

Proceeding of review meeting of outreach programme PhytoFuRa at NASC lecture hall, New Delhi on

15 March 2010

The meeting started at 08:30 hours with the introductory remarks by DDG (Hort) and DDG (Crop Sciences). The project coordinators of the projects, Dr. M. Anandaraj for PhytoFuRa and Dr. P. Chowdappa for Foliar diseases gave overview of the project and its annual achievements. DDG (Crop Sciences) emphasized the importance of deciphering molecular mechanisms of governing host pathogen interaction. The benefit of execution of projects under network mode was highlighted by DDG (H).

While delivering his address, DG appreciated the efforts by DDGs for coordinating the projects under network mode in India under ICAR. DG appealed (to the scientific community) to determine threshold level of pathogen for causing the diseases in plants in order to preserve the pathogen biodiversity while keeping the disease under check. Inconsistencies related to the effects of biocontrol especially with much hyped *Trichoderma* need to be address, he added

The salient recommendation emerged from the presentation and the subsequent discussion are furnished below

1. *Phytophthora*

The web portal, which houses the information related to *Phytophthora*, *Fusarium* and *Ralstonia* and its utility for day to day monitoring the project was highlighted by Dr. Eapen of IISR, Calicut. The right of access to the portal is for all the collaborators of the network project

General recommendations emerged

- i. Phytoplasma wilt of coconut can be a part of this net work project
- ii. Core collection of cultures of *Phytophthora* assembled under PHYTOFURA project at various centers need to be pooled at the nodal center, IISR, Calicut
- iii. Construction of phylogenetic tree based on various molecular markers should involve an out-group from a closely as well as a distantly related organisms
- iv. Recent incidence of *Phytophthora* epidemics in tomato need to be addressed in the project

Specific recommendations

- i. IISR, Calicut: Species and strain specific diagnostics should be given priority
- ii. CPRI, Shimla: Request for an isolate of *Pseudomonas* by NRC on Grape for evaluation trials in grape is accepted and the culture will be sent after generating few additional data within a year
- iii. CPCRI, Kasaragod: Seedling progenies of cocoa need to be analyzed for possible segregation of progenies for resistance reaction against *Phytophthora*
- iv. CTCRI, Thiruvananthapuram: Consequent upon the transfer of Dr. Misra, Dr. Vinyak Hegde will be the project investigator with immediate effect
- v. NRC (Citrus), Nagpur: The old collections of *Phytophthora citrophthora* made by Late Dr. Naqvi need to be revisited in the new project
- vi. ICAR Research Complex for NE: Local strains of *Trichoderma* should be given emphasis especially the ones with “hyper-sporulation”. Biological control agent must be isolated when the disease is in its peak in the field during the crop season. The off season collection can be stopped.

2. *Fusarium*

General recommendations emerged

- i. Compatibility studies on biocontrol agents for development of consortium of antagonists must involve the pathogen in the assay
- ii. Diagnostics for plants and soil need to be given priority under the project
- iii. Core collection of cultures of *Fusarium* assembled under PHYTOFURA project at various centers need to be pooled at the NBAIM, Mau
- iv. Training on molecular biological techniques to be imparted to the needy network centers under PhytoFuRa

Specific recommendations

- i. IARI, New Delhi: New isolates need to be deposited at NBAIM, Mau,
- ii. IIPR, Kanpur: Common research methodology need to be adopted (eg. Media)
- iii. DOR, Hyderabad: The center must develop diagnostic methodology for *Fusarium*
- iv. CISH, Lucknow: The reported resistant root stocks of Guava need to be registered with NBPGR, New Delhi. The centre must demonstrate the technologies developed for guava wilt management
- v. IIVR, Varanasi: Consequent upon the transfer of the present investigator, Dr. Loganathan will lead the project. Dr. Naik of UAS, Raichur would share the cultures of chilli isolates to the center for comparison
- vi. NRC (Banana), Trichy: Opportunistic human or animal pathogens need not be used for any kind of agricultural use especially in biological control.
- vii. NBAII, Bangalore: Methodology for elicitin based seedling dip need to be standardized
- viii. NBAIM, Mau: Issues related to culture deposit need to be sorted out

3. *Ralstonia*

General recommendations emerged

- i. IISR, Calicut would impart training on basic bacteriological and molecular biological techniques to the network centers under PhytoFuRa
- ii. The reported difficulty in isolating genuine isolate of *R. solanacearum* is to be addressed with the help appropriate expertise within the PhytoFuRa. The timing of the training will be worked out in consultation with the collaborating centers
- iii. The pathogenicity of the isolates needs to be confirmed prior to deep analysis by genotypic methods and the duplicate isolates need to be eliminated using appropriate tools (eg. BOX-PCR) prior to make core repository
- iv. Core collection of cultures of *Ralstonia solanacearum* assembled under PHYTOFURA project at various centers need to be pooled at the nodal center, IISR, Calicut
- v. Cross infectivity of the isolates on various Solanaceous and Zingiberaceae host may be conducted at all the centers
- vi. Hotspot areas of disease need to be explored for collection of isolates and the same may be executed under joint survey and explorations
- vii. Diagnostics need to be given priority under the project
- viii. Expertise based priority need to be workout for each of the center

Specific recommendations

- i. IISR, Calicut: IISR will organize hands on training for the network centers on basic bacteriological tools. Characterization by latest genotypic methods (analysis of virulence and house-keeping genes) will be handled by IISR, Calicut for all the nation- wide collection of *R. solanacearum* under PhytoFuRa to develop a virulence map (of *Ralstonia solanacearum*) in India and bar-coding thereof. Biocontrol strategies need to be prioritized for management of bacterial wilt of ginger
- ii. IIHR, Bangalore: Diagnostics will be given priority and the center will work in close collaboration with nodal center at IISR, Calicut to that effect. Biocontrol strategies need to be prioritized for management of bacterial wilt of chilli

- iii. ICAR-RC-Goa: Biovar specific and race specific probes need to be developed from the core collection of *R. solanacearum* rather than exploiting the general primers available in public domain. Biocontrol strategies need to be prioritized for management of bacterial wilt of eggplant
- iv. IARI, New Delhi: Biovar specific and race specific probes need to be developed from the core collection of *R. solanacearum* rather than exploiting the general primers available in public domain. Biocontrol strategies need to be prioritized for field control of bacterial wilt in solanaceous tomato
- v. ICAR-RC-NE, Umiam: The centre is handling two projects under PhytoFuRa. In order to reduce the work pressure, the centre must reorient the working arrangement for *Phytophthora* and *Ralstonia* in future. Biocontrol strategies need to be prioritized for the crops identified for these regions
- vi. NBAII, Bangalore: The center will initiate biocontrol strategies using bacterial antagonist isolated from suitable sources in addition to phage mediated biocontrol of all *R. solanacearum* representing the priority crops

Specific suggestions aired by DDG (Horticulture)

1. Molecular characterization of *Trichoderma* species in order to clear the confusions in taxonomic identity as well as the diversity. Two institutes namely , IARI, New Delhi and IISR, Calicut would coordinate this programme
2. Phytoplasma disease of palms can be integrated into the programme on PhytoFuRa and consequently the advancements made on this pathogen will be reported under this project
3. Core collection of *Phytophthora*, *Ralstonia* and *Trichoderma* will be handled by IISR, Calicut. The collection of *Fusarium* would be maintained by NBAIM, Mau and IIPR, Kanpur
4. Disease combating strategies through planting material and soil health management need to be worked for these pathogens in every crop identified under this programme