PULSES
NEWSLETTER
ICAR-Indian Institute of Pulses Research, Kanpur

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Celebration of 32nd Foundation Day of ICAR-IIPR

ICAR-Indian Institute of Pulses Research (IIPR) celebrated its 32nd Foundation Day in presence of Prof. Shamsher, Vice-Chancellor of Harcourt Butler Technical University, Kanpur, as the Chief Guest and Dr. Shiv Kumar, Coordinator for South Asia and China (ICARDA), along with Dr. Shantanu K Dubey, Director ICAR-ATARI, Kanpur, as Special Guests. Prof. Shamsher lauded the

significant contributions made by Institute for nation's development through its research in pulses. He highlighted the challenges in crop productivity posed due to climate change and erratic precipitation and pressing issue of malnutrition, thus urging agricultural scientists to address these issues in their research. He also welcomed future collaborations between HBTU and IIPR, marked by the signing of a Memorandum of Understanding (MoU) on the occasion.

Dr. G.P. Dixit, Director, IIPR briefed the institute's achievements, emphasizing the efforts taken towards achieving self-sufficiency in pulse production, including the export capability of *Kabuli* chickpeas. He said that focus is on developing cost-effective technologies and improved seeds for farmers. He shared that the Institute has upgraded the mini *dal mills* and

technologies, and has signed several MoUs, underscoring the importance of public-private partnerships. Dr. Dixit expressed gratitude for government support and was optimistic about achieving targets upto 2030.

Dr. Shiv Kumar praised IIPR and the AICRPs for developing large number of improved pulse varieties and efficient technologies that led to the increase in production from 14 million tonnes to 26 million tonnes and affirmed the Institute's capability to tackle future challenges, especially with the recent budget allocation for agriculture by the GoI. Dr. Shantanu K Dubey reiterated the praise for IIPR and stressed upon importance of marketing and business knowledge for farmers to maximize their benefits. He urged the need for extensive research in pulses, given the vegetarian majority in the country.

The publications "IIPR at a Glance," "Technical Bulletin - Conservation Agriculture in Pulse-Based Cropping Systems," and a Hindi bulletin "Quality Seed Production Technology in Pulse Crops," were released by the Chief Guest on this

occasion. Progressive pulse farmers from various districts were honoured for their outstanding work and provided with improved seeds. Institute awards for outstanding contributions in 2024 were given to Dr. Yogesh Kumar (Outstanding Scientist Award, Senior Category), Dr. K.K. Hazra (Outstanding Scientist Award, Young Category), Mr. Malkhan Singh (Outstanding Technical Officer Award), and Mr. Har Govind Rathore (Best Worker Award in the Administrative category). Dr. R.K. Mishra and his team received the Outstanding Team Award for their research and development activities. The event concluded with a vote of thanks from Dr. Shailesh Tripathi, Project Coordinator (*Rabi* Pulses). The event was convened by Dr. R.K. Mishra, Principal Scientist, IIPR.

INSIDE

29th Annual Group Meet on *Rabi* Pulses

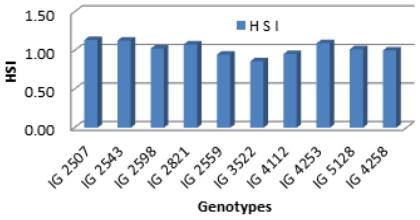
The 29th Annual Group Meet of AICRP on *Rabi* Pulses was organized at ICARDA-FLRP, Amlaha, Sehore (MP) from September 2-4, 2024. The AGM was inaugurated by Dr. T.R. Sharma, DDG (Crop Science), ICAR, New Delhi. He appreciated the research achievements made and stressed on integration of novel molecular approaches with conventional breeding to accelerate genetic gain.

The welcome address was delivered by South Asia Coordinator, ICARDA Dr. S.K. Agarwal who highlighted the current status and accomplishment of research partnership between ICAR and ICARDA and the future line of collaboration. In his introductory remarks, ADG (O&P), ICAR, Dr. Sanjeev Gupta emphasized the need to identify ecology-wise research thrust areas in different *rabi* pulses. Dr. G.P. Dixit, Director, ICAR-IIPR presented an overview of the R & D activities on *Rabi* Pulses in India. Dr. Shailesh Tripathi, Project Coordinator (*Rabi* Pulses) presented progress report of *Rabi* Pulses for the past year. The Hon'ble Agriculture Commissioner, Govt. of India, Dr. P.K. Singh appraised the audience the outlook of the Government and Ministry of Agriculture regarding pulses production and linking farmers to market. The gathering of over 150 researchers aimed to formulate future road map, building partnerships with national and international institutes to enhance *rabi* pulses production in India.

Research Highlights

Key physiological traits influenced by high temperature (>30^{0}C) in lentil

Ten promising contrasting lentil lines (IG 2507, IG 2543, IG 2598, IG 2821, IG 2559, IG 3522, IG 4112, IG 4253, IG 5128, and IG 4258) were screened for heat tolerance (*Rabi* season 2023-24) at two locations (IIPR RS, Phanda and IIPR, Kanpur). Data recorded from each of the genotypes from normal and late sown crop revealed higher crop vigour, MSI, pollen viability, pod formation in terminal branches, pod development and grain filling rate as the parameters severely affected with increase in temperature beyond 30^{0}C. Plant Canopy temperature (Cooler canopy) was found crucial for normal plant function and played pivotal role in pod development and grain filling under late sown conditions (Flowering at >30 ^{0}C). Genotype IG 3522 performed better at both the locations and had the least HSI compared to all other genotypes under test.



Heat Susceptibility Index (HSI) of Lentil Genotypes at RS, Bhopal

D.P. Patel, Jitendra Kumar and Surendra Ghritlahre

Nutritional and health-promoting properties of chickpea microgreens

Microgreens are young and tender leafy greens with a diverse range of flavours and colours. They are harvested between 7 and 21 days after planting and are typically consumed raw. They are reported to have significantly higher nutrient concentrations than their mature counterparts. In this study, chickpea microgreens were grown using a hydroponic system, and a comparison of the nutritional and health-promoting properties of chickpea seeds and microgreens was conducted. Total protein content was found to be significantly higher in the microgreens as compared to the seeds, total carbohydrates and soluble sugars were lower in the microgreens compared to the seeds. In terms of health-promoting properties, the total phenol content, total flavonoid content and total antioxidant potential were significantly enhanced in microgreens compared to seeds.

Chickpea microgreens grown under a hydroponic system

The study concludes that chickpea microgreens are nutritionally superior to seeds and have a positive effect on human health.

Vaibhav Kumar, Kalpana Tewari, Rinki Devi, Namrata Laskar, Yogesh Kumar and M. Senthil Kumar

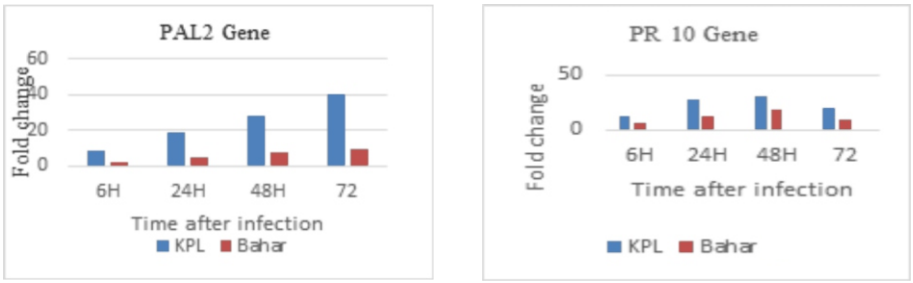
A comparison of the nutritional and health-promoting properties of chickpea seeds and microgreens.

	Chickpea seeds	Chickpea microgreens
Total protein content (%)	26.10 0.61	44.06 0.54
Total carbohydrate content (%)	41.21 0.81	10.00 0.51
Total Soluble sugar content (%)	9.62 0.25	3.90 0.10
Total Phenol content (mg GAE/g DW)	8.10 0.34	32.86 0.79
Total Flavonoid content (mg CE/g DW)	0.69 0.03	1.72 0.15
Total antioxidant potential (DPPH scavenging activity) (mg TE/100 mg DW)	0.59 0.08	0.85 0.05

Values are presented as mean ± SD

Expression analysis of defence responsive genes during *Fusarium udum* infection

The present study was undertaken to understand the molecular mechanism of defence response during pigeonpea-*Fusarium udum* interaction. To analyze the response of defence related genes (PAL-2 and PR-10) expression using reverse transcription quantitative real time PCR (RT-qPCR), roots of resistant (KPL-44) and susceptible (Bahar) pigeonpea cultivars were infected with *F. udum*. Infected samples were collected at 6, 24, 48, and 72 hours, after inoculation. After 24 hours of infection (HAI), gene expression of both the genes showed increased expression in resistant cultivars KPL-44 when compared to susceptible cultivar (Bahar).



Expression analysis of PAL-2 and PR-10 gene using RT-PCR

R.K. Mishra, Abhishek Tiwari and Sonika Pandey

Expression of NHX gene family members in *Vigna mungo* under salt stress

The NHX gene family plays an important role for maintaining the cellular pH and ion homeostasis, essential for cellular growth and development. The availability of genome sequences for several *Vigna* species enables the identification and characterization of NHX genes, which may be used in future breeding and genetic engineering initiatives aimed at developing salt-tolerant cultivars. A thorough investigation to discover and describe the NHX gene family in *Vigna mungo* to acquire genomic insight into the NHX genes that regulate salt tolerance in *Vigna* species was done. A total of 44 Sodium Hydrogen Exchanger (NHX) gene family members were discovered in *Vigna mungo*. These genes were classified into two categories based on their domains, evolutionary relationships, and gene architecture. Intron-poor genes were classified in clade I, whereas intron-rich genes were designated to clade II. The comparison of the *V. marina* NHX genes with those of cultivated species indicated a convergent evolution of NHX genes. Gene profiling, ion partitioning, and biochemical studies have elucidated the mechanism of salt resistance in blackgram. Data indicates that expression patterns of five Vm_NHX genes (Vm_NHX16, Vm_NHX17, Vm_NHX29, Vm_NHX30, and Vm_NHX33) are associated with salinity tolerance. Notably, all of these, with the exception of Vm_NHX30, were situated in the lysosomal and vacuolar membranes.

Kuldeep Kumar, Sudhir K Jha, Vaibhav Kumar, Pritee Sagar, Meenal Rathore, Khela R Soren, & G P Dixit

Development of SNP based functional marker in urdbean for MYMIV resistance

Urdbean (*Vigna mungo* (L.) Hepper) is a highly consumed pulse crop contributing about 10 per cent of pulses production in India. India is the largest producer of urdbean or blackgram. The low productivity in this crop is caused by many biotic stresses, among them, disease caused by the Mungbean Yellow Mosaic India Virus (MYMIV) is one of the most prominent one. Sometimes, due to the susceptibility of certain varieties hundred per cent crop failure may occur.

Hence, an extensive experiment was executed to find out the differential gene expression in a highly resistant variety (PU 31) and a highly susceptible variety (LBG 17). LBG 17 is resistant to the Mungbean Yellow Mosaic Virus (MYMV) but showed susceptibility to the MYMIV. These two varieties were tested for differential gene expression under control (disease free) and treatment condition (disease condition) each with three biological replications. Hence, RNA-Seq data was generated for 12 samples and *de novo* assembly was developed and differential gene expression analysis was conducted. Transcripts with FDR < 0.05 and absolute Log Fold

Change value > 1 were considered as differentially expressed (DE).Heat maps were developed for top 20 genes which are common and differentially expressed between the parents. A set of sixteen transcripts were selected based on their role in imparting disease resistance in same or related species, for gene expression analysis using real-time PCR. Among these, two validated transcripts were used to develop DNA based PCR marker. SNPs were found between resistant and susceptible parents for these two genes. Using these SNPs polymorphic PCR usable primers were designed and validated in a panel of *urdbean* genotypes which differ in terms of MYMIV resistance or susceptibility. These markers will be useful in marker assisted selection in *urdbean.*

D Sen Gupta, S P Das, S Kumar, S Banik, J Kumar, A K Parihar, K R Soren, A Konda, A Chandra, P K Katiyar and G P Dixit

Phytophthora-Macrophomina Stem blight disease (PMSBD) complex epidemic in short duration pigeonpea

Due to erratic rainfall and prolonged soil moisture condition, the Phytophthora blight become more aggressive and in epidemic form caused up to 60-70% loss in association with *Macrophomina phaseolina* resulted as Phytophthora-Macrophomina stem blight disease complex (PMSBD) in pigeonpea plants. During the experimentation from July to October, 2023-24 and 2024-25, an extensive survey was conducted and monitoring of pigeonpea fields at the ICAR-IIPR research station, for meticulously recording parameters such as temperature range, rainfall, relative humidity and disease incidence of these fungal pathogens. A total of 50 diseased samples were collected having symptoms of Phytophthora blight and Macrophomina stem canker (circular or irregular water-soaked lesions on leaves, dark brown to black cankers and blighted lesions, some up to 6 cm in length, frequently girdled stems, causing branches above infection sites to wilt and die) from IIPR pigeonpea experimental field for laboratory examination and diagnosis. Based on cultural, microscopic and molecular confirmation, *Phytophthora cajani* and *Macrophomina phaseolina* mixed infection has been obtained. The accession number of these *Phytophthora* and *Macrophomina* isolates are PQ 596505, PQ 596506, MN 929967, MN 929968 provided by NCBI.

R.K. Mishra, Pragati Nema, Utkarsh Upadhyay, Abhisek Bohra, A.K. Parihar and Naimuddin

Genotype variability found in chickpea for P acquisition efficiency

An experiment on phosphorus acquisition and shoot P content was undertaken during winter season in three consecutive years of 2019-20 to 2021-22 with diversified genotypes. Thirty chickpea genotypes contrasting in P utilization efficiency were selected and grown in plastic pots containing 3 kg of soil. The bulk soil from the top 15 cm was collected from the A2 block of new research campus of ICAR-IIPR, Kanpur. The soil was a sandy loam, alkaline in soil reaction (pH, 8.79), low in Kjeldahl nitrogen (180 kg/ha), organic matter (0.17%), low available phosphorus (5.30 P kg/ha) and low available potassium (79.5 kg/ha). The experiment was arranged in a completely randomized design having three replicates in net house under natural light. The required amounts of N, P and K were added at the time of pot filling while N was applied in three equal splits in P sufficient pots. Thirty chickpea genotypes were grown at two P levels [*i.e.*, adequate (P_2O_5 addition at 27 mg/kg soil @ 60 kg/ha P_2O_5) and deficient P (native soil P_2O_5 at 5.30 mg/kg soil without external P addition)]. At the active vegetative stage (45 days after sowing), three uniform and healthy seedlings of each genotype were uprooted for shoot P content estimation. The plants were dried at 70°C till constant weight for dry weight estimation and P analysis. Results revealed that the shoot P content varied across genotypes under deficit and sufficient P. Genotypes ILWC 21, JG 11, GG2, and JGM 7 had higher shoot P content under deficit P condition. This finding led to further identification of large genotypes of chickpea for P-acquisition and P-use-efficiency.

C.P. Nath, U.C. Jha, Narendra Kumar, Yogesh Kumar, M Senthilkumar, G.P. Dixit

प्रौद्योगिकी हस्तांतरण

Promotion of Pulses in NE Region under IIPR NER Programme

- Trainings, Demonstrations and Input distribution activities were conducted in the North eastern states of Assam, Arunachal Pradesh, Mizoram and Nagaland during the first quarter of 2024-25 under "Promotion of Pulses in NE Region" under IIPR-NER Programme. Several trainings on "Scientific Cultivation of Pigeonpea in Nagaland" were organized in eight districts of Nagaland *viz.*, Chumukedima, Dimapur, Peren,

Wokha, Zunheboto, Nuiland, Mokokchung and Tseminyu. Twenty eight numbers of "Cropping System Based Demonstrations (Rice-Pulse)" were conducted in Kolasib, Serchhip, Aizawl, Lunglei, Siaha, Champhai, Lawngtlai, Mamit, Hnahthial and Saitual districts of Mizoram. In East Siang and Upper Siang districts of Arunachal

Pradesh, "Intercropping of pulses with horticultural crops" were demonstrated in over 2 ha area.

- In these districts of Arunachal Pradesh, "Demonstrations of intercropping of Blackgram with dragon fruit (Variety-SBC 40)" were also covered in over 10 ha area. "Package and Practices of Scientific Cultivation of Pigeonpea" were demonstrated covering six ha area in Peren, Wokha, Zunheboto, Nuiland, Mokokchung, Tseminyu districts of Nagaland. Seeds of Frenchbean (34 q), Ricebean (15 q) and Cowpea (54 q) were distributed in 18 districts of Mizoram, 1.2 q of blackgram seeds in Upper Siang district of Arunachal Pradesh and 1.3 q of pigeonpea seeds were distributed in Chumukedima, Dimapur, Peren, Wokha, Zunheboto, Nuiland, Mokokchung, Tseminyu districts of Nagaland. In addition to this, seeds of blackgram (45 q), greengram (40 q) lentil (30 q), pea (40 q) were distributed to the farmers through the KVKs in Baksa, Barpeta, Chirang, Darrang, Dhemaji, Golaghat, Jorhat, Nalbari, Sonitpur, Udalguri under AAU Jorhat. Apart from seed inputs, 2 q of bio-fertilizers and plant protection chemicals were also distributed in Chumukedima, Dimapur, Peren,Wokha, Zunheboto, Nuiland, Mokokchung and Tseminyu districts of Nagaland.

Anup Chandra, DP Patel and GP Dixit

Institute-FPOs linkage programme Initiated

For leveraging the strengths of farmers' collectives for effective and efficient dissemination of improved pulse production technologies as well as extending technological support to large number of pulse growers, Institute-FPOs linkage programme was initiated. In this regard, on occasion of Institute Foundation Day 2024, the Institute signed Memorandum of Agreement with four FPOs operating in major pulses producing region of UP state. These FPOs included Skyfed Farmer Producer Company Ltd., Chaudagra, Fatehpur; Pulketu Farmer Producer Company Ltd., Barnaon, Kanpur Dehat; Mrigank Farmer Producer Company Ltd., Vill.-Pasikheda, Bhitargaon, Kanpur Nagar and Udeernah Agro Producer Company Ltd., Vill.-Khersa, Block-Bidhnu, Kanpur Nagar. These collaborative efforts of FPOs along with Institute are envisioned to contribute to better pulse productivity and farm returns to member farmers of FPOs.

Uma Sah, Hemant Kumar and Vikrant Singh

Trainings organized

- **A five-day farmers' training programme organized -** A five-day farmers' training programme on "Improved cultivation and processed products of pulses' was organized by the Division of Social Science of Institute during August 5-9, 2024. The training programme was sponsored by ATMA, Madhubani, Bihar and a total of 29 farmers from 20 blocks of Madhubani district participated in it. The Director, ICAR-IIPR, Kanpur interacted with the trainee farmers and stressed the importance of quality input, scientific cultivation practices and awareness of the current technologies in enhanced pulse production. The training programme was coordinated by Dr. Uma Sah and Dr. Rekha Rani, Division of Social Science, ICAR-IIPR, Kanpur.
- **A three day farmers' training programme organized -** A three day farmers training programme entitled 'Improved pulse production technologies' was conducted during Aug.19-21, 2024 for farmers of Bari block, Jajpur, Odisha. A total of twelve lectures were delivered with focus on pulse production technologies for Odisha state.
- **A four day farmers' training programme organized -** A farmer training programme entitled 'Improved pulse production technologies' was conducted by the Division of Social Science during September 03-06, 2024, for the farmers' of Rasulpur block, Jajpur, Odisha. A total of 15 lectures were organized, covering various aspects of pulses production in Odisha. The training programme was coordinated by Dr. Uma Sah and Dr. Ashis Ranjan Udgata, Division of Social Science, ICAR-IIPR, Kanpur.
- **A five day exposure cum farmers' training programme organized -** A five day exposure-cum-training programme sponsored by Organization of Rural Development & Economic Research (ORDER), Cuttack, Odisha on "Improved Pulse Production Technology" was organized by the Division of Social Science during July 1-5, 2024 and was coordinated by Dr. Uma Sah and Dr. Devraj. A total of 45 participants from different districts/blocks of Sambalpur, Cuttack, Odisha state participated in this training programme.

- **A five day farmers' training programme organized -** A five day farmers' training programme on "Improved Pulse Production Technology" was organized by the Division of Social Science during July16-20, 2024. A total of 15 lectures and 2 field visits were organized wherein 29 farmers from Samastipur, Bihar participated in the training programme. The training was sponsored by ATMA, Samastipur, Bihar. Dr. Uma Sah and Dr. Devraj coordinated the programme.
- **A five day farmers' training programme organized -** A five day farmers training programme on "Improved Pulse Production Technology" was organized by the Division of Social Science during Sept. 9-13, 2024. Dr. Uma Sah and Dr. Devraj coordinated the programme. The training was sponsored by ATMA, Darbhanga, Bihar. A total of 22 farmers from different blocks of Darbhanga, Bihar participated in the training programme.

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

- Distribution of quality seeds of pigeonpea and urdbean to about 470 SC farmers of Kanpur Dehat, Unnao, Hardoi, Raibarelly, Fatehpur, Auraiya districts of U.P. and Bikaner of Rajasthan
  Location : ICAR-IIPR, Kanpur **Quantity** : 47.0 q
- Distribution of *Rhizobium* Culture (Liquid) to SC farmers of Kanpur Dehat, Unnao, Hardoi, Raibarelly, Fatehpur and Auraiya districts.
  Location : ICAR-IIPR, Kanpur **Quantity** : 200 No
- Distribution of Poultry chicks to SC farmers of Kanpur Dehat, Fatehpur and Unnao districts
  Location : ICAR-IIPR, Kanpur **Quantity** : 2100 No

ICAR-IIPR enters into agreements with multiple stakeholders

(Agreements were entered into on 5th September, 2024)

- Licensing of machine harvestable chickpea variety (IPC 2015-132, *Kundan*) with M/s IFSA Seeds Pvt Ltd for commercialization
- MoU with M/s Ross Life Sciences Ltd., Pune for biopesticide registration and commercialization
- MoU with HBTU for collaboration of training and research work of post graduates and Ph.D. students and exchange of research material

संस्थान में हिंदी दिवस मनाया गया

भाकृअनुप– भारतीय दलहन अनुसंधान संस्थान में दिनांक 19 सितम्बर, 2024 को हिन्दी दिवस समारोहपूर्वक मनाया गया। लोकप्रिय कवि, लेखक एवँ शिक्षाविद् डॉ सुरेश अवस्थी इस समारोह के मुख्य अतिथि थे। समारोह की अध्यक्षता संस्थान के निदेशक डॉ. जी.पी. दीक्षित ने की। समारोह में संस्थान के सभी वैज्ञानिक, तकनीकी, प्रशासनिक एवं सहायक वर्ग के कर्मचारियों ने भाग लिया।

मुख्य अतिथि, डॉ सुरेश अवस्थी ने अपने उद्बोधन में कहा कि देवनागरी लिपि में लिखी गई हिन्दी हमारी राजभाषा है और हम उसका प्रचार–प्रसार देश के प्रशासनिक कार्यों में ही नहीं, अपितु ज्ञान–विज्ञान एवं तकनीकी के सभी क्षेत्रों में कराने हेतु संकल्पबद्ध रूप से प्रयासरत हैं। यदि हमें भारत को उन्नत राष्ट्रों की श्रेणी में लाना है तो इसकी एक राष्ट्रव्यापी भाषा का होना उतना ही आवश्यक है जितना कि नवीन प्रौद्योगिकियों का। आज विकास की गति में राजभाषा हिन्दी एक मजबूत सूत्रधार का कार्य कर रही है। अतएवं एकता की इस कड़ी को और अधिक मजबूत करना प्रत्येक भारतीय का कर्तव्य है।

अध्यक्षीय उद्बोधन में संस्थान के निदेशक, डॉ. गिरीश प्रसाद दीक्षित ने कहा कि संस्थान में राजभाषा हिन्दी के प्रचार–प्रसार एवं प्रयोग को आगे बढ़ाने के

लिए बहुआयामी प्रयास किए गए हैं। इसी क्रम में हिन्दी में, मौलिक वैज्ञानिक लेखन, कार्यालीन पत्राचार और सृजनात्मक अभिव्यक्ति को बढ़ावा दिया गया है। डॉ राजेश कुमार श्रीवास्तव, सचिव, राजभाषा ने संस्थान में राजभाषा की प्रगति आख्या प्रस्तुत की। इस अवसर पर हिंदी में सर्वाधिक प्रकाशित लेखन हेतु डॉ राजकुमार मिश्रा, प्रधान वैज्ञानिक, डॉ पी के कटियार, विभागाध्यक्ष और डॉ मनमोहन देव, वैज्ञानिक को नकद पुरस्कार एवं प्रशस्ति–पत्र से सम्मानित किया गया।

हिंदी निबंध प्रतियोगिता में डॉ मनमोहन देव, श्री यदुवीर यादव और श्री मोहित सविता को हिंदी वाद–विवाद प्रतियोगिता में डॉ सुधीर कुमार, डॉ मनमोहन देव और श्री यदुवीर यादव को, हिंदी प्रश्नोत्तरी प्रतियोगिता में डॉ मनमोहन देव, श्रीमती रीता मिश्रा और श्री सुमित कुमार, डॉ सुधीर कुमार, डॉ कन्हैया लाल और श्रीमती मीनाक्षी वार्ष्णेय श्री यदुवीर यादव, श्री मोहित सविता और श्री देवी प्रसाद को नकद पुरष्कार एवं प्रशस्ति–पत्र से सम्मानित किया गया।

हिंदी में अधिकाधिक काम करने हेतु श्री सुकदेव महतो, श्रीमती मीनाक्षी वार्ष्णेय, श्री मयंक मिश्रा, श्रीमती रीता मिश्रा, श्री हसमत अली, श्री अनिल सोनकर, श्री हरगोविंद राठौर, श्री देवी प्रसाद को नकद पुरस्कार एवं प्रशस्ति–पत्र से सम्मानित किया गया। डॉ शैलेश त्रिपाठी, परियोजना समन्वयक, (रबी दलहन) ने धन्यवाद ज्ञापित किया। कार्यक्रम का संचालन डॉ राजेश कुमार श्रीवास्तव, सचिव, राजभाषा द्वारा किया गया।

FOREIGN VISIT

Dr. Debjyoti Sen Gupta, Urdbean Breeder visited Brisbane city of Australia where he presented his research in the 11th International Conference on Legume Genetics and Genomics (ICLGG 2024) which was held during September 30- October 03, 2024. He presented about the development of functional markers in urdbean for Mungbean Yellow Mosaic Resistance, these markers will be useful in marker assisted selection in urdbean for MYMIV resistance.

PERSONNEL

Appointments, Promotions, Transfers, *etc.*

Appointments

Sl.	Name	Post	Date of joining
1	Mr. Sumit Kumar	Assistant	21.08.2024
2	Mr. Shivam Shresthi	Assistant	23.08.2024
3	Mr. Abhishek Singh Rajput	Assistant	29.08.2024
4	Mr. Amit Kumar Gupta	Assistant	30.08.2024
5	Mr. Mohit Savita	Assistant	02.09.2024
6	Mr. Aakash Kumar Mishra	Assistant	09.09.2024
7	Ms. Sabita	Assistant	30.09.2024
8	Mr. Sachin Singh	Assistant	30.09.2024
9	Mr. Jitendra Kumawat	Technician	02.07.2024

Promotions

Sl.	Name	Promoted to	w.e.f.
1	Dr. Kali Krishna Hazra	Senior Scientist (Research Pay level-13 A)	20.04.2023
2	Dr. Anup Chandra	Senior Scientist (Research Pay level-13 A)	27.04.2023
3	Dr. Debjyoti Sen Gupta	Senior Scientist (Research Pay level-13 A)	03.05.2023
4	Dr. Shanmugavadivel P.S.	Senior Scientist (Research Pay level-12)	01.01.2023
5	Dr. Neetu Singh Kushwah	Senior Scientist (Research Pay level-12)	01.07.2023
6	Dr. Revanasidda	Scientist (Research Pay level-11)	05.07.2022
7	Sh. Sudhir Kumar Jha	Scientist (Research Pay level-11)	05.07.2022
8	Sh. Sunil Kumar Sunani	Scientist (Research Pay level-11)	02.07.2023
9	Sh. Anand Kumar Yadav	Technical Officer (T-5)-Level-7	20.10.2022
10	Sh. Yaduvir Singh	Sr. Technical Assistant (T-4)-Level-6	08.08.2023
11	Sh. Amit Kumar Bhatore	Sr. Technical Assistant (T-4)-Level-6	13.08.2023
12	Sh. Mohite Nikhil Ramrao	Sr. Technical Assistant (T-4)-Level-6	11.10.2023
13	Sh. Santosh Kumar	Sr. Technician (T-2)-Level-4	07.07.2022
14	Sh. Priyank Shrivastava	Sr. Technician (T-2)-Level-4	26.11.2023

Retirements:

Sl.	Name	Post held	Date of retirement
1	Mr. Mohd. Shabbir	LDC	31.07.2024
2	Mr. Ram Gulam	SSS	31.08.2024
3	Mr. Babu Lal	Sr. Technician	30.09.2024

Director's Desk

Dear Readers,

With evolution of man and advancement in technology, there has been an equal upsurge in anthropogenic activities. Whilst India's population has increased so as to surpass China, it is expected to account for 17.78% of the world's total population. We are already facing pressing issues around climate change, and its effect on agriculture and nutritional security. With an increasing population, decreasing arable land and climatic aberrations being witnessed globally, there is a dire need to utilize our resources efficiently and effectively.

Pulses (like beans, lentils, chickpeas, peas, and other leguminous seeds) play a critical role in achieving nutritional security due to their rich nutrient profile, sustainability, and affordability. Pulses have high protein content in their grains, are rich in essential amino acids, dietary fibers, micronutirents, have a low glycemic index and hence are a healthy power source for the current generation. While it can be consumed as grain, a post-harvest product or as commonly used as *dal*, it is now also largely preferred as microgreens.

Microgreens are young, edible plants harvested at an early stage of growth, typically when the first true leaves (cotyledons) have developed. They are highly nutritious and are often considered a superfood due to their high concentration of vitamins, minerals, and antioxidants compared to mature plants. When we specifically look at legume microgreens (such as

pea, lentil, chickpea, and mungbean), they offer several health benefits and a rich nutrient profile. Legume microgreens are a nutrient-dense food that provides a wide array of vitamins, minerals, fiber, and plant-based protein. They are a great addition to any diet, especially for those looking for plant-based nutrition or seeking to enhance the nutritional density of their meals. Microgreen legumes have gained popularity in the market also due to their quick growth cycle and versatility in culinary uses. They offer an attractive option for health-conscious consumers and food enthusiasts.

Coming to market as packaged microgreens, they are also available along with fresh ones on the shelves of supermarkets, grocery stores, health food stores and online retail. ome upscale restaurants and cafes serve microgreen legumes as garnishes, in salads, or as part of plant-based dishes, contributing to their demand in the food service industry. However, challenges they face in the market include a short shelf life, limited awareness and a premium price tag that is largely compared to fresh vegetable prices by common man.

Overall, microgreen legumes are a growing segment within the broader microgreens market, driven by their high nutritional value, sustainability, and versatility in modern diets. As consumers increasingly prioritize health, sustainability, and convenience, the demand for legume microgreens is expected to continue to rise. For producers, there are opportunities to capitalize on this trend by offering fresh, high-quality microgreens and educating consumers about their health benefits. The Institute has also initiated research by assessing the available nutrition in different popular legume microgreens.

(Girish Prasad Dixit)

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