

**Training report on**  
**Estimation of heartwood content in sandalwood using ERT**  
**ICFRE-Institute of Forest Genetics and Tree Breeding**  
**5 March 2025**

The training was conducted under the aegis of All India Co-ordinated Research Project on sandalwood titled “Conservation, Improvement, Management and Promotion of Sandalwood (*Santalum album* Linn.) cultivation in India”. The training was conducted in collaboration with ICFRE-Institute of Wood Science and Technology, Bengaluru and was imparted to 15 Forest Range Officers from Tamil Nadu Forest Department and 13



progressive farmers from the state. At the outset, Dr. Mathish Nambiar Veetil, Scientist G & Head, Division of Plant Biotechnology & Cytogenetics welcomed the participants. This was followed by an overview of the activities undertaken in AICRP on sandalwood by Dr. Modhumita Dasgupta, Training Co-ordinator and National Project Co-ordinator of the project. She highlighted the need for implementing a structured breeding program in sandalwood to supply quality planting material to the stakeholders. She further informed that the non-invasive technology of Electrical Resistivity Tomography (ERT) for estimating heartwood content in standing trees was developed under the program by Dr. B.N. Diwakara, Scientist F, ICFRE-IWST and the same was extended to farmers and forest departments of Karnataka, Andhra Pradesh and Chhattisgarh. The need to introduce the technology to sandalwood growers of Tamil Nadu was reiterated.

Subsequently, Dr. R. Yasodha, Scientist G highlighted the different tree breeding programs being implemented at ICFRE-IFGTB and the reach of clones developed by the Institutes across the country. The inaugural address was delivered by Dr. C. Kunhikannan, Director, ICFRE-IFGTB.

He reiterated the importance of robust phenotyping system in tree breeding programs. He also mentioned that the estimation of heartwood content in field will support the sandalwood growers in assessing the quality of the timber and also its market value. He urged the participants to interact with the resource persons and disseminate the technology across the state. The inaugural session concluded with vote of thanks by Dr. A. Balasubramanian, Scientist B, ICFRE-IFGTB.



As a prelude to the demonstration on ERT technology, short presentations were made on ‘Sandalwood Breeding Program’ by Dr. V. Sivakumar, Scientist G, ICFRE-IFGTB; ‘Sandalwood based agroforestry system’ by Dr. C. Buvaneswaran, Scientist G, ICFRE-IFGTB and ‘Estimation of heartwood content in sandalwood using ERT’ by Dr. B.N. Diwakara, Scientist F, ICFRE-IWST, Bengaluru.



The demonstration on use of ERT to estimate heartwood formation in sandalwood was conducted in the farmer’s field in Muthandipalayam, Palladam, Tiruppur District. Initially, an interactive session was held with all the



participants to understand the challenges faced in establishing and maintaining on farm sandalwood plantations. Several farmers expressed that the unavailability of quality planting material from known



sources, use of different hosts in trials, protection of mature trees and knowledge on heartwood formation were major concerns in sandalwood. Dr. B.N. Diwakara explained the process of heartwood estimation using ERT while Dr. C. Buvaneswaran answered the queries regarding agroforestry trials. Subsequently, heartwood was estimated in different age classes using ERT. The 2D and 3D visualization of the heartwood content was also done. Dr. Diwakara further explained the method to predict the volume of heartwood content and biomass based on the bole height, girth, tree diameter, heartwood diameter and percent heartwood. The equation was shared with all the participants.

The training ended with distribution of certificates to the participants.