# PULSES
## NEWSLETTER
ICAR-Indian Institute of Pulses Research, Kanpur

VOLUME 35, No. 01 Jan to March- 2024


## Celebration of World Pulses Day

World Pulses Day was organized at ICAR-Indian Institute of Pulses Research on 10th February, 2024. On this occasion, Dr. N.P. Singh, Vice Chancellor, BUA&T, Banda was the chief guest and Dr. PK Singh, Agriculture Commissioner, Government of India, and Dr. A.K. Singh, Vice Chancellor, CSAUA&T, Kanpur were the Guests of Honour. The Chief Guest praised the achievements of the Institute under the able leadership of the Director. Elaborating on the importance of World Pulses Day being celebrated since 2016, he reiterated the success in the pulse crops chickpea, moong bean and emphasized need to focus on pigeonpea and uradbean, as we have to become exporter of pulses and not remain an importer. The Guest of Honour, Dr. PK Singh expressed happiness on the occasion and laid emphasis on increasing production and productivity of pulses further with low cost of production for farmers.

Dr. G.P. Dixit , Director, IIPR shared the ongoing activities under ongoing projects on pulses under international institutions and national programmes that have led to generation of improved varieties, technology and human resources. He recognized and thanked the support received from the Government of India enabling supply of more improved seeds to the farmers. Emphasizing on the Institute's focus on public - private partnership, he revealed that many agreements with stakeholders have been signed recently.

On this occasion, six publications from different disciplines were released by the Chief Guest. Also progressive farmers from different districts of the state were also honoured by the chief guest for their excellent works in pulses farming and improved seeds and equipments were also distributed. Dr. Shailesh Tripathi, Project Coordinator (*Rabi*) extended vote of thanks & Dr. Rekha Rani, Scientist conducted the programme.

## The 29th meeting of the Research Advisory Committee of ICAR- IIPR

The 29th meeting of the Research Advisory Committee (RAC) of ICAR-Indian Institute of Pulses Research, Kanpur was held on February 14-15, 2024 under the Chairmanship of Dr RM Chauhan, Vice-Chancellor, Sardar Krushi Nagar Dantewada Agriculture University, Dantewada (Gujarat) in hybrid mode. The meeting was attended by all the RAC members. Dr. M. Senthil Kumar, Member Secretary, welcomed the chairman and members of RAC. Dr. GP Dixit, Director of IIPR, also extended a formal welcome and gave an overview of the pulses research

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and developmental activities undertaken at IIPR during 2023-24. He apprised the RAC that 10 varieties of pulses were released for cultivation during the last one year. The Chairman, Dr. RM. Chauhan, in his remarks appreciated the Institute's accomplishments and emphasized the significance of natural/organic farming, research efforts on pod fly and pod borer resistance, Fusarium wilt, and blight in chickpea and pigeonpea. The Heads of Divisions, regional centre and In-charges of regional stations presented the salient achievements accomplished by their respective divisions and stations. Dr. Sanjeev Gupta, ADG (O&P), suggested targeting rapid grain-filling-related traits in pulses for further improvement in pulses. The meeting ended with a vote of thanks from Member secretary, RAC.

## The 48th meeting of Institute Management Committee held at ICAR- IIPR

The 48th meeting of Institute Management Committee of ICAR-Indian Institute of Pulses Research, Kanpur was held on 21st February, 2024. At the outset, Sh. Sujeet Kumar Verma, Sr. Administrative Officer, ICAR-IIPR, Kanpur & Member Secretary, IMC welcomed the Chairman, Members of IMC and special invitees. Thereafter, Dr. G.P. Dixit, Director, ICAR-IIPR, Kanpur & Chairman, IMC welcoming all the dignitaries appraised the progress of research/developmental activities and other administrative steps taken to improve the functioning of the Institute, projects & its four regional centre/ Stations. Sh. Kunal Kalra, Sr. Finance & Accounts Officer informed the house about allocation/ utilization of budget which was appreciated by the IMC. The IMC members Dr. V.K. Yadav, Director (A.), ICAR-IGFRI, Jhansi; Dr. S.K. Chaturvedi, Director (Research), RLBCAU, Jhansi; Dr. C. S. Prahraj, Principal Scientist, ICAR-DGR, Junagadh and Dr. C. Bhardwaj, Pr. Scientist, ICAR-IARI, New Delhi appreciated ongoing research activities being carried out at ICAR-IIPR, Kanpur and gave critical inputs where required. The suggestions made by members were appreciated, suitably responded and documented.

## Workshop organized on product profile development and redefining plant types in *Kharif* pulses

A brainstorming workshop on 'Redefining plant types in pigeonpea and *Vigna* pulses for central and south India and product profile development' was organized on January 8-9, 2024 at Agricultural Research Station, VNMKV, Badnapur, Dist. Jalna, Maharashtra. The workshop was organized jointly by AICRP on *Kharif* Pulses and ARS, Badnapur and >70 participants including. Dr. Indra Mani Mishra, Hon'ble Vice Chancellor, VNMKV, Parbhani; Dr. Sanjeev Gupta, ADG (O&P), ICAR; Shri Atul Kumar, Additional Chief Secretary, Govt. of Maharashtra; Dr. S.N. Puri, Former VC, CAU, Imphal and MPKV, Rahuri; Prof. N. Nadarajan, Former Director, ICAR-IIPR, Kanpur and Dr. Aditya Pratap, Project Coordinator, AICRP on *Kharif* Pulses besides pulses scientists from central and south India, farmers, pulse millers, seed sector and industries took part in the discussion. Elaborate deliberations were held on the need of redefining plant types in pigeonpea, mungbean and urdbean under the changing climate scenario as well as new productivity enhancement goals to meet the challenge of complete self-sufficiency in pulses by the end of 2027. In the debate, panelists elaborated their ideas on new traits that can be incorporated into desired plant structure. This was followed by an open house discussion wherein participants aired their ideas about the most acceptable plant types.

## DST-SERB sponsored three-day workshop on "Genomics Mediated Breeding Strategies to Develop Climate-Resilient Nutrient-Dense Pulse Crops"

ICAR-Indian Institute of Pulses Research (IIPR), Kanpur organized a three-day workshop on "Genomics Mediated Breeding Strategies to Develop Climate Resilient Nutrient-Dense Pulse Crops" under Scientific Social Responsibility (SSR) activity of DST-SERB funded project "Detection of genetic loci associated with yield attributes and seed quality traits under high-temperature exposure in field pea (*Pisum sativum* L.)" from March 6-8, 2024. A total of 23 faculty members from different colleges, institutes, and organizations participated in the programme. The workshop primarily

aimed to provide training to the researchers and teachers interested in the application of various molecular and genomic tools to develop climate-resilient and nutrient-dense pulse crops. The inaugural session was chaired by Dr. G.P. Dixit, Director, ICAR-IIPR and co-chaired by Dr. P.K. Katiyar, Head, Crop Improvement Division, ICAR-IIPR, Kanpur. At the outset, Dr. A.K. Parihar, PI of the project and Course Director of the workshop formally welcomed the chairman, co-chairman, and all the participants. He narrated the objectives & initiatives of the SSR policy of SERB and a brief introduction of the three-day Workshop. In the inaugural session, two publications *i.e.*, Workshop Compendium and Training Manual were released by the dignitaries.

## Agricultural spraying drone demonstration conducted at 18 villages of Kanpur

The Demonstration-cum-awareness programmes on agricultural spraying drones were conducted at farmers' fields of total eighteen villages in Kanpur Nagar and Kanpur Dehat districts of Uttar Pradesh namely; Mitanpur, Biroha, Silhara, Kandhi, Kandhiki Madaiya, Nariha, Dewanpur, Akorhi, Dullapur, Angoori, Suniapur, Gaurikaran, Nihutha, Basausi, Dhakanpurva, Manpur, Dharhara, and Kiratpur during 29-09-2023 to 15-03-2024. The team consists of Dr. Narendra Kumar, Head and Principal Scientist, Crop Production Division; Dr. Uma Sah, Head and Principal Scientist, Social Sciences Division and Dr. R.K. Mishra, Principal Scientist, Crop Protection Division. Total 363 farmers have participated in the demonstrations-cum-awareness programme and approximately 418 acres of area of rice, wheat, pulses, coriander, berseem, potato, *etc*. were benefited by spraying with micronutrients, nano-urea *etc*. Farmers were provided with real-time knowledge about drones, battery backups, charging, nozzles, chemical spraying, benefits and limitations of drone technology.

# Research Highlights

## Emergence of foliar diseases in chickpea during prolonged cold spell in January

Foliar diseases like *Botrytis* Grey mold, *Ascochyta* blight and *Scrlotinia* stem rot affect chickpea crop grown in northern hilly regions under cool and humid weather. In plains, these are reported as minor diseases with sporadic occurrence. During *rabi* 2024, prolonged spell of cold along with winter rains have been observed during the months of December and January leading to high RH and excessive foliage growth in chickpea crop. Due to these, mixed infection of three foliar diseases *viz*., *Botrytis* grey mold, *Ascochyta* blight and *Scrlotinia* stem rot have been observed in chickpea lines. The Botrytis grey mold caused by *Botrytis cinerea* caused drooping of the affected terminal branches and grey to light brown lesions on the leaflets and the branches. Sclerotinia rot (white rot) incited by *Sclerotinia sclerotiorum* (Lib.) de Bary caused discoloration of the stem and then necrosis of

**Appearance of BGM and Sclerotinia rot in field**

**Fungal Culture of *Botrytis* (Grey) and Sclerotinia (White along with black sclerotia)**

branches or the whole plant with presence of fluffy, white mycelium on lower stem or branches. Ascochyta blight was also observed in few patches on lower leaves. Isolation of fungus from infected plant parts was carried out and the presence of BGM and Sclerotinia rot was confirmed by culturing on PDA media. Large variation was reported in the breeding material ranging from 0-40% of foliar infestation. In general, varieties with spreading habit showed more disease than those with erect plant type. The *desi* varieties IPCB 2015-132 (Kundan), IPC 2011-112 (Keshav), IPC 2010-134 (Shiva), IPC 2007-28 (Atal) and *kabuli* variety IPCK 2013-163 (Madhav) were resistant to these foliar diseases.

*AK Srivastava, Rishikesh Kumar, Amrit Nayak, Rahul Kumar, Pravin Tiwari, B Mondal, Yogesh Kumar and GP Dixit*

## Rust Severity in Fieldpea

Forty-two genotypes of fieldpea (*Pisum sativum* L.) were screened under natural epiphytotic conditions to determine the severity of rust (*Uromyces viciaefabae)* disease. Two lines of each genotype were sown in two replications. On the basis of the fortnightly interval observation recorded, none of the genotypes was found to be completely resistant against rust disease. Among all the genotypes, two genotypes, IPF 18-20 and IPFD 22-2, showed a moderately resistant reaction; three were moderately susceptible; eight were found susceptible; and 29 germplasms were found highly susceptible. The two germplasms, IPF 18-20 and IPFD 22-2, which showed moderately resistant reactions, had 12% and 15% disease severity, respectively. The pustules that appeared on these genotypes were small (1.5–1.7 mm) as compared to other susceptible genotypes. Moderately susceptible genotypes scored a disease severity score of 20–22. The size of the pustules showed a high variation of 1.3–4.4 mm. Genotypes with susceptible reactions showed a severity range of 32–60%.

*R.K. Mishra, A.K. Parihar, Utkarsh Upadhaya, Deepak Dixit and A.K. Singh*

## Influence of pigeonpea sowing dates on pod-borer complex

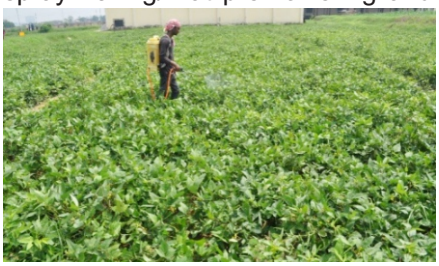
Pigeonpea, *Cajanus cajan* (L.) Millsp. is a resilient legume crop but faces significant yield reduction due to pod-borer complex. A field experiment was conducted at New Research Campus to observe the influence of sowing time on infestation level of pod-borer complex comprising Gram pod-borer, spotted pod-borer and pod fly. A set of 25 different short duration pigeonpea genotypes were planted on three different dates; 16.06.23 (early), 03.07.23 (mid) and 17.07.23 (late). From each genotype, four plants were tagged and from each plant, five pods were randomly

picked for recording of infestation. Round irregular hole on pods was identified as gram pod borer infested (Fig a), pin-sized hole on pods was identified as pod fly infested (Fig b) whereas irregular scraping on pods was identified as spotted pod borer infested pods (Fig c). The per cent pod damage was calculated (n=20) wherein, for gram pod-borer, significant difference was found among the three dates of sowing. The highest per cent pod damage (32) was recorded in case of mid-sown crop whereas early (11.6) and late (13.8) sown crops were statistically at par with each other. In case of spotted pod-borer and pod fly, no significant difference was observed in per cent pod damage among the three dates of sowing.

*Anup Chandra, Shravan Kumar Verma, Sujayanand GK and Ashok K. Parihar**

## Standardization of Nano Zinc Oxide dosages for enhanced pulse crop nutrition

Field experiments were conducted during *kharif* & *rabi* seasons of 2021-23 at new research campus, ICAR-IIPR, Kanpur aiming to study the effect of nano zinc oxide as nano-fertilizer in chickpea (IPC 11-112) and urdbean (IPU 11-02) respectively. Crops performance was studied with different zinc management practices which included nano zinc oxide liquid formulation from ICAR-CIRCOT, Mumbai. Nano zinc oxide spray @ 50 mg/L at pre-flowering and pod formation in chickpea recorded a significant higher yield of 2309 to 2247 kg/ha which was 23.7 to 25% higher in comparison to control. Among different treatments in urdbean, nano zinc oxide foliar spray @ 50 mg/L at pre-flowering and pod formation showed significant higher yield (941 to 1043 kg/ha) and was 31 to 35% higher than the control and was on par with Nano zinc oxide foliar spray 25 mg/L at pre-flowering and



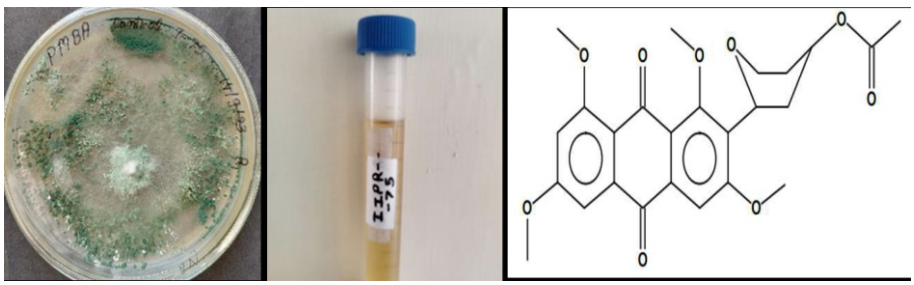
**Urdbean (Pod formation stage) Chickpea (Pre-flowering stage)**

pod formation which was equally responsive as higher dosage. Therefore, nano zinc oxide spray @ 50 mg/L at pre-flowering and pod formation of liquid formulation has emerged as a significant viable option to increase chickpea yields. Unlike chickpea, the response of Nano zinc oxide spray in urdbean was optimum at 25 mg/L dose at pre-flowering and pod formation. Therefore, liquid formulation of nano zinc oxide @ 25 mg/L sprayed twice at pre-flowering and pod formation could be a viable option for zinc management in urdbean.

*Kancheti Mrunalini, Narendra Kumar, C P Nath and N Vigneshwaran*

## Volatile secondary metabolite profiling of *Trichoderma asperellum*

In the present study, we provide a summary of isolated volatile metabolites from *Trichoderma asperellum* (IIPR-75) strain. A total of 79 secondary metabolites were isolated from IIPR-75 isolate by using ethyl acetate solvent extraction method. Out of the different compounds obtained, 9, 10-Anthracenedione, 2-[4-(acetyloxy) tetrahydro-2H-pyran-2-yl]-1,3,6,8-tetramethoxy (cis) is first time found to be present in *Trichoderma asperellum* (IIPR-75). This compound



**(a) *Trichoderma asperellum* strain IIPR-75 (b) Extracted secondary Metabolites from strain (c) 9, 10-Anthracenedione, 2-[4-(acetyloxy) tetrahydro-2H-pyran-2-yl]-1, 3, 6, 8-tetramethoxy (cis)**

works as a plant growth regulator. Seventeen mycoparasitic compounds were also identified from the ethyl acetate fraction of the *Trichoderma*.

*R.K. Mishra, Shailesh Dixit and Sonika Pandey*

## प्रौद्योगिकी हस्तांतरण

- Signing of an MoU with DCM Sriram for promotion on pulses research & development on 9th February, 2024.
- Signing of an MoU with M/s Omkar Seva Sansthan on 10th February, 2024.
- Licensing of Mungbean (Shikha) and Urdbean (IPU 11-02) varieties with M/s Prasad Agro Seed Industries on 18th March, 2024.
- Signing of an MoU with M/s Kushawati Seeds Company for licencing and commercialization of extra early variety of mungbean (Virat) on 9th February, 2024.

## Progress and achievements under Schedule Caste- Sub Plan (SC-SP)

- Distribution of quality seeds of mungbean 45.00 q (cv. Shikha and Virat) at ICAR-IIPR, Kanpur.
- Distribution of seed storage bins (200 nos.) by ICAR-IIPR, Kanpur.
- Distribution of *Rhizobium* culture for mungbean (100 nos.) by ICAR-IIPR, Kanpur
- Conducted Off-campus farmers trainings at Barabanki, Hardoi and Raibarelly.

## Evaluation of grading capacity of IIPR Grader for Chickpea and Pigeonpea

Pulses are consumed after dehusking and splitting in the form of *dal*. At domestic level, the process of pulse milling is performed in stone *chakkies*. Abrasive emery rollers, horizontal or vertical *chakkies* are used in higher capacity pulse milling units. Emery or carborundum rollers are used for husk removal in commercial mills, whereas *chakkies* are used to split the grains into two halves. Gap between the rotating and stationary disks can be increased or decreased depending upon grain size. Performance of milling machines improve with uniform quality of grains. Therefore, grading of grains is an essential operation to obtain grain of uniform seed size, which ultimately result into better quality of end product, *i.e.*, *dal*. In the study. The grader, developed at ICAR-Indian Institute of Pulses Research, Kanpur was evaluated for obtaining uniform seed size of

ICAR-IIPR Grader

chickpea and pigeonpea. The IIPR, Grader is having two tier sieve system for separation of over size, under size and shriveled or immature grains. The unit operates on 370 watts single phase motor with 7.62 cm drive motor pulley at 1425 rpm. Driven pulley of 30.48 cm diameter provides 356 rpm to grader shaft. Cam arrangement ensures stroke length of 1.50 cm. Upper round hole sieve of 6 and 5 mm are used for collecting normal size chickpea and pigeonpea grains, respectively. Smaller grains are collected below the top sieve with rectangular holes of 19.60 x 1.70 mm. Small grains can be processed separately. Immature and shriveled grains are collected at the bottom. The overall size of sieves is 72.50 x 43.5 cm. For chickpea, the grader yielded the average grading capacity of about 400 kg/h and for pigeonpea, about 380 kg/h capacity was obtained. The grader can be used for size grading of all the pulses and agricultural commodities by using sieves of appropriate grain sizes.

*PrasoonVerma, Man Mohan Deo and Narendra Kumar*

## DST-SERB sponsored students exposure

A students visit programme was organized on 21st March, 2024 under DST-SERB funded projects as Scientific Social Responsibility (SSR) policy in the Division of Crop Production of ICAR-IIPR, Kanpur. Two projects are being undertaken at Division of Crop Production : (i) "Carbon foot-print and microbiome community structure in diversified cropping systems under conservation and conventional agriculture"; Principal Investigator, Dr. Narendra Kumar (Head, CPD), and (ii) "Identification of chickpea genotype for higher phosphorus use efficiency"; Principal Investigator, Dr. Chaitanya Prasad Nath (Scientist, Agronomy). Accordingly, total of 50 students (25 students in each project) were accommodated in this visit as per DST-SERB guidelines. The students were from School of Advanced Agricultural Science and Technology, Chhatrapati Shahu Ji Maharaj University, Kanpur. The students are pursuing Master of Science in Agriculture in disciplines of Agronomy and Master of Science in Horticulture in disciplines of Fruit Science, Floriculture and Landscaping, and Vegetable Science. The progarmme was started with registration of students. The inaugural programme was graced by Dr. G.P. Dixit (Director, ICAR-IIPR, Kanpur), Dr. Narendra Kumar (Head, CPD) and Scientists of Division. Dr. G.P. Dixit presented overview on Institute activities, research programmes, thrust areas, and its success stories.

## Trainings organized

- **Two days farmers training programme organized during January 9-10, 2024 -** A two-day farmer training programme on "Improved Pulse Production and Protection Technologies" was organized by the Division of Social Sciences during January 9–10, 2024. Under the Sub-Mission on Agriculture Extension (ATMA) Scheme. A total of 40 farmers, including women farmers from Jalaun districts of Uttar Pradesh, participated in the training programme.
- **Two days farmers training programme organized during January 11-12, 2024 -** A two day farmer training programme on "Improved Pulse Production and Protection Technologies" was organized by the Division of Social Sciences during January 11–12, 2024. The training programme was conducted by *Pragya Gramothan Sewa Samiti*, Fatehpur, under the Sub-Mission on Agriculture Extension (ATMA) Scheme. A total of 34 farmers from the Fatehpur district of Uttar Pradesh participated in the training programme. The training programme was successfully completed with the involvement of Dr. Uma Sah, as a Course Director, Dr. Hemant Kumar and Dr. Rekha Rani as Course Coordinators.
- **Five days farmers training programme organized during March 04-08, 2024 -** A five days farmers training programme on "Improved Pulses Production Technology" was organized by the Division of Social Sciences during March 04-08, 2024. The training programme was conducted by NIGAM, Institute for Governing Activities of Mass, a state level organization, under the project on diversification of crops in Cuttack district of Odisha. A total of 17 farmers from the Cuttack district participated in the training programme.
- **Five days farmers training programme organized during February 16-22, 2024 -** A five day farmers training on "Improved Pulse Production Technology" was organized by the Division of Social Sciences on Feb. 16-22, 2024 under Odisha State Plan Scheme "Crop Diversification Programme under Mega Lift Irrigation Project" Distt. Subaranpur, Odisha. Total 22 farmers participated in the training programme.
- **Three days exposure cum training programme organized during March 18-20, 2024 -** A three days training programme on "Exposure cum Training on Pulse Production Technology" was organized by the Division of Social Sciences during March 18-20, 2024 for 27 farmers from CDP-MLIP, Kendrapada, Odisha.
- **One day training programme programme organized on March 18, 2024 -** One day training programme on "Importance of Mechanization in Pulse Crops" was organized by the Division of Social Sciences on March 18, 2024 for 60 farmers from Kanpur Dehat, Uttar Pradesh under Model Pulse Village Project funded by SCSP. Total three lectures were organized on importance of mechanization in pulse crops, demonstration of agri-drone sprayer and post-harvest processing and value addition in pulse crops besides exposure visit of main farm of IIPR, Kanpur.
- **New initiative -** Division of Social Sciences received an externally funded research project entitled "Artificial intelligence enabled biotic & abiotic stress detection and advisory mobile application for crops" under the National Agricultural Science Fund (NASF) with the total cost of ₹ 97.40 lakh for a period of three years (April, 2024 to March, 2027)

## Extension Activities

- **Incubation support extended to *Matra Bhumi* Bio Tech, Kanpur under ABIC**
  Agri-Business Incubation Center extended the on-site incubation support to *Matra Bhumi* Bio-Tech, Kanpur on "Quality improvement of indigenous bio-fertilizer and supplements" for six months *i.e.* December 18, 2023 to June 17, 2024.
- **Incubation support extended to Sehkar Farmer Producer Company, Fatehpur under ABIC**
  Offsite incubation support on "Seed production of pulses and promotion of farm products" was extended to Sehkar

Farmer Producer Company, Fatehpur under ABIC for six months (February 10, 2024 to August 09, 2024).

- **Farmer Connect 1.0 conducted under ABIC on 10th Feb 2024**
  Farmer Connect 1.0 programme (Sensitization cum training programme) on "Agri-Business Opportunities in Pulses" was organized on World Pulse Day 10th February, 2024 under Agri-Business Incubation Centre, wherein Dr. Uma Sah, Head, Division of Social Sciences & PI, ABIC was the Course Director for the training programme. A total of 150 farmers and farm womens from Kanpur Dehat district participated in the programme.
- **Five days long Entrepreneurship Development Programmes conducted under ABIC**
  A total of 05 Entrepreneurship Development Programmes (EDP) of five days long each, including EDP 1.0 on "Pulse processing" under the mentorship of Dr. Prasoon Verma, Sr. Scientist (AS & PE), ABIC during February 05-09, 2024, EDP 2.0 on "Bio-fertilizer production" under the mentorship of Dr. M. Senthil Kumar, Head, Division of Basic Sciences, ABIC during February 19-20, 2024, EDP 3.0 & 4.0 on "Seed Production of Pulses" under the mentorship of Dr. P.K. Katiyar, Head, Division of Crop Improvement, ABIC, EDP 5.0 on "Pulse processing" during March 18-22, 2024".
- **Sensitization programmes on "Entrepreneurship Opportunities in Pulses" organized under ABIC**
  A two day Sensitization programmes on "Entrepreneurship Opportunity in Pulses" was organized by Agri-Business Incubation Centre (ABIC), ICAR-IIPR, Kanpur organized for the students of Chhatrapati ShahuJi Maharaj University, Kanpur and Chandra Shekhar Azad University of Agriculture and Technology, Kanpur on March 07, 2024. Dr. Uma Sah, PI, ABIC and Course Director of the programme presented an overview of the incubation support services of the ABIC.
- **Online Pre-incubation program "*Dalhanday* 1.0" completed by ABIC, ICAR-IIPR, Kanpur organized**
  A five day long online Pre-incubation program "Dalhanday 1.0" with theme on "Navigating the Pulses for Profitable Ventures" was successfully completed on March 15, 2024 by Agri-Business Incubation Unit, ICAR-IIPR, Kanpur. A total of 86 participants actively participated in the programme that included, students, entrepreneurs, farmers and FPO members.
- **FPO Connect 1.0 programme organized by ABIC**
  A three day long FPO Connect 1.0 programme was organized with the theme "Business prospects in pulses" during March 20-22, 2024 under ABIC, wherein 37 CEOs, Directors and members of 27 FPOs across Uttar Pradesh states participated. The basic objective of the programme was to provide hands on experience to the participants about the available technologies and prospects for transforming them into successful business ventures.

## Foreign visits

Dr. Aditya Pratap visited Kasetsart University, Bangkok, Thailand between March 5-8, 2024 to attend the 'International Mungbean Congress' and the mid-term review of the 'International Mungbean Improvement Network – 2 (IMIN-2)'. During the Congress, he presented a key address on the topic 'Mungbean value chain development in India towards achieving sustainable development goals' besides a research paper on Comprehensive RNA-Seq analysis of *V. glabrescens* reveals candidate genes and transcription factors modulating powdery mildew resistance in *Vigna*'. He also steered the group discussions on 'Mapping future research priorities'. During the mid-term review of IMIN -2, he made a presentation on the progress and future plan of work in the network in India.

## Felicitations/Awards

Dr. Aditya Pratap, Project Coordinator, AICRP on *Kharif* Pulses has been awarded with the prestigious Fellowship of the National Academy of Agricultural Sciences, (NAAS) w.e.f. Jan. 01, 2024.

Dr. Aditya Pratap, Project Coordinator, AICRP on *Kharif* Pulses has been admitted to the Membership of the prestigious National Academy of Sciences, India w.e.f. Jan. 01, 2024.

## PERSONNEL

### Appointments, Promotions, Transfers, *etc.*

### Transfers

| Sl. | Name | Designation | From | To | Date |
|---|---|---|---|---|---|
| 1 | Dr. K.R. Soren | Sr. Scientist | ICAR-IIPR, Kanpur | ICAR-IIAB, Ranchi | 22.12.2023 |
| 2 | Dr. Basavaraja T. | Scientist | ICAR-IIPR, Kanpur | ICAR-IIOR, Hyderabad | 15.12.2023 |
| 3 | Dr. Devindrappa | Scientist | ICAR-IIPR, Kanpur | ICAR-CICR, Nagpur | 15.12.2023 |
| 4 | Dr. Alok Kumar | Scientist | ICAR-IIPR, Kanpur | ICAR-IISS, Mau | 15.12.2023 |

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# Director's Desk

Dear Readers,

Climate change is an urgent and pressing issue that is already affecting various regions around the globe, including South Asia. In India, the impact of climate change on pulse crops yield is particularly concerning. Rising temperatures, increased climate variability, and extreme weather events pose significant challenges to pulse plant growth and yields. These challenges include reduced crop productivity, increased vulnerability to diseases and pests and changes in flowering and pollination patterns. Moreover, shortage of water resources and unpredictable market dynamics further exacerbate the difficulties faced by pulse farmers in India. Though several measures can be and are being undertaken to improve resilience of crops nationally, the most prominent includes crop diversification, improved and precise irrigation practices, use of climate resilient varieties, adoption of sustainable agricultural practices, use of weather forecasting and advisory services, capacity building and farmer training.

Encouraging farmers to diversify their crop production can help to reduce the dependency on traditional pulse crops that may be vulnerable to climate change impacts. Developing and promoting the cultivation of climate-resilient pulse varieties that are adapted to the changing climatic conditions can help to ensure a stable pulse production despite adverse weather events. Encouraging sustainable agricultural practices such as conservation agriculture, agro-

forestry, and organic farming can help in improving soil health, water retention and overall resilience of the farming systems. Providing timely and accurate weather information to farmers can help them make informed decisions regarding their agricultural practices, including sowing times, irrigation schedules and pest management strategies in the face of changing climatic conditions. Conducting training programmes and capacity-building workshops for farmers on climate-smart agricultural practices, modern farming techniques and risk management strategies can empower them to adapt to and mitigate the impacts of climate change on pulse production. By implementing a combination of these strategies tailored to the specific needs and challenges faced by pulse farmers in India, it is possible to improve pulse production and resilience in the face of climate change.

Scientists at the Institute are engaged in research touching each of the areas mentioned; the breeders are especially focused in developing improved pulse cultivars targeting key traits of heat and drought tolerance, water use efficiency, nitrogen fixation, pest and disease resistance, early maturity, yield stability and adaptation to variable climate conditions.

With the advent of advanced technologies precision breeding encompassing genome editing has also been initiated in effort to strengthen ongoing activities to improve plant types for enhancing the productivity of pulses under climate change. The Institute is now a part of ongoing Flagship programme on 'Enhancing climate resilience and ensuring food security with genome editing tools catering to different yield & nutritional aspects in pulse crops *viz.* chickpea, pigeonpea, urdbean, lentil and lathyrus.

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