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SEASONAL VARIATION IN YIELD OF RUBBER

Wasana Wijesuriya, Chintha Munasinghe and Nandani Wanigatunga

INTRODUCTION

Most of the perennial crop species exhibit seasonal variation as well as year to year variation in their life cycle. Seasonal variations of latex yield have been studied for several commercial clones in Malaysia (Lee & Tan, 1979). Accordingly, within a clone tapped on a particular system, the maximum yield is usually obtained during October to January and the minimum during February to April. A different demarcation was made in India by Licy *et al.* (1992), where the peak yielding period was taken as September to December and the yield during the period of February to May as the summer yield.

Little information, however is available on seasonal variations in yield under Sri Lankan conditions, necessitating the study of seasonal variations before the establishment of any sampling procedure to estimate annual yields. Once the seasonal variation is identified, it can be related to other factors such as; variation in leaf nutrient contents and latex properties. Further, the information on seasonal variation can be used in identification of strata for sampling of latex yield.

Method

Tapping records available at the Dartonfield estate located in the agro ecological zone, WL_1 were employed in this study. The estate yields were recorded in kilograms per tapping block. The extent of a tapping block varied from less than a hectare to several hectares. Being a perennial crop, the yield of rubber varies within the year and also shows variability from year to year with the expansion of trunk girth and the introduction of different tapping panels. Since it was intended to investigate the seasonal variation of different rubber clones, the estate tapping records of PB 86 and RRIM clones (panels A and B) and RRIC 100 (panel A) were used to study the seasonal variations in rubber yield.

Statistical method

As quoted by a number of authors, decomposition methods are among the oldest forecasting approaches. However, they have been widely used and are most satisfactory for general use (Neiswanger, 1956; Makridakis *et al.*, 1983; Chatfield,

1984). Hence, this method was employed in calculating the adjusted seasonal indices which were averaged in the next step of the calculation to obtain a single index of "typical" seasonal variation. Mathematically, these computations accomplish the following.

$$X_t = I_t T_t C_t E_t$$
$$M_t = T_t C_t$$
$$I_t = X_t / M_t E_t$$

where:

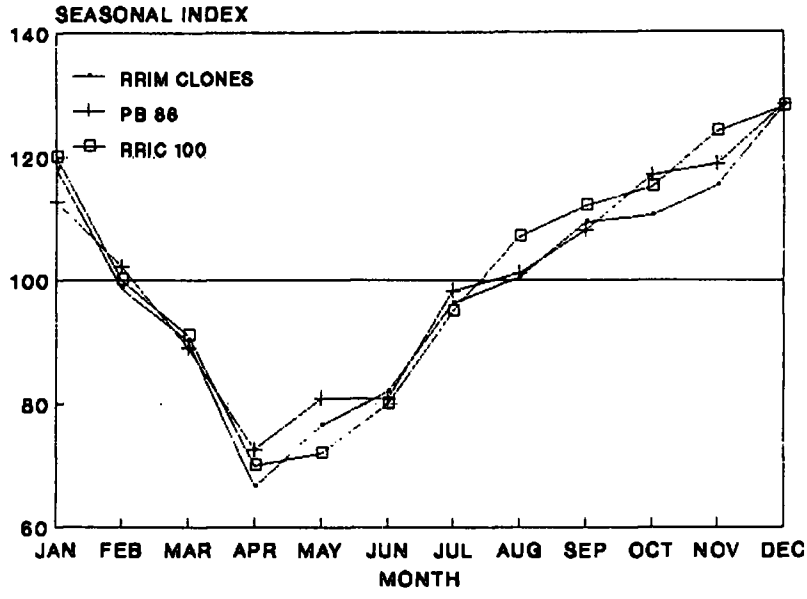
X_t = Time series value at period t
I_t = Seasonal component (or index) at period t
T_t = Trend component at period t
C_t = Cyclic component at period t
E_t = Irregular component at period t
M_t = Resulting moving average at period t

The statistical package, SPSS version 4.0 was employed in the statistical approach towards computation of seasonal variation.

RESULTS

The analysis of seasonal variation showed a similar pattern of yield variation for PB 86, RRIC 100 and RRIM clones. The four seasonal quarters of the yield cycle were identical to those reported in Malaysia by Lee and Tan (1979).

As shown in figure 1, the yields dropped below average during February to July. Moreover, no marked changes were observed for different tapping panels. At the start of this period, rubber trees shed leaves. Hence, February, March and April were termed as 'wintering' months with a steady drop in yield. The next period, the 'post wintering' starts from May and extends to the end of July with an increase in yield. August, September and October are termed as 'high yielding' months, followed by the 'peak yielding' period extending from November to end of January. Therefore, the above mentioned quarters in the yield cycle can be considered as the natural strata if someone is interested in stratified sampling approach to estimate annual yield of rubber.



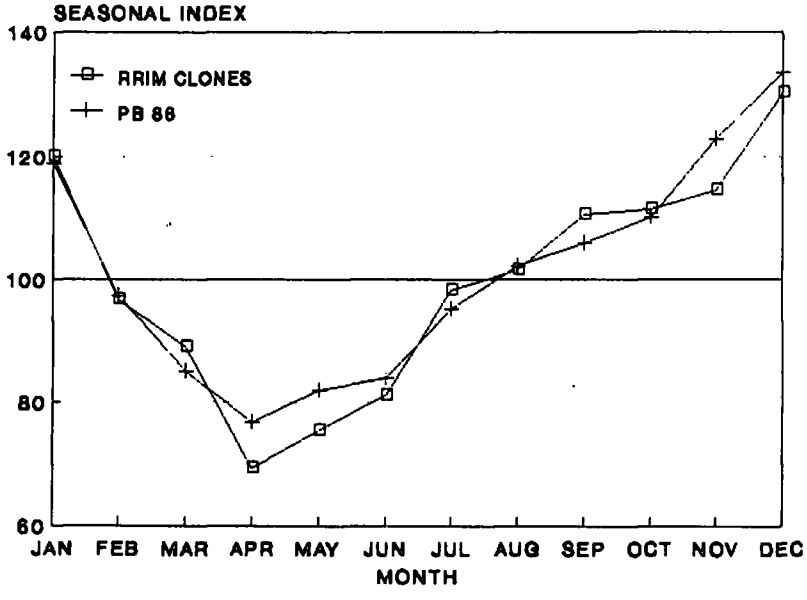


Fig.1. Typical seasonal indices for different clones tapped in panels A and B

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