Project Profile

Project Code:	IFGTB-29(N)
Project Title:	Enhancing productivity of Casuarina species through interprovenance and interspecific hybridization
Principal investigators	Dr. A. Nicodemus Scientist-G
CO-PI:	Dr.B. Nagarajan Scientist-G
Funding Agency	ICFRE
Date of commencement of the project:	June 2003
Date of completion of the project:	March 2008
Total Budget of the project:	Rs. 2.51 lakhs

Objectives:

1. To identify superior provenances and families of Casuarina equisetifolia and C. junghuhniana from multilocational field trials.
2. To produce interprovenance and interspecific hybrids through control pollination.
3. To screen putative interspecific hybrids produced through open pollination.
4. To confirm hybridization and heterosis through molecular analysis and field trials.

Summary:

Forty outstanding clones were selected from the first generation provenance-family trials of Casuarina equisetifolia and C. junghuhniana and clonally propagated to function as parents in control pollination experiments. These clones were assembled in a potted hybridization orchard in which all control pollination experiments were conducted. Pollen drying and storing techniques were standardized to store pollen up to 3 months for effecting crossing between clones with non-overlapping flowering phenology. Performed control pollination between clones drawn from different provenances of the same species or between the two species. During the first two years the fruit set was less than 1% and was improved to 2-3% in the third year. Harvested fruits of 40 control pollinated fullsib families. Seeds were sown in the nursery and seedlings were raised. Seedling growth and morphological parameters were assessed. An index was developed based on four morphological characters viz. needle colour, leaf tip colour, needle thickness and number of leaves per node to identify hybrid plants. Selected hybrid individuals and their parents were screened with RAPD markers for validation. Established three hybrid progeny trials in Sriharikota(Andhra Pradesh), Panampally (Kerala) and Veedur (Tamil Nadu) to select outstanding hybrid individuals. Early growth at 6 months showed clear superiority of inter-specific hybrids over parent species. The average height of the best 5% of hybrid trees was about 3 metres which is 49 to 99% more than that of local unimproved seedlot and 19 to 32% over seed orchard progeny. Shortlisted about 100 outstanding individuals from the three progeny tests for clonal propagation and further testing.