OPTIMUM PLOT SIZE AND STATISTICAL RELATIONSHIPS BETWEEN

TAPPING PANEL VARIABLES AND YIELD OF RUBBER

By

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Thesis

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in the

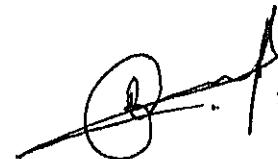POSTGRADUATE INSTITUTE OF AGRICULTURE
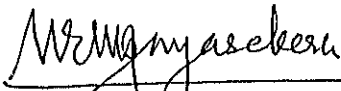
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ABSTRACT

Data collected from Eladuwa Estate in Kalutara district on yield (dry rubber content) of clones, RRIC-100, RRIC-101, RRIM-623 and PB-86 were used to study the optimum plot size, for rubber and to identify the relationship of tapping panel variables (girth, tapping cut length, tapping height and bark thickness) to yield.

From a uniformity trial Smith's index of soil heterogeneity was estimated for all four clones and used in the determination of optimum plot size. Two procedures, the empirical relation ship between plot size and plot variance proposed by Smith, and the method proposed by Hathway , were followed in the determination of optimum plot size. The optimum plot size for rubber was determined to be a minimum of 6-8 trees per plot. For the analysis, a computer programme (written in BASIC) was developed to investigate the optimum plot size.

Regression analysis showed that there was a linear relationship between tapping panel variables and yield. But correlation analysis showed that the tapping panel variables are interrelated. Hence, Principal Component Analysis was

done to identify the number of independent factors and this revealed the existance of only one independent factor. Therefore only girth which was the variable with the highest correlation with yield was used to obtain the prediction equation.

In the collection of data, it is necessary to take into account the factors that influence the response variable. In addition data collection should be flexible enough to handle unexpected conditions as well. Covariance analysis is useful in such situations and can be used effectively in the interpretation of direct effect of a particular factor.