SOME GROWTH CHARACTERS AS CRITERIA FOR SELECTION OF NEW TEA CLONES (*Camellia sinensis* (L.) O. Kuntze)

By

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ABSTRACT

The objective of this study was to correlate various plant attributes of tea clones in their different growing phases viz. nursery stage, bushes recovering from pruning and bushes in plucking, with their proven yields in order to identify attributes that could be employed directly or in combination as selection criteria for future selection programmes; these clones had initially been identified as high and low yielders on proven yields.

For each of these growing phases studied linear regression models were worked out for single attributes. Attempts were made to incorporate additional attributes through forward regression analyses to improve and enhance their predictability values (R^2). Combination of attributes of a single phase was not successful while high values were obtained for combination of attributes from more than one phase or different phases. Those plant attributes showing highest R^2 values were identified for use in selection work.

In the nursery, plants of high yielding clones grew better resulting in greater plant dry weight compared to plants of low yielding clones. Differences in growth attributes were more marked in 8 and 12 month plants than in 4 month plants. Strong positive linear correlations were obtained between plant height, number of side shoots, leaf area, girth of stem and dry weight of stem

and of plant of 8 and 12-month-old plants with proven yields. This indicates that selection of promising clones could be done at the nursery stage in plants that are 8 to 12 months of age.

Attempts made to fit those attributes of nursery plants that showed a high correlation with their proven yield into a model in order to explain the variation in yield of the clones studied gave predictability values of 73 to 85% at 8 months.

The high yielding clones also had longer internodes in the tipping shoots and showed predictability values of 88% and no further improvement of the predictability value was possible.

Though high yielding clones had fewer shoots in the harvested crop compared to low yielding clones the superior yields of the high yielders was due to the contribution made by the size of the internodes of the flush component. The high yielding clones also had larger plucking surfaces and high shoot density that gave a correlation coefficient of 0.68 with proven yield.

There were more marked differences in the depth of canopy of high and low yielding clones with the former having deeper canopies resulting in a strong positive correlation coefficient of 0.88. The predictability value obtained for the model with depth of canopy and proven

yield was 78% and the model could not be improved further. The high yielding clones had greater harvest index and produced more dry matter.

This study has served to provide guidelines based on morpho-physiological characters to the practical selectionist to identify potential high yielders based on simple attributes of plants at the nursery and/or mature bush stage and this eliminates the need to evaluate field performance over protracted periods which further entails space and aftercare measures.

Once a potential high yielder has been identified in the field, the present method envisages evaluations of its nursery vigour for an year and to evaluate its other characteristics within a period of 3 to 4 years under glass house conditions. It is hoped that this period could be further reduced once the technology of tissue culture techniques become available in the near future. Thus it should be possible to recommend potential high yielders within 5 years time from initial field selection compared to the laborious traditional methods which take a minimum of about 15 years before firm recommendations could be made.