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PULSES Newsletter

Indian Institute of Pulses Research, Kanpur

INDIAN INSTITUTE OF PULSES RESEARCH
IIPR
भादअस

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CONTENTS

Group Meet on Mungbean and Urdbean for Spring, Summer and Rice Fallow Cultivation

The Annual Group Meet of AICRP on MULLaRP was held at ARS, Lam on October 18-19, 2012. About 30 delegates from SAUs and cooperating centres participated in the Group Meet. Dr. Y. Koteshwara Rao, Principal Scientist and I/C Pulses, RARS, Lam welcomed the august gathering and provided information on potentialities of rice fallow cultivation in Andhra Pradesh, particularly the Krishna District which recorded the highest productivity under such system. Dr. Sanjeev Gupta, Project Coordinator, MULLaRP presented the PC report and informed that it is the I[st] group meet for rice fallow cultivation and elaborated the importance of rice fallow areas in increasing pulse production of the country. He stressed upon use of extra early genotypes of mungbean in national crossing programme, exploratory trials in rice fallow areas and practicing resource conservation technology.

Dr. N. Nadarajan, Director IIPR applauded the newly launched efforts for improvement of rice fallow pulses. He stressed upon broadening the genetic base of mungbean and urdbean through distant hybridization and alien gene introgression, utilization of wild species and distant relatives; development of genomic tools for *Vigna* improvement, linkage map and suitable plant types for rice fallows; resistance to biotic and biotic stresses as well development of short duration cultivars which could escape terminal heat stress. This was followed by a special lecture by Dr. R. Satyanarayana who explained the history of development of varieties such as LBG 17, LBG 402, LBG 648 and LBG 645. He also emphasised upon plant type concept in mungbean and urdbean and stressed the need to work upon yellow mosaic disease.

In his remarks, the chief guest of the session, Dr. A. Raghvaiah, Director, RARS Lam informed that in Andhra Pradesh, during *rabi* season, 40 lakh ha area is under pulses cultivation out of which 45% area is under mungbean and urdbean. He emphasized upon the need of developing new cultivars suitable for special niches such as rice fallows and development of short duration genotypes. Later, the results of previous crop season were discussed and technical programmes for the next crop season were finalized.

IMC Meeting Held

The meeting of the Institute Management Committee was held on October 31, 2012 under the chairmanship of Dr. N. Nadarajan, Director. The meeting was attended by Dr. B.B. Singh, Assistant Director General (O&P), ICAR, Mr. L.S. Katiyar, Joint Director (Pulses), Directorate of Pulses, Lucknow, Dr. Bhagwan Singh, Director of Research, NDUA&T, Faizabad, Dr. Jyoti Kaul, Principal Scientist, DMR, New Delhi, Dr. Jitendra Kumar, Principal Scientist, IARI, New Delhi, Dr. A.K. Patra, Principal Scientist, IARI, New Delhi and Dr. V.V. Ramamoorthi, Principal Scientist, IARI, New Delhi, along with Project Coordinators (Chickpea and MULLaRP), Heads of Divisions, Administrative Officer and Finance & Accounts Officer.

At the outset, Dr. N. Nadarajan, Chairman extended a warm welcome to all the members and other participants. Dr. Nadarajan briefed the house about the progress made in research and various developmental activities since the last meeting. All the Heads of Divisions and Project Coordinators presented highlights of research achievements made during the period. The Committee reviewed different research and developmental activities and applauded the overall progress made by the Institute.

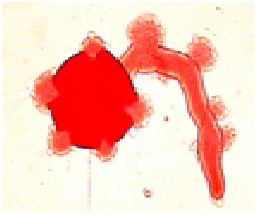
Institutional Bio-safety Committee Meeting Held

The newly constituted Institutional Bio-safety Committee (IBSC) meeting was held on December 10, 2012 at the Institute. The Committee comprises of Dr. N. Nadarajan, Director, IIPR (Chairman), Dr. Samir V. Sawant, Plant Molecular Biology and Genetic Engineering, NBRI, Lucknow (DBT Nominee-IBSC), Dr. K. Subramaniam, Department of Biological Sciences and Bioengineering, IIT, Kanpur (External Expert-IBSC), Dr. P.K. Singh, Bio-safety Officer, Department of Pathology, GSVM Medical College, Kanpur (IBSC), Dr. S.K. Chaturvedi, IIPR (Internal Expert-IBSC), Dr. K.R. Soren, IIPR (Internal Expert) and Dr. Alok Das, IIPR (Member Secretary). The Committee reviewed the arrangements made to deal with bio-safety issues. Committee also visited different laboratories and containment facilities. Member Secretary explained about the details of the safe disposal of experimental bio-waste by the Institute and apprised that the IIPR is following DBT Guidelines (Rules, 1989). For safe disposal of transgenic experimental waste IIPR Kanpur is registered with Medical Pollution Control Committee (MPCC), Kanpur.

Research Highlights

Screening Thermotolerance in Greengram

High temperature adversely affects photosynthesis and reproductive parts particularly pollen germination beyond 35-40ºC in greengram (*Vigna radiata* L.). Variations in protein profile and photosynthesis are being explored for screening thermotolerance in mungbean.



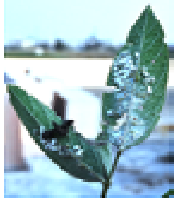
Abnormal pollen germination at 45ºC

Abnormal pollen germination with multiple tubes were observed at temperature exceeding 40^0 C. High temperature induces expression of few proteins (*i.e.*, heat shock proteins, HSPs) that provided cellular level thermostability in heat tolerant greengram genotype.

Shweta Gupta, Priyanka Porwal, Mudit Srivastava, Shivangi Singh, Rinki Devi, Jagdish Singh, Sanjeev Gupta and P.S. Basu

Heavy Infestation of *C. cajani* in Early Pigeonpea

Heavy infestation of *Ceroplastodes cajani* Maskell (Coccidae : Hemiptera) commonly known as mealy bug or soft scale was observed in early pigeonpea at IIPR main farm during October-November, 2012. Maximum infestation was recorded in var. Paras where almost all the plants were infested. Minimum infestation was recorded in Manak where only one plant was infested. Earlier, its infestation on 50% plants was reported in Tamil Nadu and Gujarat.



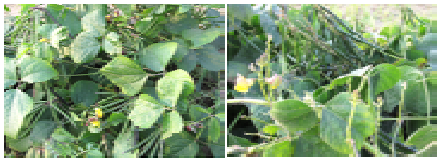
Hem Saxena, Shyam Kumar and S.D. Mohapatra

Congratulations

Dr. C. Chattopadhyay, Head, Division of Crop Protection was relieved from the Institute on 30.11.2012, to join as Director, National Centre for Integrated Pest Management, New Delhi.

Identification of Photo-thermo Insensitive Wild Accessions of *Vigna*

Two wild accessions of *Vigna viz., V. glabrescens* (IC 251372) and *V. umbellate* (IC 251442) have been identified as photo-thermo insensitive, which can be valuable resources for transferring this important trait into *Vigna* crops. Fifty four wild accessions of *Vigna* belonging to 16 species (8 accessions of *V. trilobata,* 7 of *V. umbellata,* 6 of *V. radiata* var. *radiata,* 5 of *V. mungo* var. *mungo,* 4 each *of V. mungo* var. *sylvestris* and *V. hainiana,* 3 of *V. radiata* var. *sublobata,* 2 each of *V. radiata, V. radiata* var. *setulosa* and *V. glabrescens,* 1 each



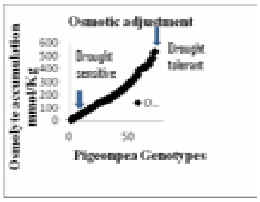
V. glabrescens (IC 251372) *V. umbellata* (IC 251442)

of *V. delzelliana, V. pilosa, V. trinernia, V. trinernia* var. *bournei, V. vexillata, V. unguiculata*) and 5 of unknown species were evaluated for photo-thermo insensitivity during 2010-12 under natural field conditions as well as in pots in green-house. All the accessions were observed for vital growth parameters and normal reproductive behavior during the entire growth period. After maturity, the plants were not harvested and allowed to senesce and die naturally. While most of the accessions died after completing their life cycle during *kharif* season itself, *V. glabrescence and V. umbellata* rejuvenated again and showed normal growth behavior during spring/summer as well as *rabi* seasons during all the three years. This was evidenced by normal flower and pod set while pollen viability studies also supported the results. More than 70% viable pollen and normal pollen tube formation were observed at temperatures as high as 42.4ºC during summer 2011 and as low as 6ºC during *rabi* 2012. Both, *V. glabrescens* and *V. umbellata* have semi-erect growth habit, indeterminate growth pattern and dark green leaves. *V. glabrescens* has yellow flowers, long and constricted pods and dark green, mottled, drum shaped seeds, while *V. umbellata* has light yellow flowers, smooth, curved and semi-flat pods, shiny, beige, oval and large seeds. Both the genotypes exhibited resistance against major diseases including Mungbean Yellow Mosaic India virus and powdery mildew, thus can be utilized in developing photo-thermo insensitive genotypes in *Vigna* crops including mungbean and urdbean.

Aditya Pratap[1], Joseph John K.[2] and P.S. Basu[1]
[1]Indian Institute of Pulses Research, Kanpur
[2]National Bureau of Plant Genetic Resources, Regional Station, Thrissur, Kerala

Enhancing Physiological Efficiency in Pigeonpea

Pigeonpea and chickpea have higher osmotic adjustment, high rooting vigour, higher osmotic adjustment (upto 1.4 MPa) that lead to better adaptation of these crops to drought and heat stress. Therefore, genetic variability available to these traits among germplasm can be exploited to enhance physiological efficiency against above stresses.



Among a number of germplasm accessions, wild accessions of pigeonpea which are rich source of drought tolerance genes, showed higher osmatic adjustment on the basis of osmotyle accumulation concentration.

Sadhna Yadav, Dibendu Datta, Jagdish Singh and P.S. Basu

Direct Antigen Coating (DAC)-ELISA for Detection of Cry1Ac δ-endotoxin in Transgenic Pigeonpea

A Direct Antigen Coating–Enzyme Linked Immuno Sorbent Assay (DAC-ELISA) technique was optimized for detection of Cry1Ac δ-endotoxin expressed in transgenic pigeonpea lines, using rabbit raised polyclonal antibodies. Leaf tissue from control and transgenic pigeonpea plants were homogenized in carbonate buffer (pH 9.6) containing additives like Triton X-100, PMSF, PVP, Tween-20 and sodium azide. The insoluble plant material was pelleted by centrifugation and the total soluble protein in supernatant solution was estimated by dye-binding assay (Bradford). Extraction buffer was used as blank and Cry1Ac protein as positive control. A 96-well microtitre plate was coated with isolated protein extract from control and transgenic plants and the plates were incubated in dark at 37°C for 2 hours and processed following standard ELISA methods (Harlow and Lane, 1999). The free binding sites were blocked with BSA in physiological saline containing Tween-20 (PBS-T buffer). Polyclonal antibody raised in rabbits challenged with purified Cry1Ac protein was added to wells and incubated for 2 hours at 37°C. Washing was done to remove unbound antibodies. Subsequently, alkaline phosphatase labeled goat anti-rabbit-IgG was added to the sample wells. The phosphatase activity was measured using pNPP as substrate. The reaction was terminated by adding H_2SO_4 and the plate was read in ELISA plate reader at 405nm. The average of the OD_{405} was calculated and the sample with OD > (Negative Control + 0.1) were recorded as positive for Cry1Ac.

Alok Das, Manoj Patel, Manoj Yadav and Nandeesha P.

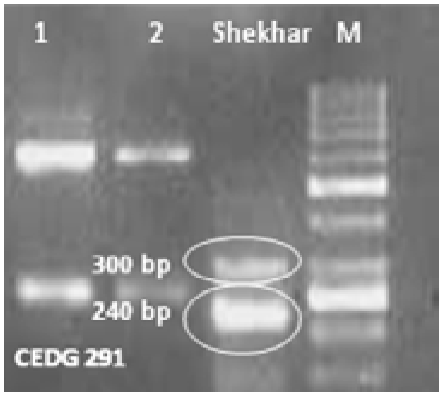
Suitability of Crop Wastes and Organic Substrates for Multiplication of *T. Harzianum*

Trichoderma as a bio-agent has opened a new avenue for management of different diseases in field crops *vis-a-vis* pulses. However its large scale application in pathogen infested sick fields requires its multiplication at cheaper cost. Eight organic substrates *viz.,* sorghum grain, chickpea straw, pigeonpea straw, sugarcane bagasse (after juice extraction), whole neem seed, cow dung (dried), farm yard manure and goat dung were evaluated *in-vitro* for their potentiality to multiply *Trichoderma harzianum* strain IPT 31. Among these, sugarcane bagasse showed best growth (11.0 cm), followed by chickpea and pigeonpea straw, sorghum grain and neem seed (7.0 cm) on the basis of length of column in the test tubes colonized by *Trichoderma* at 72 h. Observations on the survival of *Trichoderma* strain on these substrates (cfu/g dry substrate) after six months of inoculation showed 3.3-8.3x 10^{10} cfu/g powder.

Shubha Trivedi, Neetu Trivedi and R.G. Chaudhary

Development of Diagnostic Marker in Urdbean

Thirty seven urdbean germplasm accessions comprising of released varieties, landraces and other collections were screened by using 51 SSR markers for developing DNA diagnostic marker. Eighteen SSR markers showed polymorphism. Among these, two markers (CEDG 291 and CEDG 304) were genotype specific. CEDG 291 produced two unique bands of 240bp and 300bp, whereas CEDG 304 amplified 750 bp fragment specific only to Shekhar 2. These genotype specific markers can be used to identify admixture.



Genotype specific amplification profile in urdbean genotypes with SSR markers

K.R. Soren, G. Pandey and S. Datta

Manually Operated No-Till Drill Developed for Rice-fallow Condition

For small farmers a manually operated No-Till Drill has been developed at IIPR, Kanpur. By use of this no-till drill, the line sowing is done timely at a reduced cost and at proper

depth without any residue clogging under rice fallow conditions. It requires low pulling force due to double disc opener fitted with rolling coulter and hence, less drudgery as compared to existing inverted 'T' type no-till drill. It has field capacity of 0.05 ha/h with the help of two manpower and is expected to be used for working on 20 ha per year. The cost of operating manual zero-till drill is Rs.925/ha.

M. K. Singh, Narendra Kumar and Prasoon Verma

Simple and Low Cost Traps for Management of Whitefly in Mungbean and Urdbean

Whitefly, *Bemisia tabaci* Gennadius is an efficient vector of mungbean yellow mosaic virus and hence, its control can be helpful to manage the MYMV. This insect vector easily gets attract to yellow colour. Therefore, a cheap and commonly available yellow polyethylene film of 2'x1' size was test verified as yellow sticky traps at National Pulses Research Centre, Vamban during 2011-12. It was tied with 2 wooden poles at both the ends and installed in the field just above the crop canopy after 15 days of sowing. After installation, sticky fluid *viz*., castor oil was smeared over the polythene sheets on both sides and it was repeated once in a week. The traps were kept @ 12 no./ha in mungbean seed production plots during *rabi* 2011-12 and *kharif* 2012. On average, 7.0-26.1 whiteflies per trap were recorded during *rabi* 2011-12, while 61.5–284.3 whiteflies per trap were caught during *kharif* 2012. The maximum adult population of whitefly was recorded during February in *rabi* and during 1st week of August, 2012 in *kharif*. The cost of each trap was estimated at Rs. 15/- and thus only Rs.180/- will be required for installing 12 traps in one hectare. These simple and low cost traps can control effectively the sucking pests *viz*., whitefly and thrips in mungbean and urdbean crops.

Soundararajan, R.P., Dinakaran, D., Chitra, N. and Geetha, S.
National Pulses Research Centre
Vamban, Tamil Nadu

Secondary Infestation of Khapra Beetle in Stored Pulses

Khapra beetle, *Trogoderma granarium* (Dermestidae, Coleoptera) infestation was observed on the stored pulses damaged by the bruchids (*Callosobruchus* spp.). It preferred *kabuli* chickpea as compared to other major pulses. The adult beetle is small sized (2-4 mm), oval shaped and reddish brown in colour. The adult lays eggs on the seeds and the larvae feeds by surface scratching and devouring grain into frass. Many larvae found inside the bruchid damaged *kabuli* chickpea feed on the entire grain contents leaving only the shell behind. Due to excessive moults, the seeds and stored bags are contaminated with larval skin. Pupation occurs on the surface of grain or inside grain and also in storage bags. Regular monitoring of stored pulses and removal of bruchid infested grains prevents the attack of khapra beetle in pulse crops and its multiplication.

Khapra Beetle damaged chickpea grains

P. Duraimurugan and C. Chattopadhyay***
Indian Institute of Pulses Research, Kanpur
**Present address: Directorate of Oilseeds Research, Hyderabad*
***Present address: Director, NCIPM, New Delhi*

Behaviour of Adult *M. Pustulata* and Indication of Aggregation Pheromone

Blister beetle (*Mylabris pustulata*) is one of the major insect pests of pulse crops. The adult beetles cause damage of all stage flowers. A single beetle can destroy as many as 20-30 flowers a day. Management of the blister beetle is very difficult due to wandering behavior, ineffectiveness of the insecticide and problem in mechanical collection. Hence, the behaviour of the beetle was studied during *kharif* season in order to manage the pest through semio-chemicals. The study showed that both sexes of beetles aggregate in huge number (40-50 beetles) near the field for mating on barbed wires or in the trees of *Hibiscus rosasinensis* or *Mimosa* during dusk (5–7 pm). It indicates the presence of aggregation pheromone in *Mylabris pustulata,* which results in the arrival of both sexes at a calling site for mating. Further studies are required to identify and exploit the pheromone for monitoring and management of the blister beetle in pulse crops.

Aggregation of both sexes of the blister beetle for mating

P. Duraimurugan
Indian Institute of Pulses Research, Kanpur
Present address: Directorate of Oilseeds Research, Hyderabad

Post-emergence Herbicide for *Kharif* and Summer Pulses

Kharif season pulses are infested with weeds of more diverse and robust nature depending on frequency and intensity of rainfall and soil factor. The major weed flora in pulses during *kharif* season include *Digera arvensis, Commelina benghalensis, Trianthema monogyna, Euphobia hirta* (non-grasses), *Digitaria sanguinalis, Panicum sp., Echinocloa colonum, Dactyloctenium aegypticum, Eleusine India* (grasses) *and Cyperus rotundus* (sedges) and during summer season are *Amaranthus viridis, Portlaca quadrifida, Trianthema monogyna* (non-grasses), *Setaria glauca, Eleusine indica, Digitaria sanguinalis* (grasses) and *Cyperus rotundus* (sedges). Evaluation of several herbicides against these weeds since 2008 led to identification of Imazethapyr as an effective post-emergance herbicide against major weeds species associated with *kharif* and summer pulses like pigeonpea, mungbean and urdbean. Imazethapyr @ 100 g/ha during *kharif* and 80 g/ha during spring/summer applied at 20-25 DAS can control all types of weeds including suppression of *Cyperus rotundus* (80-90% WCE).

Imazethapyr @ 100 g/ha in mungbean

Narendra Kumar and K.K. Hazra

Online Database and Information Retrieval System for AICRP on MULLaRP

Online database and information retrieval system for AICRP on MULLaRP has been developed with an aim to reduce the time and cost on collection, compilation, data analysis, retrieval and report generation. At the first instance, efforts were made to use plant breeding data as it covers more than 60% of total trials. The system has been developed using ASP.NET with C# as the front-end coding and SQL server 2005 as database development. This system has three basic functional modules *viz.*, Data Entry & Submission, Data Analysis and Report Generation. The system generates quick and accurate reports which provide ranking of varieties based on particular trial in a specific zone for average yield performance and other related characters independently. The

system is designed to be user friendly and is completely menu-driven with options for assigning login IDs and Passwords for centre in-charges and reporting scientists. It can be accessed efficiently through URL: www.aicrpmullarp.res.in.

Devraj, G.P. Dixit, P.K. Katiyar and Sanjeev Gupta

Integrated Management of Fungal Foliar Diseases of Mungbean

The integrated management of fungal foliar diseases of mungbean variety Narendra Mung 1 indicated that seed treatment with carbendazim (1g/kg) followed by two foliar sprays of the same fungicide (0.05%) at 30 and 45 DAS significantly reduced cercospora leaf spot, anthracnose and powdery mildew diseases and increased the

grain yield (923 kg/ha) as against 405 kg/ha in control. Seed treatment and 2 foliar sprays of *Trichoderma* strain IPT 10 (@ 10^9 spores/ml) though resulted in increased grain yield by about 50%, but the decrease in diseases individually was not significant. Possibly, the increase in yield was achieved as accumulative reduction of all three diseases together.

R.G. Chaudhary, Naimuddin, Shrawan Kumar and Neetu Trivedi

Visit Abroad

Dr. Muraleedhar Aski, Scientist (Crop Improvement) was deputed to attend Generation Challenge Programme (GCP) sponsored Integrated Breeding-Multiyear Course-1(IB-MYC-1) training programme held in The Netherlands during 15-27 October, 2012. This training was jointly conducted by the Waganingen University and Research Center (WUR) and Generation Challenge Programme (GCP) faculty from Mexico.

Honour & Awards

Dr. Narendra Kumar, Sr. Scientist (Agronomy) was honoured with Dr. P.S. Deshmukh Young Agronomist Award 2009 by Indian Society of Agronomy at 3rd International Agronomy Congress held at IARI, New Delhi during 26-30 November, 2012.

Dr . C.S. Praharaj, Principal Scientist (Agronomy) was honoured with Best Paper Award 2010 by Indian Society of Agronomy at 3rd International Agronomy Congress held at IARI, New Delhi during 26-30 November, 2012 for his work on "Low cost drip irrigation".

Personnel

Appointments

Name	Post	Date of joining
Dr. Sujayanand G.K.	Scientist (Entomology)	8.10.2012
Mr. Anand Kumar	T-3	20.10.2012
Mr. Ravi Ranjan	T-1	10.12.2012

Transfers

Name	Post	From	To	Date of relieving
Dr. S.D. Mohapatra	Sr. Scientist	IIPR, Kanpur	CRRI, Cuttack	19.11.2012
Mr. Sanjay Kumar	T-3	IIPR, Kanpur	IIVR, Varanasi	30.11.2012

Retirement

Mr. Rajendra Singh, Administrative Officer retired on superannuation on 30.11.2012.

प्रौद्योगिकी हस्तांतरण

मॉडल प्रशिक्षण कोर्स का आयोजन

संस्थान में 18-25 नवम्बर, 2012 को कृषि एवं सहकारिता विभाग, कृषि मंत्रालय, नई दिल्ली द्वारा वित्तपोषित ''दलहनी फसलों के लिए उन्नत प्रौद्योगिकी पैकेज'' विषय पर आठ दिवसीय मॉडल प्रशिक्षण कोर्स का आयोजन किया गया। प्रशिक्षण के आयोजन का मुख्य उद्देश्य प्रसार कार्य से जुड़े लोगों की व्यावसायिक दक्षता को बढ़ाना था। डा. ना. नडराजन, निदेशक ने इस बात पर बल दिया कि क्षेत्र/राज्य विशेष में उत्पादकता के वांछित स्तर को प्राप्त करने के लिए, कृषि पारिस्थितिकी पर आधारित दलहनी फसलों की संस्तुत प्रौद्योगिकियों को प्रचलित किया जाए। प्रशिक्षण कार्यक्रम में संस्थान के वैज्ञानिकों द्वारा वार्ता पर आधारित कुल 26 व्याख्यान दिए गए जिनमें प्रजाति सुधार, फसल उत्पादन, सुरक्षा, कटाई-उपरान्त प्रबन्धन जैसे महत्वपूर्ण पहलुओं पर जानकारी प्रदान की गई। कानपुर देहात के बाढ़ापुर ग्राम के किसानों के लाभ हेतु संस्थान द्वारा चलाई जा रही परियोजनाओं के प्रभावों को प्रदर्शित करने हेतु प्रक्षेत्र भ्रमण कराया गया। प्रतिभागियों को संस्थान की प्रयोगशालाओं, बीज उत्पादन एवं शोध प्रक्षेत्रों का भी भ्रमण कराया गया। इस कार्यक्रम में मध्य प्रदेश, गुजरात, महाराष्ट्र, कर्नाटक, राजस्थान, हरियाणा, आन्ध्र प्रदेश, छत्तीसगढ़ एवं उत्तर प्रदेश से आये हुए संयुक्त निदेशक, उपनिदेशक, सहायक निदेशक, उपमण्डलीय कृषि प्रसार कार्यकर्ताओं समेत 16 प्रतिभागियों ने भाग लिया। डा. एस.के. सिंह इस प्रशिक्षण कार्यक्रम के कोर्स निदेशक थे।

कृषकों के लिए प्रशिक्षण कार्यक्रमों का आयोजन

- संस्थान में 4-6 अक्टूबर, 2012 को ''रबी दलहनी फसलों की उत्पादन प्रौद्योगिकी'' विषय पर एक प्रशिक्षण कार्यक्रम का आयोजन किया गया। प्रशिक्षण के दौरान वार्ता पर आधारित व्याख्यान दिए गए। साथ ही प्रक्षेत्रों का भ्रमण भी कराया गया। आत्मा (एटीएमए) योजना के अंतर्गत, उत्तर प्रदेश के फतेहपुर जिले के 13 ब्लाकों से आए कुल 21 कृषकों ने इस प्रशिक्षण कार्यक्रम में भाग लिया। प्रत्येक प्रतिभागी को संस्थान द्वारा प्रकाशित साहित्य की प्रतियाँ भी उपलब्ध करायी गई।
- ''उन्नत दलहन उत्पादन प्रौद्योगिकी पैकेज'' विषय पर 9-11 अक्टूबर, 2012 को संस्थान में तीन दिवसीय एक अन्य प्रशिक्षण कार्यक्रम का आयोजन किया गया। यह प्रशिक्षण कार्यक्रम, झारखंड के कोडरमा जिले की कृषि प्रौद्योगिकी प्रबन्धन एजेन्सी द्वारा प्रायोजित किया गया। प्रशिक्षण के दौरान वार्ता के माध्यम से कृषकों को प्रजाति सुधार, उत्पादन, सुरक्षा, कटाई-उपरान्त प्रबन्धन जैसे महत्वपूर्ण पहलूओं पर जानकारी दी गई। प्रशिक्षुओं को संस्थान द्वारा प्रकाशित साहित्य भी उपलब्ध कराया गया। इस आयोजन में झारखंड के कोडरमा जिले से आए 18 कृषकों ने भाग लिया।

आई.आई.पी.आर. स्टॉल को प्रथम पुरस्कार मिला

दिनाँक 3-6 अक्टूबर, 2012 को चन्द्रशेखर आजाद कृषि एवं प्रौद्योगिकी विश्वविद्यालय, कानपुर में आयोजित अखिल भारतीय कृषि मेला एवं कृषि उद्योग प्रर्दशनी में संस्थान ने सहभागिता की। इस कार्यक्रम में प्रजाति विकास, फसल उत्पादन, सुरक्षा, कटाई-उपरान्त प्रबन्धन सम्बन्धी एवं क्षेत्र विशेष की विशिष्ट प्रौद्योगिकी का प्रदर्शन किया गया। संस्थान द्वारा विकसित मिनी दाल मिल

आगन्तुकों के आकर्षक का केन्द्र थी। संस्थान के स्टॉल का भ्रमण शोधकर्ताओं, विकास से जुड़े कार्मिक, छात्रों, गैर सरकारी संगठनों व्यापारियों तथा किसानों द्वारा किया गया। माननीय कृषि मन्त्री, उत्तर प्रदेश सरकार ने चन्द्रशेखर आजाद कृषि एवं प्रौद्योगिकी विश्वविद्यालय के कुलपति के साथ संस्थान के स्टॉल का निरीक्षण किया। सभी सरकारी स्टालों में संस्थान के स्टॉल को प्रथम पुरस्कार मिला।

सहभागी कार्यक्रमों का आयोजन

क्र.सं.	कार्यक्रम	सहभागी संस्थान/विभाग	दिनांक	प्रतिभागियों की संख्या
1.	प्रशिक्षण	राजकीय बीज निगम	30-10-2012 एवं 29-11-2012	34 और 23
2.	राज्यस्तरीय कृषक बैठक	यू.पी.डी.ए.एस.पी., कृषि विभाग, लखनऊ	27-11-2012	75

Director's Desk

Dear Readers,

Pulses are very important in Indian agriculture both in terms of enriching soil health and nutritional security of country's ever growing population. Pulses being predominantly rainfed crop with multiple constraints and limiting factors in its growing environment, the increase in the productivity had remained a major challenge for several decades. Recently, different mechanisms have been suggested to enhance pulse production in the country both vertically and horizontally. Expansion of pulses in new niches such as rice fallows, introducing mechanization to reduce cost of cultivation and minimizing the post-harvest losses are some of the potential methods to enhance pulse production. Mechanization has been well received by the world over as one of the important elements of modernization of agriculture. It is now recognized that availability of mechanical power and improved equipments has enabled many developed countries in the world to achieve high levels of productivity. Farm mechanization has become important in the light of rising labour costs after the introduction of the national rural employment guarantee scheme by the government of India. Farm mechanization not only reduces the time spent on "back-breaking" jobs like rice planting, but also cuts down losses. The era of farm mechanization has started in India and the next decade will witness significant growth in the area.

Mechanization in pulses will help timely field preparation, add to the efficiency of the farmers in performing various field operations and economize upon the cost of cultivation. Use of animal or tractor drawn seed drill for pulses enables farmers to cover large areas in a short period very economically. Besides, seed drill sowing leads to uniform crop stand and row spacing which facilitates interculture operations. Similarly, tractor drawn rotavator pulverizes the soil, chops and mixes crop residues in the soil to increase the organic matter in the soil and thus improves the soil fertility.

With a view to facilitating the pulse growers with modernised agricultural practices, the National Pulses Research Centre, Vamban introduced a combined mechanised harvester. The harvester, not only separates the grains but also avoids the conventional manual thrashing process, thereby eliminating a good part of labour normally required for harvesting the crop. Costing Rs. 15 lakh, the machine saves both time and expenditure for the pulse growers. This machine can harvest an acre within an hour. The cost of harvest would be reduced to a great extent, as the harvester avoids the conventional mode of labour-intensive process. The harvester would be available to farmers on a nominal rental tariff to be fixed shortly.

Line sowing of pulses in combine harvested rice fields with uniform spreading of residue by mounting a device at the rear of combined mechanized harvester is one possibility for better crop establishment under rice fallow. To achieve simultaneous sowing of pulses and harvesting of rice in single operation, suitable attachment to existing rice harvester should be developed. Mobile sprinkler in combination with residue management is one of the options to mitigate terminal drought. A low cost no-till seed drill has been fabricated at IIPR, Kanpur for rice fallow which needs to be popularized.

Under precision mechanized farming, Laser leveler has great role for land preparation enabling uniform moisture distribution and thereby maintain optimum plant population and saving irrigation water. Under NFSM, Government of India organized 60,000 pulses and oilseeds villages in rain fed areas. Under this scheme, tractors, rotavator, ridge and furrow planter and sprinkler irrigation sets were supplied to the farmers on 100% subsidy basis. Besides seeds, fertilizers and other inputs, supply of these farm machineries impacted significantly towards increasing additional pulse production to the tune of 2-3 million tonnes.

Presently, breeding strategies are being evolved at IIPR, Kanpur to develop tall, erect and lodging resistant chickpea varieties for mechanical harvesting and semi-dwarf pigeonpea for mechanized plant protection measures. In view of increasing the pulse production, country's manufacturing companies and researchers need to develop energy-efficient machinery appropriate to Indian cultivation methods and make those accessible to small scale farmers.

(N. Nadarajan)

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