# Short Note: Possibilities of early selection in Hevea brasiliensis

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**Summary**

The relationship between the yields of *Hevea* from year to year for a period of eight years was studied at the Rubber Research Institute of Nigeria main station, Iyanomo. Positive and highly significant year to year correlations were obtained, an indication that selection for yield character was possible in the first few years of clonal yield testing.

*Key words:* Correlation, Selection, Ramet, Clone

**Zusammenfassung**

Im Rubber Research Institute von Nigeria, in der Hauptniederlassung Iyanomo wurde der Zusammenhang zwischen den Latexerträgen von *Hevea* in verschiedenen Jahren über einen Zeitraum von acht Jahren untersucht. Es wurden positive und hoch signifikante Korrelationen zwischen den einzelnen Jahren festgestellt, ein Hinweis darauf, daß eine Selektion auf den Ertrag bereits in den ersten Jahren der Klonversuche möglich ist.

## Introduction

Rubber yield is the most important characteristic considered in the selection of rubber clones for planting. Normally there is a lapse of 2 years from pollination to field planting, a wait of 6—7 years until tapping is started, then a 10—15 year period of tapping and clonal evaluation. Thus, the time required to produce and test new clones may rang from 18—24 years. It would be desirable to reduce that period.

According to a recent study in Nigeria (Alika, 1978) there is a high repeatability (R = 0.71) of rubber yield from month to month. The present study was undertaken to determine whether there were sufficiently high year-to-year correlations to justify early selection. Specifically, the present paper reports on correlations over an 8-year period for 30 clones tested in Nigeria.

## Materials and Methods

In 1962, at the Rubber Research Institute of Nigeria (RRIN) at Iyanomo, a root stock nursery was planted. When the seedlings were 2 years old they were cloned by budding with thirty different clones introduced from Malaysia. These resulting clones were planted in an experimental plantation at Iyanomo, using a spacing of 6.7 × 3.4 meter. This plantation followed a randomized complete block design in four replicates with 196 ramets per clone.

In 1971, approximately 84 months after budding, the trees were tapped for the first time. Thereafter tapping continued on an every other-day basis. The trees were tapped by cutting a slit in the bark. This slit was cut at a 30° angle to the horizontal and extended half way around the trees.

The trees were tapped in the morning, and the latex was allowed to run into a coagulating cup which was collected 24 hours later. The coagula from the trees were dried and weighed in the field on plot basis.

At the end of each year the total yearly yields for each tree and clone were summarised. The year totals for the clones were subjected to simple correlations analysis, showing correlations between ages 1 to 8.

## Results

At the spacing of 6.7 × 3.4 meter there were approximately 300 ramets per hectare at full maturity. Therefore, the average yield per ramet was multiplied by 300 to obtain the average annual yield per hectare.

This average yield increased gradually as the test plantation grew older. Specifically, the average yield (kg/ha) were 818, 863, 974, 1,230, 1,183, 1,243, 1,044 and 1,282 respectively in the 1st, 2nd, 3rd, etc. years after the onset of tapping.

The year-to-year correlations are presented in *Table 1*. The correlation between the 1st and 2nd year was very high (r = 0.92) but the correlations dropped gradually with the 3rd, 4th, etc. years after tapping. A similar trend was obtained with the 2nd and the subsequent years. Correlations were generally found to be highest between closely related ages.

These high and statistically significant correlations indicate that selection for high rubber yield can be practiced

*Table 1.* — Correlation coefficients between year-to-year rubber yield in *Hevea* for a period of eight years of tapping.

| | Age from the on set of tapping | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. | 0.92** | 0.80** | 0.70** | 0.65** | 0.63** | 0.45* | 0.59** |
| 2. | | 0.84** | 0.72** | 0.69** | 0.71** | 0·49* | 0.61** |
| 3. | | | 0.81** | 0.78** | 0.77** | 0.68** | 0.63** |
| 4. | | | | 0.76** | 0.57** | 0.53** | 0.51** |
| 5. | | | | | 0.81** | 0.69** | 0.61** |
| 6. | | | | | | 0.87** | 0.73** |
| 7. | | | | | | | 0.69** |

*, ** Significant at $P < 0.05$ and $P < 0.01$, respectively.

at relatively early ages, especially where significant correlations of 0.59, 0.61 and 0.63 were obtained separately between the 1st, 2nd, 3rd and 8th years of tapping. GILBERT (1961), has indicated that even small correlations between two characters could have very important effects in selection.

The intensity of selection at each age can be learned by ranking the 30 clones at each age and inspecting these rankings to learn how many clones must be saved at any one age in order to insure keeping the 8 clones which would prove to be the highest yielders the 8th year after tapping.

This was done with results as shown in the following *table 2.*

*Table 2.* — Number of the eight top clones in relation to the time of preservation and to the 30 clones observed.

| Number of years after the onset of tapping | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Number of clones which had to be preserved out of 30 in each year to keep the 8 top clones | 9 | 8 | 9 | 9 | 15 | 11 | 13 | 8 |

## Literature cited

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