ISO 9001-2008

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agri search with a human touch

PULSES Newsletter

ICAR-Indian Institute of Pulses Research, Kanpur

VOLUME 26, No. 2 APRIL - JUNE, 2015

CONTENTS

News 2
- Group Meet on Mungbean and Urdbean
- Annual Group Meet on Arid Legumes

Research Highlights 2-6
- Beet Army Worm: An Emerging Pest
- Varieties Identified
- Potential *Trichoderma* Sp from Pulses Rhizosphere
- Western Hybridization for Cry1Ac Detection in Different Tissues
- Transfer of Chickpea Plantlets Affects Growth and Development
- *Zygograma bicolorata* – A Weed Killer Beetle of *Parthenium hysterophorus*
- Chickpea Performance under Different Rice Culture Methods
- Variations for Delayed Senescence in Mungbean Genotypes
- Incidence of Pigeonpea Pod Borer *Nanaguna breviuscula* Walker
- Dispersible and Non-dispersible Granular Formulations of Herbicides
- *Methylobacterium* Enhances Vigour and Alters Agronomic Traits in Fieldpea
- Bio film Forming Bacteria for Moisture Stress Management in Chickpea
- Bio Assay of *Trichoderma* spp on Root Knot Nematode for Parasitism Attachment
- Tissue-specific Cry1Ac Expression in Transgenic Chickpea and Pigeonpea
- Weed Diversity at IIPR-RRC Farm, Dharwad
- Introgression of Early Growth Vigor into Cultivated Background
- Summer Mungbean with Less Water
- Participation in ICAR Zonal Sports

प्रौद्योगिकी हस्तांतरण 7
- मूँग पर प्रक्षेत्र दिवस का आयोजन
- कृषि प्रदर्शनी एवं किसान मेले में सहभागिता
- कृषक-वैज्ञानिक परिचर्चा का आयोजन

Director's Desk 8

EDITORIAL COMMITTEE

Dr. N.P. Singh	Chairman
Dr. P.S. Basu	Member
Dr. G.P. Dixit	Member
Dr. Jitendra Kumar	Member
Dr. Naimuddin	Member
Mr. D. Upadhyaya	Member Secretary

Deputy Director General (CS) Visited IIPR

Dr. J.S. Sandhu, Deputy Director General (Crop Science) visited ICAR-IIPR, Kanpur on June 7, 2015. He visited all the breeding, agronomical and plant protection experimentation trials along with Director, Project Coordinators, HoDs and concerned scientists of respective Divisions. He suggested several researchable points mainly related to summer mungbean. He also addressed to scientific staff of the Institute. He emphasized upon active involvement of scientists in providing need based information on pulses technologies to the farming community. A field trip was arranged to show performance of demonstrations at farmers' fields at Barahpur village of Kanpur Dehat. Dr. Sandhu along with Dr. N.P. Singh, Director and scientists of the Institute visited demonstration plots. A large number of farmers of nearby villages were also present at the occasion. Dr. Sandhu keenly observed the performance of mungbean varieties, interacted with the farmers and

appreciated the efforts. He observed that summer mungbean cultivation could be a huge success with the farmers and could help tremendously in diversification of rice-wheat system. Technologies for summer mungbean cultivation are already available and their dissemination among the farmers will boost its cultivation in many regions of northern parts of India. Dr. Sandhu appreciated the efforts of Institute in conductance of mungbean demonstrations in compact block and popularization of proven technologies to the farmers.

Group Meet on Mungbean and Urdbean

Annual Group Meet on mungbean and urdbean under AICRP on MULLaRP was held at Birsa Agricultural University, Ranchi on May 22-24, 2015. Dr. George John, Vice-Chancellor of the University inaugurated the meet. Dr. B.B.Singh, Assistant Director General (O&P), ICAR presided the inaugural session. Dr. N.P. Singh, Director, IIPR presented a glimpse of the production enhancement that was witnessed in the recent years in pulses, achieving a record production of 19 m t. Dr. Singh stressed on short duration genotypes, sharing of the material generated across research stations and MYMV and powdery mildew diseases as current issues.

Dr. George John illustrated a set of newer agricultural challenges like climatic adversities which will further be aggravated by the increasing emergence of insect/pest and disease problems. Dr. B.B. Singh expressed satisfaction over the developments in pulses research in the country. He called upon the scientists for aggressive efforts for accelerating transfer of technologies to farmers, preparation of a roadmap for pulses improvement, development of short duration and photo-thermo insensitive genotypes in pulses.

Dr. Sanjeev Gupta, Project Coordinator (MULLaRP), while presenting a brief report of the project, apprised about the major achievements and constraints in mungbean and urdbean crops. A session on Inter-Project Linkages was also held in

which role of global cooperation on mungbean improvement was discussed and programmes for such collaborations were formulated. In later sessions, results of *kharif* 2014 were discussed and technical programme for *kharif* 2015 was finalized.

Annual Group Meet on Arid Legumes

Annual Group Meet of National Network Research Project on Arid Legumes was held on June 8-9, 2015 at ICAR-Central Arid Zone Research Institute, Jodhpur. About 70 delegates from cooperating centres of SAUs, ICAR Institutes, State Department of Agriculture and Seed Agencies attended the group meet. While welcoming the dignitaries and delegates Dr. R.K. Bhatt, Director, ICAR-CAZRI, Jodhpur emphasized the importance of arid legumes in farming system and changing scenario of climate. Dr. Shiv Sewak, Nodal Scientist (Arid Legumes) presented the progress report for 2014-15. Mr. S.K. Sharma, Secretary, Guar gum Manufacturers Association of India expressed his views on importance of Guar gum as foreign exchange earner. He urged the scientists to develop guar varieties with large endosperm to extract more gum. Dr. B.B. Singh, ADG (O&P) in his Chairman's remarks envisaged that arid legumes would be the future crops with global warming situation. Dr. N.P. Singh, Director, ICAR-IIPR, Kanpur expressed his views about the research and development of pulses in general and

of arid legumes in particular. He emphasized the need to develop high yielding, disease resistant varieties and protection and production technologies to increase the productivity and production of these crops.

Research Highlights

Beet Army Worm : An Emerging Insect Pest of Mungbean

Severe defoliation in spring/ summer mungbean is being noticed in three villages *viz*., Faridpur, Paradan and Thathrahi of Fatehpur district for last three years. Observation revealed that the defoliation was due to the feeding of an insect's larvae that appeared to prefer terminal younger leaves, which caused defoliation of cotyledonary leaves which affected the seedling establishment. In one month old crop the pest load varied from 1 to 5 larvae per plant. The grown up larvae had dark green band on lateral sides and prepupal stage was brown in colour and the adults were dull brown with small circular orange spot on both the forewings. Based on larval and adult morphology it was identified as beet army worm, *Spodoptera exigua* Hubner (Noctuidae: Lepidoptera). It is a polyphagous pest with wide host range

Fig. a, b and c: Defoliation due to the pest Fig. d and e: Larvae and adult of *S. exigua*

including beetroot, potato, radish, peas, groundnut, sunflower, bhindi, sorghum, *etc*. Summer/spring mungbean is taken after the harvest of potato. Moreover some beet army worm larvae were also observed on the remnant potao crop in the nearby fields. Thus, unusually high infestation of the insect appears to be resulting from its left over population in potato fields that migrated to mungbean crop. Hence a holistic management for *S. exigua* is needed to sustain spring/summer mungbean production in the area.

Sujayanand, G.K., Uma Sah, Aditya Pratap and Ashish Nigam

Varieties Identified

CRHG 22: This horsegram variety developed through induced mutation using gamma rays irradiation has been identified for rainfed areas of Andhra Pradesh, Tamil Nadu, Telangana, Karnataka and Kerala. It has semi compact and semi erect plant type with moderate height. Its seed colour is black. It mature in 94-101 days with average yield of 800-900 kg/ha. It is moderately resistant to anthracnose, yellow mosaic virus and cercospora leaf blight diseases.

LBG 787: This urdbean variety developed from the cross LBG 685 x IPU 981 has been identified for cultivation in *rabi* season for Andhra Pradesh, Tamilnadu, Karnataka, Telangana and Andman & Nicobar. It has average yield of 1800 kg/ha, shining black seed colour and main stem bearing plant type.

Western Hybridization for *Cry1Ac* Detection in Different Tissues

Western hybridization was used to detect and quantify the intact protein in chickpea tissues. Total soluble protein was extracted in modified extraction (bicarbonate) buffer from young leaves (L), pod wall (PW) and immature seed (IS) at 133 DAS. Upon detection with cry1Ac specific antibodies, 66.0 KDa band was detected in all organs. The solitary band indicates intactness of protein during isolation and also higher expression in leaf as compared to pod wall and immature seed. The modified protocol can be used for isolation of protein from different tissues at different developmental stage.

Western hybridization in different chickpea tissues
C: Purified Cry; NC: Negative control; L: Leaf; IS: Immature seeds; PW: Pod wall

Alok Shukla, Arvind kumar Singh, Alok Das and N.P. Singh

Transfer of Chickpea Plantlets Affects Growth and Development

Identifying transgenic progenies is an arduous task involving rigorous screening in containment facility. Seeds sown in small poly-bags for screening should be transferred to bigger pots for normal growth and development. However, the growth and development of transferred plants

(A) showing better vegetative growth
(B) reduction in vegetative growth of transferred plant in big pot

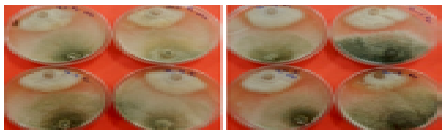
shows reduced vigour, late and often less flowering, and finally low podding. This may be due to disturbance in rhizosphere during transfer and change in micro-climate, post-transfer.

Malkhan Singh, Alok Shukla, Alok Das and N.P Singh

Potential *Trichoderma* sp from Pulses Rhizosphere

Trichoderma species are most extensively and widely exploited for management of many soil borne pathogens. It is not only antagonistic to fungal pathogens but also enhances plant growth. Location specificity among *Trichoderma* isolates warrants identification of potential isolates from pulses rhizosphere and their exploitation against soil borne pathogens of pulses.

Total 20 potential isolates of different *Trichoderma* sp. *i.e.*, *T. harzianum* (13), *T. viride* (4) and *T. virens* (3) were identified from pulses rhizosphere in Kanpur Dehat, Fatehpur, Hamirpur, Jalaun and Varanasi districts. All these isolates were characterized for their antagonistic potential against *F. udum*. The study showed that *T. harzianum* isolates have highest antagonistic potential on the growth of *F. udum,* followed by *T. viride* and *T. virens* isolates.



Antagonistic potential of *T. harzianum* isolates against *F. udum*

R.K.Mishra, P. R. Saabale, Naimuddin, R. Jagadeeswaran and O. Mishra

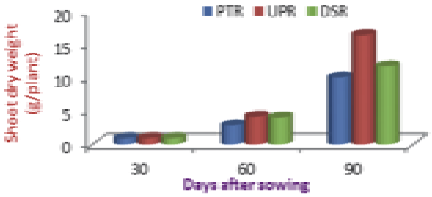
Zygograma bicolorata – A Weed Killer Beetle of *Parthenium hysterophorus*

Zygograma bicolorata adult beetles and grubs were found feeding on parthenium leaves in Kanpur area during April–May, 2015. All the life stages (egg, grub, pupa and adult) of the *Zygograma* beetle were found on the parthenium plants. Each parthenium plant was harbouring 10-18 adults/plant. This shows the natural biological control of parthenium weed in Kanpur.

Sujayanand, G.K. and Hem Saxena

Chickpea Performance under Different Rice Culture Methods

Three rice culture techniques *viz.*, puddle transplanting (PTR), unpuddled (UPR) and direct seeded (DSR) were studied to know their effect on chickpea performance under rice fallow condition. Higher RLWC (12.3%) and chlorophyll a/b pigments (43.9 %) were recorded in UPR over PTR. In contrast to chlorophyll a/b, maximum quantity of carotenoid pigment was observed under PTR (66.0 and 36.4%, respectively) over UPR. Similar to physiological parameter, 46.9 and 63.6% higher shoot dry weight was recorded in UPR at flowering and pod development stages, respectively over PTR. Under UPR significantly higher root length (15.9% at vegetative), root dry weight (62.7 and 15.3% at flowering and pod development stages, respectively) and root nodules/plant (59.4, 67.1 and 50.8% at vegetative stage, flowering stage and pod development, respectively) were recorded in UPR over PTR. Similar trend was observed in nodule dry weight. Due to enhanced plant and root growth higher yield of chickpea (23.9%) was recorded in UPR over PTR.



Effect of rice transplanting system on shoot dry weight of chickpea

Narendra Kumar, S.S. Singh, C.S. Prahraj, P.S. Basu, Senthil Kumar, Arti Yadav, Satendra Yadav and Saumya Singh

Variations for Delayed Senescence in Mungbean Genotypes

Faster leaf senescence of summer mungbean exposed to high temperature often limits photosynthesis and reduces assimilate transport leading to seed hardening due to incomplete sink development. Genetic variability for delayed senescence through SCMR (SPAD chlorophyll meter reading) was studied among five genotypes of summer mungbean at maturity. Substantial variations were recorded for SCMR values among the genotypes. It was highest in Pusa 9531 (46.0), followed by IPM 205-07 (44.2) and lowest in IPM 410-03 (41.1). Higher concentration of chlorophyll even at maturity stage leads to transformation of source to sink. This could also be treated as a trait for efficient nitrogen use by the plants.

Ummed Singh, C.S. Praharaj, S.S. Singh, Aditya Pratap, Sanjeev Gupta and P.S. Basu

Dispersible and Non-dispersible Granular Formulations of Herbicides

Sustain release dispersible and non-dispersible granular formulations of imazethaypr and pendimethalin herbicides were prepared to control weeds in chickpea field. The granular formulations of 4-80 mesh size and containing approximately 3-10% active ingredient were prepared by impregnating the active ingredient on carrier auxiliaries. Field experiments were conducted using the double and triple dose of the developed formulations of the herbicides. Concentrations for pendimethalin based granular formulations were adjusted to 1500 and 2000 g ai/ha, whereas, imazethaypr based granular formulations were applied @ 250 and 300 g ai/ha. The formulations were applied at the time of sowing under two different situations *viz.*, rainfed and irrigated. The pendimethalin based granular formulations at concentration of 1500 and 2000 g ai/ha controled weeds effectively (60-70%), whereas, imazethaypr based granular formulations controlled the weeds significantly in both the test concentrations.

Lalit Kumar, G.K. Srivastava and Jagdish Singh

Incidence of Pigeonpea Pod Borer *Nanaguna breviuscula* Walker

An experiment was carried out in short duration pigeonpea (ICPL 67B) with seven different border crops *viz.*, cluster bean, green gram, black gram, cowpea, *dsaincha*, sorghum and pearlmillet as different treatments along with sole pigeonpea crop as control for management of spotted pod borer. However, in this experiment, incidence of *Nanaguna breviuscula* Walker was found from 40th to 45th SMW invariably in all treatments. The larval incidence varied from 2 to 4 per plant. The larvae web the leaves along with flowers and pods and bores the inside pods within the web. The damage symptom is similar to that of spotted pod borer. The larvae have hairs sparsely distributed throughout their cuticle. It apperars to be a sporadic pest. Hence, constant surveillance of its population is necessary to device its management strategies.

Sujayanand, G.K. and Hem Saxena

Methylobacterium Enhances Vigour and Alters Agronomic Traits in Fieldpea

A member of the α-proteobacterial genus *Methylobacterium* represents one of the most abundant bacterial genera in the phyllosphere. They are also referred to as Pink Pigmented Facultative Methylotrophs (PPFM) because of their pigmentation by carotenoids and their ability to grow on one-carbon compounds, such as methanol, produced as a by-product of pectin metabolism in growing cell walls, which is emitted *via* the stomatal pores. Total 43 PPFM isolates were isolated from the eight fieldpea cultivars and identified as *Methylobacterium* spp. based on cultural, biochemical and C utilization tests. *In vitro* bioassay indicated that most of the PPFM isolates were able to produce IAA and urease. Seed bacterization under *in vitro* condition enhanced the seedling vigour index over control to the maximum of 31.9% and also altered the agronomic traits like, seedling vigour, rooting and root branching. These effects were generally attributed to the synthesis of biologically active compounds such as auxins, cytokinins, urease and other substances by PPFM.

Enhanced vigour and altered rooting pattern in fieldpea

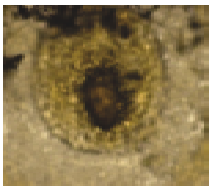
S. Paulraj, M. Senthil Kumar, Dnyaneshwar Borase and Jagdish Singh

Biofilm Forming Bacteria for Moisture Stress Management in Chickpea

Bacterial biofilm formation with attached soil aggregates is one of the important traits involved in drought tolerance by plants. Certain bacteria form biofilm on the surface of plant roots through production of exo-polysaccharides (EPS) and protect them from drying. Exo-polysaccharides possess unique water holding and cementing properties and help in formation of soil aggregates. EPS protect the microorganisms and plants from water stress by enhancing water retention, and by regulating diffusion of organic carbon sources. In the present study, 317 bacterial isolates were obtained from the rhizosphere and root nodules of *desi* and *kabuli* chickpea grown under rainfed condition. Different morphological traits like colony size, elevation, and colour were observed and the bacterial isolates were further purified on nutrient agar plates and stored in five sets at -80°C as 25% glycerol stock. The bacterial isolates were assessed for the production of IAA and exo-polysaccharides. Isolate No. 168 recorded maximum amount of IAA production, followed by Isolate No. 210. EPS was extracted with ethanol and iso-propanol and quantified and the values were in the range of 42.5-67.4 mg/l.

M. Senthilkumar, Dnyaneshwar Borase, S. Paulraj and Jagdish Singh

Bio Assay of *Trichoderma* spp on Root Knot Nematode for Parasitism Attachment



Trichoderma mycelial attachment on adult female

Thirty one isolates of *Trichoderma* spp were bio assayed for parasitism attachment on eggs, adult female and egg mass of *Meloidogyne* spp. Only one IIPR isolate IPT 31 (*Trichoderma harzianum*) was found promising in parasitism attachment for management of root knot nematode.

R. Jagadeeswaran, Bansa Singh and P.R. Saabale

Tissue-specific *Cry1Ac* Expression in Transgenic Chickpea and Pigeonpea

Total soluble protein isolated from different tissues *viz*., leaves, flowers, pod wall and immature seeds of transgenic chickpea and pigeonpea lines was used to quantify the Cry expression through ELISA. In pigeonpea lines, expression was higher in pod wall (avg.13.00±3.76 ng/mg of TSP) in comparison to immature seeds (avg. 9.84±3.76 ng/mg of TSP) and flower (avg.11.71±5.07 ng/mg of TSP) (188 DAS). In case of chickpea, *Cry* expression was higher in leaves (avg.10.03±1.56 ng/mg of TSP) as compared to immature seeds (avg.7.05±0.86 ng/mg of TSP) and pod wall (avg.8.50±1.51 ng/mg of TSP) (133 DAS). Lower expression of Cry protein in immature seeds and pod wall may be due to switching of alternate metabolic pathways post flowering in plants.

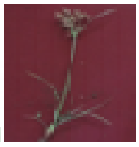
Alok Shukla, Arvind, Alok Das and N.P. Singh

Weed Diversity at IIPR-RRC Farm, Dharwad

The yield losses in pulses due to competition with the weeds can range from 20 to as high as 80 per cent. In rainfed agriculture, weeds cause severe moisture stress and force the grains to shrivel. Extensive monitoring was done on regular basis for identification of different weed flora and assess their extent at the IIPR-RRC Farm during *kharif* and *rabi* seasons of 2014-15. Among major monocot weeds, *Cyanodon dactylon*, *Digitaria marginata*, *Dinebra retroflexa, Dinebra arabica*, *Eleucine indica and Echinocloa sp.* were dominant. At the same time, major dominant broad leaved weeds were *Knoxium mollis*, *Parthenium hysterophorus*, *Commelina benghalensis*, *Ageratum conyzoides, Phyllanthus maderaspatensis, Digeria arvensis* and *Cynotis cucullata*. Among sedges, *Cyperus rotundus* and *Cyperus esculentus* were pre-dominant during both *kharif* and *rabi* seasons. Although manual weeding is the most predominant practice followed, there is need to develop integrated weed management modules involving preventive, mechanical, cultural and chemical methods of weed control.

Cyanodon dactylon

Parthenium histerophorus



Cyperus rotundus

Venkatesh M.S., Ganajaxi Math, Revanappa, S.B., Hosmath, J.A., and Chaturvedi, S.K.

Introgression of Early Growth Vigor into Cultivated Background

An exotic line ILL 7663 identified earlier for early vigor in lentil, was used to introgress early growth vigor in cultivated background and a cross was attempted with improved breeding line IPL 315. Twenty single plants selected in F_2 segregating population last year were grown in 20 different F_3 progeny rows. Among these, one breeding line showed early growth vigor after 50-60 days of sowing. Visual scoring was performed on 1(excellent) - 5 (poor) scale to record growth vigor. Total 18 single plants were selected from this particular line having early vigor for next year evaluation.

Jitendra Kumar, Rohit Kant and Syed Mohd. Quatadah

Growing Summer Mungbean with Less Water

A field demonstration on summer mungbean involving use of less water and modern agro-techniques indicated the pertinent role of good variety selection and sprinkler irrigation. Mungbean cv. Samrat sown during the end of March was successfully raised with only two irrigations (with portable sprinkler sets). Improved practices involving row spacing of 22.5 cm coupled with sprinkler irrigation at 25 and 45 days after sowing resulted in yield of 12.5 q/ha with 30% less water use as compared to 10.5 q/ha realized under farmers' condition (with 30 cm wide row spacing + flood irrigation). This was in contrast to 2nd week of April sowing where three irrigations were required to sustain a good mungbean crop against the high evaporative demand. This type of innovative and contingency crop growing could possibly bridge the gaps in overall production scenario of pulses in the country especially under short rainfall conditions.

C.S. Praharaj, U.Singh, S.S. Singh and N. Kumar

Personnel

Appointments

Name	Post	Discipline	Date of joining
Mr. Bandi Sanjay Maruti	Scientist	Entomology	10.4.2015
Dr. Satsish Naik S.J.	Scientist	Genetics & Plant Breeding	10.4.2015
Mr. Devindrappa	Scientist	Nematology	10.4.2015
Dr. Manjunatha L.	Scientist	Plant Pathology	10.4.2015
Mr. Ram Lal Jat	Scientist	Agronomy	10.4.2015
Dr. Basavaraja T.	Scientist	Genetics & Plant Breeding	10.4.2015

Transfers

Name	Designation	From	To	W.e.f.
Dr. K.K. Singh	Principal Scientist	ICAR-IIPR, Kanpur	ICAR-IISR, Lucknow	5.5.2015
Mr. Alagupalamuthir Solai	Scientist	ICAR-IIPR, Kanpur	ICAR-IISR, Calicut	12.6.2015

Retirement

Name	Post held	Date of retirement
Mr. Raghubansi Singh	Technical Assistant (T 2)	30.5.2015
Mr. Prahalad	Technical Assistant (T 2)	30.6.2015

Participation in ICAR Zonal Sports Tournament

The Institute participated in the ICAR Zonal Sports Tournament-2015 (North Zone) organised at Indian Institute of Soil & Water Conservation, Dehradun, during April 18-21, 2015. IIPR players won Gold Medal in long jump, Silver Medal in 100 metre race and Badminton singles and Bronze Medal in 400 and 1500 meter race. Volleyball smashing team got the runner-up medal. Dr. Rajesh Kumar accompanied the contingent as CDM and Sri K.N. Gupta as team manager.

Transfer of Technology

मूँग पर प्रक्षेत्र दिवस का आयोजन

दिनाँक 28 मई, 2015 को कानपुर देहात के बाढ़ापुर गाँव में प्रक्षेत्र दिवस का आयोजन किया गया। जिसमें ग्रीष्मकालीन मूँग उत्पादन की समग्र प्रौद्योगिकी यथा अल्पकालिक रोगरोधी मूँग की प्रजातियों, अंकुरणपूर्व खरपतवारनाशी का प्रयोग, बीजोपचार, फूल लगने की अवस्था में चूसक कीटों का प्रबंधन आदि पर जानकारी उपलब्ध करायी गई। साथ ही मूँग की उन्नत प्रजातियों जैसे आईपीएम 409-5, आईपीएम 205-7, एचयूएम 16, पूसा विशाल, सम्राट एवं स्थानीय प्रजातियों पर कृषकों के अनुभवों को भी एकत्र किया गया। इसके माध्यम से कृषकों को बताया गया कि वे फसल प्रणाली में सही प्रजातियों का चयन कैसे करें। इस अवसर पर एक परिचर्चा भी आयोजित की गयी जिसके मुख्य अतिथि डा. बी.बी. सिंह, सहायक महानिदेशक (तिलहन एवं दलहन) आईसीएआर थे। डा. सिंह ने सुझाव दिया कि सरसों, चना, आलू और गेहूँ की कटाई के उपरान्त मूँग की अल्पावधि प्रजातियों की खेती लाभकारी है। डा. एम.सी. दिवाकर, निदेशक, गन्ना विकास निदेशालय, लखनऊ ने ग्रीष्मकालीन मूँग के महत्व को बताया एवं संस्थान के वैज्ञानिकों एवं कानपुर देहात के कृषकों के संयुक्त प्रयासों की सराहना की। संस्थान के निदेशक डा. नरेन्द्र प्रताप सिंह ने अल्पकालिक रोगरोधी मूँग की प्रजातियों के विकास एवं विभिन्न फसल प्रणालियों में उनको लोकप्रिय बनाने पर अपने विचार प्रस्तुत किए।

कृषकों ने वर्तमान में मूँग के लगाए गए प्रदर्शनों, उसकी बिक्री एवं होने वाले लाभ पर अपने अनुभव साझा किए। इस कार्यक्रम में 46 महिलाओं सहित कुल 116 कृषकों ने भाग लिया। कार्यक्रम में डॉ. एस.के. चतुर्वेदी, डॉ. संजीव गुप्ता, डॉ. एस.के. सिंह, डा. आदित्य प्रताप तथा आईएआरआई से पधारे डॉ. एच.के. दीक्षित ने मूँग की उत्पादकता को बढ़ाने सम्बन्धी विचार प्रस्तुत किए। डॉ. सुशील कुमार सिंह, प्रधान वैज्ञानिक (कृषि प्रसार) ने कार्यक्रम का समन्वयन किया।

कृषक-वैज्ञानिक परिचर्चा का आयोजन

फतेहपुर जिले के अलीपुर गाँव में दिनाँक 27 जून, 2015 को वर्तमान परिस्थितियों में उपयुक्त, कम लागत और आवश्यकतानुसार कार्यक्रम तैयार करने के उद्देश्य से एक बैठक का आयोजन किया गया। कार्यक्रम के दौरान कृषकों को टिकाऊ खेती एवं ग्रामीण जीविका हेतु यह सिखाया गया कि वे "कम पानी एवं अधिक फसल" सिद्धांत को अपनाएं। कृषकों ने भी मौजूदा प्रौद्योगिकी एवं कृषि की स्थितियों पर अपनी राय रखी।

डा. एस.के. चतुर्वेदी, डा. एस.एस. सिंह, डा. एस.के. सिंह एवं डा. फणीन्द्र सिंह इस अवसर पर प्रमुख वक्ता थे। डा. चतुर्वेदी ने सुझाव दिया कि किसान वर्तमान मानसून की स्थितियों ज्यादा से ज्यादा दलहनी खेती पर ध्यान दें। डा. एस.एस. सिंह ने कम लागत वाली धान एवं दलहन की खेती सम्बन्धी महत्वपूर्ण तकनीकी जानकारी दी। इस कार्यक्रम के समन्वयक डा. सुशील कुमार सिंह प्रधान वैज्ञानिक (कृषि प्रसार) थे।

कृषि प्रदर्शनी एवं किसान मेले में सहभागिता

दिनाँक 27-28 जून, 2015 को आईएआरआई, बरही, हजारीबाग (झारखण्ड) के उद्घाटन के अवसर पर आयोजित कृषि प्रदर्शनी में संस्थान के वैज्ञानिकों ने सहभागिता की। प्रदर्शनी का उद्घाटन श्री राधा मोहन सिंह, माननीय कृषि मंत्री, भारत सरकार ने किया। इस अवसर पर श्री रणधीर कुमार सिंह, कृषि मंत्री, झारखण्ड, डा. एस. अय्यप्पन, महानिदेशक आईसीएआर तथा डा. ए.के. सिंह, उपमहानिदेशक (कृषि प्रसार) ने संस्थान के स्टाल का भ्रमण किया और वैज्ञानिकों से वार्ता की। इस अवसर पर एक किसान गोष्ठी का भी आयोजन किया गया।

28 जून, को श्री नरेन्द्र मोदी, माननीय प्रधानमंत्री ने आईएआरआई की आधारशिला रखी। श्री मोदी ने दलहन उत्पादन, मत्स्य विकास, सूक्ष्म सिंचाई, वैज्ञानिक खेती जैसे महत्वपूर्ण विषयों पर विशेष जोर दिया। उन्होंने कहा कि देश को दूसरी हरितक्रान्ति की महती आवश्यकता है जो देश के पूर्वी भाग से ही सम्भव लगती है। श्री राधामोहन ने जानकारी दी कि आईएआरआई के लिए झारखण्ड सरकार 100 एकड़ भूमि उपलब्ध कराएगी और केन्द्र सरकार से 1000 करोड़ रुपये दिए जाएगें। डा. राजेश कुमार, डॉ. नरेन्द्र कुमार एवं श्री राधा कृष्ण ने संस्थान का प्रतिनिधित्व किया।

दिनाँक जून 27, 2015 को कृषि विज्ञान केन्द्र, मुजफ्फरनगर, उ.प्र. में आयोजित खरीफ किसान सम्मेलन एवं प्रदर्शनी में संस्थान ने सहभागिता की। डा. संजीव बलियान, माननीय कृषि राज्यमंत्री, भारत सरकार इस अवसर पर मुख्य अतिथि थे। डा. बलियान ने संस्थान के स्टॉल का भ्रमण किया और ग्रीष्म मूँग विशेषतः गन्ने के साथ सहखेती विषय में गहरी रुचि दिखाई। किसानों को उर्द एवं मूँग के गुणवत्तायुक्त बीज उपलब्ध कराए गए। कृषक-वैज्ञानिक वार्ता के दौरान कृषकों को नवीनतम जानकारी उपलब्ध करायी गई और वैज्ञानिकों ने कृषकों के अनुभवों को भी सुना। डॉ पुरुषोत्तम, डा. उम्मेद सिंह, डा. आर.के. मिश्रा एवं डा. आर.के. श्रीवास्तव ने संस्थान का प्रतिनिधित्व किया।

Director's Desk

Dear Readers,

Under rainfed agriculture, resources are the major constraints limiting agricultural productivity in India. These are the areas where majority of the marginal and poor farmers live and earn their livelihood with great hardships. They have limited options to diversify the cropping systems due to frequent crisis of water *i.e*., poor or erratic rainfall. Under very low rainfall areas like Bundelhand of U.P. and parts of Madhya Pradesh and central India, farmers usually grow low-water demanding crops like pulses or oilseeds. During past several years, the Bundelkhand region received very low rainfall during monsoon. Pulses are largely affected due to poor conserved soil moisture availability, or on the other hand heavy rainfall during podding stages that severely damage the standing crops. Thus agriculture in this region needs contingent planning to sustain the existing pulses and oilseeds cultivation in these areas.

It is realized that adoption of matching technologies is more important. Among various inputs, availability of seeds and varietal selection under a given agroclimatic situations is most important component which farmers actually need. IIPR, Kanpur has been actively involved to promote pulses in this region through various programmes through farmers participatory mode. Under NARS system during 2009-14, a farmers participatory action research programme (FPARP) was carried out in seed production and multiplication of major pulses to generate awareness and ensure availability of quality seed to farmers in Hamirpur district of Bundelkhand region of U.P. Total 161 farmers with 61 ha of net cultivated area participated in this FPARP programme in three major pulses *viz*., chickpea, lentil and pigeonpea. Farmers were trained for acquiring initial know-how and subsequent skill/expertise development. The study amply demonstrated yield advantages to the tune of 30 to 50% in improved varieties of these crops over local varieties following the recommended practice. Highest yields were realized with improved varieties under farmers' conditions and cost of cultivation also reduced substantially resulting in higher benefit cost ratios. Due to FPARP, farmers were able to produce truthful level seed for all the pulses. In addition, significant quantity of this produce could also enter into the seed chain by the adopted farmers themselves. Chickpea seed was diffused fastest and farthest from the adopted villages to other 18 villages in a radius of 24 km. Similar programme was also initiated by IIPR in District Hamirpur under IVLP.

The Institute has been instrumental in technological backstopping the farmers of Uttar Pradesh for seed production of pulse crops to ensure seed sufficiency at the village level for past one decade. These efforts on the one hand have led to strengthening the informal seed system in the villages, while on the other, they have worked towards establishment of formal seed system with linkages with national and state seed agencies like NSC, UP State Seed Corporation and UP State Seed Certification Agency. Selection of varieties for seed production was carried out through farmers participatory varietal selection trials prior to initiation of seed production. In the process farmers were technologically and economically empowered by organizing them in seven registered seed producer groups in Kanpur Dehat, Hamirpur, Fatehpur and Balia districts. The groups contributed approximately 4000 q of seeds of different pulses *viz*., pigeonpea, chickpea, urdbean and mungbean, which resulted in enhancement of areas of farmers' preferred pulse varieties and their production. Assessment of bio-intensive module for management of pod borer in chickpea ecosystem was also carried out with participation of about 300 farmers of Bundelkhand region. The bio-intensive module included pheromone traps, NSKE, HaNPV and safer insecticide (Spinosad). Which resulted in significant reduction in pod damage (7.6 to 10.22%) against control (14.15 to 25.52%). To popularize the IPM technology for management of pod borer in chickpea and pigeonpea, need based demonstrations were conducted in 2000 ha area each in Banda, Hamirpur and Fatehpur districts of U. P.

The Institute has gained successful experience in harnessing the linkage with KVKs located across the states for wider diffusion of pulse production technologies in different outreach programmes for farmers, farm youth and tribal community. For achieving speedier dissemination of pulse production technologies among the farmers, farmer to farmer extension mechanism was evolved. Institute is providing technological support to the national extension system of the country by way of conducting need oriented capacity enhancement programmes for extension officers and Subject Matter Specialist from KVKs from all over the country. Need based trainings for farmers are also carried out by the Institute round the year. To reach farming communities with use of modern communication technologies. Institute has collaborated with All India Radio, Kanpur, DD Lucknow *etc*. Thus, with awareness and knowledge upgradation, the farmers could ensure quality seed production and its multiplication and thereby, making seed production system viable and remunerative.

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.

(N. P. Singh)

Published by Dr. N.P. Singh, Director, ICAR-Indian Institute of Pulses Research, Kanpur-208 024
Tel. : 0512-2570264; EPBAX Lines : 0512- 2572464, 2572465; Fax : 0512-2572582
E-mail : director@iipr.ernet.in ; npsingh.iipr@gmail.com; Website; http://www.iipr.res.in

Printed at Army Printing Press, 33, Nehru Road, Sadar Cantt., Lucknow-226 002. Tel. : 0522-2481164, 6565333