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# EVALUATION OF POLY-CROSS PROGENY POPULATIONS OF *HEVEA BRASILIENSIS* IN THREE AGRO-CLIMATIC ZONES OF INDIA

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Open pollinated seeds of *Hevea brasiliensis* were collected from polyclonal seed gardens and multi-clone trials situated in both traditional and non-traditional rubber growing zones in India and evaluated in three agro-climatically different zones *viz.* traditional region (Kerala), drought (Maharashtra) and cold (West Bengal) conditions. Evaluation of these polycross progeny populations resulted in the selection of 146 superior progenies. The minimum dry rubber yield of selections in Kerala was 20 g $t^{-1}10t^{-1}$, West Bengal was 15 g $t^{-1}10t^{-1}$ and Maharashtra was 5 g $t^{-1}10t^{-1}$. Mean dry rubber yield of the selections from each population was significantly different from the mean of each population. The highest number of selections was obtained from the progeny population of Tura followed by Kanyakumari, Nagrakata and Agartala. The final selections were 64, 39, 43 which was 7, 4 and 6 per cent, respectively from Kerala, Maharashtra and West Bengal. Progeny populations originated from the traditional regions outperformed the populations from the non-traditional regions of Maharashtra and West Bengal even when screened in their respective non-traditional climates. Meanwhile, when the progeny populations originated from the non-traditional regions were planted in the ideal traditional climate, they performed better than in their native climates. A clear distinction was obtained between the yield of the progenies with girth below the population mean and the yield of the progenies with girth above the population mean. From a total of 6126 progenies evaluated, a total of 2685 progenies were test-tapped and out of the 146 selections, only two of the selections fell in the below mean girth group while 144 selections (99% of the selected progenies) were in the above mean girth group. A strong association of 49 per cent ($R^2$) dependence of the population yield on girth was observed. Progenies originated from the drought region showed a high dependence of yield on girth (56%) suggesting vigorous girth as a requirement for economic yield in the drought regions. Rubber plants grown in cool climate was superior in yield and girth than that observed under hot climate. Severe reduction in girth and rubber yield was found under the dry climate while reduction in height of plants was noticed under the cool climate. This study also suggests establishment of new PSGs to obtain recombinants with higher levels of yield and girth growth.

**Key words**: *Hevea* breeding, Natural rubber, Polycross progenies, Progeny evaluation

## INTRODUCTION

Location specific clone development and extension of rubber cultivation to non-traditional regions in India are important research programs of the Rubber Research Institute of India (Sethuraj and Jacob, 2012). Clones of *Hevea brasiliensis* that grow vigorously and yield satisfactorily under

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