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PULSES Newsletter

Indian Institute of Pulses Research, Kanpur

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EDITORIAL COMMITTEE

Dr. N. Nadarajan	Chairman
Dr. P.S. Basu	Member
Dr. M.S. Venkatesh	Member
Dr. Jitendra Kumar	Member
Dr. Naimuddin	Member
Mr. D. Upadhyaya	Member Secretary

New Regional Station of IIPR Established at Bhopal

New Regional Station of Indian Institute of Pulses Research, Kanpur has been established at Bhopal (MP). The station is located at Fanda village at Bhopal-Indore highway, about 15 km from Bhopal city. The land for this station has been provided by the Government of Madhya Pradesh. Dr. N. Nadarajan, Director, IIPR on behalf of Secretary, DARE & Director General, ICAR and the District Collector, Bhopal on behalf of Government of Madhya Pradesh signed the lease deed on 01.02.2013, which was followed by physical possession of land on March 13, 2013.

The station will prove to be a milestone in expansion of research and extension activities of IIPR. It will cater at the needs of pulse growing farmers of central India, large scale quality seed production and generation of breeding material of pulses for the states of central India. The station will also develop location specific technologies and varieties for enhanced pulses production and will contribute to capacity building of officials of state department of agriculture and impart need based training to pulse growing farmers in association with state agricultural universities.

Research Advisory Committee Meeting Held

The 19th meeting of Research Advisory Committee was held on January 30-31, 2013 under the chairmanship of Dr. S.A. Patil, Former Director, IARI, New Delhi. The meeting was attended by Dr. D.P. Singh, Former Director Research, GBPUA&T, Pantnagar; Dr. S.V. Sarode, Director Research, PDKV, Akola; Dr. Karabi Datta, Coordinator, Biotechnology Support Programme (DBT), Calcutta University, Kolkata; Dr. Bijay Singh, ICAR National Professor, PAU, Ludhiana and Dr. N. Nadarajan, Director, IIPR, Kanpur. Project Coordinators and Heads of Divisions also participated in this meeting.

Dr. N. Nadarajan, Director welcomed the chairman and members of the RAC and informed about the impressive growth rate of pulses production during 2010-11. Institute has released three high yielding varieties of pulses *viz.*, IPL 316 of lentil for CZ, IPU 07-3 of urdbean for SZ and IPFD

6-3 of fieldpea for U.P. Two varieties of pigeonpea IPH 09-5 (Hybrid) and IPA 203 (Long duration) have been identified for NEPZ. In lentil, IPL 526 has been identified for Uttar Pradesh. Two photo-thermo insensitive lines of wild *Vigna viz.*, IC 251372 and IC 251442 have been identified which can be used in hybridization programme in *Vigna*. Institute has developed low cost traps for management of whitefly in *Vigna* crops and manually operated No-Till drill for rice–fallow conditions.

Dr. Mohan Singh, Member Secretary, RAC presented the action taken report on the recommendations of the last RAC meeting held on February 28-29, 2012. RAC members visited both the main research farm and new research farm and appreciated the upkeep of the experimental fields.

Participation of IIPR Scientists in 100th Indian Science Congress

The centenary session of the 100th Indian Science Congress was organized on January 3-7, 2013 at University of Calcutta. The Congress was inaugurated by Hon'ble President of India in the presence of Hon'ble Prime Minister of India and President, Indian Science Congress. A separate session on Agriculture and Forestry Sciences was organized under chairmanship of Dr. M.S. Swaminathan, which started with the Presidential address by Dr. P.K. Ghosh on "Paradigm shift in managing natural resources and food security: Strategy to action". Dr. S. Ayyappan, Secretary, DARE & DG, ICAR delivered the Platinum Jubilee lecture on Climate Smart Agriculture. Dr. S. Datta, DDG (Crop Science), ICAR delivered the invited lecture on 2nd Green Revolution: Challenges and Opportunities. Dr. N. Nadarajan, Director, IIPR, in his invited lecture talked about "Pulses and nutritional security: Challenges ahead", wherein he highlighted the role of pulses in nutritional security as well as enriching soil fertility by supplementing nitrogen as well as organic matter. Other participants from IIPR, Kanpur included Drs. Sanjeev Gupta, Jagdish Singh, P.S. Basu and Dr. M.K. Singh. A panel discussion on "Ending era of farmer's suicide" was also organized on 4th of January 2013, which was presided over by Dr. R.B. Singh/ Dr. S.A. Patil. The panellists included Dr. S. Ayyappan, Dr. S. Datta, Dr. C.D. Mayee, Dr. A.N. Mukhopadhya, Dr. A.K. Srivastava and Mr. N. Subba Rao, a farmer representative from Andhra Pradesh.

Participation in XI Agricultural Science Congress

IIPR participated in XI Agricultural Science Congress organized during February 6-9, 2013 at Odisha University of Agriculture and Technology, Bhubaneswar. Shri Devi Prasad Mishra, Hon'ble Minister of Agriculture, Odisha State inaugurated the exhibition organized at this occasion.

During the programme, Dr. S. Ayappan, Secretary, DARE & Director General, ICAR, Dr. P.K. Sharma, Vice-Chancellor, CSAU&T, Kanpur, Dr. S.A. Patil, Chairman Farmers Commission, Karnataka, Dr. G. Kalloo, Ex-DDG and other dignitaries visited IIPR stall. Scientists, students, official and farmers of Odisha state also visited IIPR stall. Various display approach *viz.*, poster, charts, photographs, seed samples, *etc.*, were used in the exhibition. PulsExpert System (electronic display) was the main attraction for the visitors.

Participation of IIPR in ICAR Sports

IIPR participated in the ICAR Sport Tournament-2013 (North Zone) held at Indian Institute of Sugarcane Research, Lucknow during March 19-22, 2013. Dr. K.R. Soren, Scientist won the Gold Medal in 100 metre race. A contingent of 37 players participated in table tennis, carom, chess, volley ball shooting and smashing, football, badminton, kabaddi and racing. Dr. Rajesh Kumar accompanied the team as CDM and Sri Panchoo Lal, AO and Sri K.N. Gupta, F & AO as Team Managers.

IIPR Organizes International Training Course

International Training Course for officials of Afghanistan on "Improvement of pulses production in dry land farming" is being organized at IIPR from March 29 to April 18, 2013. This training course is funded by Ministry of External Affairs, GoI, New Delhi and supported by ICAR, ICARDA and ACIAR. Total 29 participants of different states of Afghanistan from Ministry of Agriculture, Livestock, Irrigation *etc*., are taking part in this training.

Dr. N. Nadarajan, Director, IIPR highlighted the importance of pulses in improving soil health, maintaining ecological sustainability and in providing nutritional security to the huge vegetarian population. He also briefed the participants about the scenario of pulse production and prospects of increasing the pulses production. In the inaugural session, Dr. Javed Rizvi, Country Manager, ICARDA for Afghanistan stressed about the potential role the pulses can play in agricultural growth and in nutritional security.

A visit to Barhapur village of Kanpur Dehat was also organized on March 29, 2013. Dr. S.K. Singh, Course Coordinator briefed about impact of out-reach project and involvement of farmers' associations in quality seed production of pulse crops. Participants visited the farmers' fields and interacted with the farmers.

Training on DUS Test – Chickpea

AICRP on Chickpea organized training on DUS Test – Chickpea at IIPR, Kanpur on February 7-8, 2013 to create awareness among breeders about Plant Variety Protection Rights (PVPR), DUS Test and Registration of Varieties. Total 32 participants from different cooperating centres of AICRP on Chickpea attended the programme. Dr. N. Nadarajan, Director IIPR inaugurated the training and emphasized the importance of registering the precious germplasm material and released varieties in the era of IPR. Dr. N.P. Singh, Project Coordinator (Chickpea) in his welcome address emphasized the importance of PVPR and registration of varieties. Certificate of registration of chickpea varieties *viz*., RSG 902 (Aruna), RSG 991 (Aparna), RSG 973 (Abha), RSG 895 (Arpita), RSG 807 (Abhar), Virat (Phule G 95311), DCP 92-3 and JG 11 issued by PPV&FR Authority, New Delhi were distributed among the concerned breeders.

Lectures on various aspects of DUS Test were delivered by different speakers and a visit was also organized to DUS chickpea plots where reference and example varieties are grown.

Rice-fallow Review Meeting at TRRI, Adhuthurai (TN)

Review meeting of the project "Mitigating abiotic stresses and enhancing resource-use efficiency in pulses in rice-fallows through innovative resource conservation practices" was held at TRRI, Adhuthurai (TN) on February 25-26, 2013 under the chairmanship of Dr. C.L Acharya. Dr. N. Nadarajan, Director, IIPR Kanpur, Dr. P.K. Ghosh, Director, IGFRI Jhansi, Dr. P.S. Basu, PI of the project, Dr. Narendra Kumar, Co-PI and CCPIs of different centers were present in the meeting. Dr. P.S. Basu briefed the

overall progress of the project, while the CCPIs of different centers presented center-wise progress. The participants also visited the farmers' fields in the delta region of Tamil Nadu in order to access the real situation of the rice-fallows.

Bangladesh Scientists Visited IIPR

Dr. Tapan Kumar Dey, Head Plant Pathology and Md. Abid Hossain, Chief Scientific Officer of Bangladesh Agricultural Research Institute (BARI) visited IIPR on March 7-10, 2013 under ICARDA sponsored programme. They interacted with scientists of the Institute and got adequate acquaintance with recent advances in pulses research. They appreciated the breeding strategies of the Institute to develop lentil and chickpea varieties and expressed further knowledge sharing between the two countries.

Model Training Course Organized

Eight days Model Training Course on "Management of pests and diseases in pulse crops" was organized during February 8-15, 2013 at the Institute. The training, sponsored by Directorate of Extension with the support of DAC, Ministry of Agriculture, GoI, aimed to develop diagnostic skills of participants for diagnosing the symptoms of pest attack and disease infestation in pulse crops. Dr. N. Nadarajan, Director IIPR urged the participants for quick dissemination as well as adoption of technological packages as per recommendation of different states, so that gap between production and productivity can be fulfilled. Total 22 interactive lectures were delivered in the training. A field trip was arranged in Barhapur village of Kanpur Dehat. Total 16 delegates from Tamil Nadu, Andhra Pradesh, Rajasthan, M.P., Chhattisgarh, Jharkhand, Maharashtra, Karnataka, Haryana and U.P. attended the training. Dr. Rajesh Kumar acted as Course Director.

Deputation Abroad

Dr. Jitendra Kumar, Senior Scientist (Plant Breeding) was deputed to visit BARI, Gazipur, Bangladesh during February 3-10, 2013 for participating in training on ''Quantifying epidemiology and forecasting risks of crop diseases on lentil Stemplhylium blight''. The training was organized by ICARDA in a joint collaboration with the ACIAR and BARI.

Dr. Subhojit Datta, Sr. Scientist (Biotechnology) was deputed under DBT-CREST Award to undergo one year training on legume genomics during 20.1.2012 to 19.1.2013 at University of California, Davis, USA.

Special Secretary DAC Visited IIPR

Md. Siraj Hussain, Special Secretary, Department of Agriculture and Cooperation, GoI visited IIPR on February 15, 2013. Dr. N. Nadarajan, Director briefed about Institute activities and achievements. The Special Secretary interacted with Heads of Divisions and visited the Institute museum, biotechnology labs, experimental plots and seed production plots along with a team of officials of Directorate of Agriculture, Lucknow (U.P.). He appreciated the efforts of the Institute for developing various technological options for different agro-ecological situations of the country. He also urged the scientists to develop varieties, management and protection technologies to suit climate resilient agriculture.

Research Highlights

Thermotolerant Variety JG 14 to Boost Chickpea Production in New Niches

Climate resilient chickpea genotype ICCV 92944 released as JG 14 is fast getting popularity among farmers due to its unique tolerance mechanisms to high temperature and drought. A greenhouse experiment conducted at IIPR, Kanpur showed that ICCV 92944 is photo-thermo-insensitive (flowering and poding at maximum temperature 40^0 C and 16 hours day length). The genotype is equally efficient under normal condition (25^0 C and 10-12 hours day length). It is also tolerant to cold and drought due to its vigorous root system and earliness with higher membrane stability. This variety

ICCV 92944 (Short day) ICCV 92944 (Long day)

is suitable for rice fallows, late sown condition as well as drought and sub-temperature climates.

P.S. Basu, S.K. Chaturvedi, P.M. Gaur, Jagdish Singh, S.K. Singh, Anita Babbar and Priyanka Porwal

Variability for Peduncle Number per Internode in Lentil

Expression of one peduncle per internode is usual in lentil. However during *rabi* 2012-13, two peduncles per internode were noticed on few internodes per secondary branch in a genotype derived from cross IPL 406 x ILL 6002. Both peduncles were productive and had 2-3 pods/ peduncle. This trait can be an important trait for changing the lentil plant type towards higher yield/plant.

Jitendra Kumar, Ekta Srivastva and Mritunjay Singh

Incidence of Alternaria blight in Chickpea in Karnataka

Alternaria blight caused by *Alternaria* sp. became serious threat for early sown chickpea crop in and around Karnataka. It showed 100% mortality in experimental plots at Bangalore. Shedding of lower leaves and sparse poding are the most obvious symptoms of the disease. Initially, this disease has small irregular necrotised leaf spots and as the environment favours, these spots coalesce and thereby the leaf area with necrotised dark brown irregular spots develop throughout the leaf. Lesions on leaflets are water soaked, small circular and purple. These lesions are surrounded by chloratic tissues without definite margins. Lesions later turn brown to dark brown. When humidity is high they coalesce, cover the leaf area and cause rapid withering of individual leaflets. On the stems, the lesions are elongated and are brown to black.

On the pods the infections are circular slightly sunken and irregularly scattered. Affected parts turn dirty

Symptoms on stem and pods

black. On the mature pods, the lesions remain as localised, tiny, black superficial flecks. Seed is infected and shrivels. Under favourable weather conditions the entire foliage can die. However, correct identification of cause of this disease became difficult due to overlapping of symptoms of this disease with Ascochyta blight and Colletotrichum blight. Therefore it can be traced out by taking microscopic sections of infected parts of the plant.

Muhammad Saifulla, Jayarame Gowda, Chandrashekara, K., Mudalagiriyappa, Nehru, S.D., Nagaraju, K., Manjunatha. H. and Manjunatha, S.V., UAS, GKVK, Bangalore

Suitable Substrate for Mass Multiplication of *P. lilacinus*

Paecilomyces lilacinus is a nematode egg parasitic fungus having high potential to bring down the population of root knot nematode (*Meloidogyne* spp.) and pigeonpea cyst nematode (*Heterodera cajani*). An experiment was carried out to find out suitable substrate for mass multiplication of this fungus which can be introduced to field through enriching farm yard manure. Based on the cost and performance, bajra grain was found suitable substrate for mass multiplication of *P. lilacinus* to enrich farm yard manure, though multiplication was high on chickpea grains.

R. Jagadeeswaran, Bansa Singh and R.G. Chaudhary

New Chickpea Variety for Mechanical Harvesting

A new variety of chickpea GBM 2 is developed at ARS Gulbarga, Karnataka. Plant height of this new variety is 1.5 to 2.0 times taller than the traditional variety released in Karnataka. It is lodging resistant due to strong stem. Harvesting of crop of this variety with combine harvester gave clean, undamaged grains without any loss in the field. The new variety gave scope for mechanical harvesting of chickpea and can help to increase the area and production of chickpea which is restricted due to the problem of manual harvesting (*i.e.*, shortage of labour).

D. M. Mannur, ARS, Gulbarga

Infestation of Pod Sucking Bugs in Mungbean

Heavy and unusual infestation of pod sucking bugs, *Clavigralla gibbosa* and *Riptortus* Sp. was recorded in mungbean in experimental plots at Regional Agricultural Research Station, Lam, Guntur, (AP) during the month of October, 2012 *i.e.*, at the time of pod maturity and continued upto harvesting. Both nymphs and adults congregated in large numbers at the top of the plants, where pods were found in clusters and were observed to suck the sap from developing pods. The severity was high in mungbean as compared to urdbean, since the pods

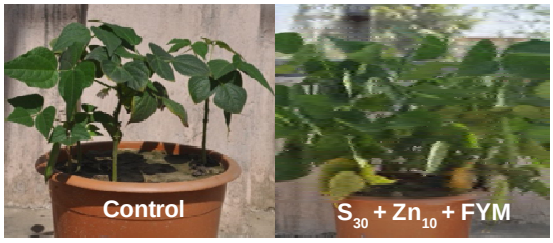
Adults and nymphs sucking sap from pods

were available in clusters on the top plants in mungbean. Effected pods turned to pale brown and hence the seeds got shriveled. In severe incidence, dropping of flowers and developing pods was also observed. Small white specks with cement like substance were found on the leaves underneath to effected inflorescences and pod clusters. Foliar application of either systemic or contact insecticide can control the pod sucking bugs effectively.

M.S. MahaLakshmi, J. Sateesh Babu, M. Dinarayana, Y. Koteswara Rao, Regional Agricultural Research Station, Lam, Guntur (AP)

Integrated Effect of Sulphur, Zinc and FYM in Rajmash

Rajmash does not nodulate with native rhizobial strains and thus responds well to irrigation and fertilizers. In multilocation studies, nitrogen use efficiency at 90 kg N/ha ranged between 9-10 kg grain/ kg N in North-East plain zone and central zone. In intensive agriculture and use of high analysis fertilizers, deficiency of sulphur and micronutrients especially zinc is increasingly being observed. In this context, a pot culture trial was conducted at IIPR to evaluate the effect of sulphur, zinc and FYM levels on rajmash (cv. PDR 14). Results revealed 22% and 31% increase in dry weight and leaf area, respectively in S @ 30 kg/ha+ Zn @ 10 kg/ha + FYM @ 10 t/ ha treatment as compared to control indicating good response of rajmash to application of secondary (S) and micronutrient (Zn) in presence of organic manure in Inceptisols.

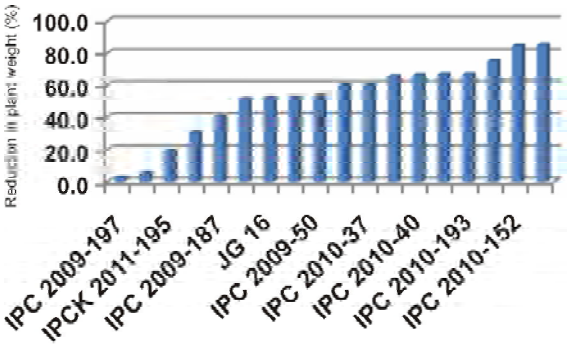


Response of rajmash to sulphur, zinc and FYM

M.S. Venkatesh, K.K. Hazra, Narendra Kumar and Vedram

Genetic Variability for P-use Efficiency among Chickpea Genotypes

Eighteen genotypes of chickpea were evaluated for growth and nutrients uptake under low and high P levels in field. Soil deficient in P was having Olsen's P, 7 ppm with organic C 0.22% and pH 7.8, while fertilized soil had Olsen's P, 23 ppm with organic C 0.43% and pH 7.8. Soil with low P contained 1937 spores/100 g soil which were two folds higher as compared to the population in soil with high P. In general, nodule number as well as plant weight at 30 days of growth in different genotypes were low at lower P level as compared high level. VAM infection in root pieces was high (60 to 90%) at lower P level as compared to higher soil P level (40 to 50%). Reduction in plant biomass due to low P availability in soil varied from less than 10 to 80% among the genotypes. It was lowest in IPC 2009-197 and IPC 2006-127 and highest in IPC 2010-152 and IPC 2010-217. Thus significant variations in P use efficiency among the genotypes were observed. The results also showed that low level of soil P adversely affected nodulation in chickpea, but higher levels of VAM infections in roots helped plants in improved P uptake and growth.



Reduction (%) in plant biomass accumulation due to low P level in soil

Mohan Singh, S.K. Chaturvedi and M.P. Singh

A. tenuifolius: An Emerging Weed of *Rabi* Pulses in Bundelkhand

Asphodelus tenuifolius (Onion weed) is a serious weed of *rabi* crops in many parts of the world. It belongs to Asphodeloideae sub family of Xanthorrhoeaceae. In the last few years, its infestation has increased in chickpea and lentil grown mainly in light soils. In some places, infestation of this weed is so severe that it looks like main crop. It is an erect annual monocotyledonous herb and resembles to cultivated onion plants. One onion weed plant produces more than thousand seeds which grow next year at suitable time and compete with pulse crops throughout the growing season. The yield loss due to this weed in chickpea was observed up to 60% at farmers' fields. It is not relished by cattle, hence it cannot be used for cattle feeding. An integrated weed management strategy can only be effective to control this weed and to get higher yield of pulses.

Narendra Kumar

Personnel

Promotion

Name	Promoted to	*W.e.f.*
Dr. A.K. Choudhary	Principal Scientist	14.6.2011
Dr. Farindra Singh	Principal Scientist	1.1.2009
Dr. P.K. Katiyar	Principal Scientist	13.2.2010
Dr. M.S. Venkatesh	Principal Scientist	22.9.2011

Retirement

Name	Post held	Date of Retirement
Mr. Lallan Yadav	TO (T-9)	31.1.2013
Mr. Jokhu Ram	TO (T-5)	31.1.2013

Resignation

Dr. Promod Kumar, Scientist (Agronomy) has resigned from his service on 7.3.2013, consequent upon his selection in UP PCS.

बौद्धिक संपदा संरक्षण एवं कृषक अधिकार हेतु जन जागरण अभियान

बौद्धिक संपदा अधिकारों की व्यवस्था संबंधी समझौते के अंतर्गत पौधों की नई किस्मों के विकास को प्रोत्साहित करने एवं पौधा किस्मों तथा किसानों के अधिकारों के संरक्षण के लिए एक प्रभावी प्रणाली स्थापित करने हेतु भारत सरकार ने ''पौधा किस्म एवं कृषक अधिकार संरक्षण अधिनियम 2001'' को लागू किया। यह विधान वाणिज्यिक स्तर पर कार्यरत प्रादप प्रजनकों एवं किसानों के योगदान को मान्यता देता है साथ ही निजी, सार्वजनिक क्षेत्रों, शोध संस्थानों एवं गरीब किसानों को आर्थिक मदद हेतु व्यवस्था करता है। इस अधिनियम के विषय में कृषकों में जागरूकता अभियान के तहत दिनांक 15 मार्च, 2013 को संस्थान में एक प्रशिक्षण कार्यक्रम आयोजित हुआ जिसमें संस्थान के निदेशक डा. ना. नडराजन ने उक्त प्रावधानों पर विस्तृत जानकारी दी। डा. संजीव गुप्ता, परियोजना समन्वयक (मुलार्प) ने विशिष्ट जानकारी देते हुए आनुवांशिक संसाधन और उनके संरक्षण और सुधार में कृषकों के योगदान की मान्यता पर विस्तार से चर्चा की। कानपुर देहात एवं फतेहपुर के लगभग 100 किसानों ने कार्यक्रम में भाग लिया। अन्य वक्ताओं ने जीन बैंक एवं उसके लाभों पर प्रकाश डाला तथा पंजीकरण संबंधी जानकारी भी प्रतिभागियों को दी गई।

उ.प्र. के बलिया जिले में प्रक्षेत्र दिवस का आयोजन

संस्थान द्वारा बलिया एवं फतेहपुर जनपदों में डीएसी-इकार्डा-आई.सी.ए.आर. की सहभागिता से संचालित ''उत्तर-पूर्व भारत में भोजन, पोषण सुरक्षा एवं ग्रामीण जीविका हेतु मसूर का उत्पादन बढ़ाना'' परियोजना के अंतर्गत दिनांक 27.2.2013 को बलिया के मैदौरा गाँव में, एक प्रक्षेत्र दिवस का आयोजन किया गया। 13 चिन्हित गाँवों के किसानों ने एन. डी.एल. 1, पी.एल. 6, एच.यू.एल. 57, डी. पी.एल. 62, डब्ल्यू.बी.एल. 77 एवं मसूर की देशी प्रजातियों के पौधों को बड़े ही सुव्यवस्थित तरीकों से एक स्थान पर प्रदर्शित किया। जिसे सहभागी कृषकों, जिला कृषि अधिकारियों, नाबार्ड बैंक एवं प्रमुख बैंकों के अधिकारियों, के.वी.के. सोहावन के वैज्ञानिकों, आईआईपीआर और इकार्डा के प्रतिनिधियों द्वारा रूचिपूर्वक देखा गया। साथ ही विभिन्न महत्वपूर्ण विषयों पर चर्चा भी हुई। डा. एस. के. सिंह, प्रमुख अन्वेषक ने उक्त परियोजना के उद्देश्यों एवं सम्भावनाओं पर प्रकाश डाला। संस्थान के वैज्ञानिकों ने कृषक-परिचर्चा में भाग लिया। संस्थान द्वारा विकसित साहित्य भी किसानों को उपलब्ध कराया गया।

जिन प्रक्षेत्रों में धान की कटाई के उपरान्त पी.एल. 6, एन.डी.एल. 1, डी.पी. एल. 62 एवं मसूर की देशी प्रजातियों को बोया गया था, उन प्रक्षेत्रों का भ्रमण किया गया। कृषि विभाग, नाबार्ड, प्रमुख बैंकों एवं कृषकों के साथ वैज्ञानिकों के एक दल ने मसूर बीज उत्पादन के आठ प्रक्षेत्रों का भ्रमण किया। कुल 208 कृषकों ने उक्त कार्यक्रम में सहभागिता की।

प्रौद्योगिकी हस्तांतरण

फली भेदक के प्रबन्धन हेतु जैव कारकों के प्रयोग पर प्रक्षेत्र प्रशिक्षण

संस्थान द्वारा दिनांक 1 फरवरी, 2013 को ''फली भेदक के प्रबन्धन हेतु जैव कारकों का प्रयोग'' विषय पर प्रक्षेत्र प्रशिक्षण एवं परिचर्चा का आयोजन किया गया। यह कार्यक्रम उ.प्र. के जालौन जिले के महेवा ब्लाक के बराई गाँवों में आयोजित किया गया। उक्त कार्यक्रम में जालौन जिले के चिन्हित गाँवों

यथा बराई, किरातपुर, मैंगरोल, नेवारी काशीरामपुर एवं जयरामपुर के 108 किसानों ने सहभागिता की। प्रशिक्षण में किसानों को जैव कारकों से जुड़े घटकों जैसे फेरोमॅन ट्रैप, एन.एस.के.ई., एच.ए.एन.पी.वी. आदि के संबंध में महत्वपूर्ण जानकारी प्रदान की गई। साथ ही सहभागी कृषकों ने जैव प्रौद्योगिकी विभाग, नई दिल्ली के सलाहकार डा. ए.एस. निनावे तथा वैज्ञानिक डा. एस.यू. अहमद के साथ गत वर्षों में प्राप्त अपने अनुभवों पर भी चर्चा की। डा. निनावे ने परियोजना के कार्यों की सराहना करते हुए कृषकों को सलाह दी कि वे उक्त के माध्यम से ज्यादा से ज्यादा लाभ लेने का प्रयास करें। साथ ही कृषकों एवं वैज्ञानिकों ने संयुक्त रूप से बराई एवं काशीराम पुर गाँवों का दौरा किया एवं फेरोमॅन ट्रैप एवं उसकी उपयोगिता के विषय में मौलिक जानकारी का आदान-प्रदान किया।

उक्त कार्यक्रम के समन्वयन में, डा. उमा साह, डा. हेम सक्सेना, डा. राजेश कुमार एवं डा. नरेन्द्र कुमार की महत्वपूर्ण भूमिका रही।

Director's Desk

Dear Readers,

Globally the nutritionally poor and unhealthy diet as well as the reduced physical activity and sedentary lifestyle are the major risk factors for several chronic diseases. According to WHO, the non-communicable diseases such as cardiovascular diseases, stroke, cancer and diabetes are by far the leading causes of mortality in the world and according to a survey made by WHO, India will become hub of these diseases by the end of this century. Health professionals are promoting dietary changes, including the increased consumption of plant foods to combat nutritional deficiencies and chronic disease risk and one plant food high on the health promotion list is pulses. Pulses are important food crops in many countries due to their high level of protein and essential amino acid content. The carbohydrate content of the pulses is about 60 per cent. Besides protein, they are rich source of dietary fibre, complex carbohydrates, resistant starch and an array of vitamins and minerals. Pulses are high fibre (15-30% DF) and low fat foods with a low glycemic index (GI) (28-52). The low glycemic index values means that they are less likely to raise blood glucose and insulin levels hence good for diabetic people.

India needs to produce more food in terms of quantity in order to feed its ever increasing population, but large sections of people have very less awareness about the quality of the food or balanced diets. Presently one-fourth of the population of India is malnourished mainly protein deficiency with a hunger index of about 20-35%. Presently, per capita availability of pulses in India is only 37 g against ICMR recommendation of about 80 g. The populations that are largely depended on vegetarian food are likely to suffer protein malnutrition if its availability is not enhanced.

This is the call of the time that people should be adequately educated for the balanced diet they need to lead a healthy life. Lack of fibres, micronutrients, proteins, essential amino acids, vitamins and antioxidants coupled with stressful environment, lead to obesity, diabetes and major cardiovascular diseases. A survey made by nutritionist indicated that large section of Indians depend only on cereal-*dal* combinations adopted as their

daily food and with adequate physical exercise are able to lead a disease free healthy life. The food values of seeds of pulses are high providing 1040 to 1430kJ of energy per 100 g. Pulses have high protein content (18-28%) and amino acids except few sulphur containing amino acids, methionine and cysteine, but having high lysine and tryptophan content. Therefore, when they are used along with cereals, which are poor in lysine and tryptophan, the proteins complement one another, giving a better quality protein by supplying the respective limiting amino acids. In addition to the traditional macronutrients, pulses contain a wide variety of non-nutritive bioactive components such as enzyme inhibitors, phytosterols, indoles, flavones and saponins. These bio-active compounds have been scientifically proven to be health protective. Phytic acid and phenolics exhibit antioxidant activity and protects DNA damage. Saponins have hypocholesterolaemic effect and anti-tumor and anti-mutagenic activities and can lower the risk of cancers. Pulses are also fairly good sources of thiamin and niacin and provide calcium, phosphorus and iron. Pulses are low in fat, most of which is provided by polyunsaturated and monounsaturated fatty acids.

There is significant increase in nutrients in sprouted pulses as compared to their dried embryo. In the process of sprouting, the vitamins, minerals and protein increase substantially. Sprouting of the pulses not only improves nutritive value but also digestibility. Pulses supply adequate vitamins and minerals such as copper, chromium, iron, zinc, selenium and magnesium which are essential for human health and their deficiency causes many disorders. Diets high in folate are associated with decreased risk of colorectal and breast cancer. Pulses are very good source of folates fulfilling almost 95% of daily requirement.

India is one among those countries, where people need to conceive the idea of balanced diet to lead a healthy life. Without quality improvement in our daily diets, we are reaching to a stage of hidden threats which need to be addressed. Pulses are one component in our food which can largely supplement the required nutrition. They could constitute an interesting alternative in fight against the diseases such as cardiovascular diseases and diabetes. Given the important role that pulses play in the human diet, their availability needs to be increased on priority.

(N. Nadarajan)

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