

Screening of Selected Genotypes for Commercial Deployment and Development of Breeding Strategies in *Casuarina equisetifolia*

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Abstract

Casuarinas contribute significantly as an important commercial plantation crop which thrive well in saline and alkaline soils. It was therefore inevitable to develop genetically superior planting material that could be deployed for higher economic returns both through seed and clonal routes. Selection of 55 plus trees of *Casuarina equisetifolia* was carried out at Chengalpet and Chidambaram in the State of Tamil Nadu (India) using Index selection method for six economically important traits. The selected accessions showed 50 to 75 % improvement over the base population with high genetic diversity. The clonal *vis-a-vis* seed raised stocks were assessed for genetic worth and growth performance under uniform environmental conditions. Clone CHCE890903 demonstrated its superiority over all other clones for height, DGL, DBH and volume at an early age of 12 months, and maintained superiority in subsequent growth stages. Though average volume for 42 clones at 12 months of age was estimated to be 2157.16 cm³, Clone CHCE890903 achieved as high as 6633.18 cm³ followed by CHCE892003 (4925.46 cm³) and CHCE893004 (4365.40 cm³) which calculated to 207 per cent higher than that of average of 42 clones, 35 per cent over second best performer (CHCE892003) and 1008 per cent better than that of the least performer (CHCE891002). The superiority of clonal stock over seed raised plants may be due to intensive selection criteria adopted as well as transfer of both additive and non-additive effects under clonal propagation. The broad sense heritability varied from moderate to high while the genetic gain was high. Such exceptional genotypes could play an important role not only in commercial deployment but also in hybridization programmes as parents and establishment of seed orchards.