



PULSES



Newsletter

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Group Meet on Pigeonpea Held

The 22nd Annual Group Meet of AICRP on Pigeonpea was held on May 19-21, 2017 at Dr. Rajendra Prasad Central Agriculture University, Pusa, Samastipur (Bihar). About 120 delegates from cooperating centres of SAU's and ICAR Institutes attended this group meet. Dr. R.C. Srivastava, Vice-Cancellor, DRCAU, Pusa, Bihar chaired the Inaugural Session and Dr. S.K. Varshney, Dean, Agriculture, Dr. R.P. Roy Sharma, Ex-VC BAU, Ranchi, Dr. N.P. Singh, Director, IIPR (Kanpur), Dr. I.P. Singh, Project Coordinator (Pigeonpea) and other dignitaries were present. Dr. Varshney while welcoming the dignitaries and delegates, highlighted the achievements made by the University and stressed upon development of early and mid-early varieties of pigeonpea especially for Bihar.

Dr. R.C. Srivastava, Vice-Cancellor, in his remarks, appreciated the constant research efforts of pulses research community that reflected in the form of record pulse production. He stressed upon the need for appropriate

storage facility for pulses and suggested that the value addition at village level would greatly strengthen the livelihood of marginal farmers. Dr. R.P. Roy Sharma emphasized upon the necessity to examine the phenological alterations



in pigeonpea during different temperature regimes. Similarly, problems in pigeonpea like high flower drop and effective number of seeds per pod should be addressed and this demands for a multidisciplinary approach.

Dr. N.P. Singh presented the scenario of pulses in the country and appreciated the sincere efforts of scientific community, in addition to favourable weather conditions and government policies in place, which

collectively resulted in record production of pulses this year. He also underlined the challenge of sustaining the enhanced pulse production. He highlighted the development of seed hubs that cover 150 districts across the country. Dr. Singh also briefed about the important government schemes including development of biofertilizers and bio-control units. He stressed on pre-breeding programme to broaden the genetic base of pigeonpea. He informed that regulatory approval was obtained for conducting confirmed field trials on transgenic chickpea and pigeonpea. He said that the current scenario demands for photo-thermo insensitive pulse crops, and genotypes that are amenable to mechanical harvesting.

Dr. I.P. Singh, Project Coordinator (Pigeonpea) presented annual progress of the project. He informed that various entries found promising were promoted to next level of evaluation. Later in the technical session, programmes of various disciplines were discussed and finalized.

Group Meet on MULLaRP and Arid Legume Crops Organised

Group meet on mungbean and urdbean under AICRP on MULLaRP and Network Programme on Arid Legumes was held at G.B. Pant University of Agriculture & Technology, Pantnagar on May 6-8,

2017. Prof. J. Kumar, Vice-Chancellor of the University inaugurated the meet. Dr. J.P. Singh, Director Research, GBPUAT welcomed the dignitaries on the dias. Prof. J. Kumar, Vice-chancellor enlightened the house about the enormous existing possibilities for increasing pulses production in the country.

Dr. Sanjeev Gupta, Project Coordinator, MULLaRP while presenting report of the project, apprised about major achievements and constraints

in mungbean and urdbean crops including problem of MYMV and some other emerging diseases like groundnut bud necrosis virus. He emphasized that plant types need to be changed inducing



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Cont... Group Meet on MULLaRP and Arid Legume Crops

photo-thermo insensitivity and developing cold tolerance for rice fallow cultivation. He elaborated upon the efforts going on pre breeding, productive cropping systems with mungbean and urdbean, development of IPM modules and microbial consortium.

Dr. Shiv Sewak, Nodal Officer, AINP on Arid Legumes presented the report of the project. He informed the house that one cowpea variety KBC 9 was identified for cultivation in South zone.

Dr. N.P. Singh, Director, ICAR-IIPR elaborated the ongoing R&D

activities in pulses in India. He highlighted the significance of coordinated pulses and arid legume research. He congratulated the entire NARS partners associated with pulses research for the current year's record production. Dr. Singh also stressed upon the need for transgenic development and updated the house regarding progress made in chickpea and pigeonpea.

In his special remarks, Dr. S.K. Chaturvedi, Acting ADG (O&P), ICAR briefly highlighted the research needs in these priority crops and ICAR's efforts

to increase the pulses production in the country. The research aim should be to enhance the factor productivity and therefore a holistic approach is required.

In the group meet, a session on inter-project linkages was also held in which Dr. Ram Krisnan Nair elaborated the activities of International Mungbean Network supporting NARS activities in India. Results of *kharif* 2016 were discussed thoroughly and technical programme for *kharif* 2017 was finalized.

NICRA Technical Programme Workshop Held at IIPR

The technical programme finalization workshop of NICRA for the period 2017-20 for NICRA Partner Institutes was held on May 11, 2017 at IIPR, Kanpur. The meeting was chaired by Dr. N.P. Singh, Director, IIPR, Kanpur and co-chaired by Dr. K. Sammi Reddy, Acting Director, CRIDA, Hyderabad. Dr. Singh while welcoming the delegates emphasized the need to have coordination while working on the same crop by different institutes. Dr. Sammi Reddy highlighted outcome from the past five years of NICRA and felt the need to take some of these technologies for on-farm testing and wide scale adoption. Presentations by PIs of 13 partner institutes were made highlighting major achievement, focussed areas of research for next phase of NICRA and

proposed technical programme for 2017-20. It was suggested that material generated in the NICRA project should be shared between the institutes working on same crop viz., wheat (IARI, IIWBR and NBPGR), rice (NRRI, IIRR, IARI and ICAR-NEH,) maize (IIMR, ICAR-NEH and CRIDA) and there is a need for convergence of activities across the institutions to avoid duplication of works. Results of NICRA project should be presented in the respective crop workshops for scientific inputs, fine-tuning of the activities and avoid duplication of works. Priority should be given for up keeping and maintenance of



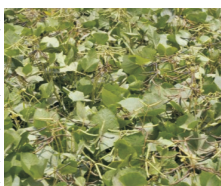
infrastructure facilities established under NICRA at different partner institutes. These facilities should be made available to other research institutes, may be on charging basis to cover part of maintenance cost. After thorough discussion, the technical programme for each institute was formulated. Dr. Sanjeev Gupta, PI of NICRA programme IIPR, Kanpur extended vote of thanks.

Research Highlights

New Mungbean Varieties Identified for Uttar Pradesh

Two new mungbean varieties viz., Kanika (IPM 302-2) and Varsha (IPM 2K14-9) were identified for commercial cultivation in Uttar Pradesh. Kanika has been identified for Spring and *kharif* seasons as it exhibited a wider adaptability and yield superiority of >15% over the best check variety IPM 02-3 in State Adaptive Trials over 3 years (2014-16). In AICRP-IVT trials also this variety recorded yield superiority of about 14% (1192 kg/ha) over the best check Pusa 9531 (1048 kg/ha) in Spring season. This variety recorded an average grain yield of 922 kg/ha in Spring and 524 kg/ha in *kharif* season across different locations of Uttar

Pradesh. It matures in 61-78 days in *kharif* and 65-72 days in Spring with average maturity of around 70 days. It is highly resistant to MYMV and Cercospora leaf spot and resistant to leaf crinkle and leaf curl diseases. It has green, shining, attractive and medium large (3.4 g/100-seed weight) seeds.



Other variety, Varsha, has been identified for *kharif* cultivation. It exhibited yield superiority of >20% over the best check variety IPM 02-3 in State Adaptive Trials over 3 years

(2014-16). It recorded an average grain yield of 560 kg/ha across different locations of the state, the highest being 1065 kg/ha at Meerut. Maturing in 65-75 days, it is highly resistant to Mungbean Yellow Mosaic disease and powdery mildew and moderately resistant to Cercospora leaf spot. It has green, shining, attractive and medium large (3.0 g/100 seed weight) seeds. These two varieties will pave a way for horizontal as well vertical expansion of mungbean in U.P.



Emerging Insect-Pest and Natural Enemy Diversity in Summer Mungbean

A survey was conducted in May, 2017 at Bindki and Katri villages of Fatehpur district. Mungbean varieties viz., Samrat, Virat and Shikha were sown on 20th April 2017. In Bindki, urdbean (IPU12-43) was also cultivated. Heavy pod infestation of *Helicoverpa armigera* Hubner in summer mungbean was recorded. The pods had 1-5 circular bore holes on them. *H. armigera* was seen damaging the developing green pods and flowers. Twenty plants were randomly selected and average larval load was recorded (1.4 larva / plant). The larvae were mostly in fourth or fifth instar. Apart from pod borer, defoliators (*Spodoptera litura* Fabricius and *Spodoptera exigua* Hubner) infestation was also recorded on mungbean with a

larval density of 2-4 larva/sq.m.

The data about plant protection measures practiced by farmers revealed that after sowing Coragen® (3ml/16L of water) spray was done to manage *S. exigua*, followed by a spray of lambda cyhalothrin to manage pod borer and *S. litura*. The cropping pattern followed in the villages is potato/wheat/mustard-summer mung/colocasia. Egg masses of *S. litura* (3/sq.m) were recorded from colocasia. The *S. litura* larvae were collected and reared on artificial diet in laboratory.

Out of 700 larvae, 3 larvae died due to parasitization by *Peribaea orbata* Weidmann belonging to Tachinidae. Two tachinid pupae were formed from a single *S. litura* larva.

Three Hemipterans and a Coleopteran species were also recorded from Fatehpur district. Among the 3 Hemipterans, 2 were predators (Pentatomidae and Reduviidae) and 1 is a pest (*Homoeocerus signatus* Walker - Coreidae). The coccinellid, *Coccinella transversallis* Fabricius occurrence is common in summer mungbean at Fatehpur. The summer mungbean grown at Fatehpur is having high arthropods diversity with 4 insect pests, a larval parasitoid and three predators, which is due to cropping pattern followed in these villages. The arthropods recorded belong to orders Hemiptera, Lepidoptera, Diptera and Coleoptera.

Sujayanand, G.K., Uma Sah, Narendra Kumar, Sonika Pandey and Krishna Kumar

Pre-miRNA Based Microsatellite Markers in Chickpea

The pre-miRNA sequences of the reported mature miRNAs were retrieved manually from ICC4958 draft genome sequence version 1.0 and CDC frontier genome sequence and searched for the presence of microsatellite repeat motifs and designed a pair of primers. Total 57 pre-miRNA sequences with microsatellite motifs were identified, which includes 38 and 19 pre-miRNA sequences belonging to conserved and novel miRNAs, respectively. Forty eight simple SSRs and 9 compound SSRs were identified and grouped into class I microsatellite with motif repeat length ≥ 20 nt (9) and class II microsatellite with < 20 nt and ≥ 12 nt (48) based on their length of repeat motif. SSRs according to motif repeat

type, maximum of 24 tetra-nucleotide repeats followed by 20 di-nucleotide repeats and least hexa-nucleotide repeat motifs (4) were found in the different pre-miRNA coding sequences of chickpea. These SSRs are present in all 8 linkage groups of chickpea (25) and also in unplaced scaffold sequence of chickpea (32). The variation in microsatellite repeat motif length of pre-miRNA could be responsible for differential genesis of miRNAs that might successfully influence the trait expression and these markers will yield more information in genetic diversity analysis and tagging and mapping of genes/QTLs.

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

Development of Intron Spanning Markers in Lentil

A set of polymorphic intron spanning markers (ISMs) using a cross species mapping approach has been developed in lentil. In this approach, putative unique transcripts (PUTs) of *Lens culinaris* from PlantGDB (version 187) were mapped on to the *Medicago truncatula* genome due to its high synteny with lentil genome. Spliced alignment of the PUTs using GeneSeqer resulted in a total of 25717 alignments, resulting in development of 1703 ISMs. Out of these, a sub-set of 105 ISMs was synthesized and validated with 51% amplification success rate in genetically diverse panel of 32 lentil genotypes including wild species. Out of these ISMs, 40 (74%) were polymorphic and generated 2-11 alleles/per locus. The clustering of the tested genotypes was in conformity to their pedigree relationships. This set of polymorphic intron spanning markers along with their functional annotation data will be useful in lentil genetics and breeding.

Debjoyoti Sen Gupta, Jitendra Kumar, Sunanda Gupta, Sonali dubey, Priyanka Gupta, N.P. Singh and Gaurav Sablok

Promising Effect of Liquid Biofertilisers on Urdbean

Bio-fertilizers are low cost and eco-friendly inputs having potential for supplying nutrients which can reduce the chemical fertilizer dose by 25–50 per cent. Liquid bio-fertilizer formulation (LBF) is promising technology. In a field trial conducted during *kharif* 2016 at IIPR-Regional Centre-cum-Off Season Nursery, Dharwad, effect of liquid cultures of *Rhizobium* and Phosphate solubilises was investigated with 100% and 75%

of recommended dose of fertilizers in urdbean. Results revealed that application of 100 % RDF with liquid biofertilizers was at par with 75% RDF+ biofertilizers. The study needs detailed investigation on the effect of liquid biofertilizers on pulses in terms of productivity as well as soil quality parameters.

Venkatesh, M.S., Patil, C.R. and Revanappa, S.B.

Adieu

Sh. Ram Kishan, Skilled Supporting Staff has retired on superannuation on June 30, 2017.

Powdery Mildew Disease in Horsegram

Horsegram (*Macrotyloma uniflorum* (Lam.) Verdc. Syn. *Dolichos biflorus*) is an important pulse crop grown in southern India. Low yield of horsegram is due to various biotic and abiotic stresses. Powdery mildew caused by *Erisiphe polygoni* DC is an important disease limiting its production and productivity. It appears during November and December, when favourable weather conditions such as dry and high humidity thrive. Initially symptoms appear on lower parts of leaves and spread to upper leaves in the form of circular brown spots. Later the spots enlarge and are covered by white powdery growth of the fungus. Total 72



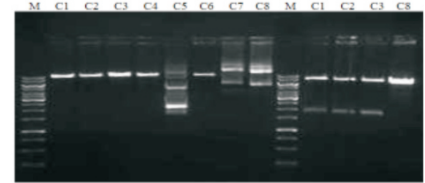
accessions of horsegram were screened for powdery mildew disease under natural field conditions during late *kharif* season of 2016-17 at IIPR Regional Research Centre-cum-Off Season Nursery, Dharwad. Most of the horsegram entries revealed highly susceptible reaction to powdery mildew disease. Entries *viz.*, GPM 18, GPM 24, GPM 59, GPM 44-4 and GPM 4 were found highly resistant to powdery mildew disease under natural field condition.

Revanappa S.B., Saabale P.R., Venkatesh M.S. and Shiv Sewak

Modification of pRI201AN Vector for Use in Co-transformation Studies

Presence of selectable marker gene, especially antibiotic resistance genes, in developed transgenic may raise public and regulatory concerns along with possible technological disadvantages. Marker free transgenic is hence now preferred and use of the two vector system to develop them is a strategy of choice. In this context, the pRI201AN vector was modified to have a single *nptII* gene. Multiple cloning sites were excised along with additional nucleotides towards the right border (1442 bp) using restriction enzymes *EcoRI* and *HindIII* to create staggered and incompatible ends. The desired vector fragment was eluted from agarose gel, purified and the ends made compatible using desired enzymes. The

vector was ligated, transformed into *E.coli* and screened through blue white colony selection. Screened transformants were confirmed by *PmeI*–*NsiI* double digestion and also colony PCR. The developed vector can now be used for co transformation studies following the two vector strategy.



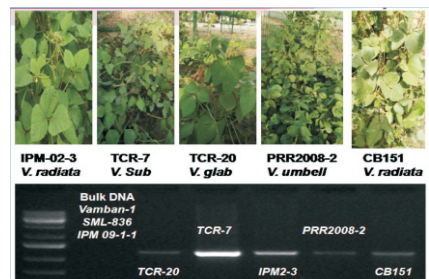
M is 1 Kb DNA marker and C1-C8 are recombinant clones of marker gene expression cassette.

Paras Pandey, Meenal Rathore, Alok Das and N.P. Singh

Yellow Mosaic Disease Resistance in *Vigna* Gene Pool

Two hundred ninety *Vigna* accessions including 101 wild accessions belonging to 22 species were grown at wild *Vigna* garden of ICAR-IIPR. Besides, 189 cultivated accessions consisting of 164 mungbean (*Vigna radiata* L. Wilczek), 20 urdbean (*Vigna mungo* L. Hepper) and 5 rice bean (*Vigna umbellata*) were grown at two locations (main farm and new research farm of IIPR) to evaluate for yellow mosaic disease resistance. The disease was recorded on 0-9 scale. The PCR with specific primers for MYMIV, MYMV and HgYMV were performed to confirm the presence of viruses. The samples were found positive for MYMIV only. Based on phenotypic score of YMD and presence of CYR1 (a resistance gene analog, which gives 1.5 kb amplicon in resistant accessions), total 117 accessions

including cultivated species, breeding lines and wild accession belonging to 19 different species were identified as potential donors for MYMIV resistance.



Some representative resistant accessions characterized by CYR1 from GP1, GP2 and GP3

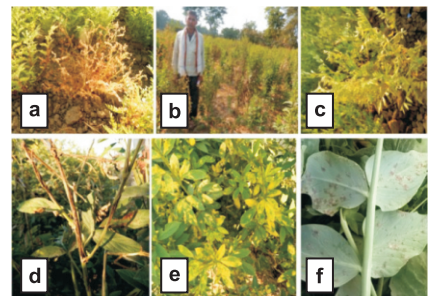
(Vamban-1, SML-836 and IPM09-1-1 are highly susceptible, TCR-20, TCR-7, IPM2-3, PRR2008-2 and CB151 are highly resistant)

Chandra Mohan Singh, Ajeet Kumar Gupta, Aditya Pratap and N.P. Singh

Disease Complex in Pulses at Farmers' Fields in Bundelkhand Region

Monitoring of seed production plots of chickpea, pigeonpea, lentil and fieldpea crops at farmers' fields in Hamirpur, Banda and Chitrakoot district of Bundelkhand region was conducted during February-March, 2017. It was observed that incidence of wilt disease was significantly higher in chickpea, pigeonpea and lentil crop in all the districts. However the severity of the disease was highest in lentil in Hamirpur district, followed by pigeonpea and chickpea. In fieldpea Downey mildew (*Peronospora pisi*) was predominantly present in most of the

farmers' fields in all the three districts surveyed, with highest in Hamirpur district where disease incidence was 20-25%. In pigeonpea, yellow mosaic (YMD) and stem rot (*Sclerotinia sclerotiorum*) diseases were also observed to widely infect the crop and was recorded as emerging diseases in Hamirpur district. Wilt disease was more common in fields where regularly same crop rotation was followed. Diseases like, stem rot, yellow mosaic and downey mildew were observed to occur in sporadic form in patches.



Wilt infected chickpea (a), pigeonpea (b) and lentil (c) crop, stem rot (d), yellow mosaic (e) disease in pigeonpea and downey mildew infected fieldpea (f) at farmers fields

R.K.Mishra, Ummed Singh, Narendra Kumar, Amrit Lamychamy and Uma Sah

Molecular Markers Associated with Flowering Time in Lentil

A diverse panel of 96 accessions of lentil germplasm was used to study flowering time over environments and to identify simple sequence repeat markers associated with flowering time through association mapping. Screening of 534 SSR markers resulted in identification of 75 SSR polymorphic markers (13.9%) across studied genotypes. Model based cluster analysis based on above SSR markers resulted in two distinct sub-populations. Distribution of flowering time ranged between 40 to 70 days in sub-population I and 54 to 69 days in sub-population II and did not skew towards either late or early flowering time within sub-population. No admixture was observed within sub-populations. Use of most accepted maximum likelihood model (P3D mixed linear model with optimum compression) of MTA analysis showed significant association of 26 SSR markers with flowering time at <0.05 probability. The per cent of phenotypic variations explained by each associated marker with flowering time ranged from 2.1 to 21.8% and identified QTLs for flowering time explained high phenotypic variation across the environments or in a particular environment. These markers can be used in lentil breeding programme for developing short duration cultivars.

Jitendra Kumar, Sunanda Gupta, Revanappa S. Biradar, Sonali Dubey and Priyanka Gupta

Pulse Based Bio-village Sustainable Models

A project on development of pulses based bio-village sustainable models is being implemented in villages Barapur in district Shahjahanpur and Kucharam in Chitrakoot. The demonstrations cum seed production on *rabi* pulses viz., chickpea (var. Ujjawal) and fieldpea (var. Adarsh, Vikash, IPF 4-9) were organized with 42 farmers in 10.0 ha and was registered with state seed certification agency. Farmers were empowered through field level trainings and meetings. The biopesticide spinosod 45 SC (0.4 ml/l water) and neem based formulations (1.5 ml/l water) were applied in chickpea against *Helicoverpa*. Farmers appreciated the impact of

Pulse-prenuers for Strengthening Informal Farmers' Seed System

Efforts for improving the overall system productivity of mungbean inclusive cropping pattern were made in Paradan and Faridpur villages of Khajuha and Malwa blocks in Fatehpur district of U.P. by introducing mungbean production with disease resistant varieties (Samrat, Meha, IPM 2-3, Virat) for summer cultivation. The production technologies were introduced in rice-potato, rice-mustard, rice-wheat and rice-coriander cropping systems during summer/spring 2015-17. Forty nine partner farmers with 27.50 ha area were also encouraged for seed production of these varieties.

The project interventions resulted in average productivity of 9.40 q/ha of mungbean against 5.53 q/ha in local practice. Partner farmers got average net income of Rs. 20,000 to Rs. 26,000 /ha in different mungbean inclusive cropping systems. Two participating farmers, Arvind Verma of Faridpur and Rakesh Kumar of Paradan village emerged as seed prenuers for

mungbean in the area. These two farmers collectively disposed about 2114



kg of produce as seed to other farmers through social networks in 47 villages spread within a radius of 25 km. The diffused seed could cover additional 106 ha area in adjoining villages in Fatehpur, Unnao, Banda, Kanpur Dehat and Kanpur Nagar districts. In addition, they sold the produce as seed at a higher price (Rs. 70-100/kg) than market price for grain (Rs. 60/kg). These two farmers together also contributed about 291 kg of seed of improved mungbean varieties in the formal seed system. Over past three years they have contributed towards strengthening the informal farmers' seed system as well as formal seed system of mungbean in the district.

Uma Sah, Narendra Kumar, Aditya Pratap, Sujayanad, G.K. and Sandeep Sharma

these insecticides. Grain yield of chickpea was recorded 16.25 and 14.50 q/ha with average of 11.37 and 12.25 q/ha in Chitrakoot and Shahjahanpur, respectively. Performance of field pea varieties was better at Chitrakoot with maximum yield of 22.50, 13.75, 11.25 q/ha as compared to Shahjahanpur with yield of 12.24, 11.78, 13.15 q/ha, respectively. Total 27.68 q quality seed of chickpea (var. Ujjawal) was supplied by 21 farmers with amount of Rs. 2.7 lakh to IIPR. One IIPR mini *dal* mill was supplied for processing and employment generation in village Kucharam in Chitrakoot.

Purushottam, Rajesh Kumar and Ravindra Singh

Large Scale Diffusion of Short Duration Mungbean Variety Virat

Virat (IPM 205-7) is a short duration (55 days) disease resistant mungbean variety released for cultivation. The variety was introduced in Barapur village in Kanpur Dehat district in spring /summer 2016, in the form of 50 evaluation kits of 2 kg seed each. Farmers were encouraged to assess the variety in their agro-climatic situation. In a survey conducted during

2017, it was recorded that with the preferred varietal characteristics of earliness and superior yield potential, the variety Virat spread to about 185 acres during 2017 which was about 60% of total mungbean grown in the village. Collaborating farmers during 2016 had diffused the farm-saved seed for this area expansion during 2017. With good crop growth and adoption of critical crop protection measures, farmers could achieve an average productivity of 10-12 q/ha and earned gross returns of about Rs. 96,000 per hectare. Farmers of the project villages perceived a huge demand for seed of Virat in the subsequent years with an increased coverage expected in coming years.

Uma Sah, Aditya Pratap, Sanjeev Gupta and Sandeep Sharma

Promotions

Name	Promoted to	W.e.f.
Sh. A.B. Singh	Chief Technical Officer	3/2/2016
Sh. R.S. Mathur	Chief Technical Officer	1/7/2016
Dr. G.K. Srivastava	Chief Technical Officer	1/7/2016
Sh. A.P. Singh	Asstt. Chief Technical Officer	2/9/2016

प्रौद्योगिकी हस्तान्तरण

प्रसार गतिविधियाँ

किसान मेला में सहभागिता

संस्थान ने अप्रैल 15-19, 2017 को मोतीहारी, बिहार में चम्पारण सत्याग्रह शताब्दी समारोह के मौके पर आयोजित किसान मेले में सहभागिता की।

प्रशिक्षण का आयोजन

7-9 जून, 2017 को दलहनी फसलों के लिए उन्नत उत्पादन प्रौद्योगिकी विषय पर जालौन जिले के 30 किसानों के लिए 22-24 जून, 2017 को कन्नौज जिले के 25 किसानों के लिए और 27 जून, 2017 को कानपुर के 50 किसानों एवं फतेहपुर जिले के 18 किसानों के लिए प्रशिक्षण कार्यक्रम का आयोजन किया गया।

प्रदर्शन हेतु भ्रमण

मध्य प्रदेश के 55 एवं उत्तर प्रदेश के 97 कृषकों के लिए प्रदर्शन हेतु भ्रमण का आयोजन किया गया। किसानों को टेक्नोलॉजी पार्क में लगे ग्रीष्म कालीन मूँग के परीक्षणों एवं संग्रहालय को दिखाया गया। किसानों को संस्थान द्वारा विकसित साहित्य भी उपलब्ध कराया गया।

संस्थान में अन्तर्राष्ट्रीय योग दिवस मनाया गया

अन्तर्राष्ट्रीय योग दिवस 21 जून, 2017 को भारतीय दलहन अनुसंधान संस्थान के प्रांगण में बड़े उत्साह के साथ मनाया गया। प्रातः 6:00 बजे आयोजित इस योग कार्यक्रम में संस्थान के वैज्ञानिकों, तकनीकी व प्रशासनिक वर्ग के कर्मचारियों ने भाग लिया। इस अवसर पर विभिन्न योग क्रियाओं के अतिरिक्त योग पर व्याख्यान का आयोजन भी किया गया। इस अवसर पर संस्थान के निदेशक डॉ. नरेन्द्र प्रताप सिंह ने जीवन में योग के महत्व पर प्रकाश डाला। उन्होंने कहा कि आज के इस प्रदूषित वातावरण में योग को जीवन में अपनाकर ही स्वस्थ रहा जा सकता है और तनाव मुक्त जीवन जीया जा सकता है। योग क्रियाएं आयुष मंत्रालय के प्रोटोकाल के अनुरूप संस्थान के प्रधान वैज्ञानिक डॉ. बन्सा सिंह ने पूर्ण करवाईं। पतंजलि योग समिति, कानपुर पश्चिम के अध्यक्ष योगाचार्य श्री राम सिजोर ने अपने व्याख्यान में योगासनों पर विस्तार



फार्मर फर्स्ट परियोजना के अंतर्गत मुर्गीपालन हेतु चूजों का वितरण

जून, 2017 में फार्मर फर्स्ट प्रोजेक्ट के अंतर्गत फतेहपुर जिले के गाँवों का सर्वेक्षण किया गया और पाया गया कि गाँवों में रोजगार एवं आमदनी की काफी समस्या है। गाँव के युवकों ने बताया कि आमदनी के लिए मुर्गीपालन एक उपयुक्त रोजगार हो सकता है। अतएव योजना के अंतर्गत युवकों को मुर्गीपालन का प्रशिक्षण दिया गया। प्रशिक्षण के दौरान युवकों को मुर्गीपालन के सभी पहलुओं की पर्याप्त जानकारी उपलब्ध करायी गई। सीएआरआई, इज्जतनगर से श्यामा, निर्भीक और देवेन्द्र प्रजाति के द्विउद्देशीय 1600 चूजे मंगाए गए और उन्हें

कछलपुर, मिराय, खरौली गाँवों के किसानों को वितरित किया गया। उक्त कार्य के दो उद्देश्य हैं युवकों की आमदनी बढ़ाने के लिए मुर्गीपालन केन्द्र का विकास एवं ग्रामीणों की पोषण सुरक्षा में वृद्धि।



दक्षिण अफ्रीका की टीम ने फतेहपुर जिले के कछलपुर गाँव का भ्रमण किया

21 अप्रैल, 2017 को उ.प्र. के फतेहपुर जिले के कछलपुर गाँव का दक्षिण अफ्रीका की टीम ने दौरा किया। इस गाँव में मूँग एवं उर्द के परीक्षण लगाए गए हैं। दलहन उत्पादन के विभिन्न महत्वपूर्ण पहलुओं जैसे उत्पादन, क्रय और प्रसंस्करण प्रौद्योगिकी पर वैज्ञानिकों ने किसानों से वार्ता की। किसानों ने वैज्ञानिकों से बाजार की स्थिति एवं ज्यादा लाभ के उपायों पर जानकारी प्राप्त की। उन्हें यह भी बताया गया कि किसान सेवा समिति क्या और किस तरह से काम करती है। टीम ने वहाँ किये जा

रहे कार्यों की भूरि-भूरि प्रशंसा की जो फार्मस फर्स्ट प्रोजेक्ट के अंतर्गत हो रहा है। परियोजना के अन्तर्गत गाँवों में लगाए गए मूँग, उर्द एवं सब्जी फसलों के प्रक्षेत्रों का भी टीम ने दौरा किया।



'चनामित्र' एप-चना किसानों के लिए विकसित एक द्विभाषीय एप्लीकेशन

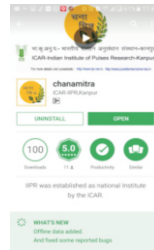
आईसीएआर-आईआईपीआर द्वारा किसानों तक अपनी पहुँच बनाने और उन्हें जानकारी उपलब्ध कराने हेतु 'चनामित्र' नाम का एक एप्लीकेशन विकसित किया गया है जिसमें नवीनतम जानकारी, सलाह और सुझाव जो चना के किसानों के लिए अति महत्वपूर्ण हैं, दोनों भाषाओं में उपलब्ध हैं।

एप्लीकेशन के अंतर्गत चरणबद्ध तरीके से प्रजातियों की जानकारी फोटोग्राफ्स के साथ उपलब्ध करायी गयी है। इसके अतिरिक्त, इसमें फसल उत्पादन प्रौद्योगिकी, फसल सुरक्षा, कीट प्रबन्धन, रोग लक्षण, बाजार भाव एवं मौसम के हाल की भी नवीनतम जानकारी उपलब्ध करायी गई है। किसान एवं अन्य हितधारक अपने मोबाइल पर ही इस एप पर सारी जानकारी चित्रों/विवरण के साथ प्राप्त कर सकेंगे। यह एप उत्कृष्ट उपयोगी है। किसान अपनी समस्याओं को रिकार्ड कर एवं लिख कर इस

पर पोस्ट करेंगे और उन्हें जल्द से जल्द उसका समाधान उपलब्ध कराया जाएगा। इस एप्लीकेशन से बहुविषयक शोधकर्ता/वैज्ञानिकगण जुड़े हुए हैं जो किसानों को उनकी समस्याओं का समाधान उपलब्ध कराते हैं।

इस एप्लीकेशन के व्यापक प्रयोग को ध्यान में रखते हुए और नेटवर्क की समस्या से निपटने के उद्देश्य से एप को ऑफ लाइन मोड में कार्य करने में समर्थ बनाया गया है। इसे एन्ड्रायड फार्म पर विकसित किया गया है जिसे गुगल प्लेस्टोर पर डाउनलोड किया जा सकता है। इसका लिंक है-

<https://play.google.com/store/apps/details?id=com.smsquare.chanamitra>



से चर्चा की। उन्होंने यह भी बताया कि कौन से आसनों का नियमित अभ्यास करके कौन से रोगों से मुक्ति पाई जा सकती है। इस अवसर पर संस्थान के वरिष्ठ पदाधिकारी परियोजना समन्वयक डॉ. आई.पी. सिंह, डा. संजीव गुप्ता, विभागाध्यक्ष डॉ. कृष्ण कुमार, डॉ. शिव सेवक, डॉ. जगदीश सिंह, डॉ. राजेश कुमार, डॉ. सी.एस. प्रहराज, वरिष्ठ प्रशासनिक अधिकारी श्री कुमार विवेक, वित एवं लेखाधिकारी श्री डी.के. अग्निहोत्री एवं श्री दिवाकर उपाध्याय भी मौजूद थे।

Pulse Day Celebrated at Samba

Pulse day was celebrated on February 18, 2017 at Pulses Research Sub-Station, Samba of SKUAST-Jammu. Dr. J.P. Sharma, Director Research of SKUAST-Jammu was the Chief Guest and Dr. R.L. Bhagat, Chief Agriculture Officer, Jammu Department of Agriculture, Government of Jammu and Kashmir, was the guest of Honour. Scientists of SKUAST-Jammu and officials of the Agriculture Department, Government of J&K and large number of pulse growing farmers participated in the function. At the outset, Dr. Brij Nandan, Senior Scientist, PRSS, Samba briefed the farmers about the importance of pulse in *rainfed* as well as irrigated situations. Dr. R.L. Bhagat highlighted the role of pulses in boosting the production and farmers income. Dr. B.C. Sharma, Head, Agronomy in his key note address highlighted the importance of pulses in changing climate scenario. Large number of farmers interacted with the scientists for cultivation of pulses and increasing the areas by sparing even small holding out of the traditional rice-wheat, wheat-maize and vegetable based cropping systems. During the function progressive pulse growing farmers were honoured by giving mementoes and certificate of appreciation.

Dr. Brij Nandan

Honours and Awards

- ❖ Dr. N.P. Singh, Director, ICAR-IIPR, was awarded with Dr. Dharpal Singh Lifetime Achievement Puraskar by U.P. Academy of Agricultural Sciences, Lucknow. The award was presented to Dr. Singh by Hon'ble Governor of Uttar Pradesh Shri Ram Naik on June 14, 2017, in presence of Drs. Mangala Rai and Panjab Singh, both former DG ICAR and other dignitaries. Dr. Singh has been awarded for his notable contributions in over all agricultural development in Uttar Pradesh.



- ❖ Dr. Uma Sah, Pr. Scientist received Dr. Ram Pratap Singh Vishisht Krishi Vaigyanik Puraskar in Agricultural extension management category for the year 2016 from UP Academy of Agricultural Sciences at Lucknow.

The award was given by Hon'ble Agriculture Minister, Uttar Pradesh, Shri Surya Pratap Sahi in presence of Hon'ble Governor, Uttar Pradesh, Shri Ram Naik on June 14, 2017 at Lucknow.



- ❖ Dr. Chandra Mohan Singh, Young Scientist (SERB-DST), Crop Improvement Division, got "Award for Distinguished Research in International Arena" in recognition of his global achievement in the field of agricultural research by Agrigate Foundation in National Seminar on "New Paradigm of Strengthening Agricultural Education in India – A Critical Overview" held at ICAR-Indian Institute of Sugarcane Research, Lucknow on April 17, 2017.

Deputation Abroad

Dr. N.P. Singh, Dr. Aditya Pratap and Dr. Sanjeev Gupta visited Bangladesh Agricultural Research Institute, Joydebpur, Dhaka, Bangladesh on May 30-31 to participate in the Annual Planning-cum-Review Meeting of the 'International Mungbean Improvement Network' funded by the Australian Centre for International Agricultural Research. In

this meeting, the progresses of the project during the initial year as well as technical programme for the next year were discussed.



Transfers

Name	Designation	From	To	Date
Sh. Kumar Vivek	Sr. Administrative Officer	CIAE, Bhopal	IIPR, Kanpur	03.04.17
Sh. D.K. Agnihottri	Finance & Accounts Officer	IIVR, Varanasi	IIPR, Kanpur	15/04/17
Dr. Dharmendra Pd. Patel	Scientist	National Institute of Abiotic Stress Management, Pune	IIPR, Kanpur	27/06/17
Dr. P.G. Patil	Scientist	IIPR, Kanpur	NRC-POM, Solapur	29/06/17

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Director's Desk

Dear Readers,

With vast vegetarian population, availability of pulses had never been sufficient to match domestic requirements. Like any crisis, production, productivity and availability of pulses drew special attention of authorities involved in policy and planning. From making seed available to increasing minimum support prices of pulses, all out efforts were made to attract the farmers, who were happy with rice-wheat rotation so far. Year 2016-17 has witnessed all time high pulse production (22.40 million tonnes). To have better control over availability and price regulation, Government of India has decided to create buffer stock of pulses to the tune of 2 mt. Governmental agencies viz., Food Corporation of India, Central Warehousing Corporation, National Agricultural Cooperative Federation of India and state agencies are geared up to procure pulses at enhanced minimum support price from local *mandies*. Assured procurement of pulses by governmental agencies has resulted in significant increase in area and production of pulses in year 2016-17.

Unlike, wheat and paddy, storage of protein rich pulse grains had always been a challenging task. Pulses start attracting insects from the field itself, which get carried to storage structures after harvesting, threshing and bagging. The insect activities emerge when the climatic conditions become favourable for their growth. High initial grain moisture and hot and humid climate can play havoc for the grains, and by the time insect activities are observed, precious cotyledons of the pulse grain are lost. Losses can be as high as 30-70% in few weeks under favourable conditions. Larvae of bruchids enter the grain and only after consuming the cotyledons, adult bruchids come out of grain shell, just for mating and laying eggs on grain surface. Reduction in grain moisture and elimination of field insect prior to storage are best possible management to minimize storage losses. After drying up to appropriate moisture (8-10%) and disinfecting the grains by fumigation in airtight chambers or sun-solarization, grains must be kept in the containers or bags impervious to external infestation. Storage in jute bags is quite prevalent in the Indian subcontinent for ease of

handling and transport. But jute bags are prone to external infestation, that is why, storing pulses in jute bags is a real challenge.

Maintaining grain quality during storage for small quantities is easy to manage. But safe storage of pulses in large capacity godowns, especially in jute bags, requires




frequent inspection and fumigation. Bulk storage structures offer flexibility of controlling moisture, temperature and insect activities of stored grains. Despite known advantages of bulk storage systems, shifting from bag to bulk is still a distant dream. Collecting grains in bags and converting it into bulk for storage and again converting it from bulk to bag for distribution is not a viable solution. With the prevailing demographic conditions, about 70% of farm produce must be stored in production catchments to match local requirements for food and seed. Farm level storage structures use locally available materials such as mud, bamboo, brick or plant material traditionally. Putting grains in such structures does not ensure grain safety. Airtight metal/plastic/concrete bins or HDPE/PP/Multilayer flexible bags placed on rat proof structures are more suited for rural storages. Even PP woven bags, which prevent moisture or insect infiltration are better than jute bags.

Recent increase in production of pulses has indicated that farmers are not going to get even minimum support price, if production is bumper and not procured by government agencies. These agencies only purchase grains on AGMARK or FCI approved quality parameters. There is need to educate the pulse growers about acceptable quality parameters. Rural pulse storage structures must ensure no degradation

in quality standards with the length of storage and to release as per market demand at better prices. Since jute bags and primitive storage structures often fail to maintain grain quality, it is essential to construct small modern storage structures of 25 to 100 tonne capacities. Farmers must bring their produce as per quality standards before storage. Such structures provide features of airtightness, air circulation and fumigation to maintain product quality for longer duration without deterioration. Insect free grains at appropriate moisture through fumigation or sun-solarization can be kept in flexible packaging materials, viz., jute bags with polythene liner, HDPE/PP bags, which are impervious to external infestation.

The country with strong rural and urban divide requires measures to develop similar urban amenities in rural areas to prevent migration of population. For that employment and income opportunities must be brought to the rural threshold. Storage and processing in production catchments can play a bigger role in strengthening rural economy. Probably this is the right time to think for decentralization of storage and processing facilities to match rural food requirements. In present scenario, cheap raw grains are transported to urban areas where it is either stored in large godowns or processed in large capacity mills. The value-added product at higher price is transported back to the villages. Advantage of value addition through storage and processing is taken away by entrepreneurs and industries. At the same time, losses during transportation and cost involved at every stage of handling operation, adds to the price of finished product. A little insight can show the money movement from rural to urban, this may be one of the reasons for poor growth of rural economy leading to farmers disenchantment with the agriculture.

I hope that decentralized storage and milling of pulses, along with processing of other agri-horti-produce may play a vital role in strengthening the rural economy and generating income and employment opportunities at village level.


(N.P. Singh)