PULSES NEWSLETTER

Indian Institute of Pulses Research, Kanpur

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Institute Celebrated Foundation Day

The 14th Foundation Day of the Institute was celebrated on September 5, 2006 with fervour and gaiety. Shri Rizwan Ahmad, Inspector General of Police, Kanpur Zone was the Chief Guest and Prof. Sanjay G. Dhande, Director, IIT, Kanpur and Dr. Shanker Lal, Former Director of the Institute were the Guests of Honour. While inaugurating the function, the Chief Guest called for efficient and vibrant extension services to extend the fruits of new research and technological development to farmers at village level. He emphasized on inculcating human values in all economic activities. Dr. Shanker Lal called upon the scientists to take up basic studies for pulses improvement programmes. He stressed upon integrating new screening methods such as carbon isotope discrimination for identifying water use efficient genotypes.

Prof. Sanjay G. Dhande called for introducing a new paradigm to develop new technologies for managing the natural resources in efficient manner. He also stressed the need for developing new varieties suitable for different agro-ecological regions to boost pulses production in the country. Prof. Dhande hailed the progress made by the IIPR in the field of research aimed at developing hybrid pigeonpea.

Dr. Masood Ali, Director outlined the progress made under research programmes being carried out at the Institute, such as

transgenics, genomics, pyramiding of resistance genes, heterosis breeding, IPM, input use efficiency, PHT, *etc*. Dr. Sanjeev Gupta, Sr. Scientist was given the "Best Scientist Award 2005" on the occasion.

On this occasion, a large number of farmers from Kanpur and neighbouring districts participated in the Farmer-Scientist interaction programme and skill oriented on-hand training on different aspects of pulses production.

Dr. V.D. Patil Joins as ADG (O&P)

Dr. V.D. Patil took over the charge of Assistant Director General (Oilseeds and Pulses) at ICAR on July 19, 2006. Born on January 1, 1949, Dr. Patil graduated from College of Agriculture, Nagpur and obtained Ph.D. degree under joint programme of MAU – IARI in 1980. He worked at University of Edenburg, UK as Post-Doctoral Fellow. He served Marathwada Agril. University as Head of Department (Genetics and Plant Breeding). Associate Dean, P.G., Director of Research and Director of Extension before moving to Dr. Panjab Rao Krishi Vishwa Vidyalaya in 2002 as Director of Extension.

Dr. Patil is widely traveled scientists having visited UK, Canada, Germany, Belgium and Ethopia. He has long working experience in oilseeds and pulses and provided leadership in development of several varieties at MAU. He guided 24 M.Sc. and 6 Ph.D. students.

IMC Meeting

The meeting of the Institute Management Committee was held on September 6-7, 2006 at the Institute under the chairmanship of Director, Dr. Masood Ali. Dr. R.P. Dua, PC (Under-utilized Crops), NBPGR, New Delhi; Dr. R.P. Katiyar, Director Research, CSAUA&T, Kanpur; Dr. D.L.N. Rao, Project Coordinator, IISS, Bhopal; Mr. Subhash Baburao Patil, Non-official Member, Nanded and Mr. Rajendra Singh were present in the meeting. All Heads of the Divisions/Sections and Project Coordinators presented highlights of research achievements made during the period. The Committee reviewed different research and development activities carried out during the period and appreciated the overall progress of the Institute.

QRT Meeting

The first meeting of the newly constituted Quinquennial Review Team was held on September 13, 2006 under the chairmanship of Dr. R.B. Deshmukh, Vice-Chancellor, Mahatma Phule Agricultural University, Rahuri (M.S.). Dr. Janardhan Singh, Dean, IAS, BHU, Varanasi; Dr. M.V. Reddy, Ex. Principal Scientist, RARS (ANGRAU), Lam (A.P.); Dr. Masood Ali, Director, IIPR and Dr. J.D.S. Panwar, IIPR also attended the meeting. During the meeting, schedule of discussion/visit of various centres of AICRP on Chickpea, Pigeonpea, MULLaRP and Arid Legumes along with IIPR was finalized. All Scientists in Charge of AICRP centres were asked to submit the status report on R&D activities undertaken during 2001-2005.

Chickpea Work – Plan Meeting under Model Seed System(s) held

A project "Development and popularization of model seed system(s) for quality seed production of major legumes to ensure seed sufficiency at the village level" has been sanctioned under the ISOPOM of Ministry of Agriculture, Govt. of India with total outlay of Rs. 10 crores for a period of four years. Chickpea, pigeonpea and groundnut are the major legumes for which seed production programme will be undertaken with collaboration of ICRISAT, Patancheru; IIPR, Kanpur; NRCG, Junagarh; OUAT, Bhuvaneshwar; PDKV, Akola; JNKVV, Jabalpur and ANGRAU, Anantpur. The work-plan meeting on chickpea was held on September 27, 2006 at IIPR, Kanpur. Dr. Masood Ali, Director, IIPR highlighted the importance of 'Model' Seed System(s) and emphasized the need of close tie-up with various seed agencies. He suggested for empowerment and improvement of economic return of the farmers. Dr. P.M. Gaur, Principal Scientist (ICRISAT) presented the tentative work plan of chickpea for the year 2006-07. With active participation of Dr. S.K. Rao, Director (Seed and Farm), JNKVV, Jabalpur; Dr. V. Shankaran, Consultant, NSC, New Delhi; Sri D. Nath, U.P. Seed Corporation, Lucknow; and Drs. B.B. Singh, S.K. Chaturvedi and S.K. Singh the work plan was finalized for *rabi* 2006-07.

Research Highlights

New Varieties Developed

Following varieties of different pulse crops have been identified during Annual Group meet on *Rabi* Pulses held at MPKV, Rahuri during 12-14 September 2006:

Rajmash

IPR 98-3-1: This variety has been developed as selection from the exotic line, EC 400418 at IIPR, Kanpur. Its average yield is 1871 kg/ha, about 21% superiority over the check. Seeds of the variety are very attractive with gulf red colour. It has been identified for *rabi* cultivation in Gujarat, Maharashtra, Madhya Pradesh and Chhatisgarh.

HUR 203: Developed at BHU, Varanasi, it is a selection from HUR 150 with average yield of 1731 kg/ha which is about 19% higher than the check. The variety has light pink colour seeds and has been identified for *rabi* cultivation in Gujarat, Chhatisgarh, Maharashtra and Madhya Pradesh.

Lentil

IPL 406: This variety has been developed at IIPR, Kanpur from a cross DPL 35 X EC 157634/382 following pedigree selection. Its average yield is 1691 kg/ha which is 13% higher than the best check DPL 62, and has extra large seeds (3.93 g/100-seed) and better resistance against rust disease. It has been identified for Punjab, Rajasthan, Haryana, Delhi and western Utter Pradesh.

VL Masoor 126: The variety has been developed from a single cross LL 498 x LH 848 following pedigree method at VPKAS, Almora. It has 30% yield superiority over the best check PL 4 with average yield of 1342 kg/ha and rust resistance. Seeds of this variety are dark black colour, which is preferred in the hill zone. It has been identified for J & K, Himachal Pradesh, Uttaranchal and hilly region of NEH states.

Field pea

VL 42: Developed at VPKAS, Almora from the cross VL Matar 1 X P 388, it gives average yield of 1868 kg/ha, a gain of 10% over the best check, HUDP 15 and matures one week earlier besides resistance to powdery mildew. It has been identified for eastern Uttar Pradesh, Bihar, West Bengal, Jharkhand and Assam.

Efficacy of *S. masoodi* against *Myllocerus* sp. on Early Pigeonpea

The efficacy of entomopathogenic nematode, *Steinernema masoodi* was tested against grey weevil, *Myllocerus* sp., a foliage feeder of pigeonpea, under green-house condition. Seeds of pigeonpea variety UPAS 120 were sown in earthen pots filled with 5 kg sterilized soil and five plants per pot were maintained. Field-collected 100 *Myllocerus* adults per pot were released at flowering and podding stage of plants and covered with nylon nets. The EPN, *S. masoodi* was sprayed on pigeonpea foliage through hand atomizer @ 1.2×10^5, 1.0×10^5 and 0.8×10^5 IJs/pot along with control (water).

No mortality was observed in *Myllocerus* adults up to 24 h of EPN sprays. However, 88% mortality was observed after 96 h when sprayed with 1.2×10^5 IJs/pot, followed by 66% with 1.0×10^5 IJs and 45% with 0.8×10^5 IJs. *Myllocerus* sp. has been found to be susceptible to *S. masoodi*, which acts as contact insecticide. However, it is not a good host for EPN multiplication. The infestation of *S. masoodi* on the grey weevil was reported for the first time. Further studies are required to know the exact behaviour of EPN and its associated bacteria on this weevil.

Healthy Myllocerus *sp.*

Infected Myllocerus *sp. to* S. masoodi.

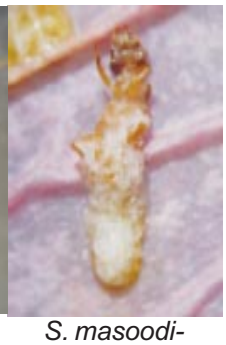
S.S. Ali, R. Pervez and R. Ahmad

Susceptibility of Termite to Entomopathogenic Nematode

Out of 300 species of termites known so far in India, about 35 have been reported to damage field crops such as pulses, wheat, maize, sugarcane, cotton and groundnut by attacking the root system at all stages of plant development and newly planted seedlings, resulting in severe yield losses. The only method to control the termite is the treatment of their colonies with insecticides. However, use of chemicals is generally discouraged due to well-known health hazards and deleterious effects on environment.

Entomopathogenic nematodes (EPN) could be deployed as a component of Bio-intensive IPM for the management of insect pests of economic importance. In the present investigation, Alates (winged adults) of subterranean termite, *Odontotermes* sp. (Isoptera: Termitidae) showed high degree of sensitivity to EPN, *Steinernema masoodi* (Nematoda: Steinernematidae) infection. The result showed that *S. masoodi* caused 90.5% mortality within four days under laboratory conditions and a single adult termite can produce 2968 infective juveniles. It is expected that the infective juveniles emerging from infected adult termite would disperse and infect healthy termites in the field, creating a chain of infection leading to eradication of termite colony in a short span of time. This finding has opened a new avenue of pest management in field crops including pulses.

Healthy adult termite



S. masoodi-infected termite

R. Ahmad, S.S. Ali, M. Abid Hussain and A. Shaheen

Status of Lentil Wilt-Root Rot Complex in U.P.

Lentil is one of the important pulse crops of India, which occupies about 1.47 million ha area with total production of 0.99 million tonnes. Uttar Pradesh is the major lentil growing state contributing 39.7% of the national production. It is generally grown as a rainfed crop and sown at the earliest opportunity to harness the residual soil moisture. As a result, many soil borne pathogens invade the plant even at seedling stage due to high soil temperature and sometimes high soil moisture too. Winter rains during active growth period and terminal drought in podding stage further favour the invasion of many pathogens. Status of the wilt and root diseases which cause lentil plants mortality was assessed by under taking roving field survey of major lentil growing areas during crop season of 2004-05 and 2005-06 covering 197 fields from 47 districts of Uttar Pradesh.

The study revealed that out of nine agro-ecological zones of Uttar Pradesh, mean mortality was maximum in eastern plains (11.4%), followed by Ghad and Tarai areas (9.9%), mid plains (9.3%), North east plains (9.1%), Bundelkhand (8.6%), Vindhyan region (6.0%), mid western plains (5.78%), western plains (1.5%) and semi-arid Agra zone (1.4%). Over all mean mortality of the state was 7.0%. The highest incidence of 68% was observed in Bundelkhand region, followed by 62% in Tarai area, while semi-arid Agra zone recorded minimum disease 1.4%.

R.G. Chaudhary, Vishwa Dhar and Rakesh Kumar Singh

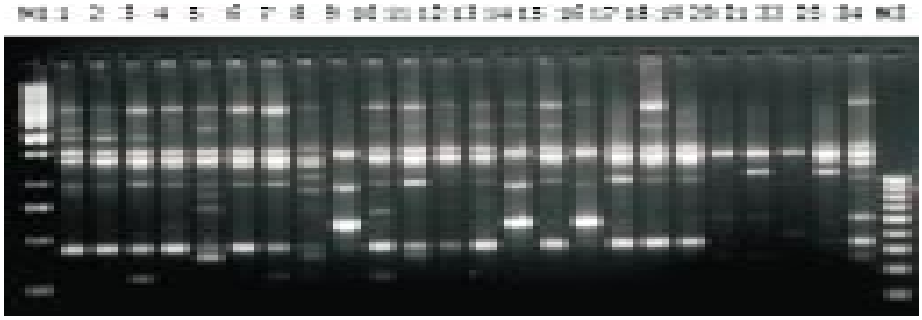
New Parasite of *Helicoverpa armigera*

Helicoverpa armigera is a major insect pest of chickpea and pigeonpea causing heavy yield losses every year. Out of 177 natural enemies of *H. armigera* recorded on various crop eco-systems in India, 84 are parasitoids and rest are predators. During 2005-06, 1128 larvae of *H. armigera* were collected from chickpea fields of IIPR. In February 2006, seventeen 3-4 instar larvae were inactive and sluggish and did not feed. These larvae were kept in the laboratory under observation. After 3 days, 3-4 maggots of parasite emerged from their body and pupated in the Petri dish. From these pupae, 7 female hymenopterous parasites emerged after 10 days which are yet to be identified.

Hem Saxena

Molecular Diversity of Mungbean

For molecular genetic diversity of mungbean, RAPD analysis of 24 varieties has been accomplished using 60 RAPD primers from OPERON and the primers, 20 primers showed more than 80% polymorphism. The total number of polymorphic bands amplified was 224 (90%). The dendogram shows that varieties



RAPD profile of 24 mungbean varieties using OPD 20 primer

data were analyzed for similarity using UPGMA method. Thirty six RAPD primers generated reproducible patterns. Out of 36 having common parents clustered together.

Subhojit Datta, Shiv Kumar, Sanjeev Gupta and B.B. Singh

Vigna Day Organized

IIPR organized *Vigna* Day on September 23, 2006. Scientists from different research centres participated in the meet. The programme was arranged to provide an opportunity to research scientists working in AICRP centres and SAUs to select useful germplasm and donors for different traits, besides segregating material and fixed lines of urdbean and mungbean for further breeding programmes. In various experiments, 1200 germplasm lines, elite breeding and segregating material of urdbean and mungbean developed by the Institute were shown to the participants. Participants showed great interest in the materials developed through wide hybridization between mungbean and urdbean. Scientists discussed ways to strengthen the research programmes on urdbean and mungbean. Dr. M. Pandian from National Pulse Research Centre, Vamban, Pudukkottai presented an overview of utilizing wild *Vigna* species in mungbean and urdbean breeding programmes. He emphasized on gene introgression from different wild species for mungbean improvement.

Group meet on *Rabi* Pulses

The annual group meet of All India Coordinated Research Projects on Chickpea and MULLaRP was held at MPKV, Rahuri on Sept. 12-14, 2006. Dr. R.B. Deshmukh, Vice Chancellor, MPKV in his inaugural address stressed upon re-orientation of pulse improvement programme. He suggested for pilot project on transfer of technology involving seed-village approach, which will help in doubling the pulses production. Dr. V.D. Patil, ADG (O&P), ICAR emphasized the need to formulate appropriate research and developmental strategies to boost pulses production. He also stressed the need to produce adequate quantity of quality seed, so that farmers can get quality seed in time.

Dr. Masood Ali, Director, IIPR, in his address mentioned about the fluctuation in area and production of pulse crops. He said that extremities of temperature poses a new challenge and has to be addressed urgently. He emphasized the need for quality seed production of pulses and increasing efficiency of inputs in an integrated and cropping system mode.

Drs. B.B. Singh, Project Coordinator (MULLaRP) and S.P. Mishra, Project Coordinator (Chickpea) focused on some researchable issues like broadening the genetic base, development of multiple disease resistant varieties and refinement of production technologies for different cropping seasons. During the Meet, the results of *rabi* 2005-06 were discussed and technical programme for *rabi* 2006-07 was finalized. Five new varieties comprising of two each of lentil and *rajmash* and one of fieldpea were identified.

Summer School Organized

A 21-day Summer School on "Crop diversification through pulses for sustainable crop production" was organized at the Institute during August 10-30, 2006. Total 25 participants from different SAUs and ICAR institutes attended the programme. Dr. Masood Ali was the Course Director and Dr. N.B. Singh, HoD (CPD) the Course Coordinator.

The School was inaugurated by Dr. G.B. Singh, Ex. DDG (NRM), ICAR on August 10, 2006. The entire course was designed with 39

lectures on various aspects *i.e.*, basic concepts, varietal requirements of pulses, natural resource management and agronomic management of pulse based cropping systems, dynamics and management of insect pests and diseases and farmers' participation in pulse based crop diversification. Thirteen practical exercises were conducted to provide on-hand experience on new skills and knowledge like estimation of macro- and micro-nutrients in soil and plants, seed treatment with *Rhizobium*, nodulation studies , isolation and purification of *Rhizobium*, identification of insect pests, diseases and nematodes and their integrated management, and bio control agents and their multiplication.

IIPR Director Conferred with ISA Gold Medal

Dr. Masood Ali, Director, IIPR, Kanpur has been conferred with **ISA Gold Medal** award for the year 2004. The award will be presented at Golden Jubilee National Symposium on Conservation Agriculture and Environment to be held on 26th October, 2006 at BHU, Varanasi. This is in recognition of his outstanding contribution in the field of cropping system research, crop management in rainfed areas and his dynamic leadership in pulses research and development.

Award/Recognition

In recognition of his significant research contributions, Dr. Sanjeev Gupta, Senior Scientist (Crop Improvement Division), was presented **Best Scientist Award 2005** of the Institute.

HRD

● Dr. Shiv Kumar, Principal Scientist was deputed to attend 10-day training on "Phenotyping water deficit in crop plants" at INRA-Agropolis, Montpellier, France during 3-12 July 2006. The training provided an opportunity to learn advances in physical bases of environmental variables, measurement of the components of the water and energy balances, physiological components of growth and yield under water stress conditions, modeling of traits and GE interaction using APSIM and data analysis.

● Dr. Subhojit Dutta, Scientist (Sr. Scale) was deputed to participate in the International Workshop on "Genomics enabled improvement of legumes" at Asilomar, California, USA during August 29-September 1, 2006 under the Indo-US Agricultural Knowledge Initiative.

PERSONNEL

A. Appointment

Name	Post	Date of joining
Dr. Shiv Kumar	Principal Scientist, Plant Breeding	15.7.2006

● Dr. P.K. Agrawal, Sr. Scientist at the Institute was relieved on 29.7.2006 to join as Principal Scientist at VPKS, Almora.

● G.K. Jha, Scientist (Sr. Scale) at the Institute was relieved on 31.7.2006 to join as Senior Scientist at IARI, New Delhi .

B. Transfers

Name	Post	From	To	*w.e.f.*
Dr. J.D.S. Panwar	Principal Scientist	IIPR, Kanpur	IARI, New Delhi	16.9.06
Dr. R.R. Burman	Scientist	IIPR, Kanpur	CPRS, Shillong	30.9.06

हिन्दी दिवस

संस्थान में हिन्दी दिवस 20 सितम्बर, 2006 को समारोह पूर्वक मनाया गया। प्रमुख हिन्दी दैनिक समाचार पत्र 'अमर उजाला' के उप महाप्रबन्धक श्री गणेश तिवारी समारोह के मुख्य अतिथि थे। अपने उद्बोधन में श्री

तिवारी ने कहा कि किसी भी देश की पहचान उसकी मातृभाषा से होती है। उन्होंने कहा कि अंग्रेजी के मोह में हिन्दी की उपेक्षा नहीं होनी चाहिए। हिन्दी तो इतनी सरल और सहज है कि वह सबको खुद ही सम्मोहित करती है। इस अवसर पर मुख्य अतिथि ने संस्थान की राजभाषा पत्रिका **दलहन आलोक** तथा एक अन्य उपयोगी प्रकाशन **हिन्दी सहायिका** का विमोचन किया।

समारोह की अध्यक्षता कर रहे संस्थान के निदेशक डा. मसऊद अली ने कहा कि शब्द ही मस्तिष्क का दर्पण होते हैं। यानी जो हम सोचते हैं वह शब्दों के माध्यम से ही अभिव्यक्ति करते हैं और हम भारतवासी स्वाभाविक रूप से हिन्दी में ही सोचते हैं। फिर अभिव्यक्ति के लिए दूसरी भाषा का सहारा क्यों लेते हैं। उन्होंने कहा कि हिन्दी को अपनाने में और व्यवहार रूप में लाने में किसी भी प्रकार का संकोच नहीं करना चाहिए। इस अवसर पर बोलते हुए डा. सुभाष चन्द्र प्रमाणिक ने कहा कि अहिन्दी भाषी राज्यों के लोगों ने ही हिन्दी को बढ़ाने की अलख जगाई थी। उन्होंने कहा कि जब तक हम हिन्दी को अपने दिल में नहीं बसाएंगे, तब तक हिन्दी के मर्म को समझ पाना दुष्कर है।

इस अवसर पर हिन्दी में उत्कृष्ट और उल्लेखनीय कार्य करने वाले वैज्ञानिकों तथा अधिकारियों को सम्मानित एवं पुरस्कृत किया गया। कार्यालयीन कामकाज में हिन्दी का अधिकाधिक प्रयोग करने वाले कर्मियों को भी पुरस्कृत किया गया। समारोह का संचालन श्री दिवाकर उपाध्याय ने किया।

"दलहन" पुरस्कृत

संस्थान के प्रकाशन **"दलहन"** को भारतीय कृषि अनुसंधान परिषद द्वारा **डा. राजेन्द्र प्रसाद पुरस्कार 2003-04** से पुरस्कृत किया गया है। दिनांक 18 अगस्त 2006 को नई दिल्ली में आयोजित विशेष समारोह में संस्थान की ओर से निदेशक डा. मसऊद अली ने यह पुरस्कार श्री कान्ती लाल भूरिया, केन्द्रीय राज्यमंत्री, कृषि, उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण से प्राप्त किया। इस पुस्तक में दलहनी फसलों की वर्तमान स्थिति आनुवांशिक संसाधन, अभिजनन विधियॉं संकर प्रजातियों के विकास, जैव प्रौद्योगिकी, बीज प्रौद्योगिकी, रोग-कीट- खरपतवार नियंत्रण, सस्य पद्धतियॉं, जल एवं पोषक तत्व प्रबंधन आदि पर लेख समाहित हैं। विभिन्न अध्यायों में दलहन उत्पादन से संबंधित महत्वपूर्ण विषयों पर किए गए शोध प्रयासों की चर्चा के साथ भावी रणनीति पर भी प्रकाश डाला गया है। इस पुस्तक के प्रथम लेखक डा. मसऊद अली, निदेशक हैं तथा डा. संजीव गुप्ता, श्री नईमउद्दीन एवं श्री दिवाकर उपाध्याय ने विभिन्न विषयों पर जानकारी संकलित कर पुस्तक प्रकाशन में अपना योगदान दिया है।

नई प्रजातियॉं विकसित

राजमा

आई.पी.आर. 98-3-1 : भारतीय दलहन अनुसंधान संस्थान, कानपुर द्वारा विकसित, इस प्रजाति की औसत उत्पादकता 1781 कि.ग्रा. प्रति हेक्टेयर है। इसके दानों का रंग गहरा लाल है। यह प्रजाति रबी मौसम में उगाने के लिए गुजरात, महाराष्ट्र मध्य प्रदेश और छत्तीसगढ़ के लिए चिन्हित की गई है।

एच.यू.आर. 203 : बनारस हिन्दू विश्वविद्यालय, बनारस द्वारा विकसित, इस प्रजाति की औसत उत्पादकता 1731 कि. ग्रा. प्रति हेक्टेयर है। इसके दानों का रंग हल्का गुलाबी है। रबी मौसम में उगाने के लिए यह प्रजाति गुजरात, महाराष्ट्र, मध्य प्रदेश और छत्तीसगढ़ के लिए चिन्हित की गई है।

मसूर

वी.एल.मसूर 126 : विवेकानन्द पर्वतीय कृषि अनुसंधान संस्थान, अल्मोड़ा द्वारा विकसित, इस प्रजाति की औसत उत्पादकता 1342 कि.ग्रा. प्रति हेक्टेयर है तथा यह रतुआ रोग के प्रति अवरोधी गुण युक्त है। इसके दानों का रंग गहरा काला है। यह प्रजाति जम्मू एवं काश्मीर, हिमाचल प्रदेश, उत्तरांचल तथा पूर्वोत्तर राज्यों के पर्वतीय क्षेत्रों के लिए चिन्हित की गई है।

आई.पी.एल. 406 : भारतीय दलहन अनुसंधान संस्थान, कानपुर द्वारा विकसित, इस प्रजाति की औसत उत्पादकता 1691 कि.ग्रा. प्रति हेक्टेयर है और इसके दानों का आकार बड़ा है। अन्य उन्नत प्रजाति डी.पी. एल. 62 की तुलना में इस नई प्रजाति की रोगरोधिता अधिक है। यह प्रजाति पंजाब, राजस्थान, हरियाणा, दिल्ली तथा पश्चिमी उत्तर प्रदेश के लिए चिन्हित की गई है।

मटर

वी.एल. 42 : विवेकानन्द पर्वतीय कृषि अनुसंधान संस्थान,अल्मोड़ा द्वारा विकसित इस प्रजाति की औसत उत्पादकता 1868 कि.ग्रा. प्रति हेक्टेयर है और यह अन्य उन्नत प्रजाति एच.यू.डी.पी.15 की तुलना में एक सप्ताह पूर्व पक कर तैयार हो जाती है। चूर्णी कवक अवरोधी यह प्रजाति पूर्वी उत्तर प्रदेश, बिहार, पश्चिम बंगाल, झारखण्ड और आसाम के लिए चिन्हित की गई है।

Director's Desk

Dear Readers,

Spectacular progress in agricultural productivity is rated as one of the biggest success stories of Independent India which has brought a sea change in food availability in the country, thanks to the planned public investment in agricultural infrastructure in general and agricultural research in particular. Unfortunately, resource poor farmers who make up the majority (78.2%) and usually operate under rather harsh and fragile agro-ecological conditions could not harness much of the benefit of this investment because of their inability to invest in resource enhancing and/or high-input technologies, and as a result, the crops grown by this group of farmers could not show similar progress. For example, pulses could see only marginal improvement from 8.41 million tons in 1951 to 13.11 million tons in 2006. This has led to declining per capita availability of pulses, currently 37 g per day, which contributed towards increasing undernourishment among 214 million people in the country. Ironically, more than 80 million children below 5 years age suffers from the disorders associated with protein energy malnutrition and micro-nutrient deficiency. To make India nutritionally secured, increasing pulses production in the country is one of the best options.

Pulses received hardly any specific investment on research until reorganization of ICAR and establishment of AICPIP scheme in 1965-66. During the VI Plan, Rs. 473 lakhs were allocated for pulses research, which increased subsequently to Rs. 1012 and 3019 lakhs in the VII and VIII Plans. Since late nineties, pulses research has been receiving due attention with total outlay of Rs. 8747 and Rs. 13229 lakhs in the IX and X Plans, which is almost 2.5% of the total budget allocated for agricultural research. This has further been strengthened by financial outlays under ISOPOM and externally aided schemes. In 1998, the ICAR launched the NATP with support from World Bank which also gave due recognition to rainfed agriculture where pulses are the mainstay. In the technological front, pulses still need major breakthrough in yield levels through morpho-physiological changes in plant type and incorporation of multiple disease resistance coupled with tolerance to abiotic stresses. Introgression of desirable genes from the wild relatives is identified as rewarding option for broadening the genetic base of important traits such as yield attributes and resistance to biotic and abiotic stresses. Recent developments in hybrid technology, transgenics, genomics, foolproof phenotyping, and marker assisted selection demand much more investment in pulses research and development than in the past.

Public investment in pulses research is much more relevant as private sector perceives that investment in research on these crops is not lucrative because of socio-economic reasons of resource poor farmers who are mainly engaged in pulses cultivation. Also private sector is mainly driven by short term profit consideration, while investment in pulses research needs to be viewed as long term investment for sustainable agriculture because of their intrinsic virtues like nitrogen fixation ability, less dependence on external inputs like water, fertilizer and power, per day productivity and higher protein content and its role in ecological security. In fact, economic return on public investment in pulses research and development would be much higher if their soil ameliorative values are taken into consideration. Therefore, public investment in pulses is much more crucial at this juncture as investment in pulses research is linked not only with nutritional security but also with the livelihood of the rural masses.

(Masood Ali)

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