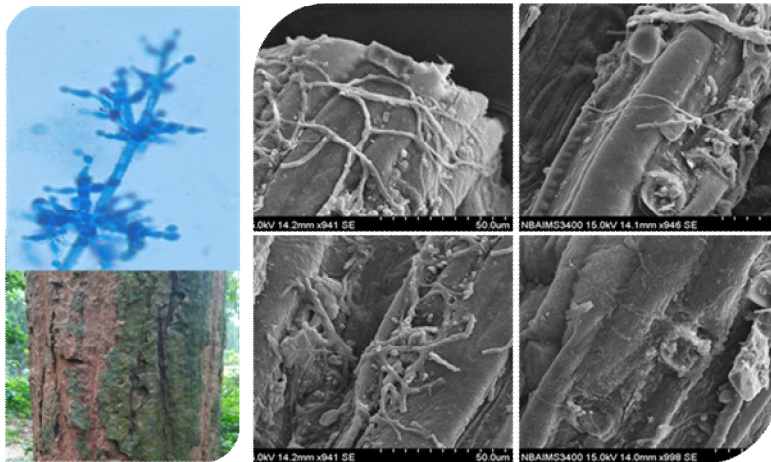
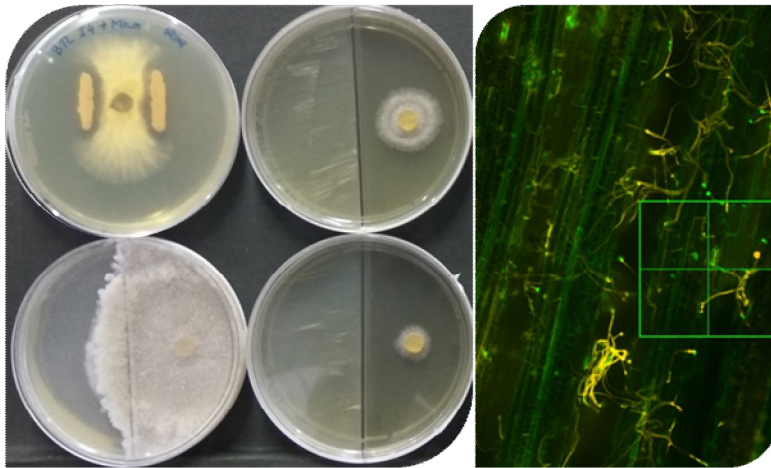




National Training on

Biocontrol strategies for invasive and emerging plant pathogens

September 21st to September 30th, 2019



**ICAR-National Bureau of Agriculturally Important
Microorganisms**

(ISO 9001:2008 Certified Institute)

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About NBAIM

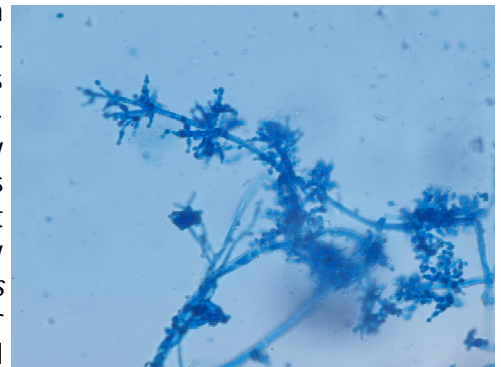
ICAR-National Bureau of Agriculturally Important Microorganisms (NBAIM) is one of the premier institutions of Indian Council of Agricultural Research (ICAR) leading research and development programs in the field of Agricultural Microbiology in India. The Bureau aims at collection, maintenance and conservation of agriculturally important microorganisms and their genomic resources for future needs. The Bureau is engaged in the cutting-edge research in Agricultural Microbiology, Microbial Biotechnology, Plant Pathology and Bioinformatics for benefit of Indian agriculture and farmers. Apart from core research, human resource development is also one of its mandates. The Bureau has organised several successful training programs on various aspects of basic and applied sciences to benefit different stakeholders of the society. In this line, national and international training programs on different areas of molecular microbial identification, characterization, molecular taxonomy, biocontrol, specific utilization of microbes in agriculture, plant-microbe interactions and the applications of bioinformatics in gene mining have been organized since the inception of the Bureau.



Key research areas at ICAR-NBAIM pertain to microbial diversity analysis from extreme and unique habitats, biological control of plant diseases, microbe mediated plant growth promotion, plant-microbe interaction, abiotic stress tolerance, quality microbial management system with special emphasis on biosystematics, DNA fingerprinting, microbial genomics, proteomics, metabolomics and bioinformatics.

Background

Food security is necessary to feed the burgeoning human population which is increasing at the rate of more than one percent per year in India. It could be achieved only by increasing crop productivity as well as reducing losses of food produce during crop production and after harvest. Moreover, yield losses due to emerging plant diseases suddenly affect the food stability. Number of historical and current plant diseases have emerged and threatened the crop in large areas. Among the most devastating examples of disease epiphytotic which affected humanity are Ireland famine caused by a new strain of *Phytophthora infestans* and Bengal famine caused by *Helminthosporium oryzae*. Now a number of plant pathogens have emerged and became devastating and affected number of hosts. Some of the emerging and devastating pathogens are *Fusarium oxysporum* f.sp. *cubense* causing Panama wilt of banana, *Rhizoctonia* spp causing sheath and leaf blight, *Fusarium* spp. causing wilts in many plants, *Macrophomina phaseolina* causing dry root rot and *Ralstonia solanacearum* causing bacterial wilt of tomato, etc.

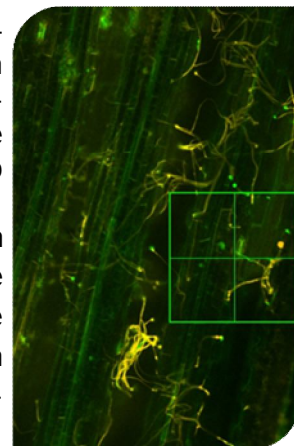


Various anthropogenic activities for agricultural intensification have strongly affected the environmental and agricultural ecosystem at a global scale. A change in climate has led to the emergence of new fungal plant pathogens. Plant pathogens that were earlier minor have now become major and cause huge economic loss. It is due to an increase in virulence, infection of a novel host and/or occurrence in a new areas. Domestication of crop species from the wild population based on its agronomic criteria is the most important activities in agricultural development. Naturally, plants were grown in random distribution, low plant density, high genetic diversity, and uneven nutrient availability. However, when monoculture is practiced the incidence of disease increases and accordingly the losses are more. This phenomenon is well described in rice domestication with its associated fungal pathogen *Magnaporthe oryzae*. The emergence of plant pathogens is driven mainly by anthropogenic change (introduction, farming techniques, and habitat disturbance), trade and land use pattern. In many cases, plants introduced in a new region for crop diversification are infected by endemic pathogens of other host species. With the declining market price of traditional crops, farmers shifted to other non traditional crops mostly fruits and vegetables. These crops grown throughout the year have promoted the frequent occurrence of pathogens and increase in incidence and severity of diseases due to continuous availability of the host.

In general plant pathogens are co-evolved with the host. However the emergence of new pathogens is driven by other factors, including introduction of a pathogen into new regions, adaptation of new host, alteration of temperature due to climate change, etc. Pathogen biology and ecology may be difficult to predict in new

environments. Well established plant disease management strategies including chemicals is the key to reduce the pathogen effects but it is not equally effective against each pathogen especially against emerging and invasive plant pathogens in the newer regions. Chemical control of plant pathogens is considered as one of the most effective control measure regardless of being costly and toxic to non target organism in agro ecosystem.

The decline in environment quality has forced the scientists to look for green technologies for control of pathogens. Microbe based technologies have emerged as the most viable option in the recent years and several biopesticides using microbes have been commercialized. The understanding of microbe plant interaction and formulation of different microbe based plant protection strategies can be utilized to curtail the effect of emerging and invasive plant pathogens.



Theme

In this perspective, the following thematic areas will be addressed in this training –

- Understanding the nature and spread of emerging and invasive plant pathogens.
- Modern tools and approaches used in the study of microbe-plant interactions.
- Novel approaches for the management of plant diseases using biocontrol agents.
- Formulation and evaluation of different microbe based management strategies in plant pathogen management.
- Development of research modules and pipelines for commercialization and regulatory requirement concerning biopesticides

The training program will include both lectures and practical sessions on the above thematic areas. Resource experts from the Bureau and other reputed institutions will address the participants.

Expected benefits to the participants

- Participant will get hands-on experience in different microbe based plant disease management strategies. Isolation and characterization of fungal and bacterial bioagents following conventional and advanced techniques and tools.
- Young researchers will get structured training on the handling of biocontrol agents and applied aspect of formulation and evaluation of plant-pathogen management strategies.
- Anyone involved or embarking into the field of biological control of plant pathogens will be benefited by getting exposure and know-how to the cutting edge research.

Eligible participants

Ph.D. students, Research Scholars, Post-Doctoral Students, Technical Officers, Scientists/Assistant Professors/Lecturers or above, from any university/institute/organization working in the area of biological sciences.

Fees for the training

Rs. 2500 per trainee for students/ research scholars and Rs. 5000/- for Technical officers, Scientists/Assistant Professors/Lecturers or above from Public/Private Universities or Govt. Institutions. Rs. 10000/- per trainee for researchers from private or Non-Government organizations/Companies/Firms.

How to apply?

Eligible participants may write to the Director, ICAR-NBAIM along with their RESUME (not more than one page) on/or before 26th August, 2019 to email id: nbaimicar@gmail.com

Please send a copy also to- drharsh2006@rediffmail.com.

The selected candidates will be notified on or before 31st August, 2019 by E-mail.