

GENETIC IMPROVEMENT OF *HEVEA* CLONES FOR ECONOMIC TRAITS THROUGH HYBRIDIZATION

M.J. Reju, Alice John¹ and Kavitha K. Mydin

Rubber Research Institute of India, Rubber Board, Kottayam-686 009, Kerala, India

¹Rubber Training Institute, Rubber Board, Kottayam-686 009, Kerala, India

Received: 02 July 2019

Accepted: 05 August 2019

Reju, M.J., John, A. and Mydin, K.K. (2019). Genetic improvement of *Hevea* clones for economic traits through hybridization. *Rubber Science*, 32(2): 181-198.

Hybrid clones evolved from the 1986 hybridization programme involving 20 Wickham parental clones in 38 cross combinations were evaluated in eight small scale trials. The trials were established at the Central Experiment Station of the Rubber Research Institute of India during 1990. A total of 134 hybrid clones resulted from the various cross combinations were evaluated in the trials. Five hybrid clones viz. 86/392, 86/312, 86/715, 86/911 and 86/887 showed significant improvement for rubber yield over RR II 105. Cross combinations of RR II 203 x RR II 105 and RR II 105 x RR IC 52 were identified as specific families for genetic improvement in *Hevea*. Hybrid clones were categorized as latex-timber, timber-latex, and latex clones based on yield and timber traits. More progenies with higher timber volume was obtained in majority of the cross combinations, but there were only very few progenies with higher rubber yield from these cross combinations. Bole volume was influenced by girth at opening, and girth attained during tapping. The study showed the superiority of RR II 105 as a female parent in cross combinations for yield improvement rather than as a male parent. Heterosis for girth at opening was observed in seven hybrids. Heterosis for girth in the mature phase was recorded in 20 hybrids. Heterosis for bole volume over RR II 105 was recorded in 69 clones. Meanwhile, heterosis for yield over the standard check clone (RR II 105) was recorded in five out of 134 hybrid clones. Primary clones such as RR IC 52, PB 28/59, PB 86, Gl 1 and RR II 33 and secondary clones (RR II 105, RR II 203 and RR IM 612) are still potential sources for tree improvement in *Hevea*.

Key words: Bole volume, Girth, Hybrid clones, Heterosis, Hybridization, Natural rubber

INTRODUCTION

Hevea brasiliensis (Willd. ex A. Juss.) Muell. Arg., the Para rubber tree, is monoecious and cross pollinating with high rate of out-crossing. The cross pollination nature of the species has led to the genesis of large variations in the populations. Such variations offer an opportunity for identification and selection of recombinants

with desirable traits, and the fixing of traits by way of vegetative propagation through bud-grafting. The heterozygous nature of the species for various economic traits coupled with high rate of open pollination warrants application of various methods to streamline breeding programs in *Hevea brasiliensis*. To enhance the availability of superior recombinants for desirable traits, methods such as hybridization through hand