

# EVALUATION OF GROWTH, YIELD AND DROUGHT TOLERANCE OF CERTAIN HYBRID CLONES OF PARA RUBBER TREE (*HEVEA BRASILIENSIS*) IN A SMALL SCALE TRIAL

C. Narayanan and Kavitha K. Mydin

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

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In order to meet rising global demand for natural rubber, rubber cultivation is increasingly being expanded to non-traditional regions which are prone to abiotic stresses like drought and cold. Thus, breeding climate-resilient clones has become an important priority for Para rubber tree (*Hevea brasiliensis*). One such hybridization for drought tolerance carried out in 1993 yielded fifteen hybrid selections which were consequently evaluated for their long-term growth and yield in a small scale trial (1998) at Central Experimental Station of Rubber Research Institute of India, Kerala State, India. Clone 93/105, followed by 93/112, 93/216, 93/214 and check clone RRIC 52 attained more than 70 per cent tappareability in opening year (2005). Other check clones PB 260 (50%), PB 217 (48%), RRII 105 (24%) and RRIM 600 (23%) had lesser tappareability. Based on growth assessed in the 15<sup>th</sup> year, check clone RRIC 52 had highest girth (84 cm) followed by clones 93/112 (80 cm), 93/216 (80 cm) and 93/184 (79 cm). Comparatively, check clone RRII 105 attained a girth of 61 cm. Based on annual mean dry rubber yield over 10 years of tapping, clone 93/214 had highest yield (71 g t<sup>-1</sup> t<sup>-1</sup>) followed by PB 260 (60 g t<sup>-1</sup> t<sup>-1</sup>), PB 217 (53 g t<sup>-1</sup> t<sup>-1</sup>) and 93/80 (52 g t<sup>-1</sup> t<sup>-1</sup>). Clone 93/88 (50 g t<sup>-1</sup> t<sup>-1</sup>) and 93/216 (50 g t<sup>-1</sup> t<sup>-1</sup>) gave on par yield with check clone RRII 105 (49 g t<sup>-1</sup> t<sup>-1</sup>). Clone 93/216 gave highest summer yield (41 g t<sup>-1</sup> t<sup>-1</sup>) followed by 93/214 (37 g t<sup>-1</sup> t<sup>-1</sup>) and 93/145 (36 g t<sup>-1</sup> t<sup>-1</sup>). Summer yield of 93/80 (33 g t<sup>-1</sup> t<sup>-1</sup>) was on par with that of PB 217 (33 g t<sup>-1</sup> t<sup>-1</sup>). In comparison, check clone RRII 105 along with RRIM 600 gave a summer yield of 26 g t<sup>-1</sup> t<sup>-1</sup>. Regarding genetic parameters, tappareability in opening year showed low heritability ( $H^2=0.36$ ). In contrast, long-term rubber yield showed high heritability ( $H^2=0.60$ ) while summer yield showed moderate heritability ( $H^2=0.40$ ). Top selection 93/214 (RRII 105 × RRIC 52), possessing highest annual rubber yield and appreciable summer yield, was elevated as pipeline clone (P 218) for further long-term evaluation in large scale trial at Chethackal and multi-locational on-farm trials under Phase 5 (2016) of Participatory Clone Evaluation Programme. After assessment of its overall performance, the above pipeline clone will be recommended as a region-specific clone for commercial planting, particularly in drought prone non-traditional regions.

**Keywords:** Breeding, Drought tolerance, Heritability, *Hevea*, Summer yield

## INTRODUCTION

Growing demand for natural rubber from Para rubber tree (*Hevea brasiliensis*) has led to expansion of cultivation to non-traditional regions, and many of these new

regions are prone to abiotic stresses, mainly drought and cold. Although rubber yield in *Hevea* is largely determined by genotype of a clone, rubber yield is greatly influenced by various edapho-climatic variables. Since