिसके अन्तर्गत 35 प्रजनक बीज उत्पादन केन्द्र और 23 बीज अनुसंधान केन्द्र कार्यान्वित हैं। इस परियोजना का मुख्य उद्देश्य प्रजनक बीजों का उत्पादन, वितरण और बीज विज्ञान के क्षेत्र में अनुसंधान का कार्य करना है। इस परियोजना के प्रारम्भिक वर्षों सन् 1981-82 में प्रजनक बीज का उत्पादन मात्र 391 टन था जो कि आज सन् 2011-12 में बढ़कर 117826.88 क्विंटल के स्तर पर पहुँच चुका है। इस वार्षिक समूह बैठक में भा.कृ.अनु.प. के विभिन्न संस्थानों, राज्य कृषि विश्वविद्यालयों एवं निजी कम्पनियों से लगभग 150 वैज्ञानिकों ने भाग लिया। डा. एस.एस. गोसाल, अनुसंधान निदेशक, पंजाब कृषि विश्वविद्यालय, लुधियाना ने कहा कि पी.ए.यू., लुधियाना में कार्यरत सात कालेजों के अलावा तीन नये कालेजों की शुरुआत की जाय।

डा. एस. राजेन्द्र प्रसाद, परियोजना निदेशक, बीज अनुसंधान निदेशालय, मऊ ने इस परियोजना की उपलब्धियों को प्रस्तुत करते हुए वर्ष 2011-12 के अन्तर्गत देश का रिकार्ड खाद्यान्न उत्पादन 257 मी. टन पर प्रकाश डाला तथा खाद्य सुरक्षा एवं बीज सुरक्षा की भूमिका पर बल दिया। उन्होंने यह भी बताया की प्रजनक बीज उत्पादन भारत सरकार एवं राज्य सरकार दोनों की मांगो से ज्यादा हुआ है। डा. बी.एस. दिल्ली ने इस बैठक के लिए पी.ए.यू., लुधियाना को आयोजन स्थल के रूप में चयन करने के

लिए आई.सी.ए.आर. का धन्यवाद देते हुए आए हुए अतिथियों का स्वागत किया। उन्होंने कहा की प्रजनक बीज उत्पादन में वैज्ञानिकों के गंभीर प्रयासों की आवश्यकता पड़ती है जिसके कारण बीज उत्पादन में शामिल वैज्ञानिकों के प्रकाशनों की संख्या ज्यादा नहीं हो पाती। इसलिए उन्होंने ऐसे वैज्ञानिकों को पुरस्कृत करने का सुझाव दिया। उन्होंने यह भी कहा कि सार्वजनिक धन का उपयोग सार्वजनिक अनुसंधान के लिए बेहतर प्रणाली के विकास में किया जा सकता है। यदि संकर शोध केवल निजी एजेंसियों के लिए इनपुट प्रदान करता है और सार्वजनिक क्षेत्रों के प्रत्यक्ष उपयोग के लिए नहीं तो ऐसे पहलू पर सार्वजनिक अनुसंधान की जरूरत पर आगे बहस व विश्लेषण किया जाना चाहिए। बारहवीं योजना अवधि के लिए एक कार्य योजना तैयार करने हेतु यह बैठक एक सकारात्मक नोट पर समाप्त हुई।

### शोध उपलब्धियाँ

**बीज गुणवत्ता संवर्धन:** एक वर्ष पुराने अरहर के बीजों को जिब्रैलिक अम्ल से 12 घंटे तक रंजीकरण करने पर बीजों का अंकुरण, पौधों की लम्बाई, पौधों का सुखा वजन एवं पौधों के ओज क्षमता सुचकांक में बढ़ोत्तरी पायी गई। जबकि पोटेसियम नाइट्रेट द्वारा रंजीकृत बीजों में एन्टी-ऑक्सीडेंट एन्जाइम जैसे केटॉलेज, पेरोक्सीडेज एवं सुपर ऑक्साइड डीसम्यूटेज की गतिविधि में बढ़ोत्तरी पाई गई।

**गेंहूँ के बीज दर को कम करने के लिए कृषि तकनीक का विकास:**

इसके अर्न्तगत गेंहूँ के तीन किस्मों पीबीडब्लू 502, पीबीडब्लू 550

एवं एचडी 2733 के बीजों का रंजीकरण जिब्रैलिक अम्ल ए आई.ए. ए. एवं कार्बोनेटीन जैसे वृद्धि नियामकों से रंजीकृत कर लगाया गया। जिसमें जिब्रैलिक अम्ल द्वारा उपचारित बीजों के पौधों का स्पाइक/बाली की लम्बाई (9.36 सेमी.) स्पाइक वजन (2.24 ग्राम), बीज/स्पाइक (44.3), 1000 बीज का भार (35.5 ग्राम), बीज ऊपज (84.2 ग्रा./प्लोट) और जैविक उपज (210.3 ग्रा./प्लोट) पाया गया जो इन सभी नियामकों में सबसे ज्यादा था। प्रजातियों पी.बी.डब्लू. 550 तथा एच.डी. 2733 की तुलना में प्रजाति पी.बी.डब्लू. 502 की प्रतिक्रिया जिब्रैलिक अम्ल के प्रति सबसे अच्छा पाया गया।

- आनुवांशिक स्तर पर एस.एस.आर. माइक्रोसेटेलाइट मार्कर के प्रयोग द्वारा कपास की संकर प्रजाति सी.एस.एच.एच. 198 तथा उसके पैतृक लाइनों के आण्विक गुणों का आनुवांशिक शुद्धता आंकलन किया गया।
- विभिन्न पौधों के अर्क के साथ सिटोफिलस ओराईजी एवं ट्राइबोलियम कॉस्टेनियम के विकर्षण गतिविधि का अध्ययन किया गया। इनमें से एडाटोडा वैसिका (Adhatoda Vasica) और मेंथा अर्वेन्सिस का अर्क सिटोफिलस ओराईजी के खिलाफ सबसे प्रभावी विकर्षक साबित हुए। जबकि मेंथा अर्वेन्सिस, ए. मैक्सिकाना और मेलिया के अर्क टी. कॉस्टेनियम के खिलाफ सबसे प्रभावी विकर्षक साबित हुए।

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