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Dr. Shiv Kumar	Member
Dr. M.S. Venkatesh	Member
Mr. Naimuddin	Member
Mr. D. Upadhyaya	Member Secretary

Group Meet on *Kharif* Pulses

The annual group meet of All India Coordinated Research Project on Pigeonpea and MULLaRP (Mungbean and Urdbean) was held at S. D. Agricultural University, S.K. Nagar on May 2-5, 2008. Dr. V.D. Patil, ADG (O&P) in his inaugural address called upon the scientists to enhance the productivity of pulses by developing CMS based hybrids in pigeonpea and infusing new variability in breeding programme and thereby help reduce country's import bill. He stressed on the need to narrow down the yield gaps existing at different levels by participation of scientists in popularization of already existing technologies. Dr. R.C. Maheshwari, Vice Chancellor, SDAU called upon the centers to adopt innovation, global vision and promptness in delivery of technologies to end users. He also stressed on formulation of District Agricultural Plan for enhancing agricultural production and farm income and emphasized

on integration of mechanization with newly developed technologies and their popularization for



reducing the cost of cultivation. Dr. N.D. Jambhale, ADG (Seeds), ICAR expressed his concern on poor conversion of breeder seed of newly released varieties into foundation and certified seeds and called upon the scientists to participate in popularization of new varieties in their areas of jurisdiction. Dr. Masood Ali, Director, IIPR congratulated the pulse team of SDAU for developing the world's first CMS based hybrid – GTH 1 in pigeonpea and called upon the scientists to take periodical observations on crops

under changing climatic conditions and come out with technologies which can cope up with such changes. This needs to be integrated with basic research on genomics, transgenics and innovative approach for breaking the yield plateau, Dr. Ali emphasized.

Dr. B.B. Singh, Project Coordinator (MULLaRP) and Dr. N.D. Majumder, Project

Coordinator (Pigeonpea) presented the achievements of their respective programmes made during 2007. Both of them discussed some researchable issues pertaining to their projects. Dr. B.B. Singh highlighted the scope for expansion of *rabimungbean* and *urdbean* in South India. The results of *kharif* 2007 were discussed and the technical programme for *kharif* 2008 was finalized.

Launch Meeting of Pulses Seed Production under NFSM organized

The Launch Meeting of Pulses Seed production under National Food Security Mission (NFSM) project was held at IIPR, Kanpur on June 30, 2008. The meeting was



chaired by Dr. Masood Ali, Director, IIPR. Nodal officers of the respective centres and concerned crop breeders attended the meeting. While welcoming the delegates, Dr. B.B. Singh, Coordinator of NFSM project gave brief account of the progress made by centres, especially GBPUA&T, Pantnagar, IGKV, Raipur and BAU, Ranchi and appreciated their efforts for initiating the programme in spring/summer 2008 itself. Dr. Masood Ali, Director, IIPR and Chairman of the meeting thanked the Vice Chancellors of various participating universities for collaborating in the programme. He also expressed his concern about chronic shortage of quality seed of pulses, a major stumbling block in boosting the productivity. He called

upon the scientists to achieve the target of doubling breeder seed of appropriate varieties. Nodal officers of participating centres (IIPR, Kanpur; NDUA&T, Faizabad; BAU, Ranchi; IGKV, Raipur; OUA&T, Berhampur; PORS, Berhampore; JNKV, Jabalpur; RAU, Bikaner; MPKV, Rahuri; MAU, Parbhani; SDAU, S.K. Nagar; ANGRAU, Hyderabad; GBPUA&T, Pantnagar; UAS, Dharwad and CCSHAU, Hisar) made presentation on the progress of work done during the current year and future planning. After thorough discussion on centre-wise presentation, variety-wise targets of breeder seed production for the year 2008-09 were fixed for each centre.

National Conference of Ministers of Agriculture and Horticulture

Indian Council of Agricultural Research (ICAR), Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Govt. of India organized a national conference of ministers of Agriculture and Horticulture of different states on May 26, 2008 at NAARM, Hyderabad under the chairmanship of Shri Sharad Pawar, Hon'ble Union Minister of Agriculture, Consumer Affairs and Public Distribution. The conference focused on the technological advances made for enhancing the production of pulses, oilseeds and coarse cereals, and the likely impact of climate change on Indian Agriculture. Dr. Masood Ali, Director, IIPR made presentation on "Technological advances for enhancing pulse production".

The Hon'ble Union Minister of Agriculture complimented the Indian farmers, scientists, state governments and others associated with agriculture for the record foodgrain production for the last two consecutive years. He stated that the farmers' friendly policies of the government have a major role in bringing about this positive scenario in agriculture. He asked the scientists to be ready for the challenges likely to be faced on account of global climate change and called for the concerted action to devise adaptation and mitigation strategies. Dr. Mangala Rai, Secretary, DARE, and DG, ICAR indicated the future thrust areas of research in pulses, oilseeds and coarse cereals and dwelt on likely impact of climate change and adaptation and mitigation strategies.

Group Meet on Long Duration Pigeonpea

Group meet on long duration pigeonpea was held at IIPR, Kanpur on June 28, 2008. About 35 participants representing six AICRP (Pigeonpea) centres / KVK/ voluntary centres viz., BHU, Varanasi; RAU, Dholi; CSAUA&T, Kanpur and Belatal; NDUA&T, Faizabad; IIPR, Kanpur; Sitapur and Koshambi attended the meeting. Dr. N.D. Majumder, PC (Pigeonpea) extended a warm welcome to the delegates. Dr. V.D. Patil, ADG (O&P) and Chairman of the meet in his inaugural address showed his concern for breaking the yield plateau in long duration pigeonpea that could be possible by modifying the plant type, cropping systems and crop management. He also stressed upon the need to follow multidisciplinary approach in varietal development process taking into account biotic and abiotic stresses and to utilize the physiological and biotechnological interventions. Dr. Masood Ali, Director, IIPR emphasized the need to develop wilt resistant varieties of long duration pigeonpea as this will help increase area under the crop in Jharkhand, U.P. and Bihar and would ultimately lead to increased pigeonpea production. Respective PI's of different disciplines presented the progress made during the previous year and the technical programme for the coming season was finalized.

Third Meeting of ISOPOM Project on Hybrid Pigeonpea held at IIPR

The third Review and Planning Meeting of ISOPOM funded project **"Enhancing yield and stability of pigeonpea through heterosis breeding"** was held at Indian Institute of Pulses Research, Kanpur on April 15, 2008 under the



chairmanship of Dr. Masood Ali, Director, IIPR, Kanpur. About 20 participants including Principal Investigators from all the cooperating (SDAU, PDKV, TNAU, PAU, ICRISAT, IIPR and NAU), and voluntary centers (IARI, New Delhi, ZARC, Khargone; MPKV, Rahuri; ARS, Gulbarga; and ARS, Warangal) and representatives from private

companies attended the meeting. Dr. Ali urged the scientists to break the yield plateau of pigeonpea by developing economically viable hybrids along with its agronomy before the end of the project. He expressed his satisfaction over the release of GTH 1 for Gujarat state and its performance in the central zone under the project. Dr. Shiv Kumar, Coordinator of the project elaborated centre-wise objectives and activities and made a brief presentation highlighting the progress made during 2007-08. Some of the hybrids showed more than 30-40% yield advantage over the varietal checks in central zone. Technical programme involving 27 short duration and 15 medium duration hybrids emanating from different centres was formulated for implementation during the current season at 14 locations involving public and private partners.

Brain Storming Meeting on Food Legumes

Under ICAR-ICARDA Collaborative Programme, a brain-storming meeting was held on 11-15 May, 2008 at ICARDA, Aleppo, Syria. Seven Indian scientists viz., Dr. Masood Ali, Director, IIPR, Kanpur; Dr. Vishwa Dhar, Head, Crop Protection Division, IIPR; Dr. N.P. Singh, Project Coordinator (Chickpea), IIPR; Dr. H.K. Dixit, Senior Scientist (Plant Breeding), IARI, New Delhi; Dr. N.K. Gautam, Senior Scientist (Economic Botany), NBPGR, New Delhi; Dr. P.M. Salimath, Director Research, UAS, Dharwad and Dr. Livinder Kaur, Principal Scientist (Plant Pathology), PAU, Ludhiana, under the leadership of Dr. Masood Ali participated in this

meeting. Scientists from other countries like Ethiopia, Tunisia, USA, Canada, Australia, Turkey, Pakistan, Bangladesh and Nepal also participated.

Dr. Masood Ali presented the status of the progress made in India on improving the productivity of lentil and *kabuli* chickpea along with the production constraints and the strategies to overcome them. Five major themes (Abiotic stresses; biotic stresses; genetic resources; seed production; varietal adaptation management and nutrition and quality) along with the areas of research were identified and concepts notes prepared.

Review and Planning Meeting of Model Seed System held

The Review and Planning meeting of the project "Development and popularization of 'Model Seed System(s)' for quality seed production of major legumes to ensure seed sufficiency at village level" was held on June 2-3, 2008 at ICRISAT. The scientists from NRCG, Junagadh; ANGRAU, Anantpur, Wadiri and Trupati; JNKVV, Jabalpur; OUA&T, Bhubaneswar; PDKV, Akola; IIPR, Kanpur and ICRISAT attended the meeting. Representatives of Directorate of Oilseeds Development Corporation, Maharashtra State

Seed Corporation, National Seed Corporation and State Farm Corporation of India also participated in the meeting. Technical session was chaired by Dr. Masood Ali, Director, IIPR,

Kanpur. The project investigators and collaborators made presentations on the progress made during *kharif* 2007 and *rabi* 2007-08. They also presented the work plan for 2008-09.

IPA 204 – A Wilt Resistant Genotype of Long-duration Pigeonpea

Wilt is a widely prevalent and devastating disease of pigeonpea causing about 20-25% yield losses every year. None of the cultivated varieties of long-duration pigeonpea is resistant to this disease. IPA 204, derived from a cross (Bahar x AC 314-314) appears to hold promise against wilt. Results of multilocation trials under AICRP (Pigeonpea) during 2005-06, 2006-07, and 2007-08 showed that IPA 204 possesses

high degree of resistance to Fusarium wilt at 13 out of 18 locations, indicating broad nature of resistance. In addition, it also possesses moderate level of resistance to sterility mosaic disease. It has marginal yield advantage (5%) over ruling varieties of long-duration pigeonpea such as Bahar and NA1.

A.K. Choudhary and I.P. Singh

New Varieties of Pulse Crops Identified

Following varieties of mungbean and urdbean were identified during Annual Group Meet on *kharif* Pulses held at SDAU, S.K. Nagar on May 2-4, 2008

KM 2241 : The mungbean variety has been developed from the cross Samrat x PDM 54. It gives an average yield of 903 kg/ha in North Hill Zone. It has yield superiority of about 24% over the best check variety ML 5 and found to be resistant to MYMV. The variety has been identified for cultivation in NHZ.

Vallabh Urd 1 : This urdbean variety is a mutant of Pant Urd 19.

It gave an average yield of 1069 kg/ha in North West Plain Zone and has shown yield superiority of about 16% over the check variety Uttara. It is resistant to MYMV and has been identified for cultivation in Punjab, Haryana, Delhi and Western U.P.

NDU 5-7 : This urdbean variety developed from the cross (NP 21 x UL 2) x NDU 1, gives an average yield 1116 kg/ha in North West Plain Zone. Its yield superiority is 20% over the check variety Uttara and possesses resistance to MYMV. It has been identified for cultivation in the states of Punjab, Haryana, Delhi and Western UP.

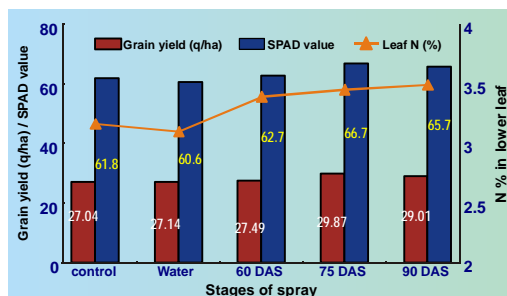
IPU 02-43 : The urdbean variety has been developed from the cross DPU 88-31 x DUR 1. It yielded 911 kg/ha in south zone and showed yield superiority of about 17% over



the check variety Pant U 30. It possesses resistance to MYMV and powdery mildew and has been identified for *kharif* cultivation in south zone comprising the states of A. P., Karnataka, Tamil Nadu and Orissa.

Foliar Application of 2% Urea for Rainfed Chickpea

Chickpea is the most important pulse crop of India, mostly grown under rainfed conditions. Soil moisture deficit at reproductive phase of crop is one of the important factors limiting its yield. Under terminal drought, more than 90 per cent of nitrogen comes from pre-podding sources particularly leaves. Application of N fertilizer to soil during pod set and seed filling is unlikely to enhance N movement from leaves because N is not taken up from dry soils. Foliar application of urea is the better alternative for fulfilling N requirement of chickpea at reproductive stage. Results of field experiment revealed that spraying of 2% urea at 75 DAS in chickpea (cv. KWR 108) resulted in significant increase in tertiary



branches/plant, grain yield (2990 kg/ha) and yield attributing characters like pods/plant, seeds/pod and 100-seed weight. Nitrogen content in lower leaves significantly increased from 3.1 to 3.4% with urea spray. An increase of SPAD value by 7% was also recorded due to foliar application of urea.

M.S Venkatesh, N.B. Singh and
P.S. Basu

A New Parasite of *Helicoverpa armigera*

Helicoverpa armigera is a major pest of pigeonpea and chickpea causing heavy losses every year. Its preference for reproductive and growing plant parts leads to serious losses in crop yield. During April 2007 and 2008, hymenopterous parasites were obtained from the *Helicoverpa armigera* larvae feeding on chickpea at New Research Farm of IIPR. During April 2008, a total number of 12 parasitized larvae of *H. armigera* were collected and reared in the laboratory. From these larvae, 24 (9 male and 15 female) parasites emerged. These male and female parasites mated soon after emergence and successfully reared in the laboratory on the fresh larva of *H. armigera*. This is a gregarious parasite forming 10-16

cocoons per larva of *H. armigera*. It completes its life-cycle within 7-9 days. This wonderful parasite paralyzes the 4 & 5th instar *Helicoverpa* larvae within 1 hour



and then lay eggs inside the body of the larvae of *H. armigera* from which full grown larvae of the parasite emerge out and pupate outside the body of the host *i.e.*, larvae of *H. armigera*. Seven generations completed in the laboratory from April- June 2008. The parasites have been sent for identification.

Hem Saxena and P. Duraimurugan

New Hosts of EPN

The infectivity of entomopathogenic nematode (EPN), *Steinernema* sp. (strain IIPR 03), against brown bug (*Clavigralla gibbosa*) and mealy bug (*Centroccocus somatis*) and its *in vivo* mass production were studied. The adults of the test insects were collected from standing crop from the IIPR and CSAUA&T farm. The adult insects of the same size were taken for present study. In a 6-well plate, one adult/well of test insect was kept and 500 infective juveniles (IJs) of *Steinernema* sp. (IIPR 03) were released in each well and observations on their mortality were recorded at 24 h interval.



Clavigralla gibbosa

Centroccocus somatis

A : Healthy, B : Infected

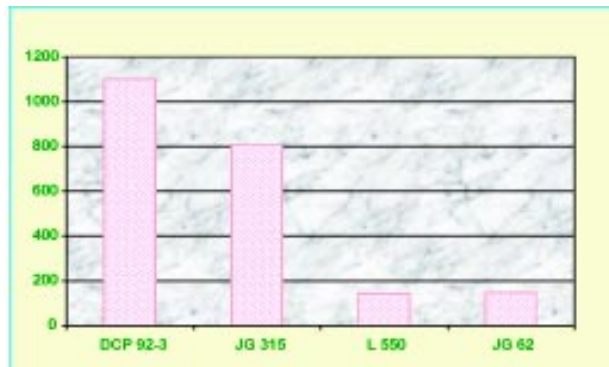
Population of EPN per larvae was also worked out.

Steinernema sp. (strain IIPR 03) was found more pathogenic to mealy bug as it brought about 100% mortality within 74 h as compared to 84 h in brown bug. No mortality was observed in control. Multiplication of this strain was highest in *C. gibbosa* (0.31×10^5 IJs/cadaver). Very poor population of IJs was obtained from *C. somatis* (0.01×10^5 IJs/cadaver). These insects *viz.*, brown bug and mealy bug are being reported as the host of this entomopathogenic nematode for the first time.

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

Phenolics and Wilt Resistance in Chickpea

A study was carried out at IIPR on different wilt resistant and susceptible genotypes of chickpea grown in inoculated and uninoculated pots during 2003-08. The results revealed that phenolic acids-chlorogenic, caffeic, coumaric and ferulic acids played an important role in imparting resistance against wilt in chickpea caused by *Fusarium oxysporum* f.sp. *ciceri*. Chlorogenic acid was the most predominant phenolic acid, responsible for imparting resistance against wilt. The possible mechanism of



Chlorogenic acid (µg/g) in root of chickpea genotypes

biosynthesis of chlorogenic acid is from p-coumaric acid to caffeic acid or ferulic acid, which is combining with quinic acid and forming chlorogenic acid. High

concentration of chlorogenic, caffeic, coumaric or ferulic acids in root is indicative of resistance against wilt in chickpea. The susceptible genotypes had very low phenolic acids content especially chlorogenic acid.

The wilt susceptible genotypes initially contained low chlorogenic acid in root, which further decreased during wilting as there was no biosynthesis of chlorogenic and other phenolic acids in the roots of susceptible genotypes.

R.P. Srivastava

Transfer of Technology

Training on Production Technologies of Pigeonpea Organized

Under National Food Security Mission – Pulse Component, a 3-day National Training Course on “Improved Production Technology on Pigeonpea” was held during 17-19 June, 2008 at IIPR with an aim to improve professional competencies and upgrade knowledge of Extension Officers. The training programme was attended by 21 extension officers from 8 different states viz., Tamil Nadu, Andhra Pradesh, Maharashtra, M.P., Rajasthan, Haryana and Uttar Pradesh identified under NFSM-P. Dr. Masood Ali, Director, IIPR highlighted importance of pigeonpea in crop diversification and

nutritional security especially of small and marginal farmers. He emphasized on strengthening of capacity and capability through organization of National training course.

The training programme covered various aspects like

production, protection and post harvest management of short, medium and long duration pigeonpea. Learner centre models viz., interactive lecture and interactive demonstration were advocated during three-day programme. Hands on

demonstration on technologies like use of bio-fertilizers and bio-control agents in pigeonpea were the main focus of this training course. Relevant literature developed by IIPR was provided to each participant. Dr. S.N. Shukla, ADG (FC), ICAR, New Delhi chaired valedictory session of the programme.



Farmers' Training Organized

Farmers' training on 'Improved Production Technology for *kharif* Pulses" sponsored by Agriculture Technology Management Agency (ATMA), District Kannauj, Uttar Pradesh was organized at IIPR, Kanpur on 23-24 and 26-27 June, 2008. The major objectives of the programme were to stimulate awareness, upgrade knowledge and improve skills of participating farmers on *kharif* pulses (pigeonpea, urdbean and mungbean) production technologies developed by the Institute. Dr. Masood Ali, Director, IIPR urged the participants to include pulse crops in their prevailing cropping systems at least once every alternate year as this will help improve and sustain the soil health. All production and post harvest related aspects of *kharif* pulses were discussed through interactive lectures and demonstrations. Participating farmers took keen interest in procuring the pigeonpea seed from the seed sale counter of the Institute. Farmers' friendly literature developed by IIPR was distributed among the participants.

Obituary

Shri Ram Swaroop S/o Shri Ramadhar, SSG I, left for his heavenly abode on June 6, 2008. The IIPR consoles the bereaved family and prays for peace of the departed soul.

Quality Seed Production and Safe Storage of Pulses: Training-cum-Awareness

IIPR organized a skill oriented training on "Quality seed production and storage of pulses" with collaboration of National Seed Corporation on 21.6.2008. Dr. B.B. Patnaik, Chairman and Managing Director of NSC was the Chief Guest. Sri Patnaik said though the country has witnessed over 100 per cent increase in seed production during the last three years, a big gap between demand and supply still remains. He emphasized on the participatory seed production of pulse crops for achieving seed replacement rate of 25-30% in coming years from the present 4-6%. He appealed to private seed companies to share the responsibility of ensuring quality seed production of pulses. National Seed Corporation distributed Seed Storage Containers to 60 seed growers from Kanpur Dehat and Fatehpur



districts selected under ISOPOM funded Model Seed System(s) project. On this occasion, Dr. Masood Ali, Director, IIPR highlighted the importance of on-farm activities and their impact. He emphasized on active participation of stakeholders in seed production of pulse crops. Institute Scientists imparted training to the farmers on quality seed production of pigeonpea. General Manager (Marketing) and Regional Manager, NSC were also present in this programme.

Our New Colleagues

Dr. Mir Asif Iquebal and Dr. Sarika, Scientist (Agril. Statistics) and Mr. Prakash G. Patil, Scientist (Biotechnology) joined IIPR on 16.5.08



Dr. M.A. Iquebal



Dr. Sarika



Mr. Prakash G. Patil

PERSONNEL

Promotion

Name	Promoted to	w.e.f.
Sh. Ram Kishan S/o Sh. Pitamber	S.S. Gr. IV	23.6.2008

Retirement

Name	Post held	Date of retirement
Smt. Gulab Dei	S.S.Gr. IV	30.6.2008
Smt. Savitri	S.S.Gr. III	30.6.2008

Director's Desk

Dear Readers,



Among natural resources, soil and water are the foundation for successful crop production. The realization of genetic yield potential of crops and varieties and impact of new production technologies can be harnessed only if the production base is improved. During recent years, the productivity growth in agriculture has been tapered off. In some cases, the declining trend is being observed mainly due to deteriorating soil health in terms of its physical, chemical and biological properties. Widespread deficiencies of many major, secondary and micro-nutrients which were in plenty earlier have been experienced in both irrigated and rainfed areas, the problem being more acute in dry areas where pulses, oilseeds and coarse cereals are generally grown. Pulses are capable of trapping atmospheric nitrogen in their root nodules through the process of symbiosis and mobilizing the soil P in association with VAM and excretion of organic acid. But that is not enough to maintain soil health which is

already impoverished. The progressive decline in the status of organic carbon and microbial biomass – an index of soil fertility is a matter of great concern. Pulses can play a decisive role in arresting this declining trend.

Water – the scarcest commodity in dry land needs special attention. In view of progressive decline in rainfall and climatic changes, the water availability has already reached to 1200 cubic meter as against the estimated requirement of 1500 cubic meter/capita. It is likely to touch the threshold level sooner if corrective measures are not taken up. The availability of water is expected to decline by almost 40 to 60% in the next three decades. Moreover, the accelerated pace of industrialization and urbanization will further constrain the water resources available to agriculture. In such scenario, pulses by virtue of their resilience under limited water availability are an excellent choice because of their better water-use efficiency. Water productivity in case of chickpea is estimated to be 0.90-1.00 kg/m³ water as compared to only 0.36-0.46 kg/m³ water in rice. The misuse of irrigation water and deterioration in its quality has contributed for further deterioration of soil in terms of salinity and alkalinity. Moreover, the

unawareness about conservation of rainwater and faulty cultivation practices have led to enormous loss of valuable upper soil and nutrients through water erosion, making the fertile land barren. Pulses by virtue of their dense canopy and soil binding ability can play an important role in reducing the runoff and consequent soil losses. It is therefore imperative that due attention is paid to soil and water and their appropriate management to bring spectacular increase in productivity of pulses on one hand and conservation of natural resources on the other hand.

The year 2007-08 has turned out to be a milestone for pulses production in the country, as for the first time it has crossed the mark of 15 million tonnes - a long cherished goal. This has cemented the status of the country as the largest pulses producer in the world with 25% share in global production from 32% area. However, the present production of 15.19 million tonnes is still short of the present consumption i.e., 17.65 million tonnes. This requires efforts to enrich the production base in terms of soil health and water use.

(Masood Ali)

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