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Selection of Plus Trees, Growth Attributes and Biomass Estimation of *Melia dubia* Genetic Resources

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Abstract

Forest plantations are generally raised through seed-based seedlings which resulted in wider variability, contributing to uncertain and unproductive yield. This necessitated establishment of strong research and development mechanism to identify and develop high yielding and short rotation varieties. The present study is about *Melia dubia* Cav., a member of Meliaceae family. It's a multipurpose agroforestry tree used for pulpwood, timber, fuel wood, fodder, plywood and afforestation purposes. *M. dubia* plantation was raised during January, 2010 under National Agriculture Innovation Project at Forest College and Research Institute, Mettupalayam, Tamil Nadu. Selection of superior genetic resources was carried out in the year 2016 by comparison tree method. The objective of selection programme is to obtain significant amounts of genetic gain as quickly and inexpensively as possible, while at the same time maintaining a broad genetic base to ensure future gains. A total of 46 candidate plus trees (CPT) were identified from the plantation based on morphometric traits viz., tree height, basal diameter, girth at breast height (GBH), texture of bark, bole straightness and free from pest and disease through check tree method. Score was given for each character and the trees which showed greater performance than the mean were selected. Further screening has been done and thirty plus trees have been finally screened for biomass estimation through destructive analysis. The plus trees exhibited good variability in terms of growth attributes. The basal girth of plus tree ranged from 48 cm (MTPMD 10) to 122 cm (MTPMD 1). The GBH of the plus tree ranged between 44 cm (MTPMD 10, MTPMD 36) and 85 cm (MTPMD 1). Similarly, the height of plus tree ranged between 12 m (MTPMD 7 and MTPMD 8) and 17.5 m (MTPMD 9). Total biomass ranges from 97 kg (MTPMD 30) to 545 kg (MTPMD 1). Stem weight, branch weight and leaf weight also vary between the genetic resources. This selection and subsequent progeny trial of selected plus trees are a base for genetic improvement. This study is essential for successful breeding program and will help in development of varieties with superior quality and high biomass to meet the present and future industrial demands.

Keywords: Plus tree selection, *Melia dubia*, Genetic improvement, Comparison tree method, Biomass estimation