Project Profile

Project Code:	IFGTB/RP/77
Project Title:	Development of advanced generation seed orchard of A. mangium based on biomass and wood density
Principal investigators	Dr. Maheshwar Hegde Scientist G
Funding Agency	ICFRE
Date of commencement of the project:	01-04-2009
Date of completion of the project:	31-03-2014
Total Budget of the project	15.31 lakhs

Objectives:

Long term objectives:

1. Development of Advanced Generation Seed Orchards of Acacia mangium, supply of improved seeds to user agencies and improvement of productivity

Short term objectives:

2. Evaluation of families of A. mangium for better growth as well as wood density.
3. Selection of trees based on index selection.
4. Raising progeny trials of selected trees for establishment of advanced generation seed orchards after evaluation.

Abstract of significant findings:

This project was initiated in August 2009 with an aim of developing advanced generation seed orchard of Acacia mangium for improved productivity and higher wood density. Initaially,existing breeding populations of Acacia mangium in the form of seedling seed orchards (SSOs) at Karunya in Tamil Nadu and Nilambur established during November 1997 and June 1998 respectively were evaluated for growth as well as wood density. The survival, growth and tree form were better at Nilambur which is a relatively high rainfall area (2500 mm) compared to relatively drier Karunya (1000 mm). A. auriculiformis (control) performance was better at Karunya. Evaluation of families and seed sources revealed that among the seed sources SSO (Karunda PNG SE) QLD , and Bituri PNG performed better for total tree height though they were not significantly different from many other seedlots. SSO (Karunda PNG SE) and QLD, Komavel PNG (SSO selections) performed better for clearbole height. Wood density was highest in A. auriculiformis (0.6008) and it was highest among A. mangium seedlots in Indonesian bulk seedlot (0.5365) and also MPM seedlot (0.536). Tully mission beach QLD performed poor among A. mangium seed sources. Heritabilities (h2) for total height (0.435), stem straightness (0.362) and girth at breast height (0.334) were relatively high. Heritabilites for clear bole height (0.294), and wood density (0.29) were moderate. For number of primary branches h2 was low at the age of 12 years. 125 Superior trees were selected based on total

height, stem form, crown and girth in Nilambur SSO (66) Karunya SSO (31), Panampally (4), KFRI campus (6), Pachamala plantaions (6) and Peringamala plantation (12). Half-sib nursery of these superior trees was raised. 126 half-sib families of A. mangium were planted in a progeny trial at Palode in Kerala during July 2011 with four replications and 4 trees in a plot in Latinized row-column design. The trial was evaluated for various growth and form characteristics at one and two years of age. During the first year evaluation except total height stem straightness all the characters found to be significantly vary among the families at 5% level of significance in F test. During the second year of evaluation all the characters found to vary significantly. The wood density ranged from 0.270 to 0.479 g/cm3 with mean wood density was 0.396 g/cm3 (among 33 families sampled) at 2½ year age in Acacia mangium progeny trial. There was high positive correlation between wood density and Resistograph readings (r=0.814) indicating that the instrument can be used for rapidly and indirectly estimating wood density in breeding population and also non destructively. It can be used in selection of families as well individuals for high and low wood density at early age. The trial was thinned during March 2014 by removing 50% inferior trees and it can be used as advanced generation seed orchard.