

QUANTITATIVE ANALYSIS OF VARIATION FOR FLOWERING PHENOLOGY AND FRUIT YIELD IN A CLONAL SEED ORCHARD OF TEAK (*TECTONA GRANDIS* L.F)

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ABSTRACT: Genetic improvement of teak has been primarily focused on identification of superior trees from diverse origin and their deployment in Clonal Seed Orchards (CSO) to obtain seeds of high genetic quality in abundance. Unfortunately, flowering asynchrony and low fruit production have been a cardinal bottleneck in realizing benefits of CSOs. However, there are virtually no efforts to quantitatively assess the variation for flowering phenology of teak using large number of clones, and to identify its relation with the poor fruit yields of CSOs. Present study was carried out to assess the variation for reproductive phenology and fruit yield in a twenty-five-year-old teak CSO, which comprised 49 clones of diverse origin from Karnataka, South India. Large inter-clone differences were identified for the flowering phenology as assessed through time of peak flowering. Flowering synchrony was assessed using a novel “overlap index” which is an extension of “Index of Similarity”. In general, clones with higher overlap index were better yielders than those with low overlap index values. Clones of NGH series with low overlap index (0.154 - 0.173) recorded the lowest fruit yield (0.068-0.087 kg/tree). The TMT clone series, which had high overlap index (0.603-0.644) showed high seed yield (0.338-1.057 kg/tree). Flowering synchrony among clones of CSO played an important role in assessing genetic value of orchard crop. Rating an entire orchard for its relative degree of flowering synchronization adopting overlap index helped to track changes in flowering on a quantitative scale throughout the orchard life as well as in evaluating the panmixia / genetic gain.

Key Words : *Clonal seed orchards, Flowering synchrony, Fruit set, Overlap index, Phenograms, Phenophases*