# Proceedings

International Conference
on

## Pulses: Smart Crops for Agricultural Sustainability and Nutritional Security

**Feb. 10-12, 2023**
at
**C. Subramaniam Auditorium, NASC,**
**New Delhi - 110012**

ICPULSES 2023

***Organized by***

Indian Society of Pulses Research and Development (ISPRD)
ICAR-Indian Institute of Pulses Research (IIPR), Kanpur
Indian Council of Agricultural Research (ICAR)

***In collaboration with***

Department of Agriculture and Farmers' Welfare, GoI
International Centre for Agricultural Research in Dry Areas (ICARDA)
India Pulses and Grains Association (IPGA)
World Vegetable Centre (WorldVeg)
Alliance for Bioversity International
National Bank for Agriculture and Rural Development (NABARD)

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# Introduction

Pulses are known for their role in food and nutritional security, soil quality enhancement and environmental sustainability. Rich in vegetarian protein and low in fat, pulses add to the dietary diversity and are important to address hunger and malnutrition. Additionally, they are affordable, capable of growing in marginal environments, have minimal carbon footprints and can be stored for long periods. Owing to multifarious uses, these contribute significantly to achieving the targets of the 2030 agenda of Sustainable Development Goals.

Celebration of the 'World Pulses Day' on 10th February every year is a step towards consolidating the international efforts for research and development in pulses. To commemorate the auspicious occasion of World Pulses Day 2023, the Indian Society of Pulses Research and Development (ISPRD) along with the ICAR - Indian Institute of Pulses Research (IIPR) and Indian Council of Agricultural Research (ICAR) organized the International Conference on "Pulses: Smart crops for agricultural sustainability and nutritional security (ICpulses2023)". The conference was co-organized by the Department of Agriculture and Farmers Welfare, GoI (DAFW), International Centre for Agricultural Research in Dry Areas (ICARDA), India Pulses and Grains Association (IPGA), Alliance for Bioversity International, National Bank for Agriculture and Rural development (NABARD), and the World Vegetable Centre (WorldVeg) while it was supported by many other partners including National Academy of Agricultural Sciences (NAAS), Trust for Advancement of Agricultural Sciences (TAAS) and National Seed Corporation (NSC).

This conference aimed to focus on the developments in accelerating genetic gains in pulses through conventional and modern breeding and biotechnological tools, integrated crops, pests and nutrients management, natural farming, post-harvest processing, value addition and socio- economic upliftment of farmers through inclusion of pulses. The event attracted international audience for a common goal of creating awareness of the benefits of pulses as well as drive the agenda of increase in production, productivity and consumption.

## Summary

The International Conference on Pulses: Smart Crops for Agricultural Sustainability and Nutritional Security (ICPulses2023) was organized during Feb. 10-12, 2023 to mark the occasion of 'World Pulses Day'. The conference was inaugurated by Sh. Kailash Choudhary, Hon'ble Minister of State for Agriculture and Farmers' Welfare, GoI in the august presence of Dr. Himanshu Pathak, Secretary DARE and DG ICAR, Dr. Naing Kyi Win, Director General, DAR, Myanmar, Dr. T.R. Sharma, DDG (Crop Sciences), ICAR, Dr. Sanjeev Gupta, ADG (Oilseeds and Pulses), ICAR, Dr. Bansa Singh, Director, ICAR - IIPR and Organizing Chairman, ICPulses2023, Dr. I.P. Singh, President, ISPRD and Co-Organizing Chairman, Dr. Aditya Pratap, Organizing Secretary, ICPulses2023 and Dr. (Mrs.) Meenal Rathore, Co-Organizing Secretary, ICPulses2023.

At the outset, Sh. Kailash Choudhary lauded the efforts of researchers, farmers, policy makers and other stakeholders for achieving self sufficiency in pulses and also emphasized on the food and nutrition targets highlighted in Sustainable Development Goals. He highlighted the efforts of scientists for developing 313 varieties during 2014-22 and implementing a robust seed hub model for ensuring seeds sufficiency in pulse crops in the country. Expressing his happiness for organization of this event which marked the occasion of 'World Pulses Day', he appreciated the relevance and timing of this event and wished it a great success. Dr. Himanshu Pathak also congratulated the gathering on the feat of achieving highest ever pulses production in the country and extended a warm welcome to all national and international participants of the conference. He hoped that the deliberations in the conference would be able to generate crisp recommendations that would pave way for futuristic research and policy planning to sustain the feat and achieving the future targets. Dr. Naing Kyi Win presented in brief a status of pulses in Myanmar and desired support from ICAR and GoI to develop active collaboration(s) with the Indian pulses research system. Earlier, Dr. T.R. Sharma highlighted the need to leverage newer tools like speed breeding, genome editing, crop designing and genomics assisted breeding to find solutions to the emerging challenges in pulses. He also stressed upon focusing on value addition and entrepreneurship development in pulses.

Four progressive pulse farmers from Fatehpur district of Uttar Pradesh were felicitated on the occasion. ISPRD awards were given under different categories for excellence in pulses research and development. The Lifetime achievement Award of ISPRD was conferred upon Dr. P.M. Salimath, Former Vice Chancellor, UAS Dharwad and UAS Raichur.

The Conference witnessed a participation of 584 registered delegates from across nine countries including Mynamar, Germany, Thailand, USA, Czech Republic,

Taiwan, Bangladesh, Nepal and Australia representing universities, research institutes, government organizations, seed companies and industries. The conference also witnessed the presence of 41 overseas delegates while the Indian delegates represented 25 states and all 8 Union Territories. A total of 207 students participated in the conference. It was encouraging to witness more than 35% participation by in ICPulses2023. ISPRD fully sponsored more than twenty delegates and another sixteen were sponsored partially for attending ICPulses2023.

The conference was organized in nine technical sessions spread over three days wherein deliberations and discussions were held under different themes that included, Farm to fork: Policy, planning and perspectives; Mendelian breeding for crop resilience; Enhancing the crop produce Nutri-smart pulses and data driven decision making; Modern tools for crop improvement; Revisiting the roots, Innovative extension approaches and New vistas for crop resilience- biotic and abiotic stresses. Two plenary sessions were also organized, one each on 10th and 11th February. Keynote addresses were delivered by Dr. Michael Baum, ICARDA, Dr. Naing Kyi Win, DAR, Myanmar and Dr. Sanjeev Gupta, ICAR, New Delhi on the first day of the conference. Another keynote address was delivered on 11th February, 2023 by Professor Rattan Lal, Ohio State University, Ohio, USA who happens to be a proud recipient of the World Food Prize. A total of 9 lead lectures, 42 invited lectures, 30 oral presentations and 27 rapid fire presentations were organized during the conference.

In an effort to laud the experiences of established researchers and motivate budding researchers, certificates were awarded to each oral and rapid-fire presentation. Each technical session was followed by a poster presentation session and a total of 274 posters were evaluated for content, quality and way of presentation by independent judging committees. Selected posters were awarded with best poster awards session-wise.

In ICPulses2023, more than 500 abstracts were compiled in the Abstract Book along with extended summaries from lead and invited speakers. In an effort to go eco-friendly and for wider circulation, the conference publications including abstract book and souvenir were released as electronic files that are freely available to the interested audience. The programme book, writing pad and poster sessions were also compiled in a single publication to save resources and minimize carbon footprints. All publications, participation certificates and photographs of the conference have also been circulated to each registered delegate via whatsapp, that can also be downloaded by scanning the QR code on the individual conference ID badges.

The Valedictory Session of ICPulses2023 was organized in the afternoon of 12th February, 2023 and was chaired by Dr. T.R. Sharma, Honourable DDG, Crop Sciences,

ICAR and co-chaired by Dr. Sanjeev Gupta, ADG, Oilseeds & Pulses, ICAR. Other dignitaries on the dais included Dr. Bansa Singh, Director, ICAR - Indian Institute of Pulses Research, Kanpur and Co-Patron, ISPRD, Dr. I.P. Singh, President ISPRD, Dr. Aditya Pratap, Secretary, ISPRD and Organizing Secretary ICPulses2023 and Dr. Meenal Rathore, Co-organizing Secretary, ICPulses2023 and Editor-in-Chief, Journal of Food Legumes. Dr. Celia Chalam V., PS, ICAR-NBPGR and Dr. Man Mohan Deo, Scientist, ICAR-IIPR, Kanpur were the rapporteurs. President ISPRD welcomed the dignitaries and participants while the Organizing Chairman, ICPulses2023, Dr Bansa Singh acknowledged the financial, logistic and moral support received from ICAR headquarters in successful completion of this conference. Co-organizing secretary, Dr. Meenal Rathore presented a summary of the conference. Following this, reports of nine technical sessions were presented by the conveners of the respective sessions.

This was followed by the remarks of the Guest of Honour and the Chairman. Guest of Honour, Dr. Sanjeev Gupta, ADG (Oilseeds and Pulses), ICAR in his remarks congratulated the pulses community and the organizers for successfully completing this mega event. He acknowledged the role of pulses for nutritional security of the masses, lauded the progress achieved in pulses production in the country during last one decade and expressed happiness that the country had reached near self-sufficiency. He added that protein-calorie malnutrition is prevalent with 18 million children below 4 years dying every year due to zinc deficiency and bio-fortified variety of pulses can play an important role in eradicating this deficiency. Industry and academia need to collaborate to meet the research demand in pulses. He emphasized on the need of using advanced technologies like genetic engineering, speed breeding, artificial intelligence, nanotechnology, big data management, etc. for increasing indigenous pulses production. He also suggested that pulse production should be export-oriented and we need to move from being seed-centric to soil-centric. He lamented that there is a need to create a special 'Pulses Research and Development Fund' to meet the financial requirement of pulses research, processing and value addition to create a protein revolution using pulse proteins.

Dr. T.R. Sharma, (DDG, Crop Sciences), ICAR and Chairman, Valedictory Session, ICPulses2023 also congratulated the organizers for the successful organization of ICPluses2023 and also choosing NASC complex, New Delhi as a venue which ensured a larger participation of researchers from across the globe. He discussed about the recommendations made during different sessions and desired that the same should be compiled and forwarded to council for future reference. While he congratulated the pulses researchers, farmers and policy makers for making the pulses revolution happen in the country, he indicated that the major challenge now is to sustain production and gradually become a net pulses exporter. He suggested

that the overall objectives in pulses development must include product profile development, higher yield, early maturity, no or less anti-nutritional factors, nutrient use efficient (NUE) crops, high nodulation, synchronous maturity, amenability to mechanical harvesting, resistance to biotic and abiotic stresses, and an increased focus on processing and value addition. Quantitative and qualitative traits ought to be transferred through Marker Assisted Selection (MAS) Breeding approach. Again, use of high throughput phenotyping, speed breeding, genome editing, complete genome sequencing of wild species, new trait discovery, functional validation of important genes, documenting disease pathogenocity in the regime of climate change, etc. for enhanced genetic gain was emphasized upon. He informed the house that two-speed breeding facilities are being created in the country, one each at ICAR-IARI, New Delhi and ICAR-IIPR, Kanpur. Dr Sharma also stated that a common program for funding with the help of different organization and collaborators is required. He congratulated all the award winners and ISPRD Fellowship awardees and hoped that the recommendations generated during this 3-days mega event will go a long way in solving some of the pending research and policy issues in pulses. Before his address, he also bestowed the best poster awards to the recipients as well as certificates to newly elected ISPRD Fellows.

Finally, the vote of thanks was presented by the Organizing secretary, ICPulses2023, Dr. Aditya Pratap.

## Themes

The conference was organized in nine technical sessions spread over three days and the deliberations were made under different sub-themes as indicated below:

### 1. Farm to Fork: Policy, Planning and Perspectives

- Storage
- Processing and value addition
- Value chain development
- Policies
- Public private partnership
- Trade and economics
- Future perspectives

### 2. Mendelian Breeding for Crop Resilience

- Traditional breeding and varietal development
- Pre-breeding and distant hybridization
- Plant genetic resources
- Seed technology

### 3. Enhancing the Crop Produce

- Cropping system intensification and diversification
- Resource conservation
- Input use efficiency
- Microbiome for soil and plant health
- New agronomy
- Farm mechanization

### 4. Nutri-Smart Pulses and Data-Driven Decision Making

- Biofortification
- Nutrition enhancement
- Antinutrient management
- Digitalization
- Data Management

**5. Modern Tools for Crop Improvement**

- Marker assisted breeding
- Genomics
- Genetic engineering and genome editing
- Precision phenotyping and genotyping
- Genomic selection

**6. Revisiting the Roots**

- Indigenous Traditional knowledge
- Natural farming
- Organic farming

**7. Innovative Extension Approaches**

- Technology assessment and refinement
- Digital extension
- Gender and youth perspectives
- Farmers' institutions

**8. New Vistas in Stress Resilience – Biotic Stresses**

**9. New Vistas in Stress Resilience - Abiotic Stresses**

# Recommendations

## Technical Session 1: Farm to Fork: Planning, Policy and Perspectives

***(A special session dedicated to World Pulses Day)***

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|---|---|
| **Chair:** | Dr. Sanjeev Gupta, ADG (Oilseeds & Pulses), ICAR, New Delhi |
| **Co-Chair:** | Mr. Bimal Kothari, President, India Pulses and Grains Association, Mumbai |
| **Coordinator:** | Dr. Pratap S Birthal, Director, ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi |
| **Rapporteurs:** | Dr. Girish Jha, ICAR-Indian Agricultural Research Institute, New Delhi |
| | Dr. Rajesh Bishnoi, ICAR-Regional Research Centre, ICAR-Indian Institute of Pulses Research, Bikaner |

### Recommendations

1. Farmers should receive incentives over and above the MSP of pulses in view of their production risk and ecosystem vulnerability.
2. There is need to synchronize production, procurement and long-term trade policies.
3. Consumers should be made aware about the nutritional benefits of pulses.
4. Development of pulse-based value-added products to create new demand in the market is required.
5. Investment for R&D to improve genetic potential and to develop advanced processing technologies including creation of other infrastructure is need of the hour.
6. Bridging the yield gaps through input management including strengthening of seed sector is essential to improve price realization of pulses through strategic reserves during bumper harvest and effectively undertake open-market operations.
7. Supply chain of pulses should be improved through promotion of FPOs and contract farming.

## Technical Session 2: Mendelian Breeding for Crop Resilience

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|---|---|
| **Chair:** | Dr. SK Sharma, Former Vice Chancellor, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur |
| **Co-Chair:** | Dr. N Nadarajan, Former Director, ICAR-Indian Institute of Pulses Research, Kanpur |
| **Convener:** | Dr. Gyan P Mishra, ICAR-Indian Agricultural Research Institute, New Delhi |
| **Rapporteurs:** | Dr. Gyan P Mishra, ICAR-Indian Agricultural Research Institute, New Delhi |
| | Dr. Shayla Bindra, Punjab Agriculture University, Ludhiana |

### Recommendations

1. Selection of traits for breeding should be prioritized. Early maturity, photoperiod insensitivity and climate resilience should be the traits of choice. Traits like machine harvesting, herbicide tolerance, biofortification (Fe & Zn) should be given special priority and must be mandatory for release of a new variety.
2. Restructuring of plant types, especially incorporating traits like deep root system, early vigour, high biomass, and high harvest index need special attention.
3. Better breeding efficiency can be achieved by speed breeding, marker-assisted breedinggenomic selection, genome editing (SDN1 and SDN2), etc. Also, prioritization is required for mutation breeding, heterosis breeding (2-line breeding) as well as cytogenetic studies in pulses.
4. Focused prebreeding strategies using suitable screening methodology for trait deployment is needed. This will aid in reversing the domestication bottleneck.
5. Duplication in pulse germplasm conserved across the world gene banks needs to be minimized and a DOI should be assigned to all germplasm for better traceability.
6. Strengthening of seed hubs to enhance seed replacement rate of recently released varieties is required. Time taken to release any pulse variety and its simultaneous adoption at the farmers' field should be reduced to the maximum possible extent.

## Technical Session 3: Enhancing the Crop Produce

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| **Chair:** | Dr Masood Ali, Former Director, ICAR-Indian Institute of Pulses Research, Kanpur |
| **Co-Chair:** | Dr PK Ghosh, Director, ICAR-National Institute of Biotic Stress Management, Raipur |
| **Convener:** | Dr Raj Singh, Head, Agronomy Division, ICAR- Indian Agricultural Research Institute, New Delhi |
| **Rapporteur:** | Ms. Mrunalini Kancheti, ICAR-Indian Institute of Pulses Research, Kanpur |

## Recommendations

1. Quantification of residue, choice of crops and suitability of varieties need to be studied in detail and shortlisted for effective conservation agriculture practices.
2. There is a need to work on breaking the crop cycle through crop diversification every 3 to 4 years, especially for reducing the incidence of pests, pathogens and weeds.
3. Breeding of trait-specific varieties of pulses should also accompany a complete package of practices under organic farming system.
4. Popularization and adoption of improved pulse production technologies including bio-fertilizers and conservation agriculture at the farmer's level requires greater attention to prudent planning.
5. Commercial availability of microbial formulations and the symbiotic potential of different microbial strains need to be explored.
6. Cultivation of pulses needs special attention through suitable agronomic interventions in rain fed conditions for climate resilience and sustainable intensification.
7. Importance of specialty pulses/underutilized traditional pulses in north-eastern region of India needs to be assessed for nutritional security, performance in cropping systems and role in improvement of soil fertility.
8. Re-orientation and designing of pulses in different ecologies, particularly rice-fallow areas with suitable genotypes and resource conservation technology is needed.
9. Assessment of different pulse-based cropping systems and pulse genotypes for deep soil carbon sequestration and nutrient bioavailability needs special attention to address sustainable soil health and carbon neutrality.

## Technical Session 4: Nutri-Smart Pulses and Data-Driven Decision Making

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| **Chair:** | Dr JS Sandhu, Former Vice Chancellor, SKN Agriculture University, Jobner |
| **Co-Chair:** | Dr Michael Baum, DDG, International Centre for Agricultural Research in Dry Areas, Morocco |
| **Convener:** | Dr Anjani Kumar, International Food Policy Research Institute, South Asia, New Delhi |
| **Rapporteurs:** | Dr Souframanien J, Bhabha Atomic Research Centre, Mumbai |
| | Dr. Padma Gore, ICAR–National Bureau of Plant Genetic Resources, New Delhi |

### Recommendations

1. Biofortification programme for enhanced nutrition should be initiated in pulses in the same line as in cereals and dedicated funding should be explored for this purpose.
2. Data on loss of grain and nutritional quality during storage of pulses needs to be documented.
3. Biofortified varieties should be made available to the general public through programmes like PDS, mid-day meal schemes and Integrated Child Development Services (ICDS) to ensure nutritional security.
4. High throughput low-cost phenotyping tools for nutritional bio-fortification need to be developed
5. Screening of the entire available germplasm in pulses for micro nutrient variability is required.
6. Inclusion of pulses in the programme on CRP on biofortification is needed.
7. Fixing the minimum level of micro nutrients for varietal release is a must in collaboration with ICMR.
8. There is a strong need of digitization of breeding programmes for a precise and effective data-driven decision making

## Technical Session 5: Modern Tools for Crop Improvement

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|---|---|
| **Chair:** | Dr. Tilak Raj Sharma, DDG (Crop Sciences), ICAR, New Delhi |
| **Co-Chair:** | Dr. Peter Smykal, Univertsity of Olomouc, Check Republic |
| **Convener:** | Dr. Tapan Kumar Mondal, ICAR- National Institute of Plant Biotechnology, New Delhi |
| **Rapporteurs:** | Dr. Jyoti Kumari, ICAR National Bureau of Plant Genetic Resources, New Delhi |
| | Dr. Alok Das, ICAR Indian Institute of Pulses Research, Kanpur |

## Recommendations

1. There is a need to emphasize basic research to understand biochemical pathways controlling key traits and studying trait genetics in pulses.
2. Efficient genotyping and phenotyping facilities need to be deployed to streamline breeding in pulses.
3. Use of modern breeding tools (Genomics Assisted Breeding, Genomic Selection) to develop climate resilient and nutritionally rich variety should be encouraged.
4. Development of genome editing platform for development of climate resilient, biotic and abiotic stress tolerant and nutritional rich pulse varieties in need of the hour.
5. Adoption of fast forward breeding to accelerate genetic gain in pulses is required.
6. There is a need to use IoT based mobile Apps for recording large scale phenotyping data.

## Technical Session 6: Revisiting the Roots

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| **Chair:** | Dr. A.K. Vyas, Vice Chancellor, Agriculture University, Kota |
| **Co-chair:** | Dr. S.S. Singh, Director Extension, Rani Laxmi Bai Central Agricultural University, Jhansi |
| **Convener:** | Dr. S.L. Patil, Principal Scientist, ICAR- Indian Institute of Pulses Research, Kanpur |
| **Rapporteurs:** | Mr. Asik Dutta, Scientist, ICAR- Indian Institute of Pulses Research, Kanpur |

## Recommendations

1. Organic farming is a holistic approach and knowledge from different disciplines must be integrated for its improvement.
2. Prerequisites under organic farming include quality farm yard manure and bio-agents which are important for maintaining bio-diversity and improving soil quality, and therefore must be encouraged.
3. Proper recycling and standardization of amount of plant residues and time of application are important aspects to be looked upon.
4. The linkage between parasite and predator has to be revalidated to control the influence of different biotic stresses under organic farming system.
5. Proper characterization of *Jeevamrit* and *Beejamrit* is essential. Their effects on soil health should also be documented quantitatively.
6. Organic farming has significant positive impact on pulses cultivation and strong scientific and policy support is required.

## Technical Session 07: Innovative Extension Approaches

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|---|---|
| **Chair:** | Dr. A.K. Singh, Vice Chancellor, Rani Laxmi Bai Central Agricultural University, Jhansil |
| **Co-chair:** | Dr. Anil Dixit, Joint Director, ICAR- National Institute of Biotic Stress Management, Raipur |
| **Convener:** | Dr. Uma Sah, PS, ICAR - Indian Institute of Pulses Research, Kanpur |
| **Rapporteur:** | Dr. Rekha Rani, Scientist, ICAR - Indian Institute of Pulses Research, Kanpur |

### Recommendations

1. Promotion of entrepreneurial activities in processing, value addition, branding and packaging of pulses need to be scaled up.
2. Infrastructural support for post-harvest storage and primary processing of pulses near production hubs needs to be enhanced.
3. Disruptive and integrated ICT based platforms with public-private partnership may be created for reaching the unreached farmer.
4. Farmer collectives in form of FPOs and farmer societies needs to be further leveraged for transfer of improved pulse production technologies and related knowledge.
5. Efforts for more inclusive value chains need to be promoted for better share in consumer price.
6. The informal seed networks in pulses need to be strengthened for faster dissemination of knowledge leading to enhanced pulse productivity at farmers' level.

## Technical Session 8: New Vistas in Stress Resilience -Biotic Stresses

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|---|---|
| **Chair:** | Dr. H.C. Sharma, Former Vice Chancellor, Dr. YS Parmar University of Horticulture and Forestry, Solan |
| **Co-chair:** | Dr. Bansa Singh, Direcor, ICAR - Indian Institute of Pulses Research, Kanpur |
| **Convener:** | Dr. Naimuddin, PS, ICAR-Indian Institute of Pulses Research, Kanpur |
| **Rapporteurs:** | Dr. Gaurav K Taggar, Punjab Agricultural University, Ludhiana |
| | Dr. Ruchi Bansal, ICAR – Indian Agricultural Research Institute, New Delhi |

### Recommendations

1. Mapping of *Fusrarium oxysporum* f.sp. *ciceri* and *Fusarium udum* populations and validation of new races in the country is required.
2. Strengthening of ICT-based pest surveillance, decision-support tools, e-surveillance and pest management advisory systems is the need of the hour for developing environmentally sound IPM strategies.
3. Strengthening of plant protection research is required by establishing analytical frameworks for emerging, trans-boundary, new and more aggressive pests under climate change scenario.
4. Considering the multiple YMD-causing viruses, a set of host differentials needs to be developed for distinguishing them. Studies on diversity in YMD-causing viruses and the white fly vector need to be strengthened.
5. Development and strengthening of precise high throughput phenotyping for major biotic stresses under climate change scenario is required.

## Technical Session 9: New Vistas in Stress Resilience - Abiotic stresses

| | |
|---|---|
| **Chair:** | Dr. NP. Singh, Vice Chancellor, Banda University of Agriculture and Technology, Banda |
| **Co-Chair:** | Dr. Anil Dixit, Joint Director, ICAR- National Institute of Biotic Stress Management, Raipur |
| **Convener:** | Dr. Senthil Kumar M, ICAR - Indian Institute of Pulses Research, Kanpur |
| **Rapporteurs:** | Dr Poonam Sharma, Punjab Agricultural University, Ludhiana |
| | Dr Dharmendra Patel, ICAR- Indian Institute of Pulses Research, Kanpur |

## Recommendations

1. Wild *Cicer* relatives and associated microbiome should be explored for better management of abiotic stresses.
2. Data from multi-omics approaches should be integrated for unravelling candidate genes for specific traits.
3. Phosphorous placement and genotypic response in chickpea may be explored for improved plant vigour.
4. Role of silicon fertilizers and plasma technologies on abiotic stress management can be reviewed for their feasibility and bio-safety.
5. Indigenous non-invasive techniques for plant phenomics need to be developed.

## Keynote Addresses

Two plenary sessions were held during ICPulses2023. The first session was held on Feb. 10, 2023 and was chaired by Dr. S.K. Sharma and Co-Chaired by Dr. B.B. Singh, Former ADG (Oilseeds and Pulses), ICAR. The session was reported upon by Dr. S.K. Jha, Principal Scientist, ICAR and Dr. Kavita Gupta, Principal Scientist, ICAR-NBPGR, New Delhi. Three keynote addresses were delivered in this session including those by Dr. Michael Baum, DDG, ICARDA, Dr. Naing Kyi Win, DG, DAR, Myanmar and Dr. Sanjeev Gupta, ADG (O&P), ICAR, New Delhi.

**Points emanating from the deliberations include:**

1. Modernization of breeding programs (speed breeding, genomic selection, high throughput phenotyping, exploitation of genetic resources, and seed systems) is important to deliver faster genetic gains.
2. Integration of pulses in cereal-based cropping systems is desirable for increased productivity and net return, improve input use efficiency and resilience, and reduce emissions.
3. Globally greater gains are also to be achieved through improved agronomy, precision fertigation technology, digital tools, *etc*.
4. There is a need to sustain the current growth rate (5.1%) in pulses to achieve self sufficiency in India by 2030.
5. There is a need to foster a demand-driven, rather than supply-driven, pulses sector.
6. There is an urgent need on research for germplasm enhancement and pre-breeding.

The second Plenary Session was held on 11.02.2023 in the evening and a lecture was delivered by Prof. Rattan Lal, Ohio State University, USA on "Pulses for Sustainable Agriculture and Improved Soil quality in the Era of climate Change". It was chaired by Dr. Sanjeev Gupta, ADG (Oilseeds and Pulses), ICAR. Rapporteurs were Dr. Dhanasekar, BARC, Mumbai and Dr. N. Manivannan, TNAU, Coimbatore.

Points emanating from this lecture are as follows:

1. Strategies for combating malnutrition must now include food fortification, dietary diversification, pulses-based diet, soil health restoration, behavioural change in communication and homestead garden.
2. For moving forward to develop sustainable food systems, we need to grow healthy food and require a policy to support it where taxes on unhealthy food

is charged. There is equal need of informative food labelling, food system transformation and restoring soil health.

3. Food demand by 2050 can be fulfilled with nutritious food that needs to be produced by reducing waste, increasing food access, improving distribution, increasing use of pulses-based diet, increasing agronomic productivity and accepting personal responsibility.

4. Famine and malnutrition are manmade tragedies and can be avoided. We should follow the Mantra of "Healthy soil-healthy diet".

# Indian Society of Pulses Research and Development (ISPRD) Awards

The ISPRD has instituted various awards for recognizing significant contributions of scientists to promote pulses research and development. These awards are presented at the time of National and International Symposia/conferences organized by the Society. During ICPulses2023, the following scientists were conferred with various ISPRD awards till date:

## Life time Achievement Award

Dr. P. M. Salimath, Former Vice Chancellor, UAS, Raichur and UAS, Dharwad

## Excellence Award

***Crop Improvement***

Dr. Shiv Kumar, ICARDA, New Delhi

***Natural Resource Management***

Dr. Poonam Sharma, PAU, Ludhiana

***Crop Protection***

Dr. Gaurav Kumar Taggar, PAU, Ludhiana

## Recognition Award

***Crop Improvement***

Dr. Sanjeev Gupta, ADG, O&P, ICAR, New Delhi

***Natural Resource Management***

Dr. A. Amarender Reddy, ICAR-CRIDA, Hyderabad

***Crop Protection***

Dr. Ashwani K Basandrai, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur

## Young Scientist Award

Dr. Kuldeep Tripathi, ICAR- National Bureau of Plant Genetic Resources, New Delhi

## ISPRD Fellow Awards

The following 23 scientists were awarded with ISPRD Fellow Award during ICPulses2023. The fellowships were awarded after a span of 3 years.

1. Dr. Devindrappa, ICAR – Indian Institute of Pulses Research, Kanpur
2. Dr. Jameel Akhtar, ICAR – National Bureau of Plant Genetic Resources, New Delhi
3. Dr. Rafat Sultana, Bihar Agricultural University, Sabour
4. Dr. Veera Jayalakshmi, Acharya N G Ranga Agricultural University, Nandyal
5. Dr. Sujayanand, G.K., ICAR- Indian Institute of Pulses Research, Kanpur
6. Dr. Awadhesh Kumar Tripathi, Banda University of Agriculture & Technology, Banda
7. Dr. PR Saabale, ICAR- Indian Institute of Pulses Research, RRS Dharwad
8. Dr. Shayla Bindra, Punjab Agricultural University, Ludhiana
9. Dr. Preeti Verma, Agricultural Research Station, Kota
10. Dr. Satheesh Naik SJ, ICAR- Indian Institute of Pulses Research, Kanpur
11. DR. Avinash Kumar Srivastava, ICAR - Indian Institute of Pulses Research, Kanpur
12. Dr. Kanhaiya Lal, ICAR - Indian Institute of Pulses Research, Kanpur
13. Dr. Kalpana Tewari, ICAR - Indian Institute of Pulses Research, Kanpur
14. Dr. Vaibhav Kumar, ICAR - Indian Institute of Pulses Research, Kanpur
15. Dr. Basavaraja, T, ICAR - Indian Institute of Pulses Research, Kanpur
16. Dr. Malay Kumar Bhowmick, IRRI South Asia Regional Centre (ISARC), Varanasi
17. Dr. Daisy Basandrai, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur
18. Dr. Chandra Mohan Singh, Banda University of Agriculture and Technology, Banda
19. Dr. Amrit Lamichaney, ICAR - Indian Institute of Pulses Research, Kanpur
20. Dr. Chanda Venkata Sameer Kumar, College of Agriculture, Rajendranagar, Hyderabad
21. Dr. Revanappa SB, ICAR - Indian Institute of Pulses Research, Kanpur
22. Dr. Meenal Rathore, ICAR - Indian Institute of Pulses Research, Kanpur
23. Dr. Madhuri Arya, Tirhut College of Agriculture, Dholi

# Best Poster Presentation Awards

### Session 1 *(Theme: Farm to Fork: Planning, Policy & perspective)*

**S1.5:** Satheesh Naik SJ, Indra Prakash Singha, Abhishek Bohrab, Ashok Kumar Parihara, Raj Kumar Mishraa, Dibendu Dattaa, Awnindra Kumar Singha and Anand Kumar Yadava. Deciphering pigeonpea [*Cajanus cajan* L. (Millisp.)] yield gap in India shows scope for improvement.

**S1.2:** H. Kumar, S. Bhat and P.R. Sabale. Effectiveness of price policy for pulses in India: Present status and way forward.

**S1.7:** Anupam Tripathi, Basavaraja, T., Arshad Husain, Jyoti Singh, Pravin Tiwari and Aditya Pratap. Production, trade, and Key policies considerations for pulses in India.

**S1.17:** Sudhir Kumar, Alok Das, Utkarsh Tiwari and Meenal Rathore. India towards '*Atmanirbharta*' in pulses.

### Session 2 *(Theme: Mendelian Breeding for Crop Resilience)*

**S2.25:** Sorabh Sethi, Shayla Bindra, Inderjit Singh and Sarvjeet Singh. Mapping of genes for efficient Chickpea-rhizobia symbiosis using inter-specific population of *Cicer*.

**S2.50:** V Jayalakshmi, S Rama devi, B H Chaithanya, J Manjunath and A Lokeshwar Reddy. Nandyal Gram 776, a high yielding machine harvestable desi chickpea variety released for Andhra Pradesh.

**S2.45:** P. R. Patel, M. P. Patel and Manish Sharma. Exploitation of obscured concealed allelic diversity of wild *Cajanus* to hasten Genomics-assisted breeding for heightening crop improvement in pigeonpea (*Cajanus cajan*).

### Session 3 *(Theme: Enhancing the Crop Produce)*

**S3.78:** V.K. Choudhary, R.P. Dubey and J.S. Mishra. Topramezone (HPPD-inhibiting herbicide) for effective broad-leaved weed control and higher productivity in chickpea

**S3.53:** C. P. Nath, Narendra Kumar, K.K. Hazra1, Asik Dutta, Raghavendra Singh, C.S. Praharaj, S.S. Singh. Post emergent herbicides tolerance in pulse crops: A new Dimension in Weed Management

**S3.56:** Ummed Singh, Dal Chand Gadri, S K Chaturvedi, P M Gaur and K K Hazra. Agronomic Evaluation of Chickpea (*Cicer arietinum* L.) Genotypes for Suitability to Mechanical Harvesting and Energy Efficiency

**S3.86:** Teekam Singh, Raj Singh, RS Bana, Anchal Dass and KS Rana. Assessment of maize and pearl-millet intercropped cowpea followed by chickpea and mustard under conservation agriculture-based tillage in rainfed situations

***Session 4 (Theme: Nutri-Smart Pulses and Data Driven Decision Making)***

**S8.9:** Samreen Fatima, Sujeela Rani, Sadiah Shafi, Aaqif Zaffar, Ishrat Riyaz, Sajad M. Zargar and Parvaze A. Sofi. Insights into the biochemical basis of pod shattering in common bean (*Phaseolus vulgaris* L.) from Western Himalayas

**S8.23:** Debjyoti Sen Gupta, Asik Dutta, Vijay Singh Sharanagat, Jitendra Kumar, Ankur Kumar, Vinod Kumar, J. Souframanien, Ummed Singh, Revanappa Biradar, Archana Singh, Yashbir Singh Shivay, Pardip Kumar Katiyar. Progress in Urdbean Biofortification Research for Iron and Zinc concentration

**S8.27:** Kancheti Mrunalini, K K Hazra, Asik Dutta, Narendra Kumar, Biswajit Mondal, Yogesh Kumar. Genotypic response of chickpea cultivars to different zinc management regimes

***Session 5 (Theme: Modern Tools for Crop Improvement)***

**S4.8:** Jagadeesan Kuppura, Asmita Sirari, Shalaka Ahale, Bharathi Mohindroo, J S Sandhu Manmohan Dhakal, Sharon Nagpal and Mandeep Hunjan. Designing, validating and expression analysis of different R Genes in compatible and incompatible Vigna - MYMIV interactions

**S4.13:** Ragul Subramaniyan and Manivannan Narayana. Marker- assisted backcross breeding to introgress bruchine pest and MYMV disease resistance in blackgram [*Vigna mungo* (L.) Hepper cv MDU 1]

**S4.47:** Arvind Kumar Yadav, Chandan Kumar Singh, Rajwant K. Kalia, Shikha Mittal, Rajesh K Kakani, Dhammaprakash Wankhede, Shraddha Ujjainwal, Aakash Sharma1, Ankit Saroha, NS Nathawat, Reena Rani, Pooja Panchariya, Manoj Chaudhary, Kantilal Solanki, Sunil Archak, Kuldeep Singh, Gyanendra Pratap Singh, Amit Kumar Singh. Genetic diversity, population structure and association analysis for the flowering trait in a diversity panel of Indian National Gene bank moth bean (*Vigna aconitifolia*) collection using genotyping by sequencing

***Session 7 (Theme: Innovative Extension Approaches)***

**S7.1:** C. Menaka, A.Yuvaraja, P. Ramakrishnan, and V. Vijayalakshmi. Development of Seed Entrepreneurs Skill to the Resource Poor Farmer under Seed Hub- Pulses

**S7.15:** Bhaskaran A, Malathi B, Prasad JV, Prasad YG, Chari Appaji, Dattatri K, Reddy AR, Ramanjaneya B, Naresh K, Harini D. Technological interventions to bridge the yield gaps in Chickpea (*Cicer arietinum* L.)

**S7.19:** Rekha Rani, Uma Sah, Hemant Kumar, Vikrant Singh. Economic assessment of fieldpea variety IPFD 1-10 (Prakash) in Jalaun district of Uttar Pradesh

### Session 8 *(Theme: New Vistas in Stress Resilience-Biotic Stresses)*

**S6.46:** Dhanasekar P, Souframanien J, Dhole VJ, Hingane AJ and Sivasankar S Physical mutagenesis for induction of resistance against legume pod borer (*Maruca vitrata* F.) in cowpea [*Vigna unguiculata* (L.) Walp].

**S6.58:** Debashish Sahu et al. Exploring the virulence role of powdery mildew effectors as keys to biotic stress management in legumes.

**S6.64:** Ankita Sarkar, Maria Ansari, Rakhi Rathod and Lovkush Satnami. Studies on Leaf Spot of Pigeonpea Caused by *Didymella* spp.

**S6.14:** Sujayanand, GK, Vaibhav Kumar, Jagadeeswaran, R, Sachin Dubey, Anup Chandra and Bansa Singh. Development of cost effective media for VIP3 production from indigenous *Bacillus thuringiensis* strain - F8.IIPR and its bio-efficacy against pod borer

### Session 9 *(Theme: New Vistas in Stress Resilience-Abiotic Stresses)*

**S6.126:** Parvaze A Sofi , Sadiah Shafi, Aaqif Zaffar, Sabya Syed, Masooda Bashir, S M Zargar, M Djanaguiraman and PV Vara Prasad. Towards an integrated approach for improving drought tolerance in common beans: Linking roots with above-ground plant responses

**S6.2:** Sajitha Biju, Sigfredo Fuentes and Dorin Gupta. Novel insights into the mechanism(s) of Silicon-induced drought stress tolerance in lentil plants as revealed through transcriptomic analysis

**S6.12:** Uday Chand Jha, Yogesh Kumar, Avinash K Srivastava, Biswajit Mondal, Virevol Thakro, Swarup K Parida, Harsh Nayyar, and Pradip Kumar Katiyar. QTL-seq underpins major QTLs controlling heat tolerance in chickpea.

**S6.48:** Chandra Mohan Singh, Ruchi, Mukul Kumar and Aditya Pratap. The Auxin Responsive Factor involved in lateral root formation and act as adoptive mechanism for seedling-water-logging tolerance in wild *Vigna umbellata* L.

## Fact File

| | |
|---|---|
| Duration of the Conference | : 3 days, Feb. 10-12, 2023 |
| Mode | : Physical |
| Total Registered Participants | : 584 |
| Female Representation | : 37 % |
| International Participants | : 41 |
| Students | : 207 |
| Live streamed on | : Youtube channel |
| No. of speakers | : 108 |
| Abstract Received | : 520 |
| Posters Presented | : 287 |
| Posters Awarded | : 28 |
| Delegates fully sponsored by ISPRD | : 21 |
| Delegates partially sponsored by ISPRD | : 16 |

# TECHNICAL PROGRAM

<table>
<tr><th colspan="3">Day 1: 10.02.2023 (Friday)</th></tr>
<tr><td rowspan="3">930- 1100 hrs.<br>Celebration of<br>World Pulses Day<br>and<br>Inauguration of International Conference on<br>Pulses: Smart Crops for Agricultural Sustainabilityand Nutritional Security<br><br>(ICPulses2023)<br>1100-1130 hrs: High Tea</td><td colspan="2">Session 1: 1400 - 1730 hrs<br>(Special Session dedicated to World Pulses Day)<br>Farm to Fork: Planning, Policy, Perspectives</td></tr>
<tr><td>Coordinator</td><td>Dr Pratap S Birthal,<br>Director, ICAR-NIAP, New Delhi</td></tr>
<tr><td>Chair</td><td>Dr. Sanjeev Gupta,<br>ADG (O&P), ICAR, New Delhi</td></tr>
<tr><td rowspan="7">Plenary lectures: 1130 – 1300 hrs.<br><br>Dr U Naing Kyi Win, Director General, DAR, Myanmar<br>Pulses Research in Myanmar: Status and WayForward<br>Dr Michael Baum, ICARDA, Morocco<br>Dr Sanjeev Gupta, ADG (O&P) ICAR<br>India's march towards self-sufficiency in pulses<br><br>Chair: Dr SK Sharma, Former Vice Chancellor, CSKHPKV, Palampur<br><br>Co-Chair: Dr. B. B. Singh, Former ADG (O&P),ICAR<br><br>Rapporteurs: Dr SK Jha, ICAR, New Delhi;<br>Dr Kavita Gupta, ICAR-NBPGR, New Delhi<br><br>1300-1400 hrs.: Lunch</td><td>Rapporteur</td><td>Dr Girish Jha, ICAR-Indian Agricultural Research Institute, New Delhi</td></tr>
<tr><td></td><td>Dr. Rajesh Bishnoi, ICAR-Regional Research Centre, ICAR-Indian Institute of Pulses Research, Bikaner</td></tr>
<tr><td>Lead Lecture</td><td>Dr PK Joshi, Former Director, International Food Policy Research Institute, South Asia Office, New Delhi<br><br>Sustaining Pulse Revolution in India</td></tr>
<tr><td>Invited lecture</td><td>Dr Eric Huttner, Program Manager (Crops), ACIAR, Australia<br><br>Examples of ACIAR research: Securing pulses crops for small holders in the Indo-Pacific</td></tr>
<tr><td>Invited lecture</td><td>Mr G Chandrashekhar, The Hindu Business line Overview of Indian pulses sector and trade policies</td></tr>
<tr><td>Invited lecture</td><td>Dr R Jaganmohan, Head, The National Institute of Food Technology, Entrepreneurship and Management, Thanjavur Futuristic opportunity for product development for nutritional security</td></tr>
<tr><td>Invited lecture</td><td>Dr A Amarender Reddy, Principal Scientist, ICAR-CRIDA, Hyderabad Policies for sustainable agriculture and nutrition through pulse-basedcropping systems</td></tr>
</table>

**1730 – 1830 hrs:** Tea and Poster session

**1900 – 2130 hrs:** Cultural programme followed by Welcome Dinner

## CONCURRENT TECHNICAL SESSIONS

| Day 2: 11.02.2023 (Saturday) | | | |
|---|---|---|---|
| **900 – 1300 hrs** | **Session 2: Mendelian Breeding for Crop Resilience** | **Session 3 Enhancing the Crop Produce** | **Session 4: Nutri-Smart Pulses and Data-driven Decision Making** |
| **Convener** | **Dr. Sanjay Kumar**, Director, ICAR – Indian Institute of seed Science, Mau | **Dr Raj Singh**, Head, Agronomy Division, ICAR-Indian Agricultural Research Institute, New Delhi | **Dr Anjani K Singh**, IFPRI, South Asia, New Delhi |
| **Chair** | **Dr SK Sharma**, Former Vice Chancellor, CSKHPKV, Palampur | **Dr Masood Ali**, Former Director, ICAR-Indian Institute of Pulses Research, Kanpur | **Dr JS Sandhu**, Former Vice Chancellor, SKNAU, Jobner |
| **Co-Chair** | **Dr N Nadarajan**, Former Director, ICAR-Indian Institute of Pulses Research, Kanpur | **Dr PK Ghosh**, ICAR-National Institute of Biotic Stress Management, Raipur | **Dr Michael Baum**, International Centre for Agricultural research in Dry Areas, Morocco |
| **Rapporteurs** | **Dr Gyan P Mishra**, ICAR-Indian Agricultural Research Institute<br>**Dr. Shayla Bindra**, PAU, Ludhiana | **Mrunalini Kancheti**, ICAR-Indian Institute of Pulses Research, Kanpur | **Dr Souframanien J**, BARC, Mumbai Dr. Padma Gore, ICAR-NBPGR, New Delhi |
| **Lead Lecture** | **Dr Pooran Gaur**, Former Director Asia Program, ICRISAT Mendelian breeding in pulses: Achievements and future outlook | **Dr PK Ghosh**, ICAR-National Institute of Biotic Stress Management, Raipur Role of pulses in conservation agriculture | **Dr Dil Thavarajah**, Clemson University, USA (Online/ Recorded) *Breeding Biofortified Pulses for human health: A high-throughput phenotyping platform for quantifying nutritional traits* |
| **Invited lecture** | **Dr Petr Smykal**, Faculty of Sciences, Palacky University in Olomouc, Czech Republic Domestication and genetic diversity of leguminous crops | -- | **Dr Parwinder Kaur**, DNA Zoo AustraliaBreaking Barriers - From *conventionalto next generation genetics targeting nutrition in pulses*<br>(Online/Recorded) |
| **Invited lecture** | **Dr JS Sandhu**, Former Vice Chancellor, SKNAU, Jobner Recombination breeding and geneticgain in pulses: A saga of success | **Dr Anil Saxena**, Former Director, ICAR- NBAIM, Mau Microbial inoculants as a natural resource for improving health and nutrition of pulse crops | **Dr Monika Garg**, NABI Mohali Nutri-genomics in pulses: Way forward |

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| **Invited lecture** | **Dr Shiv Kumar**, International Centre for Agricultural Research in Dry Areas, New Delhi, India<br>Impact of Major Genes on Genetic Gains of pulses | **Dr YS Shivay**, ICAR-Indian Agricultural Research Institute, New Delhi<br>Contribution of pulses towards food and nutritional security through organic farming | **Dr Harsh Dikshit**, ICAR-Indian Agricultural Research Institute, New Delhi Biofortification of pulses: progress, strategies and way forward |
| **Invited lecture** | **Dr GP Singh**, ICAR-National Bureau of Plant Genetic Resources, New Delhi<br>Plant Genetic Resources management and Utilization: efforts of ICAR-NBPGR in Pulses | **Dr S Bhaskar**, ADG Agronomy, Agroforestry and Climate Change, ICAR HQ, New Delhi | **Dr. Padma Ishwarya**, Good Food Institute, Mumbai Plant based food and smart proteins from pulses |
| **Invited lecture** | **Dr Ramakrishnan M. Nair,** World Veg, Hyderabad<br>*International Mungbean Improvement Network 2 (IMIN2) - New Initiatives* | **Dr. Narendra Kumar,** ICAR-Indian Institute of Pulses Research, Kanpur<br>*Pulses-climate smart crops for cropping systems intensification and resource conservation* | **Dr Prasoon Verma**, ICAR-Indian Institute of Pulses Research, Kanpur<br>*Enhancing farm income through storage and processing of pulses* |
| **Invited lecture** | **Dr GP Dixit,** ICAR-Indian Institute of Pulses Research, Kanpur<br>*Breeding Rabi Pulses for adaptation to climate change* | | |
| **Invited lecture** | **Dr PK Katiyar**, ICAR-Indian Institute of Pulses Research, Kanpur *Seed system research in pulses: Progress and perspectives* | | |
| **Invited lecture** | **Dr Shivali Sharma,** Global Crop Diversity Trust *Tapping the Untapped: Plant Genetic Resources for Grain Legume Improvement* | | |
| **Oral presentation** | **P Jayamani and D Susmitha,** Tamil NaduAgricultural University, Coimbatore<br>*Development of pre-breeding lines through interspecific hybridization between green gram and ricebean* | **SL Patil, MSVenkatesh and CR Patil.** ICAR-Indian Institute of Pulses Research, Kanpur<br>*Sustaining Crop Productivity in Maize-Chickpea Cropping System through Integrated Nutrient Management in Vertisols of Southern Peninsular India* | **Sachidananda Swain, Jyoti Nayak & Pragati Kishore Rout.** ICAR- CentralInstitute for Women In Agriculture (CIWA), Bhubaneshwar, Odisha *Processing Interventions for the Reduction of Anti-Nutrients Factors in Pulses* |

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| **Oral presentation** | **Golu Misra and *Archana Joshi Saha,*** Bhabha Atomic Research Centre, Trombay, Mumbai *Insights into regulation of organ size using genetic, physiological and molecular characterization of a chickpea (Cicer arietinum L.) mutant* | ***Sanjeev Kumar Singh*, P Rajesh and D Rajarajan.** Tractors and Farm Equipment Limited, Kanchipuram, Tamil Nadu *Evaluation of foliar application of liquid fertilizers with Unmanned Aerial Vehicle (UAV) mounted sprayer in blackgram (Vigna mungo L.)* | **Muraleedhar S Aski, Gyan Prakash Mishra, ...and HK Dikshit.** *ICAR-IndianAgricultural Research Institute, New DelhiStrategies for Identifying Stable Lentil Cultivars (Lens culinaris Medik) for Combating Hidden Hunger, Malnourishment, and Climate Variability* |
| **Oral presentation** | **Rajendra Darai, Krishna Hari Dhakal, Madhav Prasad Pandey, *et al.,*** Nepal Agricultural Research Council, Nepalgunj, Banke Lumbini Province, Nepal Effect of Genotype by Environmental Interactions on Grain Iron (Fe) and Zinc (Zn) Concentration of Biofortified Lentils in *Nepal* | **CP Nath, Narendra Kumar, K.K. Hazra, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur *Conservation agriculture and efficientweed management in rice-chickpea cropping system for intensification of rice fallows* | **Devraj, PK Katiyar and Amrit Lamichaney.** ICAR-Indian Institute of Pulses Research, Kanpur *Development of Digital Platform for Retrieval of Quality Seed Production data for Pulses* |
| **Oral presentation** | **Fouad Maalouf, Rind Balech, LynnAbouKhater and Shiv kumar.** International Center for Agricultural Research in the Dry Areas (ICARDA), Terbol, Lebanon *Novel tools for improving faba bean productivity indiverse agroclimatic conditions* | **Raj Singh, Teekam Singh, Anchal Dass *et al.*** ICAR-Indian Agricultural Research Institute, New Delhi Sustainable intensification throughpulses for improving productivity, profitability and resource use efficiency under conservation agriculture in rainfed semi-arid *environments* | **Nishanth BM, Soregaon C D and Vishwasgowda C.** University of Agricultural Sciences, Dharwad *Genotype × environment interactionseffect on grain iron (Fe) and zinc (Zn) concentration in pigeonpea [Cajanuscajan (l.) Millsp.] using AMMI model* |
| **Rapid fire presentation** | **Aung Lwin Oo, TS Bains, *Parul Sharma*,*et al.*** Punjab Agricultural University, Ludhiana Development of YMD resistant and dual season photo insensitive mungbean genotypes through interspecific *hybridization* | **Vishal Tyagi, Kuldip Jayaswall, SanjayKumar, *et al.*** ICAR-Indian Agricultural Research Institute, New Delhi *Nano-fertilizer based nutrient management in chickpea* | **Basavaraja, T, Anupam Tripathi, Asik Dutta, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur *Assessment of biofortified dry bean linesfor agronomic performance and seed micronutrient attributes in India* |

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| **Rapid fire presentation** | ***Kuldeep Tripathi*, DP Wankhede, Niranjana Murthy, *et al.*** ICAR-National Bureau of Plant Genetic Resources, New Delhi<br>*The Indian national genebank cowpeacore set: a valuable resource for research, breeding and improvement* | **Deepak Kumar Chandrakar, Mangla Parikh, Kusum Chandrakar *et al.*** Indra Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh<br>Yield maximization of fieldpea through surface seeding, seed rate and *seed priming under rice-based uteracropping system* | **Man Mohan Deo, Prasoon Verma, Narendra Kumar *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur *Effect of microwave heating as pre-treatment for milling of pigeonpea* |
| **Rapid fire presentation** | ***Amrit Lamichaney*, Satheesh Naik, Dibendu Datta, *et al.*** ICAR, Indian Institute of Pulses Research, Kanpur Breaking seed coat imposed dormancy in wild relatives of pigeonpea (*Cajanus cajan* L.) | **Asik Dutta, Kali Krishna Hazra, Chaitanya P Nath, *et al.*** ICAR, Indian Institute of Pulses Research, Kanpur *Soil phosphorus dynamics and crop productivity under pulse based cropping system for sustainable P management in an Inceptisol* | **Biswajit Mondal, Yogesh Kumar, NandanSingh, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur *Digitalization of breeding pipeline of desichickpea trials of ICAR-Indian Institute of Pulses Research, Kanpur in the Breeding Management System (BMS) platform* |
| **Rapid fire presentation** | | **Jeetendra Kumar Soni, Lungmuana, Sunil Kumar Sunani, *et al.*,** ICAR-RC NEH Region, Mizoram Centre, India *Weed smothering effect of legumes under maize based intercropping under Hilly terrain of Mizoram* | **Monika Yadav, Sreerama Y N and Meera M S**, CSIR-Central Food Technological Research Institute *Utilization of pulse-milling by-products: Effect of protein on the bio-accessibility of calcium* |

**Tea and Poster session:** 1100 -1130 hrs.

**Lunch:** 1300-1400 hrs

| 1400hrs–1800 hrs | Session 5: Modern Tools for Crop Improvement | Session 6: Revisiting the Roots | Session 7: Innovative Extension Approaches |
|---|---|---|---|
| **Convener** | **Dr Tapan K Mondal,** Principal Scientist, ICAR-National Institute of Plant Biotechnology, New Delhi | **Dr SL Patil,** ICAR-Indian Institute of Pulses Research, Kanpur | **Dr. Uma Sah,** ICAR-Indian Institute of Pulses Research, Kanpur |
| **Chair** | **Dr TR Sharma,** DDG (CS), ICAR, New Delhi | **Dr AK Vyas,** Vice Chancellor, Agriculture University, Kota | **Dr AK Singh,** Vice Chancellor, RLBCAU, Jhansi |
| **Co-Chair** | **Dr Petr Smykal,** Faculty of Sciences, Palacky University in Olomouc, Slechtitelu, Czech Republic | **Dr SS Singh,** Rani Laxmi Bai Central Agricultural University, Jhansi | **Dr R Burman,** ADG Extension, ICAR- Indian Agricultural Research Institute, New Delhi |
| **Rapporteurs** | **Dr Alok Das,** ICAR-Indian Institute of Pulses Research, Kanpur<br>**Dr. Jyoti Kumari,** ICAR-National Bureau of Plant Genetic Resources, New Delhi | **Dr. Anil Dixit,** ICAR-National Institute of Biotic Stress Management, Raipur | **Dr Rekha Rani,** ICAR-Indian Institute of Pulses Research, Kanpur |
| **Lead Lecture** | **Dr Rajeev K Varshney,** Murdoch University, Australia Genomics for legumes improvement: Present and future (Online/Recorded) | **Dr N Ravishankar,** Principal Scientist, ICAR-Indian Institute of Farming Systems Research, Modipuram Research and technological perspective on organic and natural farming in Pulses | **Dr AK Singh,** Vice Chancellor, RLB Central Agricultural University, Jhansi *Innovation in Transfer of Technologies for Enhancing Pulses Production in India* |
| **Invited lecture** | **Dr Michael Baum,** International Centre for Agricultural Research in Dry Areas, Morocco Modern Tools for pulses Improvement | **Dr Shanti K Sharma,** Maharana Pratap University of Agriculture and Technology, Udaipur *Complimentary and Supplementary Synergies of Pulses for Higher Sustainability of Organic and Natural* Farming Systems | **Dr Sreenath Dixit,** ICRISAT, Hyderabad Strategies for scaling good agricultural practices for bridging yield gap in pulses: Lessons from the across select Indian states (Online) |
| **Invited lecture** | **Dr Roland Schafleitner,** World Vegetable Centre, Shanhua, Taiwan *Modern tools for mungbean crop improvement* | **Dr Dhananjay K. Singh,** GBPUAT, Pantnagar Pulse based organic farming: new vistas for climate resilience | **Dr Rajbir Singh,** ATARI, Zone I, Ludhiana Sustainable intensification through pulses in north India–A perspective |

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| **Invited lecture** | **Dr Prakit Somta,** Kasaetsart University, Thailand Genome Research of Pulses Crops in the Genus Vigna | **Dr Mahesh Chander,** ICAR-Indian Veterinary Research Institute, Izatnagar *Organic Farming: harnessing traditional knowledge blended with science* | **Dr RN Padaria,** ICAR-Indian Agricultural Research Institute, New Delhi *Community based extension approaches: pragmatic reflection* |
| | | **Dr Anup Das,** ICAR-NEH, Tripura Center Opportunity of organic and natural farming in pulses based systems with reference to north east India | **Dr Neeta Khandekar,** ICAR-Indian Institute of Soybean Research, Indore *Developing ecosystems for sustainable legume production* |
| **Invited lecture** | **Dr KC Bansal,** National Academy of Agricultural Sciences, New Delhi *Genome Editing in Pulses for Sustainable Agriculture* | **Dr. Raghavendra Singh,** ICAR-Indian Institute of Pulses Research, Kanpur *Pulses based organic farming for achieving SDGs* | **Dr Shaik N Meera,** ICAR-Indian Institute of Rice Research, Rajendernagar,Hyderabad *Impact of cluster front line demonstrations on yield and economics of redgram (Online/Recorded)* |
| **Invited lecture** | **Dr PK Agrawal,** ADG Coordination, ICAR New Delhi *Transgenics in Pulses: Developments,Policies and Way forward* | | ***Dr Shantanu Dubey,*** ICAR-ATARI, Kanpur *Blending technology with policy at scale: success case of nationwide pulses development program in India* |
| **Invited lecture** | **Dr C Bharadwaj,** ICAR-Indian Agricultural Research Institute, New Delhi *Traversing from Genomic assisted breedingto genomic selection towards yield resilience in Chickpea* | | |
| **Oral presentation** | **Sandhya Suranjika, Seema Pradhan, Dr Ajay parida, *et al.*** Institute of Life Sciences, Bhubaneshwar, Odisha Transcriptomics of *Vigna aconitifolia* for developing a gene expression atlas | **Raghavendra Singh, CP Nath, Narendra Kumar, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur Effect of organic practices on productivity and profitability of pulse-based system in comparison to the inorganic management | **Rajesh Kumar, Bagish Kumar, M Thoithoi Devi, *et al.*,** ICAR-Agricultural Technology Application Research Institute, Zone-VI, Guwahati Impact on Yield and Economics of Field Pea (*Pisum sativum* L.) Through Cluster Frontline Demonstrations in North East India, India |

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| **Oral presentation** | **Md. Mosiur Rahman, Md. Omar Ali, Rong Liu, *et al.*,** Bangladesh Agricultural Research Institute, Joydebpur, Gazipur SSR-based genome–wide association studies foryield related agronomic and biochemical traits of grass pea germplasm collected from China and Bangladesh | **M Vinutha, E. Somasundaram, S. Sanbagavalli, *et al.*,** Tamil Nadu Agricultural University, Coimbatore *Organic blackgram productivity as influenced by the application of organic and liquid manures* | **Laxmipriya Sahoo, Monalisha Sahoo, Ankita Sahu *et al.*,** ICAR-Central Institute for Women in Agriculture, Bhubaneswar *Development and validation of "Farmwomen Led Integrated LocalSeed Network" model for improving availability of quality pulse seeds* |
| **Oral presentation** | **Shanmugavadivel PS, Jyotirmay Dubey, Kapale Vijay Pandurang, *et al.*** ICAR- Indian Institute of Pulses Research, KanpurCRISPR/ case based genome editing to improve yield and symbiotic nitrogen fixation in Chickpea | **Robin Thakur, D.K. Parmar, Rushali Katoch, *et al.*** CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur. Soil fertility and horse gram (Macrotyloma uniflorum) productivity as affected by different methods of jeevamrit application under mid hills of Himachal Pradesh | **Ramesh Rajangam, Sassikumar, D** and **A.Yuvaraja** Tamil Nadu Agricultural University, National Pulses Research Centre, Vamban Farmers Participatory Large Scale Seed Production in Blackgram for Higher Income and Seeds Exchange among *Farmers through FPO under World Bank funded TNIAM Project* |
| **Oral presentation** | | | **Uma Sah, Vikrant Singh, Jitendra Ojha, Mohit Katiyar and Prasoon Verma.** ICAR-Indian Institute of Pulses Research,Kanpur, UP, India Value transformation along lentil valuechain in Uttar Pradesh state of India |
| **Rapid fire presentation** | **Rishikesh Kumar, Manjunatha L, Khela Ram Soren, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur Rapid detection of Fusarium oxysporum *f. sp. ciceris in chickpea using xylanase transcriptional activa tor (xlnR) gene based LAMP technique* | | **Malathi B, Bhaskaran A, Prasad JV, *et al.*** ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-X, Hyderabad Effect of organic practices on productivity and profitability of pulse-based system in comparison to the inorganic management |

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| **Rapid fire presentation** | **Neeraj Kumar, C Bharadwaj, Soren KR, *et al.*** ICAR-Indian Agricultural ResearchInstitute, New Delhi *Chickpea long non-coding RNAs* (lncRNAs): genome-wide discovery and functional prediction under salt-stress | **Sachin Saharan, Janardan Singh and Rahul Sharma.** CSK Himachal PradeshKrishi Vishvavidyalaya, Palampur *Effect of Organic sources of Nutrients in Blackgram (Vigna Mungo L.) under* mid-hill conditions of Himachal Pradesh | **Rajesh Bishnoi, B Lal and T N Tiwari.** ICAR-Indian Institute of Pulses Research, Regional Research Centre, Bikaner, Rajasthan Constraint analysis and upscaling strategies to increase arid pulse production in western Rajasthan |
| **Rapid fire presentation** | **Soren, K R., Tripathi, Sandhya, Chellapilla, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur Comprehensive BURP superfamily study in Chickpea revealed RD22 genes involved in salinity stress tolerance | **Disha Joshi, Bhavna Singh Rathore, Suman Dhayal.** Rajasthan College ofAgriculture, MPUAT, Udaipur Growth and yield of urdbean [*Vigna mungo* (L.) Hepper] influenced by vermicompost and vermiwash | **Revanappa SB, Manu B, Aditya Pratap, *et al.*** ICAR, Indian Institute of Pulses Research, Kanpur. ICAR- Indian Institute of Pulses Research, Kanpur Impact of improved mungbean varietyon farmers' income and nutritional security |
| **Rapid fire presentation** | **Hardeep Singh, Vishal Sharma, Karambir, *et al.*** National Agri-Food Biotechnology Institute, Mohali Development of robust and effective Agrobacterium-mediated genetic transformation system for *CRISPR/Cas9-based genome editing inpea (Pisum sativum L.)* | | |

**Tea and Poster session:** 1530 to 1600 hrs

Pulses for Sustainable Agriculture and Improved Soil Quality in the Era of Climate Change
**Plenary Lecture (1800 – 1900 hrs)**
**Prof. Rattan Lal, Ohio State University, Ohio, USA**
**Chair: Dr. Himanshu Pathak,** Secretary DARE and DG ICAR
**Rapporteur: Dr. Dhanasekar,** BARC, Mumbai; **Manivannan, M.,** TNAU Coimbatore

| Day 3: 12.02.2023 (Sunday) | | |
|---|---|---|
| **900 – 1300 hrs** | **Session 8: New Vistas in Stress Resilience-BioticStresses** | **Session 9: New Vistas in Stress Resilience-Abiotic Stresses** |
| **Convener** | **Dr Naimuddin,** ICAR-Indian Institute of Pulses Research, Kanpur | **Dr. Senthil Kumar,** ICAR-Indian Institute of Pulses Research, Kanpur |
| **Chair** | **Dr HC Sharma,** Former Vice Chancellor, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan | **Dr NP Singh,** Vice Chancellor, Banda University of Agriculture and Technology, Banda |
| **Co-Chair** | **Dr. Bansa Singh,** ICAR-Indian Institute of Pulses Research, Kanpur | **Dr Anil Dixit, ,** ICAR-National Institute of Biotic Stress Management, Raipur |
| **Rapporteurs** | **Dr Gaurav K Taggar,** Punjab Agricultural University, Ludhiana<br>**Dr Ruchi Bansal,** ICAR-Indian Agricultural Research Institute, New Delhi | **Dr Poonam Sharma,** Punjab Agricultural University, Ludhiana<br>**Dr Dharmendra Patel,** ICAR-Indian Institute of Pulses Research, Kanpur |
| **Lead Lecture** | **Dr SC Dubey,** ADG Plant Protection, ICAR, New Delhi<br>*Diversity and management of Fusarium xysporum* f.sp. *ciceris causing chickpea wilt* | **Dr Douglas Cook,** UC Davis, California, USA<br>*Chickpea's wild plant and microbial relatives: Implications for agriculture* |
| **Invited lecture** | **Dr Subhash Chander,** Director, ICAR-National Research Centre for Integrated Pest Management, New Delhi *Pest Management in Pulse Crops with Climate Change Perspective* | **Dr Vijaya Singh,** University of Queensland, Australia *Genotypic differences in response to heat stress in mungbean and phosphorus placement in chickpea* |
| **Invited lecture** | **Dr Mamta Sharma,** Principal Scientist, ICRISAT, Hyderabad *Revamping the role of research for biotic stress management in pulses under changing climate* | **Dr Mukesh Jain,** Dean, Jawaharlal Nehru University, New Delhi, India *Integrated multi-omics for unraveling candidate genes associated with drought tolerance in chickpea* |
| **Invited lecture** | **Dr Mohd Akram,** Principal Scientist, ICAR-Indian Institute of Pulses Research, Kanpur<br>*Yellow mosaic disease of pulse crops: Diagnostics, diversity and management* | **Dr Dorin Gupta,** Associate Professor, University of Melbourne, Australia *Plant available silicone and abiotic stress mitigation – progress and perspectives* |
| **Invited lecture** | **Dr Bansa Singh,** Director, ICAR-Indian Institute of Pulses Research, Kanpur<br>*Nematode stresses of pulses, their current status and management options* | **Dr Jagdish Rane,** Principal Scientist, NIASM, Baramati<br>*Remote sensor to sense pulses of pulse crops under abiotic stress* |
| **Invited lecture** | **Dr Ajit k Shasany,** Director, ICAR-National Institute for Plant Biotechnology, New Delhi<br>*C. platycarpus*: A reservoir of resistance to biotic stresses in pigeonpea | -- |
| **Invited lecture** | **Dr Manish Pandey**, ICRISAT, Hyderabad<br>*Translational genomics to accelerate pigeonpea disease resistance breeding* | - |
| **Oral presentation** | **Shanmugam, PS, SV Krishnamoorthy, P Jayamani, *et al.***<br>Tamil Nadu Agricultural University, Coimbatore<br>*Efficacy of Seed treatment Insecticides against Stem fly and Sucking Pest Complex in Pulses* | **Aswin Reddy Chilakala, Prachi Pandey, Durgadevi Athimoolam *et al.*** National Institute of Plant GenomeResearch, New Delhi<br>*Drought attenuates the plant responses to multiple rhizosphericpathogens – a study based on dry root rot-associated disease complex in chickpea fields* |

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| **Oral presentation** | **Ravinder Singh and GK Taggar.** ICAR-Indian Institute of Pulses Research, Kanpur *Larval Parasitization of Helicoverpa armigera (*Hubner*) by Campoletis chloridae Uchida in chickpea intercropped with linseed* | **Priyanka Gupta, Khawla Aloui, Rhofrane Benhsain, *et al.*** International Center for Agricultural Research in the Dry Areas, Rabat, Morocco *Evaluation of Grasspea Germplasm for Below-Ground Traits and its relationship with ODAP under Water-Limited Conditions* |
| **Oral presentation** | **Manju Kohli, Gyan P Mishra, Hina Bansal, *et al.*** ICAR - Indian Agricultural Research Institute, New Delhi Genome-wide Association Studies for Earliness and MYMIV Resistance Governing loci in Mungbean (*Vigna radiata* L. Wilczek) using Genotyping by Sequencing Approach | **Narayan Singh, Vasudha Maurya, Ashutosh Sharma, *et al.*** DAV University, Jalandhar *Biochemical, and his to chemical analysis for screening of salt stress tolerance in Horse gram (Macrotyloma uniflorum) germplasm* |
| **Oral presentation** | **Revanasidda, Murali Mohan, K, Soren, KR, *et al.*** ICAR- Indian Institute of Pulses Research, Kanpur Diversity and distribution of bruchid species infesting ediblestored pulses in India | **Nagendra Kumar Kaushik, Ravi Gupta, Neha Kaushik, *et al.*** Plasma Bioscience Research Center, Kwangwoon University, Seoul, South Korea Plasma technologies for green environment and smart agriculture methods |
| **Rapid fire presentation** | **Jyoti Singh and Dharmendra Pratap.** Chaudhary Charan Singh University, Meerut Antifungal efficacy of green synthesized zinc oxide nanoparticles against the stem rot of legumes | **Khushwant B Choudhary, Ramavtar Sharma, *et al.*** ICAR-Central Arid Zone Research Institute, Jodhpur Crafting Genetic Variability for Refined Moth Bean Plant Type Suitable for Hot Arid Climate through Mutagenesis |
| **Rapid fire presentation** | R. Jagadeeswaran, Aravind Kumar Konda, Sujayanand GK ***et al.*** ICAR-Indian Institute of Pulses Research, Kanpur *De novo assembly, structural and functional annotation of the nematode egg parasitic fungus, Purpureocillium lilacinum strain Indian Institute of Pulses Research-PI-11* | **Vaibhav Kumar, Kalpana Tewari, Rinki Devi, *et al.*** ICAR-Indian Institute of Pulses Research, Kanpur Phytohormones response to heat stress in chickpea |
| **Rapid fire presentation** | **Mahatma Lalit and Harshalkumar P Patel.** Navsari Agricultural University, Navsari Begomoviruses: Are they seed-borne or seed-transmittedviruses? | **Umashankar, C Bharadwaj, Neeraj Kumar, *et al.*** ICAR-Indian Agricultural Research Institute, New Delhi, Hydroponic aided evaluation of chickpea (*Cicer arietinum* L.) genotypes for high aluminium stress tolerance |
| **Rapid fire presentation** | **Nishmitha K, Rakesh Singh, S C Dubey, *et al.*** ICAR-Indian Agricultural Research Institute, New Delhi Molecular cloning and in-silico characterization of novel resistance gene analogue from lentil against Fusarium wilt | |

**Tea and Poster session:** 1100 -1130 hrs
**Lunch:** 1300 – 1400 hrs

**Valedictory Session:** 1500 – 1630 hrs.
**Chair:** Dr. T.R. Sharma, DDG (Crop Sciences), ICAR, New Delhi
**Co-Chair:** Dr. Sanjeev Gupta, ADG (Oilseeds and Pulses), ICAR, New Delhi
**Rapporteurs:** Dr. Celia Chalam, ICAR-National Bureau of Plant Genetic resources
Dr. Manmohan Deo, ICAR-Indian Institute of Pulses Research, Kanpur

# FEEDBACK

I was truly privileged to be at conference. It was a nice event celebrating legumes-pulses, for which there is unlikely a better place than India that provides the major protein source to milions of people. ICPulses2023 provided a great opportunity to meet again older friends and make new ones. Conference organization was perfect, with timing and topics as well as nice Indian food. It showed the progress India made on pulses breeding and cultivation and nicely documented the power of genetics. Yes, clearly not just breeding is sufficient as it goes along with agricultural practices and postharvest processing. Definitely crops have higher biological potential but this can be manifested only on good conditions, which are unfortunately often not met in real life.

However, when there is will, then one can make progress. Nature itself and biological sciences are still with lots of puzzles, questions for which we seek answers. Wish we have place and peace to work on these.

***Petr Smykal, University of Olomouc, Czeck Republic***

It was an intellectually satisfying conference and proved to be the most successfully organized event covering all aspects of pulses. According to me one of the major highlights of the conference was the lead presentation on genome assisted breeding by Professor Rajeev Varshney from Murdoch University, Australia.

I was happy to be a part of it as an invited speaker on genome editing. I must congratulate the organizers from national as well as international institutions for the grand success of the conference.

***K C Bansal, National Academy of Agricultural Sciences, India, New Delhi***

Being the co-sponsor, ICARDA takes pride in getting associated with the well-organized conference. What I like most about the conference is its well-structured sessions with wide participation of legumes scientists, policy makers, and students from around the globe. The conference has lived its purpose by providing a platform for presentation of the latest research being undertaken by the legume researchers.

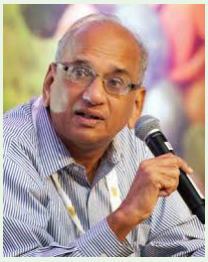
***Shiv Agrawal, ICARDA, New Delhi***

Heartiest congratulations to the Organizing Committee of ICPulses 2023 for organizing an effective, successful and productive conference. The conference had just the right mix of contents, speakers and participants. I was highly impressed to see large participation of students and budding researchers. My sincere thanks to the Organizing Committee for inviting me to this great conference.

***Pooran Gaur, ICRISAT, Hyderabad***

I participated in the International conference on Pulses held during February 10-12 at New Delhi. The technical sessions were relevant to the current need of the researchers, policy makers, industry, farmers etc. There was an overwhelming response of the participants both from home and abroad. The conference was meticulously organized and flawless. It was a great learning process for all those who attended it. I congratulate the organizers, ISPRD and the IIPR team for their hard work for conducting of the conference successfully.

***SK Sharma, Former Vice-chancellor, HP Agricultural University, Palampur***



I thoroughly enjoyed participating and delivering an invited lecture during the session on 'Farm-to-Fork: Planning, Policy and Perspectives' at the International Conference on Pulses held on February 10 to commemorate World Pulse Day. I found the conference program was well structured with domain experts sharing their insights and perspectives on a variety of topics. The value of the knowledge-intensive session stood enhanced because of the warm and friendly ambience. The right mix of veterans and young researchers as well as interactive nature of discussions made the session lively and educative. I think it is important for scientists and researchers to have greater exposure to the demands of the marketplace in order to set their research priorities.

***G Chandrashekhar, Economist, Senior Editor and Policy Commentator, Mumbai***

Thanks I could have contributed more having given opportunity to make lead presentation on transgenic pulses as I spent whole life working on that area. Congratulations to you and your team for successful organization of event.

***NP Singh, Vice Chancellor, BUAT, Banda***

Congratulations for organizing such a successful event and it was indeed a pleasure to be part of it. Thank you for the opportunity. I will suggest few points for future consideration: clear and updated version of the program to all the participants. A live screen could be placed near the registration centre providing information about the current and upcoming talks and presentations. Food and water arrangements were very good. Especially I liked that water bottles were available all the time and there were multiple stalls for participants to serve food. Only addition could be considered to have tea or coffee stalls outside food venue at least 2-3 times during the day. All organizing members were very helpful, their number could be increased and they may have volunteer tag on to help participants. Participation of more female executives should be considered to have them in every chaired session.

***Dorin Gupta, University of Melbourne, Australia***

**International Conference on**
**Pulses: Smart Crops for Agricultural Sustainability and Nutritional Security**
**#ICPulses2023**

**Feb. 10-12, 2023**
**at**
**C. Subramaniam Auditorium, NASC, New Delhi**

# Local Organizing Committee

## Scientific Programme

**Chair:** Bansa Singh; **Co-Chairs:** IP Singh, GP Dixit
**Members:** Sanjeev Gupta, Rajeev Varshney, Shiv Kumar, Ramakrisjhnan M. Nair, Meenal Rathore, P.K. Katiyar, Narendra Kumar, Uma Sah, Dharmendra Patel, Mohd. Akram
**Member Secretary:** Aditya Pratap

## Finance

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**Members:** Satheesh Naik, Kunal Kalra, RK Nigam
**Member Secretary:** DR Mishra

## Registration

**Chair:** PK Katiyar; **Co-Chair:** Naimuddin
**Members:** Satheesh Naik, Amrit Lamichaney, Vaibhav Kumar, Namrata Laskar, Mrunalini Kancheti
**Member Secretary:** DR Mishra

## Publication

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### Souvenir

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**Members:** PK Katiyar, SL Patil, Kodandaram, Archana Singh, Kunal Kalra, Sujit Kumar, Sukdeo Mahato
**Member Secretary:** Awnindra K Singh

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**Members:** Sanjay Bandi, RK Nigam, Rakesh, Manu B
**Member Secretary:** Ashok Parihar

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**Members:** KK Hazra, Kanhaiya Lal, Yaduvir singh
**Member Secretary:** Manmohan Deo

### Stage Coordination

**Chair:** Uma Sah; **Co-Chair:** Vijay Laxmi
**Members:** Rekha Rani, Revanasidda, Revanappa SB, Kanhaiya Lal
**Member Secretary:** Basavaraja, T.

### Certificate

**Chair:** Senthil Kumar M; **Co-Chair:** Satheesh Naik
**Members:** Arvinda Kumar Konda, Uday C. Jha, Jagadeeshwaran, Sunil Sunani, Monika Punia
**Member Secretary:** Sanjay Bandi

### Poster Session

**Chair:** Raghavendra Singh; **Co-Chair:** Dibendu Datta
**Members:** TN Tiwari, Rishikesh Kumar, Hemant Kumar, Anup Chandra, Debjyoti Sen Gupta, RL Jat
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### Food

**Chair:** Narendra Kumar; **Co-Chair:** Naimuddin
**Members:** Hemant Kumar, CP Nath, Omkar Nath, Rakesh, Anand K Yadav
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**Members:** Asik Datta, Devindrappa, Vaibhav Kumar, Lalit Rolania, S.K. Ghritlahre, Banwari lal
**Member Secretary:** Anup Chandra

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**Chair:** DR Mishra; **Co-Chair:** Prasoon Verma
**Members:** Asik Datta, B. Mondal
**Member Secretary:** ManMohan Deo

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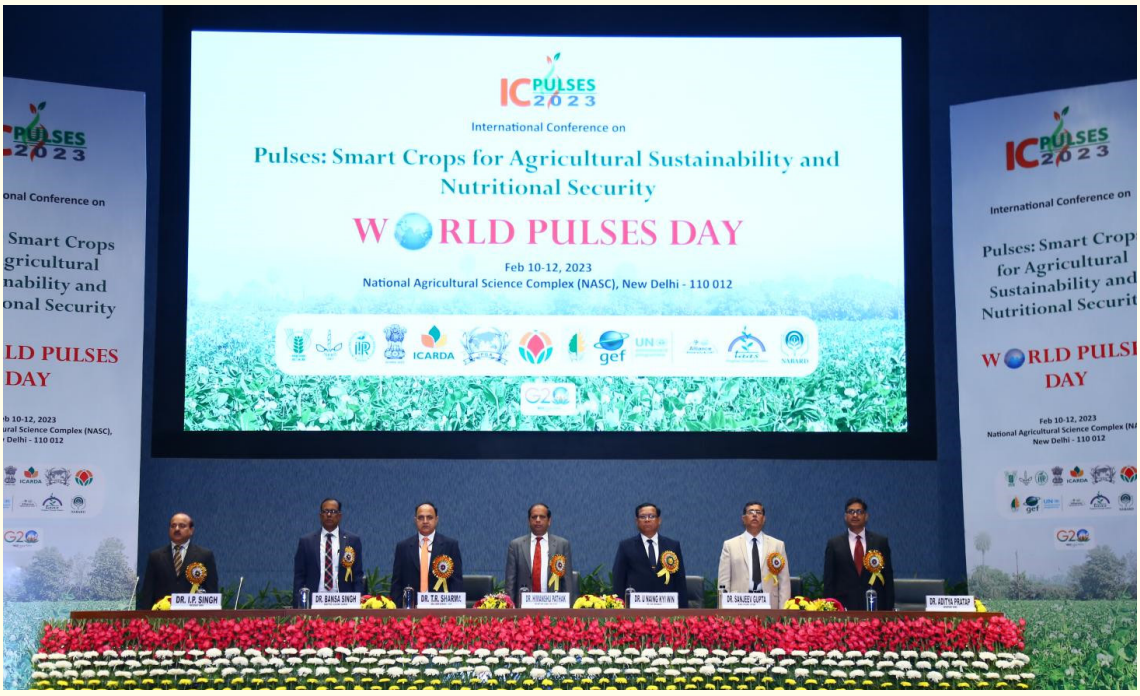
**Members:** Sujayanand GK, Rekha Rani, Satheesh Naik, Biswajit Mandal, Amrit Lamichaney, Basavaraja T.
**Member Secretary:** Rajesh Srivastava

### Secretarial Assistance

**Chair:** Aditya Pratap; **Co-Chair:** Meenal Rathore
**Members:** Uma Sah, DR Mishra, Prasoon Verma, AK Srivastava, Satheesh Naik, Sudhir Kumar, Kanhaiya Lal, Hasmat Ali

# Some Glimpses of ICPulses2023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DR. T.R. SHARMA
DR. ASHWANI KUMAR
DR. U NAING KYI WIN
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CHAIR
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RAPPORTEURS


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Pulses: Smart Crops for Agricultural Sustainability and Nutritional Security
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Efficient Mining and Use of Genetic Resources
FIGS sets
Genetic diversity panels
MAGIC populations
Wild relatives and introgression lines
Special and International nurseries
ICARDA
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CHAIR


DR. HIMANSHU PATH


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Vindhya Himanchal Yamuna Ganga
Pulses: Smart Crops for Agricultural Sustainability and Nutritional Security
WORLD PULSES DAY


The Indian Society of Pulses Research and Development (ISPRD) was founded in April 1987 with the following objectives:

- To promote research, development and extension activities in pulses
- To facilitate close association amongst pulse workers nationally and internationally
- To publish "Journal of Food Legumes", a quality research journal of the Society

**Membership:** any person interested in pulses research and development is eligible for membership of the Society by becoming ordinary, life or corporate member by paying respective membership fee as detailed below:

| Membership Fee | Indian (Rs.) | Foreign (US$) |
|---|---|---|
| Ordinary (Annual) | 750 | 75 |
| Life member | 7500 | 750 |
| Student (Indian) | 500 | – |
| Admission Fee | 100 | 20 |
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