

**PROCEEDINGS OF THE INSTITUTE LEVEL MONTHLY SEMINAR HELD
ON 31.01.2020 IN THE CONFERENCE HALL OF HIMALAYAN FOREST
RESEARCH INSTITUTE, PANTHAGHATI, SHIMLA, HIMACHAL PRADESH**

In the series of Monthly Seminar, a talk on “**Artificial Inoculation of Ectomycorrhizal Fungi in Nursery to Raise Healthy and Tall Planting Stock of Conifers**” under the thrust area “**Managing Forests and Forest Products for Livelihood Support and Economic Growth**” was delivered by **Dr. Ashwani Tapwal**, Scientist-E, Forest Protection Division on **31st January, 2020**. All the Scientists, Forest Officers, Researchers and Technical Staff were present during this seminar.

Dr. S.S. Samant, Director, HFRI chaired the proceedings of monthly research seminar. **Dr. Rajesh Sharma**, Group Coordinator Research (GCR) welcomed the Director, HFRI and all the participants. He apprised the house about the intent behind organizing these periodic seminars and



benefits of interactions held towards future research perspectives at the Institute level. He requested all, to actively participate in the discussion and give valuable suggestions.



In his presentation, **Dr. Ashwani Tapwal**, Scientist-E described various issues on ectomycorrhizal biotechnology and highlighted the current status of mycorrhizal research globally and specifically in ICFRE Institutes. He elaborated the importance of mycorrhizae in forest ecosystem and their role in raising tall and healthy planting stock of conifers and other broad leaved species. The speaker

informed that the planting stock raised by application of mycorrhizal inoculum in nursery have better growth and survival outplanting. He also emphasized on the need for conservation of mycorrhizal fungi.

Dr. Tapwal also elaborated different techniques available for artificial inoculation of seedlings during nursery operations. He informed that at present, Forest Department is using soil of natural forests to meet the requirement of ectomycorrhizal inoculum in the nursery. Though, this method fulfills the need of ectomycorrhizae, but requires more manpower and money to collect and

transport bulk quantity of soil. Besides, there is always possibility of introduction of weeds and pathogens with collected soil. Dr. Tapwal was of opinion that application of pure cultures of ectomycorrhizal fungi during nursery operation will be more beneficial.

The presenter sharing the research work carried out by Forest Protection Division of the Institute to raise the planting stock of *Pinus gerardiana* by artificial inoculations with *Scleroderma polyrhizum*, informed that inoculated seedlings have shown higher growth in nursery and better survival in outplanting.

Dr. Tapwal concluded his talk with emphasis on research needs in the field of mycorrhizal biotechnology and further presented the road map where Institute can collaborate with other research organizations for better and effective outputs.



Dr. S.S. Samant, Director, HFRI appreciated the presentation and inquired about most suitable ectomycorrhizal association in conifers. Dr. Tapwal responded by informing that most of the ectomycorrhizal fungi have wide host range and succession of different ectomycorrhizal fungi occurs



with the roots. **Dr. Rajesh Sharma, GCR** informed about the poor success rate of *Cedrus deodara* naked root stock outplanting. He suggested to conduct trials on performance of mycorrhizically tailored naked root stock of *C. deodara*. In response, Dr. Tapwal informed that the Forest Protection Division has culture collection of ectomycorrhizal fungi, and will initiate work on

these lines.

In response to the query of **Sh. Jagdish Singh**, Scientist F regarding the viability of cultures of ectomycorrhizal fungi, Dr. Tapwal informed that cultures of ectomycorrhizal fungi can be maintained under laboratory conditions on suitable media for infinite duration by successive subculturing.

Outcome of the Seminar

A). Identification of research needs:

- i. Comparative studies on the physiology, ecology, and symbiotic efficiency of different fungal species
- ii. Further studies on mycorrhizal relations among the poorly known ectomycorrhizal trees
- iii. Endomycorrhizae of forest trees
- iv. Cultures of mycorrhizal associates of conifers need to be isolated and conserved
- v. Identification of ECM fungi with wide host range
- vi. Development of a technique for seed inoculation

B). Formulation of future strategies/ road map: It was decided that the institute can work on following topics:

- i. Screening of ectomycorrhizal fungi have wide host range
- ii. Standardization of inoculation technique of conifers with ectomycorrhizal fungi to improve the survival of seedlings with naked roots
- iii. *In vitro* conservation of cultures of ectomycorrhizal fungi.

C). Networking research options identified: State Forest Department, HP University, Shimla, Dr. YS Parmar University of Horticulture and Forestry, Nauni, Solan, HIMCOSTE, Shimla, HP CSK Agriculture University, Palampur.

D). Future research directions discussed for implementation and opportunities for funding:

With collaboration of the identified agencies, the Institute needs to formulate project on different aspects of mycorrhizal biotechnology and submit to funding agencies like Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi, GB Pant National Institute of Himalayan Environment and Sustainable Development- Almora (UK), State Forest Department, HIMCOSTE, DST, DBT etc.

In the end, **Dr. Rajesh Sharma GCR** thanked **Dr. S..S. Samant**, Director, HFRI and Chairman of the monthly seminar, the presenter, Forest Officers, Scientists, Technical Officers and staff and all the researchers for their active participation and inputs for making the seminar successful.