

Importance of Bark Examination in the Selection of Prospective Mother Trees.

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THE tapping of young budded trees has now shown that rather less than 10 per cent. of the high-yielding trees from which buds have been taken prove to be good mother-trees. In the other 90 per cent. either the yield falls far below expectations, or some objectionable feature presents itself, such as the production of excessively thin bark, or the fluting of the tapped surface, etc., and it must be our endeavour when selecting prospective mother-trees to avoid as many of these as possible.

It is not contended that all these undesirable trees can be rejected after bark examination, as characters such as fluting of the tapped panel appear only in the adult tapped budgraft, but it is thought that careful selection may have an effect on the number of trees which produce high-yielding offspring with normally thick bark.

A number of papers have appeared recently showing the relationship between yield and the bark characters, viz., number of Latex rows and bark thickness, and in general these have proved that the best criterion of the value of a tree, short of the actual recording of yield over a period of time, is a count of the number of Latex rows in the bark. Figures have also been given to show the effect of girth on Yield but in all cases except one tapping has been carried out on a certain fraction of the circumference rather than on equal lengths of cut and it is thought that, in the selection of mother-trees, yield per unit length of tapping cut ought to be used.

The figures in all these papers show these relationships as coefficients of correlation. This coefficient may vary between + 1 and - 1. The relationship indicated by + 1 means that the two characters compared are governed by the same factor and, as one varies, the other varies in direct proportion.—1 would mean that, as the magnitude of one character varies, the magnitude of the other varies in the other direction, *i.e.*, in inverse proportion. It is very seldom, however, that results obtained approach either of these extremes.

As noted above the character most closely related to yield is number of Latex rows but there are smaller but definite relationships between yield and girth and between yield and bark thickness. There are also certain relationships between the three characters: girth, number of Latex rows and bark thickness, suggesting that the same factor in the composition of the trees may have power in determining the magnitude of more than one character. Thus girth and bark thickness show a high correlation. It is therefore possible that when correlating yield with girth we are really obtaining another measure of the relationship between yield and bark thickness or at least the real relationship between yield and girth is modified.

This has apparently been overlooked by other workers on the subject, and what is really required is some means of ascertaining the actual relationships between yield and each of the characters individually.

A means is provided by the method of Partial Correlation. I need not go into the details of calculation but shall merely say that these actual correlations are calculated from the figures obtained by the general correlations mentioned above.

The figures which have been obtained by applying this method average as follows:—

Correlation yield with number of Latex rows	+ '47 (eliminating effect of girth and bark thickness)
Do do do girth	+ '21 (elim. effect of number of Latex rows and bark thickness)
Do do do bark thickness	+ '19 (elim. effect of number of Latex rows and girth.)

In mother-tree examination we are not concerned with girth except for the calculation of yield per unit length of cut.

These figures certainly show the effect of number of latex rows on yield. It is difficult to give a definite number of rows which should be used as a minimum in this selection but as a working figure 30 is suggested.

The effect of bark thickness on yield probably comes under a different category. Thin barked trees may have in some cases a large number of Latex rows but only a limited number can be drawn on during tapping otherwise we run the risk of serious wounds, and so it will be seen that in all probability a tree with an equal number but with thicker bark will give a higher yield.

Here again no definite minimum thickness can be stated but anything less than 8 mm. will be likely to prove unsatisfactory.

These figures, 30 Latex rows and 8 mm. thickness refer to samples taken at 3 feet from the ground. In making this comparison of trees by bark examination it is essential that the samples be taken at a uniform height. 3 feet is suggested but this height should be regulated so that only untapped bark is sampled.

The above examination is of course to be considered as quite apart from the other factors which must be taken into account. No tree showing special proneness to brown bast or other disease should be selected and it will be well to reject trees growing in specially favoured positions. The high yield in these trees may be due to environment and unless this special treatment is repeated with the offspring the high yield is unlikely to be repeated.

Discussion.

HIS EXCELLENCY invited discussion on what he said was a highly technical paper.

MR. ROY BERTRAND said that the advice given by Mr. Taylor now was not similar to that given some time ago.

HIS EXCELLENCY replied that knowledge was advancing.

THE DIRECTOR OF AGRICULTURE said that the first figures obtained from an examination of yields of trees from Heneratgoda No. 2. indicated that it was perhaps not necessary to pay in practice too great a regard for the number of latex rows. Latex yield figures however showed that this initial opinion required modification and Mr. Taylor had in his paper indicated the correlation between the number of latex rows and yield. The figures given clearly show the effect of the number of latex rows on yield.

THE DIRECTOR OF AGRICULTURE also stated that anyone interested in the subject who would like to see the methods the Department employed in the examination of bark samples would be welcome to visit the Mycological Laboratory where they would find various samples that had been treated. He was certain that Mr. Taylor and Mr. Haigh would be pleased to meet them there on Saturday morning and explain any details of the methods used.