

## Progeny Screening for Yield Related Traits in Several Wide-Crosses of *Camellia sinensis* (Tea)

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Tea (*Camellia sinensis* [L.] O. Kuntze) yield is a complex multi-component phenomenon determined by simultaneous action of a number of traits. The current study aimed at evaluating performance of several wide-cross progenies for yield and related traits to identify heritable variability.

The study was carried out at the Tea Research Institute of Sri Lanka, Talawakelle. The field trial was laid out in a single bush randomized design. Sixteen progenies derived from fifteen different female parental lines that included TRI developed lines (TRI 62/3), introductions (INTRI 1, INTRI 5) and estate selections (2077, 2137, DEL 40, DUN 7, W 14, C 103, GF 7/6, K 136, LLEF 14/2, PING 2/1, S 106, TC 10), and two male parental lines, namely, 'China' and 'Yabukita' were used. Vegetatively propagated cultivars, DT 1 (quality standard) and TRI 2025 (yield standard) were used for comparison.

Yield related traits (viz. numbers of shoots, shoot fresh and dry weight, percentages of active shoots and three and a bud shoots) were used to determine the yield potential of the progenies. Shoot fresh and dry weight, bud fresh and dry weight were investigated further for broad sense heritability. Rate of shoot growth was measured based on a visual scale developed for this purpose.

The progenies DUN 7×'Yabukita', W 14×'Yabukita' and DEL 40×'Yabukita' were superior in number of shoots, shoot fresh weight and shoot dry weight compared to all other progenies and the standard. In the progenies, C 103×'China' and 2137×'China', percentage active shoots and percentage of three and a bud shoots were high compared to the standard respectively. When considering female parental effects, except for percentage active shoots, positive female parental effects were observed in all other traits. When considering male parental effects, except for percentage active shoots, where the 'China' progenies performed better, 'Yabukita' progenies performed better in all other traits. Broad sense heritability estimates were comparatively high for shoot fresh weight ( $h^2 = 0.83$ ,  $p = 0.00$ ,  $R^2 = 83.15\%$ ) and dry weight ( $h^2 = 0.81$ ,  $p = 0.00$ ,  $R^2 = 80.64\%$ ). The same estimates were moderate for bud fresh weight ( $h^2 = 0.53$ ,  $p = 0.02$ ,  $R^2 = 52.84\%$ ). It was not significant in bud dry weight ( $h^2 = 0.37$ ,  $p = 0.28$ ,  $R^2 = 37.42\%$ ). Seventy eight individuals that showed a high rate of shoot growth were identified.

Individual plants having high yield potential that were genetically superior in specific traits were identified by this study. With proper validation, such material can be used in vigorous selection programmes and in future breeding programmes to develop superior tea cultivars.