



21 DAYS WINTER SCHOOL

On



Biofortification of Staple Food Crops Through Conventional and Molecular Approaches

January 03-23, 2022

**Sponsored by
Indian Council of Agricultural Research(ICAR)
New Delhi**

**Course Director
Dr. Sudhir Kumar, Professor**

Course Co-coordinators

Dr. Upendra Kumar
Assistant Professor

Dr. Shikha Yashveer
Assistant Professor



Organized by

**Department of Molecular Biology, Biotechnology & Bioinformatics
CCS Haryana Agricultural University,
Hisar-125004 (Haryana)**



ABOUT THE UNIVERSITY

The Haryana Agricultural University was established on February 2, 1970 as a result of bifurcation of the erstwhile Punjab Agricultural University, through a Presidential Ordinance, ratified later on by the Haryana and Punjab Agricultural University Act, 1970 (Act No 16 of 1970) passed by the Lok Sabha on 29th March, 1970. From 31st October, 1991, it has been renamed as Chaudhary Charan Singh Haryana Agricultural University (CCS HAU). The University is spread over an area of 7219 acres at Hisar and 1426 acres at outstations. Area at Hisar under farms is 6483 acres and under buildings and roads is 736 acres. During its existence so far, it has made rapid progress in building an excellent infrastructure. It has one of the best developed campuses in India to meet academic and extra-curricular needs of the students. February 2019 marks a significant milestone in CCSHAU's History: Beginning of Golden Jubilee Year. To commemorate the occasion, a plethora of exciting events are planned which are spread over the year with our collaborations/ partners, alumni and well-wishers.

ABOUT THE DEPARTMENT

Realizing the role and wide application of Biotechnology and Molecular Biology in various fields of Agriculture, Industry and environment protection, the Department of Molecular Biology, Biotechnology & Bioinformatics was established at CCS Haryana Agricultural University, Hisar in January 1997. It offers M.Sc. and Ph.D. programs in Molecular Biology and Biotechnology and M.Sc in Bioinformatics. Today, it is recognized as one of the best and leading Department for research and teaching in various fields of Plant Biotechnology, Molecular Biology and Bioinformatics. Faculty of this department has a unique distinction and privilege to secure several prestigious fellowships. Most of our Ph.D. students have cleared CSIR/ICAR/UGC NET. The department has three projects from different outside agencies such as DST and SPARC, MHRD, Govt. of India. The department is pursuing research in several priority areas of state/ country interests. The major areas of research include:

- Plant tissue culture and micro-propagation of important plant species Micropropagation of important crop plants, cash crops, ornamentals and forest and horticultural trees.
- Biofortification of staple food crops for iron, zinc, vitamins, and beta glucan etc. through conventional breeding and molecular approaches.
- Application of CRISPR/Cas9 genome editing techniques for development of low silicone rice suitable for paddy straw management
- Development of transgenic for abiotic and biotic stress tolerance and quality improvement in wheat, rice, chickpea and pigeon pea.
- Molecular mapping and tagging of abiotic stress tolerant genes/ QTLs for development of heat and salt tolerant wheat, drought tolerant chickpea, pearl millet, brassica etc. Marker-assisted selection for resistance to rusts in wheat etc.



Course Background

Micronutrient malnutrition is known to affect more than half of the world's population and considered to be among the most serious global challenges to humankind. Modern plant breeding has been historically oriented toward achieving high agronomic yields rather than nutritional quality, and other efforts related to alleviating the problem have been primarily through industrial fortification or pharmaceutical supplementation. Micronutrient malnutrition or the hidden hunger is very common among women and preschool children caused mainly by low dietary intake of micronutrients, especially Zn and Fe. Biofortification, the process of increasing the bioavailable concentrations of essential elements in edible portions of crop plants through agronomic intervention or genetic selection, may be the solution to malnutrition or hidden hunger mitigation. The main advantage of genetic engineering and plant breeding approaches for mineral enhancement is that investment is only required at the research and development stage, and there after the nutritionally enhanced crops are entirely sustainable. Over the past few years, a range of institutions have endorsed biofortification. To apply theoretical knowledge to the practical application requires skill development. This training will cover basic and applied techniques and instrument handling to develop the candidates with effective practical skills to improve the vision of applying the learned skills. This training will provide the participants not only with theoretical information but also practical experience in molecular breeding, omics, genetic transformation and bioinformatics tools as an integral part of this program.

Objectives

- To keep the trainees abreast about the latest developments in the field of nutritional quality improvement of staple food crops
- To provide hands-on exposure to the trainees on various aspects of molecular biology, analytical tools and techniques used for crop improvement.

Eligibility

Master's Degree in Biotechnology, Genetics & Plant Breeding, Life Sciences or in any other allied subject in Agriculture Sciences. The applicant should not be below the rank of Assistant Professor/Scientist and equivalent and should be working in Colleges/ Universities/Agricultural Universities/ICAR Institutes.

Travel

Travel Allowance to the participants will be paid for the journey, to and fro, as per their entitlement for the class of travel, restricted to the maximum of AC II tier rail fare excluding Rajdhani/ Shatabdi Express by the shortest route. Participants are required to produce money receipt/ tickets in support of their claim. The reimbursement will be made as per ICAR guidelines. The candidates are advised to make their reservation in advance.

Boarding and lodging

Accommodation will be available on twin sharing basis in University Guest House.

Duration of course: 21 days (January 03-23, 2022)

Last date to apply: 15 December, 2021

Number of participants: 25 (Twenty-five)

Address for Correspondence

Dr. Upendra Kumar

Assistant Professor

Department of Molecular Biology, Biotechnology & Bioinformatics,

CCS Haryana Agricultural University, Hisar-125004

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How to apply

- Visit the website <https://cbp.icar.gov.in>. or Click on 'Capacity Building Program' link at <http://www.icar.org.in>
- Login using your User Id and Password. To create User Id use "Create New Account" link and fill required information to register.
- After login, click on "Participate in Training" link
- Select the particular training programme and fill the proforma online.
- Take a printout of filled application proforma and sign it.
- Get it signed by competent authority
- Upload approved scanned copy of the application on the above CBP Portal
- **Send approved application duly forwarded by the competent authority by post to Dr. Upendra Kumar; Course Coordinator, ICAR-Winter School, Department of Molecular Biology, Biotechnology & Bioinformatics, CCS Haryana Agricultural University, Hisar along with Postal Order/Bank Demand Draft of Rs. 50/- as registration fee (nonrefundable) in favor of Comptroller, CCSHAU' Hisar and payable at Hisar**

About the city

Haryana is the home of world famous "Murrah" buffaloes popularly called the 'Black Gold of India'. Firoz Shah Tughlaq founded Hisar in 1354 A.D. and has many places for visit like Ancient Gumbad, Agroha, Rakhigarhi, Baradari, Barsi Gate, Durgah Char Qutab, Feroz Shah's Palace, Gujari Mahal, Jindal Tower and Jahaj Kothi. Hisar is situated 184.0 km west of Delhi on the National Highway No. 09. It is well connected with rail and road routes. University campus is about 3.0 km away from railway station and 4.0 km away from bus stand.

REGISTRATION FORM

ICAR WINTER SCHOOL

On

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1. Name:
2. Designation:
3. Present employer and address:
4. Address for correspondence :
5. Telephone:.....Mob:.....
6. Email:
7. Date of birth:
8. Sex:
9. Educational Qualification(Graduation onwards):

Degree	Year	Univeristy	OGPA/Division

10. Teaching/Research/Professional Experience (Mention postheld during last five 5 years and number of publications):

Post Held	Institution	Period	Publications

11. Mention if you have participated in any research seminar/summer/winterschool/shortcourse etc. during the previous years under ICAR/other organizations

Training/Short Course	Year	Duration	Organizing Institute

It is certified that all the information furnished by me is true to the best of my knowledge.

Date:

Signature of applicant

Recommendation of forwarding authority with seal: