



PULSES



Newsletter

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Union Agriculture Minister Presided Over the Closing Ceremony of International Year of Pulses 2016

Closing ceremony of International Year of Pulses and Review of various Government initiatives for enhancing pulses production was held at Agra on December 22, 2016. The ceremony



was presided over by Hon'ble Union Minister of Agriculture & Farmers Welfare Shri Radha Mohan Singh ji. The Hon'ble Minister urged upon the scientists, farmers and policy makers for efforts towards making the country self sufficient in pulse

production by the year 2021. He reviewed the various programmes conducted by different institutes and universities during the year. The Hon'ble Minister said that the Government of India has taken a number of measures during the International Year of Pulses 2016 to increase the production and productivity of pulse crops in the country and has laid down a target of 200 lakh tonne production for the year 2016-17, 210 lakh tonne for year 2017-18 and 240 lakh tonne for year 2020-21. The Hon'ble Minister said that steps have been taken to strengthen the formal seed mechanism of pulse crops and to increase availability of seeds of improved varieties in the country. A target has been fixed to establish 150 "Pulse Seed Hubs" for increasing the availability of quality

seeds for which a provision of Rs. 225.31 crores has been made. Under this project, there is a target of 1.50 lakh quintal additional seed production per year. Each "Pulse Seed Hub" will produce a minimum of 1000 quintal quality seed of pulse crops per year and supply it. The Hon'ble Minister also said that for the first time, Government has made provision to ascertain the purchase of pulses on minimum support price from farmers and Government has increased minimum support price of the pulses to promote the cultivation and



(Cont. on page-2)

National Symposium on Plant Disease Management Organised

National Symposium on 'Eco-Friendly Approaches for Plant Disease Management: Recent Trends and Opportunities' was organized by ICAR-Indian Institute of Pulses Research in association with Indian Phytopathological Society, New Delhi on December 29

and 30, 2016 to commemorate the International Year of Pulses-2016. Prof. Akhter Haseeb, Vice Chancellor, NDUA&T, Faizabad was the Chief Guest at the occasion. About 130 scientists and multi-disciplinary resource persons across the country participated in the symposium. The symposium mainly focused on the themes related to application of modern tools for disease diagnosis and management,

microbes in crop disease management, crop disease management through host resistance, botanicals and



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Cont... International Year of Pulses 2016

production of pulses. Apart from this, the Government has also decided to maintain a buffer stock of pulses to the extent of 20 lakh tonne so that people could be provided pulses at reasonable prices when market prices escalate. The Hon'ble Minister praised the efforts of all farmers, scientists and policy makers for increasing production and productivity/availability of pulses in the country and hoped that they would put in their best efforts to make India self sufficient in pulses production.

The renowned pulse scientists were felicitated by the Hon'ble Union Minister and a bilingual mobile app (*Chana Mitra*)

developed by ICAR-IIPR, Kanpur, was also launched for the chickpea growers on the occasion.

Hon'ble MoS Agriculture & Farmers Welfare Shri Sudarshan Bhagat emphasized upon the initiatives taken by Govt. of India for enhancing pulses production in the



country. Shri Ramashanker Katheria, Hon'ble M.P., Agra also shared his views on the occasion.

Dr. Trilochan Mohapatra, Secretary DARE and DG ICAR, Dr. J.S. Sandhu, DDG (CS) and Dr. A.K. Singh, DDG (Agril. Extension) were also present at this occasion. Dr. N.P. Singh, Director, ICAR-IIPR, Kanpur presented the vote of thanks to the guests.

About 300 delegated from different organizations attended this ceremony which was jointly organised by ICAR-IIPR, Kanpur and Indian Society of Pulses Research and Development.

Cont... National Symposium on Plant.....

inducers, agronomic and integrated approaches for disease management of Agri-Horticultural



crops. In this event 8 invited, 30 oral and 40 posters presentations were made on various aspects of disease management. Eminent scientists namely, Dr. Vishwa Dhar, Dr. R.N. Singh, Prof. R.V. Singh, Dr. D.V. Singh, Prof. V.S. Bais, Prof. L.P. Awasthi, Prof. Udit Narayan, Prof. S.B. Singh, Prof. U.P. Singh, Dr. R.A. Singh and Dr. R.G.

Chaudhary were honoured at the occasion.

Dr. Rajendra Kumar, DG, UPCAR was chief guest of the Valedictory Function and Dr. N.P. Singh, Director, IIPR was guest of honour. Dr. Krishna Kumar, Organizing Secretary proposed vote of thanks, besides Dr. Mohd. Akram, Co-organizing Secretary, presented reports of National Symposium.

World Soil Day Celebrated

A Special function to celebrate World Soil Day and distribution of Soil Health Cards was organized at ICAR-Indian Institute of Pulse Research, Kanpur on December 5, 2016. On this occasion, Dr. D.D. Tiwari, Professor of Soil Science, CSA UA&T, Kanpur, was the Chief Guest and Dr S.S. Singh, Director (In-charge), ICAR-IIPR presided over the function. The ICAR-IIPR staff and farmers of adjoining districts participated in this programme. Dr. C.S.Praharaj, Principal Scientist welcomed all the participants and highlighted the importance of World Soil Day and Soil Health Cards.

Dr. S.S. Singh highlighted the need of soil testing as besides three primary nutrients (N,P& K), secondary and micronutrients such as S, Zn, Fe, B and Mo are also becoming deficient in many soils and leading to problem of nutrient

imbalance. Application of nutrients based on soil health card may provide a boost to both production and productivity of many field crops.

Dr. D.D. Tiwari, in his special remarks, said that since the productivity of soil is diminishing, every efforts should be made to



restore it. While suggesting to maintaining the soil health, he advocated for crop rotation including pulses, addition of manures and other macro/micro-

nutrients on a sustainable basis. Usually soil containing 3-4 earthworms/m² is considered as productive. He also advocated recycling of organics/crop residues (instead of burning), use of INM, IPM and organics/biofertilizers to keep the soil sustainable. He

stressed the importance of soil health cards for monitoring the status of soil and actions to improve them. He also distributed soil health cards to the farmers. Dr. Ummed Singh, coordinated the activities of the function and extended a vote of thanks to the chair and gathered farmers.

Creation of Seed Hubs for Quality Seed Production of Pulses

Pulses are grown in about 24-25 million ha annually. To cover 30% of the pulses area under quality seeds there is need to produce 30-35 lakh quintals of quality seed annually. Considering importance of the quality seed, DAC & FW, Ministry of Agriculture and Farmers Welfare, Government of India has approved a project on 'Creation of seed hubs for increasing indigenous production of pulses in India' to establish 150 Seed-Hubs in 24 states with a total out lay of Rs. 22531.08 lakh being implemented through ICAR-Indian Institute of Pulses Research, Kanpur. Under this project, 7 ICAR Institutes, 46 AICRPs located in different SAUs/CAUs and 97 Krishi Vigyan Kendras (KVKs) spread over 24 states of the country are partners. ICAR-Agricultural Technology Application Research Institutes

(ATARIs) are collaborators for implementation of Seed-Hubs project. Dr. S.K. Chaturvedi, Principal Scientist is Nodal Officer for implementation of the project. The project has a provision of one time grant of Rs. 50 lakh in the first year per seed hub for creating infrastructures. In addition, there is provision of Rs. 100 lakh to each seed hub as a revolving fund to meet various expanses for production, procurement and processing of seeds during 2016-18. The profit generated out of seed sale can be utilized by Seed-Hub for development of other facilities to increase quality seed production of targeted pulses.

It is anticipated that within three years, all 150 Seed-Hubs will become self reliant and each centre will continue production of 1000

quintals/year of quality seed of different pulses in a sustainable manner. Total 98 Seed-Hubs have started producing quality seed form 2016-17. It is expected that from 2018-19 and onward, all 150 Seed-Hubs will be producing total 150000 q quality seed of newly released high yielding varieties (not older than 10 years) of pulses on sustainable basis which is likely to ensure productivity and production increase of pulses. The breeder seed (target 5800 q) to be produced under 'Additional breeder seed production' project at 12 centres in 8 states will be available to Seed-Hubs for further multiplication to produce foundation seed and further conversion as certified seed. This will ensure availability of genetically pure seed for further multiplication and sowing at farmers' fields.

Research Highlights

Marker Assisted Gene Introgression for Enhanced Drought Stress Tolerance in Chickpea

A "QTL-hotspot" containing two sub regions "QTL-hotspot_a" and "QTL-hotspot_b" having functional implication for drought stress tolerance in chickpea was transferred through marker assisted backcrossing (MABC) approach from the drought tolerant donor parent ICC 4958, into elite genetic background of DCP 92-3. In this perspective, 21 BC₃F₄ lines were selected based on foreground marker analysis (TA170, NCPGR 21 and TR 11) and having phenotypic similarity with recurrent parent. Background analysis with 40 SSR markers revealed 65.40% to 85.3% genome recovery of recurrent parent in these selected lines. The application of MAS with the MABC breeding programme accelerated the recovery of the RP genome, reducing the number of generations and the time for incorporating drought tolerance loci in chickpea.

K.R. Soren, Priyanka Gangwar, P.S. Shanmugavadeivel, Malkhan Singh, Ashutosh Yadav, Jaya Tripathi, Neha Gupta, Ankur Bhardwaj, S. Datta, S.K. Chaturvedi and N.P. Singh

Potential of New Post-emergence Herbicides in Chickpea

Among new post-emergence (PoE) herbicides evaluated to assess their efficacy and phytotoxicity in chickpea, topramezone 60 ml/ha was found promising. Visual phytotoxicity in terms of chlorosis and leaf burning due to topramezone 60 ml/ha was minimal with excellent control of both broad-leaved and narrow-leaved weeds when applied at 27 days after sowing. Major weed flora observed in chickpea included broad-leaved weeds viz., *Coronopus didymus* L., *Convolvulus arvensis* L., *Chenopodium album* L.,

Chenopodium murale L., *Fumaria parviflora* L., *Anagallis arvensis* L., *Spergula arvensis* L. *Medicago denticulata* L. and *Vicia hirsuta* (L.) Gray. and narrow-leaved like *Asphodelus tenuifolius* Cav. and *Phalaris minor* Retz. The problematic weeds in chickpea like *Coronopus didymus* L. and *Convolvulus arvensis* L. in the region were effectively controlled by topramezone 60 ml/ha. The study suggests that topramezone 60 ml/ha as PoE may be efficient in controlling the diversified weed flora in chickpea under alluvial soil.



Performance of chickpea under topramezone 60 ml/ha vis-à-vis weedy check

C.P. Nath, Narendra Kumar, S.S. Singh and K.K. Hazra

OUR NEW COLLEAGUES

Name	Post	Discipline	Date of joining
Mr. Krishnashis Das	Scientist	Microbiology	14.10.2016
Ms. Bhagyashree S.N.	Scientist	Agril. Entomology	15.10.2016

Stink bug, *E. furcellata* (Wolff): A Potential Predator of Phytophagous Caterpillars

Predatory stink bug, *Eocanthecona furcellata* (Wolff) (Hemiptera: Pentatomidae) has a wide host range and found to predate on larvae of *Helicoverpa armigera* Hubner, *Spilosoma obliqua* (W.), *Spodoptera litura* (F.), *Maruca vitrata* Geyer, *Earias* sp., *Leucinodes orbonalis* Guenee, *Cnaphalocrocis medinalis* Guenee, *Trichoplusia ni* (Hubner) and *Corcyra cephalonica* (Staiton). *E. furcellata* passes through five nymphal instars, where both adults and nymphal stages are predatory in nature.

Predatory stink bug were found feeding on Bihar hairy caterpillar, *Spilosoma obliqua* in long duration pigeonpea var. Bahar at New Research Campus of IIPR, Kanpur during 42nd Standard Meteorological Week (SMW). In laboratory, the female bug laid orange coloured barrel-shaped eggs, hatched into nymphs without fully developed wings. Early nymphal instars of predatory bug were gregarious, whereas the late nymphal instars and adults were solitary predators. Observations on feeding behaviour revealed that the predator approached the prey from behind and thrust the stylets in between two anal prolegs of the host larvae. On capturing the prey with the help of rostrum, it fed on haemolymph, leaving no body fluid behind and finally killed the caterpillar. Its ability in killing the caterpillars could be exploited in augmentative biological control of lepidopteran insect pests in pulses.

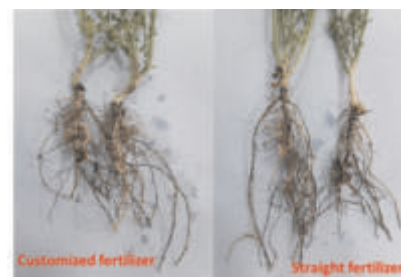


Fig. 1: Eggs and Nymphs of *Eocanthecona furcellata* (Wolff); **Fig. 2:** Insertion of rostrum by adult predatory bug in to *S. obliqua* larva; **Fig. 3:** Adult predatory bug feeding on *S. obliqua* larva by leaving no body fluid.

Kiran Gandhi B., Sanjay M. Bandi and Krishna Kumar

Improving PE and BNF with Customized Fertilizers in Chickpea

Possibility of enhancing photosynthetic efficiency (PE) through higher chlorophyll content in leaves and biological N fixation (BNF through nodulation) was explored in chickpea cv. HC 5 by application of customized fertilizers. This was studied through use of SPAD Chlorophyll meter reading (SCMR) and extent of nodulation in chickpea at branching stage, following application of both straight fertilizers (including both macro- and micro-nutrients such as 20:17:16:30:5:3:0.3:0.12) and customized fertilizers prepared locally as per nutrient need of the legume crop including chickpea formula (5.5:4.6:4.5:8.3:1.4:0.8:0.08:0.034 as NPKSZnFeBMo). Application of chickpea formula (a customized fertilizer) substantially improved SCMR and nodule number (45.6 and 28.3, respectively) over those in straight fertilizers (31.1 and 19.4, respectively). Higher light efficiency



harvested and *Rhizobium* activity observed in chickpea plants following customized fertilizer might be the result of the balanced supply of majority of essential nutrients (through integrated plant nutrient supply) to the plants in a sustained matrix. The study also confirm the need for multi-nutrient sources for plant growth and development. These could be considered as the preferred traits for determining higher nutrient use efficiency in chickpea.

Ummed Singh, C.S. Praharaj, S.S. Singh, Narendra Kumar, Lalit Kumar and K.K. Hazra

Putatively Associated SSR Markers for Resistance to *Fusarium* Wilt in Pigeonpea

Association mapping analysis was performed in 89 diverse pigeonpea genotypes, which were phenotyped consecutively for three years (2013-2016) against variant 2 under a wilt sick field. Screening of 65 pigeonpea specific hypervariable HASSR markers distributed on seven chromosomes and 29 different scaffolds resulted in 181 alleles with average gene diversity (0.55) and polymorphism information content (PIC) value of 0.47. Population structure analysis using model based and distance based approaches grouped the pigeonpea genotypes into two distinct sub-groups (K=2). The markers trait association analysis (MTAs) based on single factor analysis (SFA), general linear model (Q, GLM) and mixed linear

model (Q+K, MLM) identified 7 putatively associated SSR markers viz., HASSR 8, 30, 18, 58, 128, 121 and 174 with wilt resistance. The physical distances between SSR markers belonging to each chromosome were translated to centi morgan distances by considering the ratio of 561.1 Kb/cM. A partial genetic linkage map was drawn, which helped to visualize the genomic location of FW resistance -associated SSR markers on different chromosomes. This is the first report of identification of favourable alleles for resistance to variant 2 of *Fusarium udum* through association analysis in pigeonpea.

Prakash G. Patil, Jyotirmay Dubey, Abhishek Bohra, R.K. Mishra, P.R. Saabale, Alok Das, Meenal Rathore and N.P. Singh

MIGRATION

Name	Designation	From	To	Date
Ms. Bhagyashree S.N.	Scientist	ICAR-IIPR, Kanpur	ICAR-IARI, New Delhi	27.10.2016
Mr. Man Mohan Deo	Scientist	ICAR-CPCRI, Kasaragod (Kerala)	ICAR-IIPR, Kanpur	24.12.2016

Sources of Resistance against *Fusarium* Wilt in Wild Accession of Pigeonpea

Total 79 wild pigeonpea accessions belonging to eight different *Cajanus* species (*Cajanus scarabaeoides*, *C. platycarpus*, *C. cajanifolius*, *C. lineatus*, *C. sericeus*, *C. volubilis*, *C. albicans* and *C. viscibo*) and five species belonging to *Rhynchosia* (*R. aurea*, *R. bracteata*, *R. rothii*, *R. rufescens* and *R. minima*) of different species were screened against variant 2 of *Fusarium udum* in the wilt sick field at IIPR Research Farm for identification of new sources of

resistance against *Fusarium* wilt pathogen.

Out of 79 accessions, 35 were found resistant, while the remaining genotypes showed variable reactions such as moderately resistant (11), susceptible (14) and highly susceptible (19). After validation, the promising accessions could be effectively used in pigeonpea breeding programmes for incorporating durable resistance.



(1) Screening of wild accessions in wilt sick field, (2&3) Symptoms of *Fusarium* wilt in different wild species

R.K.Mishra, P.R.Saabale, Naimuddin, Monika Mishra, Satheesh Naik S.J., Abhishek Bohra, Prakash G.Patil, Krishna Kumar, F. Singh and I.P. Singh

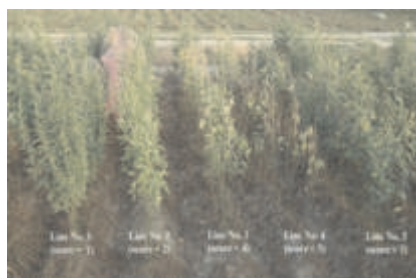
Genetic Variability for Post-emergent Herbicide Tolerance in Pigeonpea

Screening of 206 diverse pigeonpea genotypes revealed large genetic variations for tolerance to herbicides imazethapyr (100 g ai/ha at 30 DAS) and glyphosate (1.5 kg/ha at 55 DAS). Genotypes were scored on a scale of 1 to 5 (1= highly resistant and 5= highly susceptible/sensitive). In general, sensitivity of the genotypes to glyphosate was higher as compared to imazethapyr. Seven genotypes viz. DA 11, IPA 204, Pusa

992, VKG 14/12, JBT 38/101, VKSSSC 10/14 and VKG 13/126B were highly resistant to glyphosate and 75 were highly susceptible/sensitive, based on average herbicide tolerance scores. The herbicide tolerant lines identified in this study will be useful for development of herbicide tolerant cultivars and for genetic and physiological studies on herbicide tolerance in pigeonpea.



Panoramic view of field without any herbicide spray



Scoring of genotypes for resistance reaction on 1 to 5 scale

Satheesh Naik S.J., C.P. Nath, Farindra Singh, Praveen Pandey, Abhishek Bohra, R.K. Mishra, P.S. Basu, I.P. Singh and N.P. Singh

Hot Spot of *Meloidogyne* spp. Infection in Sitapur, Uttar Pradesh

A survey was carried out in Gharkatara, Piprawan, Mallapura, Taranpur, Manpur and Dudhiyapur villages in Sitapur district of Uttar Pradesh to identify nematode infestation in pulses and collect soil samples from the rhizosphere. During the survey, heavy infection of root knot nematode was observed in cowpea, mungbean and pigeonpea fields. The crops were clearly stunted in growth,



Root knot nematode infection

possessed very less number of pods and heavy galls in roots. Total 18 samples were collected from rhizosphere of these crops along with the roots for assessment of population density.

The analysis revealed that the root knot nematode density from the rhizosphere soil sample of cowpea field in Gharkatara, Piprawan and Mallapura villages were 112, 148 and 122/cc of soil, respectively. This population density is very high than the ETL (1 juvenile/cc of soil) and the field could be clearly declared as hot spot of root knot nematode, *Meloidogyne* spp.

R. Jagadeeswaran, Daya Srivastava* and Shantanu Kumar Dubey**
*KVK-II, Sitapur and ** ATARI, Kanpur

ADIEU

Name	Post held	Date of retirement
Dr. Mohan Singh	Principal Scientist (Microbiology)	30.11.2016

फतेहपुर जिले में किसान प्रथम परियोजना का कार्यान्वयन

प्रौद्योगिकी हस्तान्तरण

प्रसार गतिविधियाँ

उत्तर प्रदेश के फतेहपुर जिले में ग्रामीणों के भोजन, पोषण एवं जिविका सुरक्षा हेतु एकीकृत दृष्टिकोण विषय पर “किसान प्रथम परियोजना” का क्रियान्वयन फतेहपुर जिले के ब्लाक देवमई के तीन गाँवों कर्चलपुर, खरौन्नी एवं मिराई में किया गया है। वार्ता, भ्रमण, प्रक्षेत्र निरीक्षण के माध्यम से सर्वे किया गया और कृषकों की समस्याओं



को जाना गया। जानकारी प्राप्त हुई कि गुणवत्ता युक्त बीज उपलब्ध न हो पाने के कारण किसानों को गेहूँ, ज्वार, उर्द, मूँग, चना, अरहर आदि की उत्पादकता कम प्राप्त हो पा रही है। साथ ही यह भी ज्ञात हुआ कि किसानों को यह जानकारी नहीं हो पा रही है कि गुणवत्ता युक्त कहाँ से मिलते हैं, साथ ही उद्यान फसलों एवं पशुपालन के विषय में भी उनके पास आवश्यक जानकारी नहीं है। उनके पास कृषि उद्यम लगाने की भी कोई जानकारी नहीं है। फिलहाल इन गाँवों के 50 किसानों को सामान्य एवं देरी से बुवाई के लिए गेहूँ की प्रजातियों क्रमशः शताब्दी एवं उन्नत हलना (के 9423) का 20 कुन्तल प्रजनक बीज उपलब्ध कराया गया है।

भारतीय खाद्य निगम के गुणवत्ता आश्वासन प्रबन्धकों के लिए प्रशिक्षण

संस्थान में दिनांक 9 नवम्बर, 2016 को भारतीय खाद्य निगम के गुणवत्ता आश्वासन प्रबन्धकों एवं झारखण्ड से आए अधिकारियों के लिए एक दिवसीय प्रशिक्षण का आयोजन किया गया।

प्रतिभागियों को अरहर एवं उर्द के व्यावहारिक पहलुओं पर जानकारी दी गई। साथ



ही उन्हें बताया गया कि मण्डी से अनाज लेते समय गुणवत्ता मानकों को कैसे व्यवहार में लाना चाहिए। उन्हें सुरक्षित भण्डारण के विभिन्न पहलुओं से भी अवगत कराया गया।

संस्थान के प्रभारी निदेशक डॉ. आई.पी. सिंह ने अपने उद्बोधन में दलहनों के सुरक्षित भण्डारण के महत्व को विस्तार से समझाया। साथ ही बताया कि न्यूनतम समर्थन मूल्य में वृद्धि एवं सुनिश्चित क्रय नीति के चलते आने वाले समय में दलहन उत्पादन कई गुना बढ़ जाएगा। उन्होंने भारतीय खाद्य निगम को सुझाव दिया कि वे अपने भण्डारण के तरीकों में आवश्यक परिवर्तन लाएं जिससे दलहनों का लम्बे समय तक भण्डार किया जा सके। प्रशिक्षण में बताया गया कि दलहनों की विभिन्न प्रजातियों में क्या अंतर होता है जिसको

क्रय करते वक्त ध्यान में रखना आवश्यक है। साथ ही पूर्व एवं पश्च-भण्डारण प्रबन्धन सम्बन्धी आवश्यक पहलुओं, निगम एवं एगमार्ग द्वारा निर्धारित मानकों एवं भण्डारण के तरीकों की भी विस्तृत जानकारी दी गई। फसल उत्पादन विभाग के अध्यक्ष डॉ. एस. एस.

सिंह ने बताया कि दालों की गुणवत्ता पर प्रक्षेत्र स्तर से ध्यान दिया जाना आवश्यक होता है। साथ ही किसानों को क्रय एजेन्सीज के मानकों की जानकारी होना भी जरूरी है। डा. एस. के. चतुर्वेदी, प्रधान वैज्ञानिक ने दलहनी फसलों की विशिष्टताओं पर विस्तार से जानकारी उपलब्ध करायी। डॉ. पी.के. कटियार, प्रधान वैज्ञानिक एवं प्रभारी, बीज उत्पादन ने प्रशिक्षण में प्रतिभागियों को अशुद्ध, मिलावटी, कीटबाधित, घुन संक्रमित एवं अपरिपक्व अनाज की पहचान व्यावहारिक माध्यम से करवायी। डॉ. एस. के. सिंह, प्रधान वैज्ञानिक ने भण्डारण के दौरान लगने वाले कीटों की जानकारी दी। इंजी. प्रसून वर्मा ने भण्डारण के मानक तरीकों को समझाया। प्रशिक्षण का आयोजन डॉ. शिवाकांत सिंह एवं इंजी. प्रसून वर्मा द्वारा किया गया।

● जैव प्रौद्योगिकी विभाग, भारत सरकार द्वारा वित्त पोषित परियोजना जैव-ग्राम के अंतर्गत शाहजहाँपुर एवं चित्रकूट के दो कृषि विज्ञान केन्द्रों को चना, मटर एवं मसूर की कुल 26 प्रजातियों के बीज उपलब्ध कराए गए। मेरा गाँव-मेरा गौरव कार्यक्रम के अंतर्गत, उत्तर प्रदेश के फतेहपुर, कानपुर, महोबा एवं हमीरपुर जिले में मटर और चना के 5.0 हे. एवं मसूर के 1.0 हे. में अग्रिम पंक्ति प्रदर्शन लगाए गए। संस्थान द्वारा उत्तर प्रदेश के जालौन एवं कानपुर देहात में पंजीकृत बीज समिति के माध्यम से मटर एवं चना के क्रमशः 20.0 हे. एवं 9.50 हे. प्रक्षेत्र में, सहभागिता के आधार पर बीज उत्पादन का कार्यक्रम प्रारम्भ किया है।

● 17 अक्टूबर, 2016 को तमिलनाडू से आए 10 किसानों के लिए “दलहन उत्पादन प्रौद्योगिकी” विषय पर एक प्रशिक्षण कार्यक्रम का आयोजन किया गया।

● 5-7 दिसम्बर, 2016 को आत्मा योजना के अन्तर्गत पाकुड़, झारखंड से आए 21 किसानों के लिए “दलहन उत्पादन की उन्नत प्रौद्योगिकियाँ” विषय पर एक प्रशिक्षण कार्यक्रम का आयोजन किया गया।

● चन्द्रशेखर आजाद कृषि एवं प्रौद्योगिकी विश्वविद्यालय में दिनांक 3-6 अक्टूबर, 2016 को आयोजित किसान मेला में संस्थान ने सहभागिता की।

● 23-24 अक्टूबर, 2016 को गोरखपुर में आयोजित कृषि प्रदर्शनी एवं किसान गोष्ठी में संस्थान ने सहभागिता की। माननीय कृषि एवं किसान कल्याण मंत्री श्री राधा मोहन सिंह ने मेले का उद्घाटन किया। माननीय सांसद श्री योगी आदित्य नाथ, उप महानिदेशक (कृषि प्रसार), डॉ. ए.के. सिंह एवं डॉ. यू.एस. गौतम, निदेशक अटारी कानपुर ने प्रदर्शनी स्टाल का निरीक्षण किया।

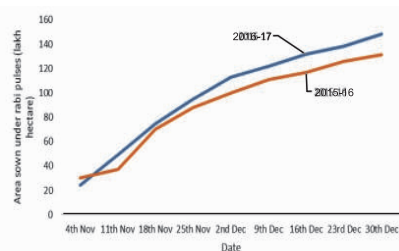
● 22-26 नवम्बर, 2016 को आई.ए.आर. आई., नई दिल्ली में आयोजित अंतर्राष्ट्रीय सस्य विज्ञान कांग्रेस की प्रदर्शनी में आई. आई.पी.आर. ने सहभागिता की।

● 28-30 नवम्बर, 2016 को मुजफ्फर नगर (उ.प्र.) में आयोजित कृषि कुम्भ में संस्थान ने सहभागिता की। मेले का उद्घाटन डॉ. संजीव बलियान, माननीय जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्री ने किया।

● 22 दिसम्बर, 2016 को अंतर्राष्ट्रीय दलहन वर्ष के समापन समारोह के मौके पर आगरा में संस्थान द्वारा प्रदर्शनी लगाई गई। उक्त अवसर पर माननीय कृषि एवं किसान कल्याण मंत्री ने, चना किसानों के लिए अत्यन्त उपयोगी “चना मित्र” मोबाइल एप का लोकार्पण किया।

दलहनी खेती का क्षेत्र बढ़ा

30 दिसम्बर, 2016 को कृषि एवं किसान कल्याण मंत्रालय द्वारा जारी किए गए नवीनतम आँकड़ों के अनुसार रबी सीजन में दलहनी खेती का कुल क्षेत्र 58.87 लाख हेक्टेयर रहा जो पिछले वर्ष की तुलना में 7% अधिक है। नोटबन्दी के बावजूद इस वर्ष पिछले वर्ष की तुलना में ज्यादा बड़े क्षेत्र में दलहनी फसलों की बुवाई की गई। इस वर्ष रबी सीजन में दलहनी फसलों की बुवाई 148.11 लाख हेक्टेयर में हुई जो कि पिछले वर्ष की तुलना में 13% अधिक रही। मटर की बुवाई का क्षेत्र 20%, मसूर का 19% और चना का 14% बढ़ा। दलहनी फसलों का उत्पादन करने वाले बड़े प्रदेशों में महाराष्ट्र में 6.93 लाख हे. की वृद्धि हुई। इसी तरह राजस्थान में 3.13 लाख हे., मध्य प्रदेश में 2.76 लाख हे., उत्तर प्रदेश में 0.70 लाख हे. तथा आन्ध्र प्रदेश में 0.66 लाख हे. क्षेत्र बढ़ा। यद्यपि कर्नाटक में 1.73 लाख हे. की कमी दर्ज की गयी।



Deputation Abroad



Dr. Aditya Pratap, Principal Scientist was deputed to visit Mozambique on November 14-17, 2016 as a part of Indian delegation for 'Establishment of pigeonpea seed production, training and demonstration centre' at Nampula.



Dr. N.P. Singh, Director was deputed to participate in the Foundation Day function of SAARC Agri. Centre, Dhaka and seminar on 'Celebrating the Pulses in SAARC Region' held on December 8-9, 2016 at Dhaka, Bangladesh. Besides country presentation by members, Dr. M.C. Saxena, Ex-ADG, ICARDA also participated in the programme.



Dr. G.P. Dixit, Project Coordinator (Chickpea) was deputed to participate in the 'JIRCAS International Symposium-2016 and Japan International Award for Young Agricultural Researchers-2016' held on December 1-2, 2016 at Tokyo, Japan.

Awards and Recognitions

Dr. Narendra Kumar, Principal Scientist has been awarded 'ISA Associateship 2013'



by Indian Society of Agronomy at '4th International Agronomy Congress' held on November 22-26, 2016 for his outstanding research contribution in the field of agronomy particularly cropping system, resource conservation and weed management.

Dr. R.K.Mishra, Senior Scientist was awarded first best poster award for his poster entitled "Cultural and pathogenic diversity of



Phytophthora dreschleri f. sp. *cajani* causing stem blight of pigeonpea" authored by R.K.Mishra, Naimuddin and Monika Mishra during National Symposium on 'Eco-friendly approaches for plant disease management: Recent trends and opportunities' held on December 29-30, 2016 at ICAR-IIPR, Kanpur

Dr. Sujayanand G.K., Scientist has been awarded Young Scientist Medal (Venus International Research Awards-2016) by Venus International



Foundation, Adambakam, Chennai on Annual Research Meet held on December 3, 2016 held at Chennai for his initiatives, discoveries and developments in the discipline of Agricultural Entomology. Justice S. K. Krishnan, Lokadalat, High Court of Madras awarded Young Scientist - VIRA 2016 in the presence of Dr. V. Ganesan, Former Associate Director, IGCAR, Kalpakkam.

Dr. Chandra Sekhar Praharaj, Principal Scientist has



been admitted as Fellow of Indian Society of Agronomy 2014 at the 4th International Agronomy Congress held on November 22-26, 2016 at New Delhi, for his outstanding contribution in the field of agronomy involving soil, water and crop management.

EDITORIAL COMMITTEE

Dr. N.P. Singh	Chairman
Dr. Krishna Kumar	Member
Dr. P.S. Basu	Member
Dr. Jitendra Kumar	Member
Dr. Naimuddin	Member
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Director's Desk

Dear Readers,

Seed is a vital component for harvesting good yields from any crop by way of ensuring optimum plant population, proper crop health and growth. In case of pulses, quality seed supply always remains a major production and productivity constraint. Seed is the basic and most critical input for sustainable pulse production in the country. The response of all other inputs depends on quality of seeds to a large extent. It is estimated that the direct contribution of quality seed of pulses alone to the total production is about 15–20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. Experts say that though seed production has increased threefold in the past several years, there still is a shortage of 50,000 tonnes of seeds. It is believed that only a decentralised model of seed production is suited for a country as large and climatically diverse as India.

The production of seeds needs greater attention from the public sector. Private companies are little interested in production of seeds for pulses crops as farmers can reproduce them on their own. The seed replacement ratio varies with states and crops. In Andhra Pradesh it is as high as 70% for chickpea, while the ideal is about 33%. The Indian Institute of Pulses Research along with its cooperating AICRP centres is playing crucial role in producing enough breeder seeds. The hitch is in multiplying them in enough quantities to meet farmers' demand. The breeder seed production has been very good. We have achieved more than 15,000 quintals of breeder seed production which is sufficient for pulses production in India for an area of 24 million hectares. But the subsequent conversion into foundation seed and certified seed, the commercial seed which goes to farmers, the conversion is not happening. If there is proper conversion then farmers can get quality seed which fetch a higher price than unprocessed *dal* but require producers to be diligent. Seed companies engage groups of farmers but if quality parameters are not met, the lot is rejected and the entire group

suffers. Shortage of quality seed continues to be major constraint in spread of new improved varieties/hybrids and realizing their yield potential. Production of seed is time consuming, cost intensive and risky under rainfed conditions in which pulses are grown. Seed production thus requires advance planning on



the part of States taking important factors into account such as increase in area under crop, varietal replacement contemplated, progressive replacement of seed in case of self/open pollinated varieties, area expansion under hybrids and promotion of the new varieties/hybrids.

Pulses are grown in about 24-25 million ha producing 17-18 million tonnes annually. To cover 30% of the pulses area under quality seeds there is need to produce 30-35 lakh quintals of quality seed annually. Recently, DAC&FW, Ministry of Agriculture and Farmers Welfare, Government of India has approved a project on 'Creation of seed hubs for increasing indigenous production of pulses in India' to establish 150 Seed-Hubs in 24 states of the country. This project is being implemented through ICAR-IIPR, Kanpur. Agricultural Technology Application Research Institutes (ATARIs) are collaborators for implementation of Seed-Hubs project. The profit generated out of seed sale can be utilized by Seed-Hub for development of other facilities to increase quality seed production of targeted pulses.

It is expected that within three years, all 150 Seed-Hubs will become self reliant and each centre will be producing 1000 quintals of quality seed of different pulses per year in a sustainable manner. Thus, total 150000 q quality seed of newly

released high yielding varieties of different pulses per year on sustainable basis is likely to ensure productivity and production increase of various pulses in India. As a backup, a small project on 'Additional breeder seed production' has been launched at 12 centres in 8 states viz., Bihar, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Odisha, Andhra Pradesh and Karnataka and National Seed Corporation, so that 5800 q additional breeder seed can be produced from 2018-19 and onward that will be available to Seed-Hubs for further multiplication to produce foundation seed and further conversion as certified seed. This will ensure availability of genetically pure seed for further multiplication and sowing at farmers' fields. With the kind of efforts made, country will be able to achieve 30% seed

replacement rate in pulses. A coordinating cell has been established at ICAR-Indian Institute of Pulses Research, Kanpur that will coordinate different activities relating to seed hubs and breeder seed production. It is also coordinating mobilization of basic seeds of selected varieties for multiplication at seed-Hubs.

To mitigate the pulse seed scarcity in the country, one vital and doable approach is sustainable supply of quality seed of high yielding varieties. By concentrating on quality seed production of pulses, pulse growing regions can mint money, leading not only to sustainable agriculture, but also the sustainable rural economy. To make agriculture sustainable, we must think of sustainable farm income and supply of quality seed of pulses can be a tool in doubling the income of farmers and employment opportunities in rural India.

With all these collective efforts, our aim is to increase pulses production in the country on the one hand, and on the other to improve the livelihood of the marginal and resource poor farmers. I am sure that in near future, these efforts will be translated in reality and will be visible to all and our country will be self reliant in pulses.

(N.P. Singh)