2016 INTERNATIONAL YEAR OF PULSES

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Group Meet on MULLaRP and Arid Legumes Held

Annual Group Meet of AICRP on MULLaRP (Mungbean and urdbean) and Arid Legumes (Cowpea and guar) was held at IIPR, Kanpur on November 28-29, 2015. About 70 delegates from SAUs and cooperating centres participated in the Group Meet. Dr. N.P. Singh, Director, IIPR in his welcome address expressed happiness over promotion of pulses in new niches specially in spring, summer and rice-fallow conditions and specifically mentioned the success of short duration varieties of mungbean occupying large niches in the country. Expressing concern on low pulse production during last year, he called upon the scientists to exert more for development of new technologies to reduce the gap between potential and harvested yield. Dr. A.K. Tiwari, Director, Pulses Development, Bhopal advocated cultivation of summer mungbean and urdbean, which has got momentum in last 5-7 years using short duration varieties and technologies for summer season. Dr. Tiwari raised high hope for cultivation of cowpea and desired that its potential should be fully exploited.

Dr. Sanjeev Gupta, Project Coordinator, MULLaRP projected tremendous scope of horizontal and vertical increase in production of mungbean and urdbean and specifically increasing production and productivity of rice fallow pulses. He highlighted various varieties and technologies developed during last three decades and their contribution in promoting summer mungbean and urdbean. Describing the success of distant hybridization programme in *Vigna* species he emphasized upon development of short duration, machine harvestable varieties having multiple resistance to diseases and insect pests. He also presented the summary of progress of summer/spring mungbean and urdbean during last season. Dr. Shiv Sewak, Nodal Officer, Network Research Project on Arid Legumes, presented the summary of progress in arid legumes during the last spring/summer seasons.

Dr. B.B. Singh, Assistant Director General (O&P) in his chairman's remarks desired that early duration

varieties are the need of the hour and special trials should be conducted for extra early genotypes across the locations. He observed that very good material is coming from distant hybridization programme. He also exhorted that other short duration pulses such as cowpea should also be promoted for increasing area under pulses, while newer areas under rice fallow should be brought under mungbean and urdbean cultivation. Later, results of previous season were discussed and technical programme for the next season was finalized.

World Soil Day Celebrated

World Soil Day was celebrated at the Institute on December 5, 2015. Shri Devendra Singh Bhole, Hon'ble Member of Parliamant, Akabarpur Parliamentary Constituency, Uttar Pradesh was the Chief Guest for the function. Around 250 farmers from 7 districts of Uttar Pradesh, besides staff members of the Institute including scientists, technical, and administrative staff and others participated in the function. Dr. Ummed Singh, Nodal Officer for development of soil health card highlighted the importance of World Soil Day and Soil Health Cards. While welcoming the Chief Guest and participants, Dr. N.P. Singh, Director, stressed upon the need for large scale soil/plant testing and development of soil health card (SHC) so as to provide a requisite boost to both production and productivity of staple crops including pulses. In this direction, he called for large scale adoption of balanced and integrated nutrient management, enhancing efficiency of fertilizer use, and use of soil health cards for managing both soil and crops efficiently.

The Chief Guest Shri Devendra Singh Bhole in his special remarks, said that farmers are the soul of a nation and urged the need to make the farmers self-sustained and self sufficient. He said that agriculture still continues as a major livelihood to a significant portion of population in the country. Shri Bhole suggested that during lean season or vacation time (May-June), the village school can act as hub for such noble activity *viz.*, development of Soil Health Cards at village level itself. He promised to extend all his support and cooperation for soil health improvement programme. Total 311 SHC were prepared for distribution to farmers. The meeting ended with a vote of thanks by Dr. S.K. Singh, Principal Scientist, Social Science.

Biosafety Workshop Organized

An Awareness Workshop on Biosafety Regulations and Issues was organized at ICAR-Indian Institute of Pulses Research, Kanpur, on November 9, 2015, under the chairmanship of Dr. N. P. Singh, Director and Chairman, Institutional Biosafety Committee. The awareness workshop was conducted to create awareness among the staff working in different Projects of the Institute on biosafety regulations and issues and good laboratory practices.

Training for FCI Officials

Training on 'Pulses grain quality and processing' for Food Corporation of India personnel from Uttar Pradesh was organised on December 7, 2015. Total 66 officials of different ranks like AGM (QC), Manager (QC) and Technical Staff participated in this programme. In his inaugural address Dr. N.P. Singh, Director IIPR highlighted the advances made in pulses production in India as well as the need of procurement of pulses in country in view of recent price rise. The training covered different aspects like pulses production technology, grain quality (physical), diseases and pests management in storage, and pulses processing and marketing. Dr. Narendra Kumar coordinated the training programme.

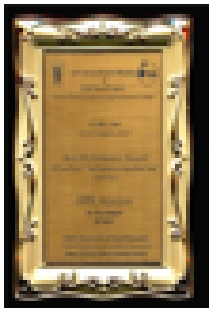
Training on Seed Production Organized

To improve the capabilities and abridge the knowledge gap of the farmers, a training on 'Farmers participatory seed production techniques in *rabi* pulses' under the aegis of Mega Seed Project was organized on December 17, 2015 for 100 farmers of Fatehpur district of Uttar Pradesh. Technological aspects *viz*., suitable varieties for different agroclimatic regions, production, protection and various field and seed standards required in quality seed production were covered with practical orientations along with seed storage and registration for quality seed with certification agency. Field visit was

organized to show the seed production techniques and relevant literature was also given to the farmers.

IIPR Awarded

ICAR-IIPR has bagged the Best Performance Award in Breeder Seed Production (ICAR Institute category) for the year 2014-15 during 10th Annual Review Meeting of ICAR Seed Project, "Seed Production in Agricultural Crops" held on 24-25 August, 2015 at ICAR-Central Costal Agricultural Research Institute, Goa.



Research Highlights

New Varieties

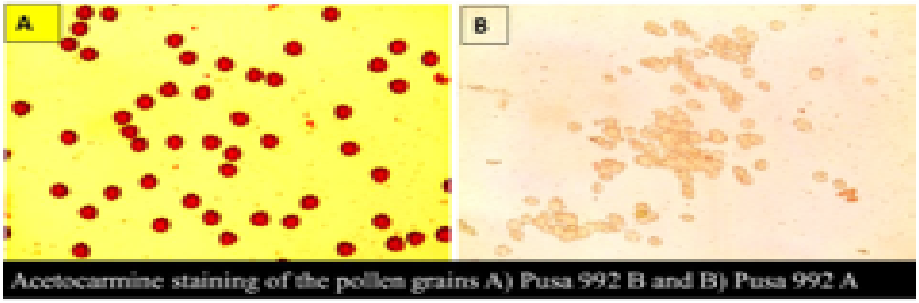
IPM 410-3: This mungbean variety developed from the cross IPM 3-1 x NM1 has been identified for spring cultivation in Punjab, Haryana, western U.P., Delhi, northern Rajasthan, Himachal Pradesh and Uttarakhand in

NWPZ and M.P., Chhattisgarh, Maharashtra and southern Rajasthan in CZ. It has given average yield of 1197 kg/ha in NWPZ and 1171 kg/ha in CZ.

SML 1115 : This summer mungbean variety developed from the cross SML 134 x SML 715 has been identified for cultivation in Tripura, Manipur and Mizoram. It has given average yield of 1105 kg/ha.

Novel A-Lines in CGMS Breeding in Pigeonpea

Three novel A-lines (Pusa 992A, ICP 88039A and DPP 3-2A) were developed using GT 288A as donor possessing A_2 cytoplasm (A_2: *Cajanus scarabaeoides*). Completely sterile nature of these three lines was evidenced by various staining techniques including *acetocarmine*, triphenyl tetrazolium chloride (TTC) and iodine-potassium iodide along with visual inspection of the anther/pollen load. The stained pollen grains represented fertile pollen grains, while the pollen grains from male sterile lines remained unstained/poorly stained. Further, these lines were crossed with potential restorers and five early maturing genotypes *viz*., AL 15, ICPL 7148, AL 201, Pusa 2002-2 and MN 5 to test the availability of a definitive restoration system for these lines. Few potential restorers failed to impart fertility (like 261354 R), while others showed adequate fertility restoration (≥95%: 261322 R and 250189 R). By contrast, no fertile plant was observed in F_1 progenies derived from the cross 'A-line × variety'. At the same time, the later can be considered as promising candidates for developing new A-lines.

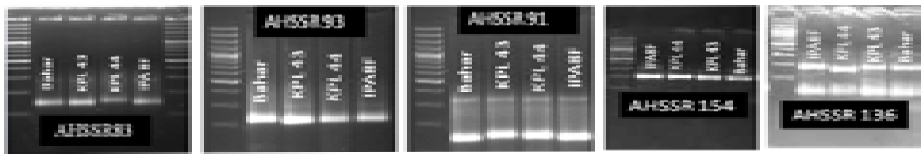


Acetocarmine staining of the pollen grains A) Pusa 992 B and B) Pusa 992 A

Abhishek Bohra, Rintu Jha, I.P. Singh, P.S. Basu, S.K. Chaturvedi and N.P. Singh

Maping Gene(s)/QTL(s) for Fertility Restoration and Wilt

One F_2 population (Type 7×ICP 8863) was preliminarily screened for reaction against *Fusarium* wilt (*F. udum* variant 2). Out of 200 individuals screened, 140 manifested susceptible reaction, whereas 60 plants showed resistance against the pathogen. Chi-square analysis (χ2 value: 2.66; df=1) supports the view that pigeonpea susceptibility to *Fusarium* wilt is dominant monogenic in nature. Besides, F_1s derived from crosses *viz.*, Bahar × IPA 8F, Bahar × KPL 44 and Bahar × KPL 43 have been grown this year to generate additional F_2 populations for mapping purpose.



SSR screening of the parental genotypes

Genomic DNA was extracted from parents (Bahar, IPA 8F, KPL 44, KPL 43) and their F_1s. A set of 100 SSR markers was screened for polymorphism among these parental genotypes. Nine SSR markers *viz.*, AHSSR 59, AHSSR 67, AHSSR 86, AHSSR 134, AHSSR 153, AHSSR 156, AHSSR160, AHSSR 164 and AHSSR 165 provided polymorphic amplicons between the mapping parents.

In parallel, attempts are being made to map fertility restoration locus (*Rf*) that contributes to rescue A_2 CMS in pigeonpea. To serve the purpose, an F_2 mapping population (PA 163 A × 261322 R) is being analyzed with polymorphic SSR markers.

Abhishek Bohra, R.K. Mishra, Prem Kumar A., P.G. Patil, Shalini, K.R. Soren, F. Singh, S.K. Chaturvedi and N.P. Singh

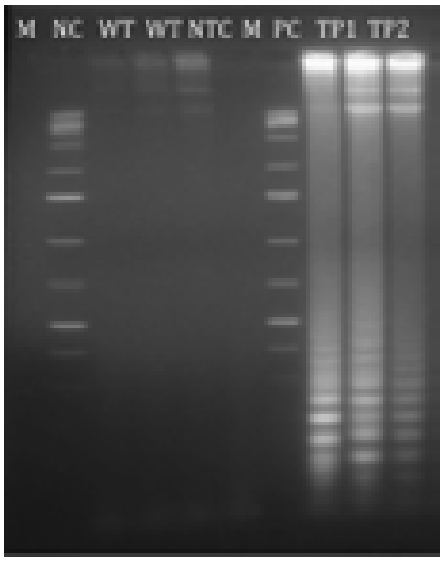
Iron Deficiency in Fieldpea

An experiment conducted at ICAR-IIPR (Sandy loam, Inceptisol), showed iron chlorosis (in young leaves) of some segregants in F_2 population of the cross IPF 13-14 x EC 502159. Fe analysis of affected leaves showed 68.4 mg/kg, which is below the critical limit (76 mg/kg) at 25 days after sowing. Contrary to this, Fe content in other segregants having no chlorosis, varied from 126.8-138.6 mg/kg. The results indicated the need of investigation to know the exact mechanism of iron chlorosis that could be useful in development of tolerant cultivars. At the initial stage, the productivity of fieldpea could be improved either through ameliorating high pH or application of iron containing fertilizers, but its management at a later stage may not be economically feasible.

A.K.Parihar, G.P.Dixit, S.K.Chaturvedi and Ummed Singh

LAMP Assay for Detection of Transgene

Loop mediated Isothermal Amplification (LAMP) assay was standardized for detection of *Bt* gene in transgenic pigeonpea lines. Target gene could be amplified at 55°C using primers developed from 6 distinct regions of the target gene. Amplificated product is determined by using photometry. Photometry based detection works on changes in turbidity caused by increasing quantity of magnesium pyrophosphate precipitate in solution as a by product of amplification. The optimized rapid LAMP protocol, less sensitive to PCR inhibitors, can be routinely used for transgene detection, avoiding long end-point PCR.



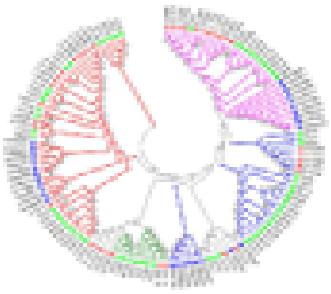
Standardization of LAMP assay in transgenic pigeonpea lines

M: 1Kb plus ladder; NC: Negative Control; WT: Wild Type; NTC: No Template Control; PC: Positive Control; TP1& TP2: T_6 Transgenic pigeonpea lines

Shallu Thakur, Alok Das and N.P. Singh

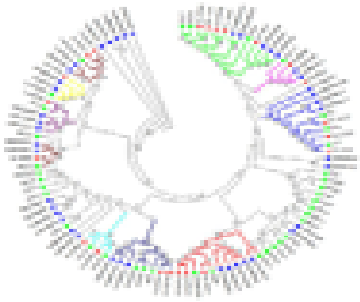
MADS Box Genes in Chickpea

Genome wide identification and structural comparison of members of the MADS (MCM1, AG, DEFA and SRF) transcription factor family of chickpea was studied. MADS box TF are involved in flower and pod development. Sixty chickpea MADS genes were detected across 8 chromosomes, which were classified into 24 type II (MIKC) and 36 type I MADS-box genes according to their phylogenetic relationships to the Arabidopsis and rice MADS-box genes. Detailed gene structure and motif distribution were then studied. Interestingly, three chickpea MADS type I genes denoted as Ca_01572, Ca_16376 and Ca_18082 resembled



Phylogenetic analysis of MADS type I proteins of chickpea, Arabidopsis and rice

MADS type II in possessing multiple introns although lacked K domain, a characteristic of MADS type II genes. In addition, chickpea MADS type I gene: Ca_14956, distinctly possessed two introns of 7kb and 13 kb long, when compared to the other chickpea MADS type I genes. In addition, one pair of



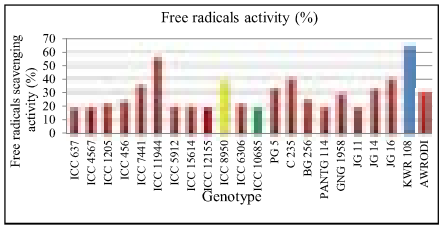
Phylogenetic analysis of MADS type II (MIKC) proteins of chickpea, Arabidopsis and rice

MIKC MADS-box genes,Ca_03887 and Ca_13111 were found on synteny blocks derived from whole genome duplication blocks.

Aravind Kumar Konda, Shanmugavadivel P.S., N.P.Singh and K.R. Soren

Free Radical Scavenging Activity of Chickpea Cultivars

Free radical scavenging activity of chickpea seed extracts determined by the DPPH (1, 1-diphenyl-2-picryl-hydrazyl) using 22 genotypes *viz*., ICC 637, ICC4567, ICC 1205, ICC 456, ICC 7441, ICC 11944, ICC 5912, ICC15614, ICC 12155, ICC 8950, ICC 6306, ICC 10685, PG 5, C 235, BG 256, Pant G 114, GNG 1958, JG 11, JG 14, JG 16, KWR 108 and Awrodhi indicated genotypic variations. The highest value (65.21%) was found in KWR 108, whereas it was lowest in ICC 10685 (20.28%).

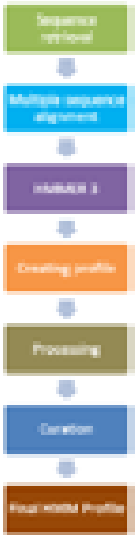


Scavenging effect of chickpea seed extracts

Nand Lal Meena, Jagdish Singh and Rajni Kanaujia

Profile Hidden Markov Model in Chickpea

Profile Hidden Markov Model (HMM) is a dynamic statistical profile being used as query sequence for identification of a group of remotely homologous proteins or transcription factors (TF), which generally share a common domain. The computational methodologies required for generating a HMM profile has been standardized in the laboratory. A HMM profile was generated for WRKY transcription factors that possess a conserved amino acid sequence : Trp(W)-Arg (R)-Lys (K)- Tyr(Y) in their DNA binding domain. Multiple sequence alignment of 73 Arabidopsis WRKY TFs and other reported WRKY TFs were converted into a position-specific scoring system (PPSM) resulting in profile sequence which is further used as an input/query sequence for genome wide identification of the TF in chickpea. This computational methodology can be used for generating HMM profiles for any given protein families in pulse crops. Its applications include genome wide identification of trypsin inhibitors, lectins, R genes and transcription factors *etc*.



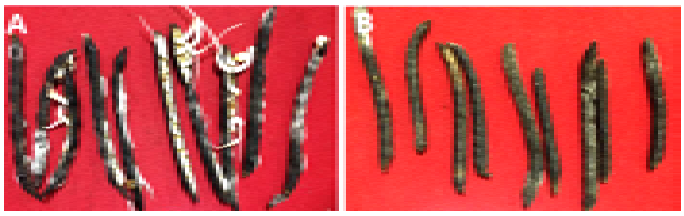
HMM profile of WRKY TF

< GYRWRKYGQKPVKGSPY-PRSYYRCTSPGGCPVRKQVER-SADDPSVVITTYEGEHNHPLPT>

Aravind Kumar Konda, Shanmugavadivel P.S., N.P.Singh and K.R. Soren

Pre-harvest Sprouting Tolerance in Mungbean

Pre-harvest sprouting (PHS) known to cause deterioration in seed/grain quality of mungbean has emerged as major problem in short duration mungbean varieties cultivated during *kharif* or late summer season. Total 176 mungbean genotypes screened in laboratory for PHS tolerance showed a wide variation among them. Popular varieties like Meha, IPM 2-14 and IPM 2-3 showed maximum pod loss due to PHS (Germination of seeds in pods upto 82.51%). However, six genotypes *viz*., CHAMU-4, DOPOLE, IC-52061, CHAMAH-1, BGG-1 and Pusa Ratna showed less than 10 % seed germination in pods and were identified as PHS tolerant. Physical dormancy in fresh seeds imparts tolerance to PHS in these genotypes.



Seed germination in pods of IPM 2-3 (A) and CHAMU 4 (B)

Amrit Lamichaney, P.K. Katiyar, S.K. Chaturvedi and Vijay Laxmi

Performance of Chickpea under Rice Fallow

Three rice establishment methods *viz*. puddled transplanting (PTR), unpuddled transplanting (UPR) and direct seeded (DSR) were used to see their effect on soil moisture, yield and growth of chickpea under rice fallows rainfed condition. At the time of chickpea sowing surface soil moisture content (SMC) varied between 18.4 to 20.0 %. Significantly higher SMC was recorded under chickpea sown after UPR at 30 cm soil depth, followed by DSR over PTR. The SMC trend was UPR>DSR>PTR. It was found that different rice establishment methods affect root and shoot growth of chickpea. Under UPR, 46.9 and 63.6 per cent higher shoot dry weight was observed at flowering and pod development stages in comparison to PTR. Similarly, higher root dry weight and root nodule count were observed in chickpea sown under UPR over PTR. Chickpea sown after UPR produced significantly higher yield (23.9%) over PTR. However, chickpea yield sown after DSR was 16.9 % higher in comparison to chickpea sown after PTR.

Direct seeded Unpuddled Puddled

Effect of rice establishment methods on chickpea

Narendra Kumar, S.S. Singh, C.S. Praharaj, Arti Yadav, S.L. Yadav and Saumya Singh

Powdery Mildew in Cluster Bean/Guar

Fusarium wilt, bacterial blight, powdery mildew and anthracnose are major diseases affecting cluster bean (Guar) crop. Among them powdery mildew is one of the important yield limiting factors. At IIPR research farm,

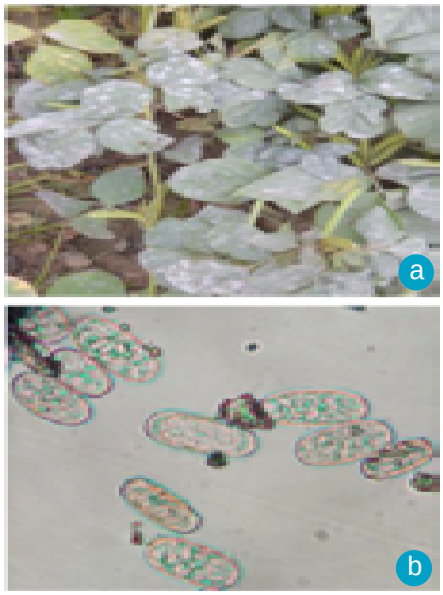


Figure 1 (a) While powdery mass on leaves (b) conidia of the pathogen

a white talcum-like powdery growth was seen on the upper surface of leaves including stem and pods during October-November, 2015. Infected leaves gradually curl downward, pale yellow or brown, often leading to defoliation. Based on symptomatology and microscopic observation, the causal organisms was identified as *Erysiphe polygoni* (Vanha) Weltzien. Conidia are hyaline, borne singly on conidiophore with hyphae attached on host surface. Fungus grows well in environments with high humidity and moderate temperatures.

R.K.Mishra and Naimuddin

Breeding for Short Stature and High Yield in Pigeonpea

Most popular varieties/hybrids of pigeonpea grow 3.5 meter in height and it is difficult to follow required plant protection measures to manage disease and insect pests infestation in the field. Therefore pigeonpea breeding has focused its efforts towards reducing the plant height at IIPR. For this purpose, Dholi dwarf which is known for its dwarf stature (92.25 cm) and compact growth habit was used as one of the parents in crossing with popular cultivars *viz.*, Bahar, NA 1, T 7, BDN 1 and Kudrat 3 and promising donors *viz.*, IPA 8F, IPA 9F, IPA 15F and IPA 16F having resistance/tolerance to multiple stress.

Dholi dwarf and IPA 15-9 grown side by side

This led to identification of genotype IPA 15-9 (Plant height of 1.80 meter) as the best plant type for targeted objective.

Satheesh Naik S.J., Farindra Singh, Abhishek Bohra, Amrendra Pratap Singh, Praveen Pandey, R.K. Mishra, S.K. Chaturvedi and I.P. Singh

Zinc Ferti-fortification in Urdbean and Mungbean

A pot experiment of foliar fertilization of zinc oxide @ 0.6% was conducted at pre-flowering stage for better zinc concentration in urdbean and mungbean grains as compared with other methods of zinc application *viz.*, seed priming, seed coating, soil application and control. Foliar fertilization recorded faster absorption of Zn by leaf epidermis and transportation to other plant parts *via* xylem and phloem. Therefore, foliar spray of Zn could serve as a noble approach under ferti-fortification that could mitigate deficiency of zinc in grains partially.

Effect of foliar applied zinc in mungbean(L) and urdbean(R)

Ummed Singh, C.S. Praharaj, S.S. Singh, Lalit Kumar and P.S. Basu

Enhancing RUE in Lentil

Moisture stress during crop growth limits the productivity of pulses grown in rice fallows. For enhancing resource use efficiency (RUE) through conservation agricultural practices in transplanted rice-lentil relay cropping system, rice establishment methods such as unpuddled rice can be useful over puddled condition. With 36-38% soil moisture retained in soil profile, the storage moisture could be possibly carried away for longer duration in both lentil cultivars (high biomass with 120 days duration for B-77 or Asha and medium biomass with 100 days for PL 6). Moisture storage period could further be expanded with effective strategies by involving minimum rationing with rice habit group such as IET 4786 and herbicides spray such as quizalofop ethyl @ 80-100 g/ha depending on soil/crop/sprout condition. Again the terminal moisture stress could possibly be mitigated by vigorously growing roots of pulses following extended soil moisture availability at initial stages (under relay system) or application of supplementary irrigation (through sprinklers). Because of optimum soil moisture for better part of life cycle of pulses following relay cropping, soil moisture and microbial population dynamics are favoured in such a system over non-cropped rice fallows.

Lentil crop in puddled (left) *vis-a-vis* unpuddled transplanted rice (right)

P.K. Bandyopadhyay, C.S. Praharaj, S.S. Singh and N. Kumar*
**Professor, BCKV, Kalyani (W.B.)*

Spodoptera Exigua in Western Maharashtra

An experiment was laid out to see the impact of different sowing dates on pest population infestation on chickpea at Pulses Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri. During experimental period, it was observed that *Spodoptera exigua* infested the crop at first 30 days after sowing. Maximum larval population (8.48 larvae/MRL) was recorded on chickpea grown on 15th September. Lowest incidence was recorded in crop sown on 15th December (0.00 larvae/MRL), followed by 16th November (0.25

larvae/MRL), 30th November (0.27 larvae/MRL), 31st October (0.53 larvae/MRL) and 30 December (0.56 larvae/MRL) sown crop.

A.P. Chavan, C.J. Sonawane, G.P. Deshmukh, M.R. Bedis and L. B. Mhase,
Pulses Improvement Project, MPKV, Rahuri (MS)

Status of Major Pulses Market in Uttar Pradesh

Based on the studies of nine major pulses mandis of Uttar Pradesh, comparison of major markets was made. It has been found that Kanpur is the largest pulse-mandi in terms of arrival being near to the pulses producing zone and better infrastructure availability. For all five pulses *viz*., urd, mung, chickpea, pigeonpea and lentil, Kanpur mandi has the highest arrival per month, which indicates that Kanpur acts as a centre or hub for pulses market to which all other mandis act as a networking link and Kanpur mandi can be selected as a reference for price, market behaviour and forecasting the market behaviour with respect to pulses. The Jhansi mandi located in the bundelkhand region, also stands apart with second rank with respect to all five pulses in terms of arrival. Important policy decisions can be made by watching price behaviour of pulses in Kanpur and Jhansi mandi for the Northern part of India. Allahabad mandi stands at third number with respect to chickpea, while Lalitpur with regard to urd, mung, pigeonpea and lentil. Urd and mung arrival patterns are quite high in Lucknow mandi.

Deepak Singh,Devraj Mishra, Rajesh Kumar, S.K. Singh and N.P. Singh

Transfer of Technology

जय किसान जय विज्ञान कार्यक्रम मनाया गया

भारतीय दलहन अनुसंधान संस्थान में दिनाँक 29 दिसम्बर, 2015 को जय किसान जय विज्ञान कार्यक्रम मनाया गया। इस अवसर पर च.शे.आ. कृषि एवं प्रौद्योगिकी विश्वविद्यालय, कानपुर और बाँदा कृषि एवं प्रौद्योगिकी विश्वविद्यालय, बाँदा के कुलपति डा. सुरेन्द्र लाल गोस्वामी मुख्य अतिथि थे। दीप प्रज्जवलन के पश्चात संस्थान के निदेशक डा. नरेन्द्र प्रताप सिंह ने अतिथियों एवं सभागार में उपस्थित सभी का स्वागत किया। अपने उद्बोधन में डा. गोस्वामी ने वैज्ञानिक शोधों का भरपूर लाभ किसानों तक पहुँचाने का आह्वाहन किया। उन्होंने सलाह दी कि किसानों की सहभागिता के साथ ऐसे कार्यक्रम चलाये जाये जिनके शोध परिणाम किसानों के खेत में भी दिखाई दें। उन्होनें वैज्ञानिको का आह्वाहन किया कि इसके लिए मिशन बना कर किसानों के हित में कार्य किया जाये।

संस्थान के निदेशक डा. सिंह ने बदलते जलवायु परिदृश्य, पर्यावरण प्रदूषण तथा खेती पर इसके दुष्प्रभाव पर चिन्ता व्यक्त करते हुए स्वस्थ पर्यावरण पर जोर दिया और उर्वरको के सन्तुलित उपयोग की सलाह दी। डा. सिंह ने संस्थान की विभिन्न गतिविधियों और उपलब्धियों पर प्रकाश डाला। उन्होंने कहा कि अन्तर्राष्ट्रीय संस्थानों एवं राष्ट्रीय कार्यक्रमों के अन्तर्गत दलहनों पर चल रही

विभिन्न परियोजनायें अत्यन्त लाभप्रद रही हैं और उनसे उन्नत प्रजातियों, तकनीकी तथा मानव संसाधन विकास में सफलता मिली है। उन्होनें कहा कि इन सभी उपलब्धियों का लाभ किसानों को मिल रहा है, जिससे उनकी आय में वृद्धि हो रही है और जय किसान जय विज्ञान का मिशन पूरा हो रहा है।

कार्यक्रम में किसान-वैज्ञानिक संवाद का भी आयोजिन किया गया। इसमें किसानों ने अपनी खेती संबंधी कठिनाइयों के बारे में प्रश्न पूछे और वैज्ञानिकों ने उनके समाधान बताये। धन्यवाद् प्रस्ताव डा. संजीव गुप्ता ने प्रस्तुत किया तथा कार्यक्रम का संचालन डा. आदित्य प्रताप ने किया।

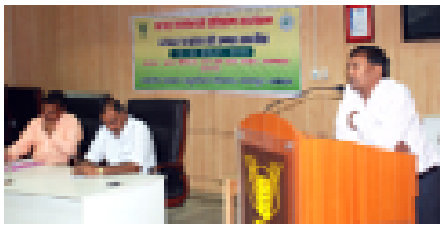
रबी दलहनी फसलों की उत्पादन तकनीकी पर कृषक प्रशिक्षण

दिनाँक 4-5 दिसम्बर, 2015 को संस्थान में जैव प्रौद्योगिकी विभाग, भारत सरकार द्वारा वित्तपोषित 'उत्तर प्रदेश के दलहन कृषकों का सामाजिक, आर्थिक व तकनीकी सशक्तिकरण परियोजना' के अन्तर्गत रबी दलहनी फसलों की उत्पादन तकनीकी पर दो दिवसीय कृषक प्रशिक्षण कार्यक्रम का आयोजन किया गया। इस प्रशिक्षण में कानपुर देहात जनपद के सिलहरा व सलेमपुर ग्रामों के 49 किसानों ने भाग लिया। कार्यक्रम का उदघाटन संस्थान के निदेशक डा. नरेन्द्र प्रताप सिंह द्वारा किया गया। उन्होने अपने उदबोधन में कृषकों को प्रशिक्षण से अधिकाधिक लाभान्वित होने की सलाह दी और उन्नत उत्पादन तकनीक के प्रयोग पर बल दिया। कार्यक्रम में रबी दलहनी फसलों जैसे चना, मटर व मसूर की संस्तुत प्रजातियाँ, सस्य

प्रबंधन, रोग व कीट प्रबंधन तकनीकी पर किसानों को प्रशिक्षित किया गया। प्रतिभागी किसानों को दलहन प्रसंस्करण तकनीक व मृदा परीक्षण के महत्व पर भी प्रशिक्षित किया गया। कार्यक्रम का समन्वयन डा. उमा साह व डा. पी.आर. साबले ने किया।

राज्य स्तरीय प्रशिक्षण कार्यक्रमों का आयोजन

संस्थान में 12-18 अक्टूबर एवं 27-31 अक्टूबर, 2015 को दो बैच में 'दलहनी फसलों की हाईटेक उत्पादन तकनीक' पर राज्य स्तरीय प्रशिक्षण कार्यक्रमों का आयोजन किया गया। दोनों ही प्रशिक्षण कार्यक्रमों का आयोजन *एटीएमए* योजना के अंतर्गत, कृषि निदेशालय, राज्य कृषि प्रबन्धन केन्द्र, रहमानखेड़ा, लखनऊ द्वारा प्रायोजित किया गया। पहले बैच में कुल 35 प्रतिभागियों ने भाग लिया जिसमें उप निदेशक, सलाहकार, ब्लाक टीम मैनेजर, विषय-विशेषज्ञ तथा प्रगतिशील किसानों (कानपुर संभाग) ने भाग



लिया। 27-31 अक्टूबर, 2015 को आयोजित प्रशिक्षण कार्यक्रम में चित्रकूट धाम संभाग के विभिन्न जिलों से पधारे 33 प्रतिभागियों ने भाग लिया। डा. एन.पी. सिंह, निदेशक ने प्रौद्योगिकी विकास पर संक्षेप में प्रकाश डाला और प्रतिभागियों से आग्रह किया कि वे टिकाऊ खेती एवं पोषण सुरक्षा को ध्यान में रखते हुए अपनी खेती में दलहनी फसलों का समावेश करें। प्रशिक्षण के दौरान, विषय विशेषज्ञों ने वार्ता आधारित विभिन्न विषयों पर व्याख्यान प्रस्तुत किए जैसे प्रजातीय, सस्यीय, कीट-रोग एवं कटाई उपरान्त प्रबन्धन। व्याख्यानों में व्यावहारिक ज्ञान देना प्राथमिकता पर रहा। प्रतिभागियों को संस्थान के मुख्य एवं नवीन शोध प्रक्षेत्रों का भ्रमण कराया गया। साथ ही उन्हें संस्थान द्वारा विकसित साहित्य भी उपलब्ध कराया गया। दोनों ही प्रशिक्षण कार्यक्रमों का समन्वयन डा. सुशील कुमार सिंह, प्रधान वैज्ञानिक ने किया।

कृषक प्रशिक्षण कार्यक्रम का आयोजन

संस्थान में 07-11 दिसम्बर 2015 को 'दलहनी फसलों के लिए उत्पादन प्रौद्योगिकी' विषय पर पाँच दिवसीय प्रशिक्षण कार्यक्रम का आयोजन किया गया। उक्त प्रशिक्षण कार्यक्रम कृषि प्रौद्योगिकी प्रबन्धन एजेन्सी, हजारीबाग, झारखण्ड द्वारा प्रायोजित किया गया था। डा. एन.पी. सिंह, निदेशक ने कृषकों को एक नया नारा दिया "अधिक दलहन उगायें"। उन्होंने किसानों को सुझाव दिया कि वे सिंचित अवस्था में आलू, मटर, सरसों, चना, गेहूँ आदि की कटाई के उपरान्त ग्रीष्म/बसन्त में अल्पावधि मूँग बोएं। पाँच दिवसीय इस कार्यक्रम में महत्वपूर्ण विषयों जैसे प्रजातीय, सस्यीय, कीट-रोग एवं कटाई उपरान्त प्रबन्धन पर विशेष जोर दिया गया। प्रतिभागी कृषकों को संस्थान के मुख्य एवं नवीनशोध प्रक्षेत्र का भ्रमण कराया गया। इस दौरान बीज उत्पादन सम्बन्धी जानकारी विशेष रूप से प्रदान की गई। परियोजना निदेशक, एटीएमए सहित कुल 25 प्रतिभगियों ने इस कार्यक्रम में भाग लिया। डा. सुशील कुमार, प्रधान वैज्ञानिक ने इस कार्यक्रम का समन्वयन किया।

कृषि विज्ञान केन्द्रों के संवेदीकरण कार्यक्रम/प्रशिक्षण का आयोजन

संस्थान में 18-19 नवम्बर, 2015 को कृषि प्रौद्योगिकी अनुप्रयोग शोध संस्थान जोन IV (एटीएआरआई) एवं भारतीय दलहन अनुसंधान संस्थान, कानपुर द्वारा संयुक्त रूप से उक्त प्रशिक्षण कार्यक्रम का आयोजन किया गया जिसका मुख्य उद्देश्य था एनएफएसएम के अंतर्गत चालू सत्र (2015-16) में अग्रिम पंक्ति प्रदार्शन के माध्यम से नई प्रौद्योगिकी एवं प्रजातियों के हस्तान्तरण को सुगम बनाना। कार्यक्रम में कुल 81 प्रतिभागियों (वरि. वैज्ञानिक सह विभागाध्यक्ष एवं विषय-वस्तु विशेषज्ञ) ने सक्रिय प्रतिभागिता की। निदेशक, अटारी ने अग्रिम पंक्ति प्रदर्शन कार्यक्रमों की समीक्षा की। डा. एन.पी. सिंह, निदेशक ने वर्तमान परिदृश्य पर अपने विचार प्रस्तुत करते हुए उ.प्र. एवं उत्तराखण्ड में दलहन उत्पादन की सम्भावनाओं पर चर्चा की। उन्होंने उत्तम गुणवत्ता के प्रदर्शन लगाने पर विशेष बल दिया जिससे राज्य कृषि विभाग को प्रौद्योगिकी का उचित लाभ मिल सके। प्रशिक्षण के दौरान, महत्वपूर्ण विषयों जैसे कि प्रजातीय, सस्यीय प्रबन्धन, रोग कीट एवं कटाई उपरान्त प्रबन्धन आदि पर विशेष जानकारी उपलब्ध कराई गई। इस बात पर विशेष बल दिया गया कि समर्थ केन्द्रों द्वारा "सीड हब" बनाया जाए जिससे पंसदीदा प्रजातियों के बीजों की उपलब्धता और सुगम हो सके। डा. ऊधम सिंह गौतम, निदेशक, एटीएआरआई, जोन IV ने प्रशिक्षण कार्यक्रम का समन्वयन किया।

सीएसीपी, नई दिल्ली की टीम का संस्थान भ्रमण

दिनाँक 31 अक्टूबर 2015 को कृषि लागत एवं मूल्य आयोग (सीएसीपी) के अध्यक्ष, सदस्य सचिव एवं सदस्यों ने संस्थान का भ्रमण किया। संस्थान में उक्त विषय पर गहन चर्चा/वार्तालाप किया गया। डा. एन. पी. सिंह निदेशक ने दलहनी फसलों की उन्नत प्रौद्योगिकी एवं भावी रणनीति पर अपने विचार प्रस्तुत किए। विभिन्न मौसमों में दलहनों की आवक और लागत एवं कीमत पर गहन विचार-विमर्श हुआ। साथ ही न्यूनतम समर्थन मूल्य एवं दलहनों की सरकारी खरीद पर भी विशेष चर्चा हुई। सभी विभागाध्याक्षों एवं परियोजना समन्वयकों ने बैठक में भाग लिया। दल ने संस्थान में आयोजित राज्य प्रशिक्षण कार्यक्रम में भी भाग लिया। बुन्देलखण्ड के प्रसारकार्यकर्ताओं एवं कृषकों ने दलहन के उत्पादन एवं उसके विपणन सम्बन्धी पहलुओं पर अपने अनुभव टीम के सदस्यों के साथ साझा किए।

Awards

- Dr. M.R. Bedis, Principal Scientist, Pulses Improvement Project, MPKV, Rahuri has been awarded with Dr. Punjabrao Deshmukh Prerana *"Krishiratna"* award for his special contribution in agricultural research especially in chickpea, pigeonpea, maize, niger, medicinal and aromatic plants and grasses. The award was given by Shri Ujjwalji Nikam, Advocate and Prof. Sanjay Jadhav, Chairman, Jaikisan Agro Forum, Nashik on 27.12.2015 at Jalgaon, Maharashtra.

- Dr. P.R. Saabale and Dr. R.K.Mishra were awarded First and Second prizes, respectively for their posters of research papers entitled 'Sources of resistance for wilt and dry root rot in elite breeding lines of chickpea' authored by P.R. Saabale, O.P.Sharma, R.K.Mishra, Naimuddin, A.K. Srivastava and S.K.Chaturvedi, and 'Biocontrol potential of native *Trichoderma* species against wilt of major pulses' authored by R.K. Mishra, Naimuddin, P.R. Saabale and Omita Mishra, presented in the zonal meeting of Indian phytopathological society cum National Symposium on 'Impact of climate change on plant-microbe interaction and its implications, held at Banaras Hindu University, Varanasi on December 18 - 19, 2015.

Personnel

Promotions

Name	Promoted to	w.e.f.
Dr. M. Senthil Kumar	Sr. Scientist	3.1.2014
Dr. Rajesh Kumar Srivastav	Sr. Technical Officer (T-6)	23.6.2015
Mr. Rajendra Prasad	Sr. Technical Officer (T-6)	1.1.2015

Transfers

Name	Designation	From	To	Date
Dr. S. Paulraj	Scientist	ICAR--IIPR, Kanpur	ICAR-CPCRI, Kasaragod	21.12.2015
Dr. Neetu Singh Kushwah	Scientist	ICAR—NRC on Litchi, Muzaffarpur	ICAR--IIPR, Kanpur	26.12.2015

Retirement

Name	Post held	Date of retirement
Mr. K.N. Gupta	Sr. Finance & Accounts Officer	31.10.2015
Mrs. A. Abraham	Asstt. Administrative Officer	30.11.2015

Obituary

Mr. Ranjan Kumar Srivastav, Sr. Technical Officer, left for his heavenly abode on 7.11.2015. May his soul Rest in Peace.

कृषकों का प्रक्षेत्र भ्रमण

दिनांक	प्रतिभागियों की संख्या	जिला	प्रदेश
03/11/2015	09	टीकमगढ़	मध्य प्रदेश
03/11/2015	50	शिवनी	मध्य प्रदेश
20/11/2015	06	भिण्ड	मध्य प्रदेश
23/11/2015	19	सिद्धार्थ नगर	उत्तर प्रदेश
17/12/2015	14	जबलपुर	मध्य प्रदेश
17/12/2015	17	फतेहपुर	उत्तर प्रदेश
18/12/2015	28	जबलपुर	मध्य प्रदेश

Director's Desk

Dear Readers,

Seasons greetings and wish you all a very happy 2016.

Seed is the basic and most critical input for sustainable crop production. Response of all other inputs depend upon quality of seeds to a large extent. It is estimated that direct contribution of quality seed of pulses alone to the total production is about 15-20% varying from crop to crop and it can be increased upto 45% with efficient management of other inputs. The major driver of food inflation during recent years was the hike in prices of pulses, which was caused by crop loss due to untimely rains during harvesting period. India's pulses production fell from 19.78 million tonnes in 2013-14 to 17.3 million tonnes in 2014-15, while imports rose from 3.18 million tonnes to 4.58 million tonnes during the same period. The urgency was so high that in an interaction with the media in June this year, Hon'ble Union Agriculture Minister said that the rise in the price of pulses was a burning issue. Even the Prime Minister exhorted the farmers to grow pulses in one-fifth of their cultivable lands to overcome the shortage and make India self-sufficient in this sector by 2022. This will need adequate and timely supply of quality seeds of these crops.

Even though seed production has increased three-fold in the past eight years, still there is a shortage of quality seeds of pulses in the country. Fortunately, there is tremendous scope of increasing area under pulses. Between *rabi* and *kharif* seasons there is a window of opportunity (March-June) to cultivate short-duration pulses. India has about 11.6 million ha of rice fallow that is left uncultivated after *rabi* rice, which can be used to grow pulses. However, to promote pulses in these areas, we need short-duration and photo-thermo insensitive varieties. Further, the government needs to make production of pulses lucrative. Like rice and wheat, the government should procure pulses, not leaving farmers dependent on the vagaries of the market. Assured MSP and procurement together will give a big boost to pulses production. The procured quantity can be distributed through public distribution system (PDS). The government should also think of encouraging private players and contract farming, and provide competitive markets for pulses. The market supply chain of pulses is quite long and unorganized involving farmers, small traders, commission agents, wholesale dealers and retailers before reaching the consumers. In this entire process, the profit margin of farmers shrinks. Apart from a long supply chain, import of pulses needs to be critically examined. When the

imports arrive Indian market in November-December, the market is already flooded with pulses produced indigenously. This brings down their price drastically and ultimately the farmers suffer. Therefore, the import of pulses needs to be planned in accordance with domestic crop situation. Further, appropriate measures have to be taken to stop farmers shifting to other crops. This is already happening in Andhra Pradesh, where farmers growing chickpea have shifted to cotton farming. Shortage of quality seed continues to be one of the major constraints in spread of new and improved varieties/hybrids and realizing their yield potential.

Seeds fetch a higher price than unprocessed *dals*, but it requires producers to be diligent. This needs greater attention from the public sector because private companies are little interested in the production of seeds of pulse crops owing to their self-pollinating nature and also because farmers can reproduce them on their own. The Indian Institute of Pulses Research, alongwith ACIRP centres located in SAUs, is playing crucial role in producing large quantities of breeder seeds. Nevertheless, their conversion in commercial (certified) seed is a major issue to produce sufficient quantities to meet farmers' demand. Although we produced about 15,000 quintals of breeder seed, which is sufficient for developing quality seeds for 24 million ha, but the subsequent conversion into foundation seed and certified seed which goes to farmers is not happening. 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.

To mitigate the pulse seed scarcity in the country, one vital and doable approach is 'seed village' concept. In this approach, farmers themselves select a variety amongst recommended ones for their area, according to their farm ecology. Subsequently, they grow the preferred variety for seed production. This is done following all the recommended practices for seed production under the supervision of seed certification agencies and guidance of the research institutes. With this 'seed village' concept, farmers get good quality seed locally. IIPR has taken a lead in this direction by forming seed producers societies registered with seed certification agencies. It is imperative that this is adopted in a large area or in a cluster of villages for large scale seed production, thereby fulfilling the needs of the whole district and also the neighboring districts. If this 'seed village' concept is extended throughout the country, I am sure that there will be no shortage of quality seed of pulse crops and thereby our country will be self reliant in pulses.

(N.P. Singh)

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