

**Proceedings of the Training Programme on
"Production of VAM Bio-Fertilizer"
To Officials of the State Forest Department, Government of Karnataka**

Venue: Institute of Forest Genetics and Tree Breeding, Coimbatore

Duration of the training: 8 to 9 August, 2019

Training Coordinator: Dr. V. Mohan, Scientist-G & Head,
Forest Protection Division, IFGTB, Coimbatore

Funding Agency: State Forest Department, Govt. of Karnataka

Bio-fertilizers are ready-to-use carrier based formulations containing beneficial microorganisms that can be applied by mixing with seed or soil. These beneficial microorganisms are known to produce extracellular enzymes, growth promoting substances and enrich the soil with other beneficial micro-flora that facilitates breaking down of the essential mineral nutrient elements, enhance growth and biomass and ward off pathogenic organisms, respectively and thus maintain the soil nutrient equilibrium and health. Application of bio-fertilizers benefits in significant reduction of synthetic chemical fertilizers/pesticides so as to continue with sustainable crop production causing relatively less pollution to the environment. The Institute of Forest Genetics and Tree Breeding (IFGTB) has been quite familiar in the field of research in beneficial Plant Growth Promoting Microbes such as Plant Growth Promoting Rhizobacteria (PGPR) and Arbuscular Mycorrhizal (AM) fungi of varied agro-forestry ecosystems and in reclamation of mine spoil areas, mine over burden dumps, etc. Having known by the credentials in the field of extensive research on beneficial microorganisms, IFGTB was approached by the **State Forest Department, Government of Karnataka** to offer a two days training programme on Production of VAM Bio-fertilizer to their officials representing Ballari Circle of the State Forest Department. The training was arranged to conduct at the Institute of Forest Genetics and Tree Breeding, Coimbatore from 8-9 August, 2019 and a team of 11 SFD Officials belong to the rank of Assistant Conservator of Forests, Range Forest Officers and Deputy Range Forest Officers led by **Dr. Malathi Priya, IFS, Conservator of Forests (Research), Ballari** had attended the training.

Dr. V. Mohan Scientist-G & Training co-ordinator gave an overview of the training and he highlighted the importance of VAM bio-fertilizer in promoting the plant growth by making available the essentials nutrients, minerals, other growth promoting substances, etc.,

to plants as well as enhancing overall soil health and offering protection against pathogenic organisms. He told that IFGTB has conducted several research extension training programmes on quality VAM bio-fertilizer production technology to various stakeholders including, SFDs, Tribal populace, women SHGs, etc. In view of this training, he expressed his deep sense of gratitude to the **Heads of Forest Force of the Govt. of Karnataka** for choosing the IFGTB as a potential nodal agency for providing such training to their staff and extending the offer for co-operation in providing scientific advice in this field.

Dr. S. Murugesan Director, IFGTB, in his inaugural address, mentioned that IFGTB has been doing advance and finest research in the field of forest environment and biodiversity and very keen in the development and extension of technologies to various stakeholders comprising of vast majority of populace from tribals to wood based industrialists. He pointed out that ecosystem health and dynamics is very much dependant on plant microbe interaction and the root colonizing soil microbes are very much instrumental for not only maintaining the soil equilibrium, but also shapes the destiny of the ecosystems. Further, he elaborated that microbes helping the plant growth is not a new idea, but making use of the beneficial microbes in production enhancement of agriculture and allied crops are relatively a new initiatives and most of the nations have progressed much in this field. Although bio-fertilizers are available for many agriculture crops from many sources, he expressed his concern that of the forestry trees for application in tree nurseries are seldom available. Also, he stressed that it is equally important to have quality bio-fertilizer products for production of healthy and quality planting material for forestry operations by stakeholders like Forest Departments.

The Training Co-ordinator Dr. V. Mohan, Scientist-G gave an elaborate lecture on 'Microbial bio-fertilizer Technology' and in that he explained about different kinds of microbial association with tree species in the forest environment and the mechanisms of their interaction that influence in maintaining the equilibrium of the environment. The lecture emphasized more on the biodiversity of beneficial microorganisms in the forest environment and the method and process to harness them for the benefit of growing quality and healthy planting stocks in tree nurseries. The lecture covered all the aspects in detail about the free living as well as symbiotic beneficial microbes especially the Mycorrhizal fungi that are known to form symbiotic association with the root system of plants and offer immense benefits varying from nutrients supply to protection against pathogens for the host trees. The method of collection of soil samples, isolation, characterization, identification & purification

and mass multiplication for application of VAM bio-fertilizer in raising quality and healthy seedlings were explained during the lecture.

Followed by the lecture class, Dr. Mohan and the technical staffs led the participants to experience the hands on training on isolation of VAM spores from rhizosphere soil samples by adopting wet sieving and decanting technique and estimation of colonization in root samples.

The second day of the training programme started with the lecture on 'Application Technology of VAM Bio-fertilizer' by Dr. A. Karthikeyan, Scientist-F. The presentation was mainly emphasized on basic information regarding identification of VAM spores, pure culture production, mass multiplication and use of PGPR for various reclamation activities.

As part of the training, the participants were exposed to the Glass House and VAM Production Unit facilities at the IFGTB and explained for pure culture and large scale production of VAM bio-fertilizer. The trainees had the opportunity to closely observe the trap culture method of multiplying pure strains of VAM using maize seedlings as host plant raised on soil-sand-vermiculite potting mixture. The trainees also observed large scale production of VAM bio-fertilizer at VAM Production Unit facility established at IFGTB and the product is being sold under the trade name *IFGTB Tree Growth Booster*.

During the valedictory session of the two days training, Dr. V. Mohan, the Training Co-ordinator briefed Director, IFGTB the actual programme of activities delivered to the participants. Further, the trainees were requested to give their feedback regarding the training and accordingly, the trainees have expressed that the training was very much informative and quite useful for practical implementation in their respective Research Circles of Karnataka Forest Department. The team leader of the trainees Dr. Malathi Priya, IFS, felt that the training was meticulously planned, directed enough to sensitize the target group and overall a very successful event.

The Director thanked the Training Coordinator and the team of the Forest Protection Division for successful conduct of the training. The Training Coordinator, Dr. Mohan, proposed the formal vote of thanks and he thanked the trainees of Karnataka Forest Department for their co-operation, the Director, IFGTB for providing all the facilities as well as the Scientists and Technical Staff of the Division, who were instrumental in arranging all the necessary facilities for successful completion of the training.



Dr. S. Murugesan, Scientist-G, Director, IFGTB addressing the participants during the Inaugural Session



Group photo of the participants of the training with the Director IFGTB, Training Coordinator and staff of the Forest Protection Division



Dr. V. Mohan, Scientist-G & Training Co-ordinator and Dr. A.Karthikeyan, Scientist-F interacting with the trainees on various aspects of Mycorrhizal Technology



Participants of the training experiencing the laboratory procedures for the processing and analysis of soil and root samples



Participants of the training interacting about VAM pure culture production at Glass House and VAM bio-fertilizer Production Unit



Dr. S. Murugesan, Scientist-G, Director, IFGTB addressing the participants during the Valedictory Session



Participants of the training receiving the Training Certificate and VAM bio-fertilizer Product