ICAR Sponsored Winter School on "Innovations in Integrated Management of insect pests and diseases of field crops through endophytes and PGPRs"

Background:

Plant diseases and insect pests take heavy toll in successful cultivation of field crops in India.The loss accounted due to pests and diseases account to nearly 30-45 per cent. Induced protection of plants against various pathogens and insect pests is emerging field in order to reduce use of pesticides and also aiming at Doubling farmers income by 2022. Since then several terms have been used to describe the phenomenon of induced resistance such as 'systemic acquired resistance, translocated resistance and 'plant immunization. Induced resistance is defined as an enhancement of the plant's defensive capacity against a broad spectrum of pathogens and pests that is acquired after appropriate stimulation. The resulting elevated resistance due to an inducing agent upon infection by a pathogen is called induced systemic resistance (ISR) or systemic acquired resistance (SAR).The induction of systemic resistance by rhizobacteria is referred as ISR, whereas that by other agencies is called SAR. SAR is expressed to a maximum level when the inducing organism causes necrosis whereas ISR by PGPR typically do not cause any necrotic symptoms on the host plants. A growing study hints at the possibility that we have been overlooking important attributes of endophytes in our quest to develop these microorganisms exclusively as biopesticides. An increasing number of recent studies demonstrated that entomopathogenic fungi play additional roles in nature, including endophytism, plant disease antagonism, plant growth promotion, and rhizosphere colonization. These newly emerging, but not yet fully understood, ecological roles provide opportunities for the multiple use of fungal and bacterial endophytes in integrated pest manaagement (IPM) strategies.

However, the emerging multiple roles played by endophytes provide promising potential for their indirect, multi- faceted and cost-effective use in sustainable agriculture, for instance as biofertilizers and dual microbial control agents of plant diseases and arthropod pests. Possible mechanisms of protection conferred by endophytic fungal entomopathogens and explores the potential use of these fungi as dual microbial control agents against both insect and pathogens. Moreover, interactions amongst endophytic fungal entomopathogens and other endophytes are required for developing long term area wide IPM/IDM programmes.

Plant growth promoting rhizobacteria (PGPR) belonging to *Pseudomonas* spp. & other microoraganisms are being exploited commercially for plant protection to induce systemic resistance against various pests and diseases. Mixtures of PGPR strains have resulted in increased productivity and suppression of insect pests and diseases of field crops by inducing systemic resistance against several pathogens attacking the same crop. Seed-treatment with PGPR causes cell wall structural modifications and biochemical/physiological changes leading to the synthesis of proteins and chemicals involved in plant defense mechanisms. Lipopolysaccharides, siderophores and salicylic acid are the major determinants of PGPR mediated ISR. The performance of PGPR has been successful against certain pathogens, insect and nematode pests under field conditions.

The utilization of natural PGPR strains as inducers of plant defence responses may increase the chance of their applicability and a practical way to deliver immunization.

Hence,the winter school covers the innovations made on these aspects in sustainable management of insect pests and diseases of field crops with an aim of Doubling farmers Income by 2022.

About the Course

The course content mainly involves lectures from subject experts, practicals and also field visits on **Innovations in Integrated Management of insect pests and diseases through endophytes and PGPRs .**The contents of the Training Program include various pest and disease management approaches in field crops through application of endophytes, plant growth promoting rhizobactebia, biorationals and their characterisation, profiling, mass production and formulations etc.The course will educate in cutting edge areas of science & technology in this emerging areas of endophytes and PGPRs.

Date and Venue:

The winter school will be organised for 21 days from 13th November to 3rd December,2018 at the Department of Plant Pathology, College of Agriculture, University of Agricultural Sciences, Dharwad

It is on the National Highway No. 04 connecting Pune (Maharashtra) to Bengaluru (Karnataka) well connected by rail and road.

Eligibility

Participants from ICAR Institutes/State AUs/CAU/ Agricultural faculty of AMU, BHU,Vishwa Bharti and Nagaland University in the cadre of Assistant Professors or equivalent and above are invited. The participants with Masters degree in Agriculture/Horticulture/Life Sciences with specialization in Plant Pathology, Agril. Entomology,Agril.Microbiology,Genetics and Plant Breeding,Seed Science & Technology and Horticulture are eligible.

Registration

Interested candidates have to apply online through Capacity Building Programme(CBP) portal at URL:http://cbp.icar.gov.in/applydetails/aspx.Applicant has to pay a non refundbale Registration fees of Rs.50/- in the demand draft or Indian Postal Order(IPO) drawn in favour of "The Comptroller,UAS,Dharwad" payable at Dharwad.The online filled in application should be printed out and approved from respective competent authority of the organization.Duly approved application form along with registration fees should be sent to **The Course Director** on or before the closing date (20-10-2018).If required an advance application may be sent to the Course Director.However,their selection will be subject to receiving of approved application only.The selection of candidates will be informed through e mail only and they should confirm the acceptance through return e mail within two days.

Travelling allowance and accommodation

Travel fare to & fro will be provided as per ICAR Norms.The reimbursement will be limited to AC II tier by Train/Air Conditioned Bus by shortest route from their place of working for attending the winter school. Travel by Air is not permissible. Photocopy of ticket by train/bus need to be produced for reimbursement. For out station participants accommodation will be arranged on twin sharing basis. Meals and refreshments will be provided as per ICAR rules for winter school. The Local participants will be provided lunch and inter session tea only.

Weather in Dharwad

Weather will be pleasant in Dharwad with maximum and minimum temperature of the city will be around 28^0 C and 15^0 C during November-December months.

About UAS,Dharwad

The University of Agricultural Sciences, Dharwad, established on 1st October 1986, presently has 5 Degree/PG Colleges, 7 Diploma Colleges, 30 Research Stations, 6 Extension Education Units, 5 Krishi Vigyan Kendras and the ATIC. The University, with its jurisdiction spread over seven districts of northern Karnataka namely Bagalkot, Belagavi, Dharwad, Gadag, Haveri, Uttar Kannada and Vijayapur caters to the research needs of diverse soil types, climate, topography, cropping and farming situations. The University has won several prestigious awards,to name few National Productivity Council Award (1986-87). Sardar Patel Outstanding Institution Award (2000 and 2015), Indira Gandhi National NSS Award (2001), CGIR King Baudouin Award (2002) and ICRISAT's Doreen Mashiar Award (2002) for Chickpea improvement; More number of Junior Research Fellowships of ICAR (2005-06, 2006-07, 2007-08, 2009-10, 2014-15); Mahindra Samurdhi Krishi Samman Award (2013); Jawaharlal Nehru Awards (15) and Sir C V Raman Young Scientist Awards (09) for outstanding contributions in the field of agricultural research. The University has about 100 National and International Academic collaborations. Research needs of farmers in the region are catered through 30 research stations spread across five agro-ecosystems and 26 All India Coordinated Research Projects (AICRPs). Presently several externally funded projects are operating in the University undertaking bacis and applied research. Several nationally / internationally funded programmes like Obama Singh Knowledge Initiative, ICAR Niche Area of Excellence, CIDA-McGill Collaborative Project, World Bank funded Sujala-III project are being implemented in the University. Intellectual Property Rights & Commercialization (IPRC) cell has been set up under the Directorate of Education to educate faculty on IPR issues and promote IP protection.

The Historical of the City:

Dharwad is the district headquarters in Karnataka and merged with Hubballi city in 1961 to form the twin city. Hubballi-Dharwad is the second-largest city in Karnataka after Bengaluru. While Dharwad is the administrative headquarter, the city of Hubballi, is the commercial centre and business hub of North Karnataka. Dharwad is famous for its Dharwad Peda a milk based sweet. Dharwad is well-known for its contributions to Indian classical music and to Kannada literature. Dharwad district is the place which produced national and international level musicians like Mallikarjun Mansur, Gangubai Hangal, and winner of the Bharat Ratna award, Pandit Bhimsen Joshi. It has prestigious educational institutions. The twin cities is familiar for its historical monuments of architectural/religious importance, *viz.*, Chandramouleshwara Temple, Banashankari Temple, Nuggikeri Hanuman Temple, Nrupatunga Hill, Navagraha Teertha, Indira Gandhi Glass House Garden, Unkal Lake and Siddharoodha Math.

Places of Historical Importance: Badami, Aiohole and Pattadakallu,Gol Gumbhaj(Vijayapur), Hampi, Utsav Rock Garden,Gotagudi, Haveri District & Goa.

GI Tags: Dharwad Peda, Dharwad Cotton Saries, Belgavi Kunda,Gokak Kardant.

Lead Educational Institutes: Karnataka University, Dharwad, Indian Institute of Technology,University of Agricultural Sciences,Dharwad & Medical and Engeering Collges.

Important Dates

- Last date for receiving applications:20-10-2018
- Intimation of Selection:25-10-2018.
- Training:13-11-2018 to 3-12-2018

Address for Correspondence-Course Director

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UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD

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(13th November to 3rd December,2018)

Organized By:

DEPARTMENT OF PLANT PATHOLOGY
UNIVERSITY OF AGRICULTURAL SCIENCES
Krishi Nagar, Dharwad - 580 005, Karnataka, India