

# SUCCESS OF RECOMBINATION AND POLYCROSS BREEDING APPROACHES IN *HEVEA BRASILIENSIS*

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A comparative study of recombination breeding and polycross breeding in rubber was attempted based on the results of long term yield from small scale evaluations of hybrid clones generated from the 1986 hybridization programme and the 1989 polycross breeding programme undertaken in the Rubber Research Institute of India. A total of 295 hybrids and 135 polycross progeny selections were evaluated in 14 field trials over 13 years of tapping. The long term yield and yield trends of elite clones identified from the two breeding programmes as well as their stability in yield over the years were compared. Recovery of superior individuals from the initial selections in terms of long term yield was higher in the case of polycross breeding (33.3%) as compared to recombination breeding (20%). The proportion of exceptionally high rubber yielders with  $>100 \text{ g t}^{-1}$  was also higher among polycross selections (1.48% of the initial number of 135 clones and 6.7% of the initial 30 selections) compared to hybrids obtained from recombination breeding (1.02 % of the initial number of 295 hybrids and 3.75% of the initial 80 selected hybrids).

The best among the hybrids were three clones: 86/122 (P 020) with  $132.5 \text{ g t}^{-1}$ , 86/111 (P 021) with  $117.2 \text{ g t}^{-1}$  and 86/428(P 027) with  $112.8 \text{ g t}^{-1}$  and among the selections from half-sib progenies were two clones HSPB252/132 (P 070) yielding  $113.1 \text{ g t}^{-1}$  and HSch26/161 (P 064) yielding  $100.2 \text{ g t}^{-1}$  over 13 years of tapping. All the five exceptionally high yielding clones proved to possess stability in yield over the years and are in the pipeline for commercial release, undergoing farmer participatory multilocal evaluation. The three highest yielding hybrids, P 020, P 021 and P 027 are the progenies of the cross RR II 105  $\times$  RR II 118. The results of this study form the basis of comparison and drawing conclusions on the suitability of the two parallel breeding approaches to attain specific goals.

**Key words:** Long term performance, Polycross breeding, Recombination breeding, Rubber yield, Small scale evaluation

## INTRODUCTION

*Hevea brasiliensis*, the Para rubber tree is the major cultivated commercial source of natural rubber because of abundance of high quality latex and convenience of harvesting. More than tenfold improvement in rubber

productivity obtained in the first 50-70 years of *Hevea* breeding in South East Asia is a success story not encountered in any other crop species. The concerted efforts of the Rubber Research Institute of Malaysia (RRIM), Rubber Research Institute of India