

# EFFICACY OF POLYCROSS BREEDING IN EVOLVING GENETICALLY DIVERSE *HEVEA* CLONES

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Recognizing the significance of maintaining genetic diversity in rubber plantations, systematic efforts on polycross breeding in rubber were initiated by the Rubber Research Institute of India in 1989. The study also addressed the challenge faced by plant breeders to provide rubber growers with diverse planting materials without compromising on yield. Open pollinated progenies comprising 1680 half sib seedlings from 20 promising parent clones were evaluated in a nursery. The superior seedling progenies were identified and 15 genotypes per progeny from 10 parents were cloned and evaluated in a field trial adopting a compact family block design for a period of 20 years which included 12 years of tapping. The progeny clones numbering 150 were evaluated for rubber yield in the two virgin panels, timber yield and secondary attributes. Thirty five selections from these progenies were classified as dual purpose latex-timber clones and timber-latex clones as well as latex clones and timber clones. In terms of yield in the long term, 25 promising half-sib clones were selected from the progeny of nine genetically diverse parents. Among these, 15 clones exhibited stability in performance over 12 years of tapping. The most promising 12 selections in the pipeline out-yielded the check clone by over 20 per cent with estimated rubber yields of 2820 to 4429 kg ha<sup>-1</sup> year<sup>-1</sup>. Clones PB 215, PB 28/83 and Ch 26 were confirmed to be prepotent for rubber yield with more than 25 per cent of their progeny being high yielding. Estimation of stability across years proved clones HS PB 252/132 the highest yielding clone to be inconsistent in performance and HS Ch 26/161 with more than 97 g t<sup>-1</sup> along with 10 other high yielding clones to be consistent in yield in the long term. The reaction of these clones to TPD, pink disease, abnormal leaf fall and powdery mildew is also discussed.

**Key words:** Disease reaction, *Hevea brasiliensis*, Latex-timber clones, Polycross, Rubber yield, Stability, Timber yield

## INTRODUCTION

The adverse impact of climate change on the productivity of clones and rubber production in general is currently a matter of grave concern. The rubber plantation sector of India and other rubber growing nations are daunted by the challenge of maintaining the profitability of rubber cultivation due to various reasons. Polycross

breeding is an approach that can deliver diverse planting material which in turn lends stability of performance under adverse situations. Polycross refers to multiple uncontrolled crossing of several parents (Simmonds, 1986) or in other words, random mating of several selected clones.

The mating system in rubber is one of predominant outcrossing. The consequent heterozygosity and heterogeneity which is