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THE RUBBER SEED PRODUCTION IN SRI LANKA: RESULTS OF AN ISLANDWIDE SURVEY

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ABSTRACT

Seed production of rubber plantations in certain areas of Sri Lanka has gone down to very low levels affecting the quality of the planting material i. e. budded stump. An island wide survey was therefore conducted to gain some knowledge on the quality and the quantity of the seeds produced on different clones in different climatic regions of Sri Lanka. The results confirmed that the regional effects most probably owing to climatic and weather factors are the main causes while the clonal effect was minimum. It was evident that the seed production in dry region is far more than the country's requirement for the production of budded stumps for annual replanting programme.

Key Words: *Hevea brasiliensis*, rubber, seed production

INTRODUCTION

Seed production of rubber trees was always satisfactory and well above the demand of the planters. This is evident by the attempts made to use rubber seeds for other purposes such as an oil and the resulting meals an animal feed.

Since the introduction of the rubber tree to Sri Lanka, the demand for seeds as a planting material remand the same though the planting material changed from unselected seeds to budded stumps. The total area under rubber in Sri Lanka is around 162000 ha. and therefore, annual replanting hectarage is about 5346. For replanting of this area nearly three million budded plants are required annually.
However, since late 1980's there was a marked decline in the seed production, specially in the wet region of Sri Lanka and this situation affected the quality of planting material to a greater extent.

Earlier it was believed that seeds of certain clones were superior to others and seeds of such clones were recommended and used for the establishment of root stock nurseries.

Since the clones recommended for plantations changed due to different reasons such as poor yield or susceptibility to diseases, the clones such as Tji 1 recommended for seed gradually disappeared. Further, it was found that, the

variation among any population is very large, as far as vigour is concerned. Therefore, the use of seeds from any available clone but selecting vigorous seedlings was recommended (Samaranayake, 1975).

Further, as far as the hectarage of rubber in Sri Lanka it may not be economically viable or practically possible to maintain plantations only to collect seeds.

Earlier study done on seed production indicated (Seneviratne *et al.*, 1997) that the reduction is limited to certain areas in Sri Lanka and the reduction can be related to climatic factors more than any other reason. In, this report, the data gathered on the seed production in a wider area of Sri Lanka is summarized.

MATERIALS AND METHOD

This survey was done by 20 Rubber Development Officers (RDO's) selected from the six rubber growing regions shown in Table 1. Preliminary work was started in May-June 1996 in order to collect data during the seed fall of 1996.

Table 1. RDO ranges where the seed survey was conducted and their annual rainfall

Region	*RDO Ranges*
Kalutara	Kalawila, Bulathsinghala, Horana, Agalawatta
Kegalle	Kandy, Kurunagala, Ruwanwella, Kegalle, Warakapola, Matale, Dehiowita
Ratnapura	Ratnapura, Kiriella, Nivitigala
Galle	Akmeemana, Elpitiaya
Gampaha	Devalapola
Homagama	Puwakpitiya, Meegoda

The selected RDO's were requested to select six sites within 10 km radious of their operating place and send us the information such as the clone, extent, age, location and rough plan with details of the adjoining lands.

Once the information was received from all RDO's selection of sites was done by us and each RDO was given three sites to conduct the survey. Plantations above 6-7 years were selected since the seed production generally starts at 6-7 years starts of age. In the centre of each selected site 50' x 50' square was marked and cleaned removing all old seeds. Seed collection was done weekly throughout the seed fall. The length of the seed fall varied from region to region.

The seeds fallen in to the marked area were collected and categorized separately as good quality seeds inferior quality seeds and pods. Categorizing seeds as good and inferior was done arbeterility and there was no chance of a good quality seed being categorized as inferior although the vice-versa was possible. The seeds inside the pods were also inferior in quality.

RESULTS

The number of seeds collected weekly were gathered from all 60 sites. However, some clearings did not produce any seeds at all. The seed production in two of the experimental plots was unbelievably high and those plots were not taken into calculation. When the locations of such sites were inspected, it was observed that they are at the base of a sloping area. Further, in some sites there were doubts on the reliability and data of such plots were also excluded.

Spread of the seed fall

The spread of the seed fall in different region are given in figure 1.

Commencement of seed fall varies from one region to the other. For instance in Kalutara and Homagama nearly 40% has been produced by mid July whereas in Kegalle the peak seed fall is in mid August. In Gampaha and Ratnapura also the peak seed fall was in mid July, but in Galle the seed production was higher at the beginning of August.

The production of seeds in different regions

The calculated number of seeds per hectare for different clones in different region is shown in Fig. 2.

Both clonal differences and regional differences can be seen from Figure 2.

The clone wise production of seeds is shown in Fig. 3 irrespective of the region. Only good quality seeds were taken in to consideration.

The highest hectarage production of seeds was shown by the clone PB 86 while it was lowest in RRIC 121 (Fig. 3).

The region wise seed production irrespective to the clone showed (Fig. 4) that the highest production in Gampaha and the lowest in Ratnapura region.

The quality of seeds

A certain percentage of seeds collected from all sites of all clones was inferior as shown in fig. 5.

When the data was presented region wise (Fig. 6) it is observed that some clones have performed differently in different regions.

As seen from Fig. 4 clone RRIC 121 has only less than 5% inferior quality seeds in Kegalle while it is nearly 40% in Ratnapura. Similarly PB 86 has a higher percentage of inferior quality seeds in Kalutara region where as in Kegalle it is about 15%.

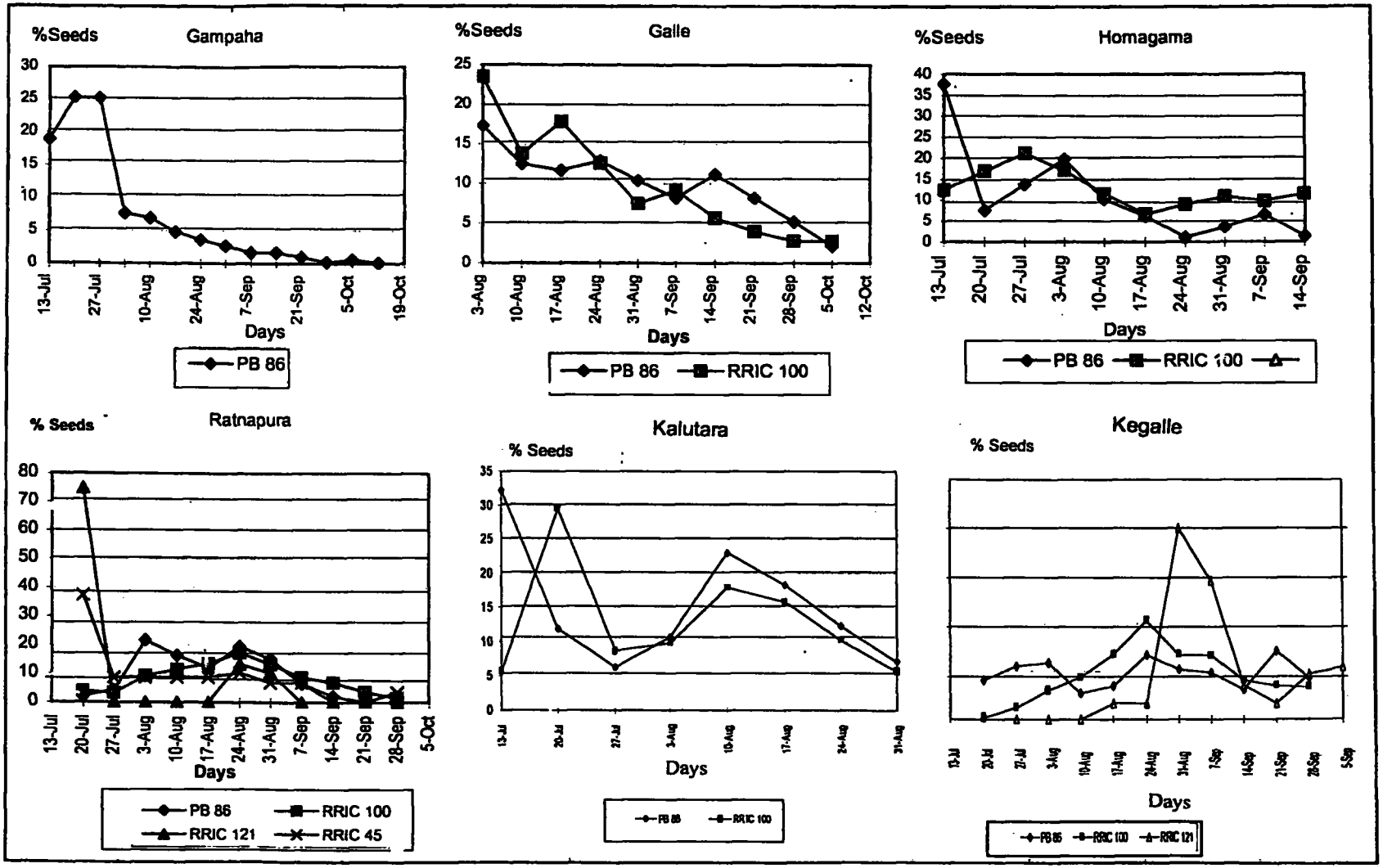

Fig. 1. Seed fall pattern in different regions

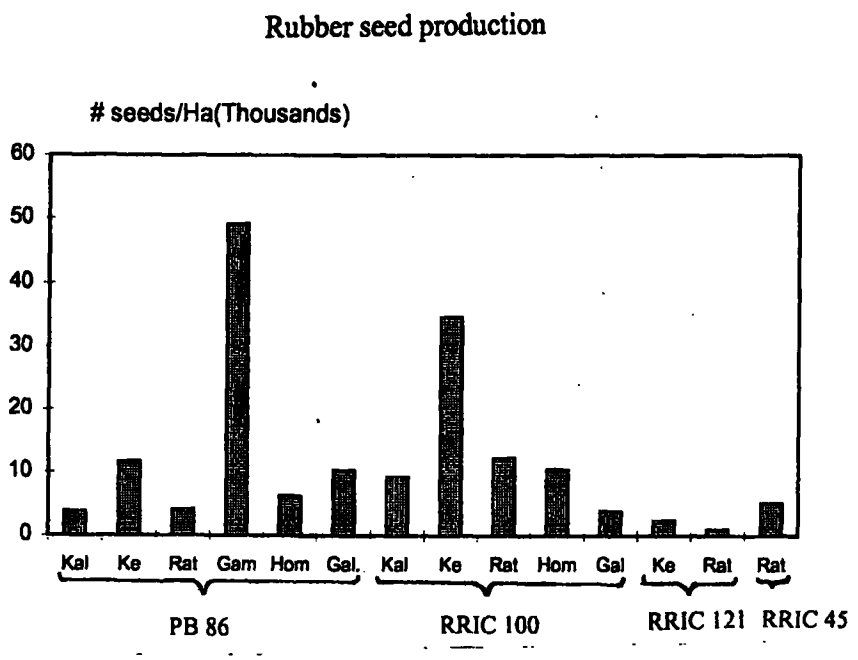

Fig. 2. Clone wise seed production per hectare in different regions

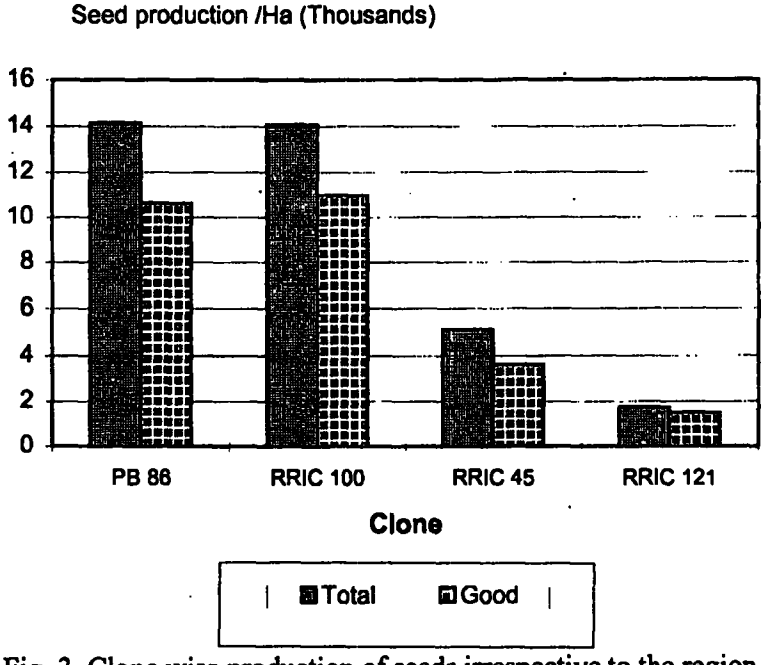

Fig. 3. Clone wise production of seeds irrespective to the region

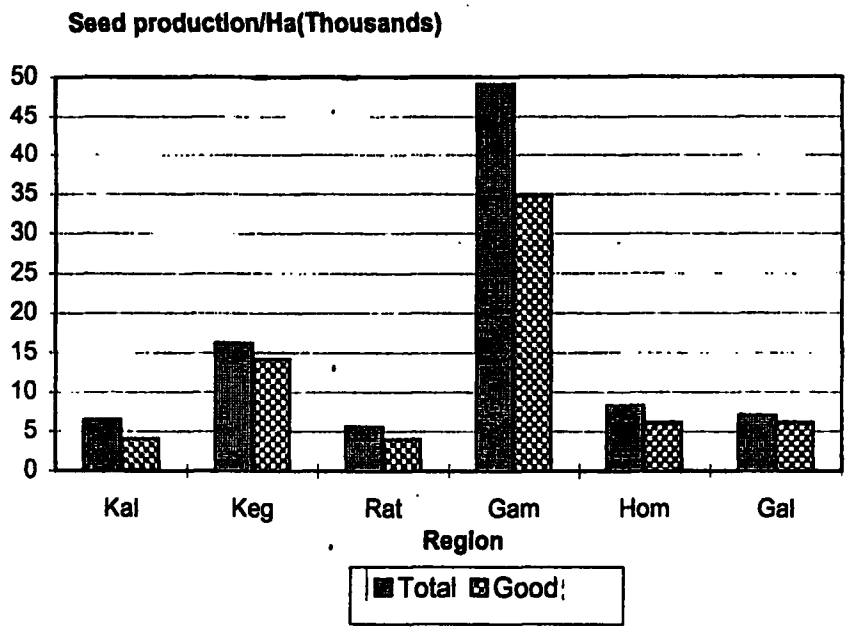

Fig. 4. Region wise production of seeds irrespective of clone

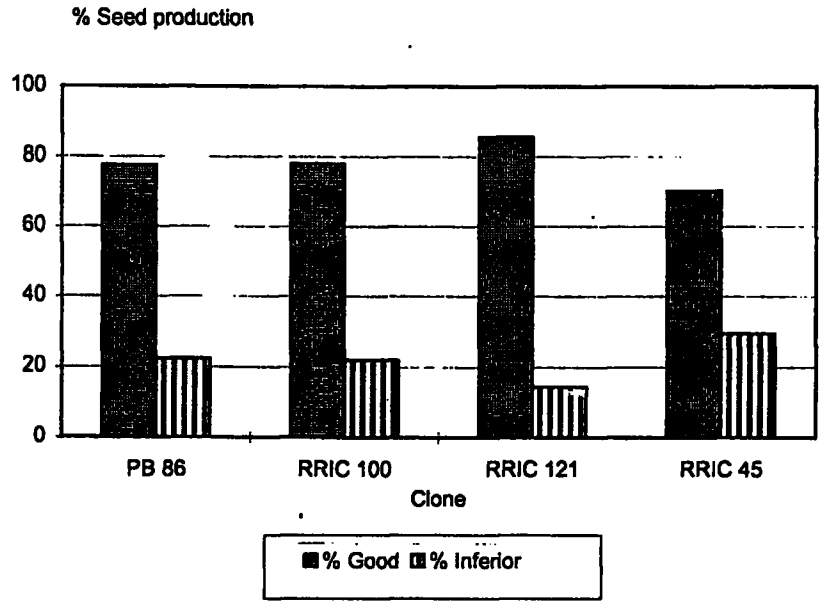

Fig. 5. Percentage of good and inferior quality seeds irrespective of region

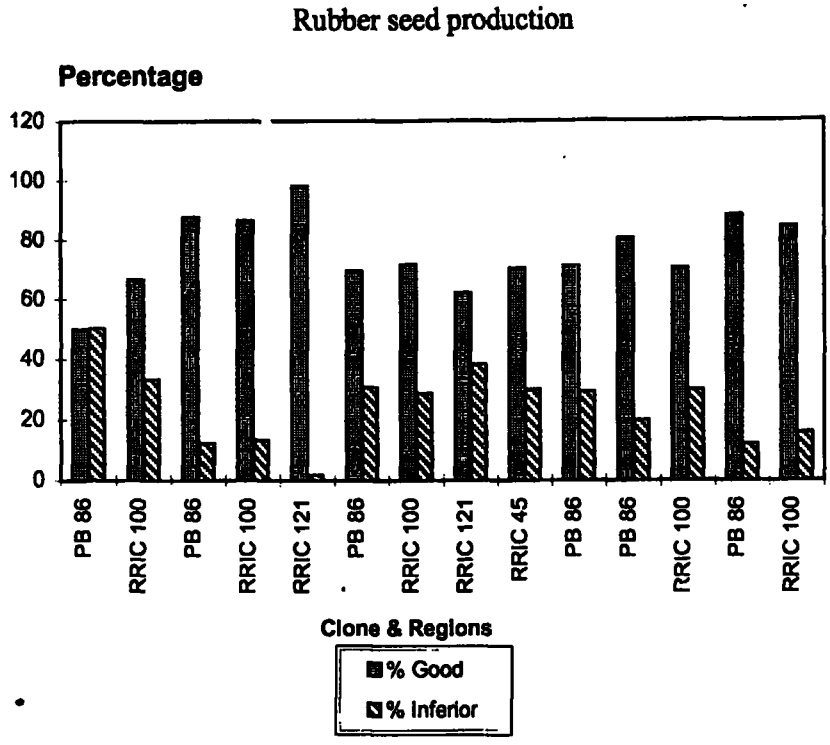

Fig. 6. Percentages of good and inferior quality seeds presented region-wise

DISCUSSION

The results of this survey revealed some regional effect in the pattern of seed fall, in the production of seeds and also in the quality of seeds. The data show similarities to what is reported by Seneviratna *et al* (1997) where the regional effect was more pronounced. In that study, done in 1995, only three sites were selected per clone per region. However, as concluded in that report also, the differences in seed production were more related to the region than any other factor. The regional differences may be related to the climatic and weather factors. Unusual reduction in the rubber seed production in wet region started late 1980's and still continues with no noticeable change. Attempts were made to identify any change in weather pattern in affected region by using the weather data obtain from the meteorological department with no success. Among the important climatic factors, the rainfall, pattern of rainfall, sunshine hours, relative humidity temperature etc. are important for the production of seeds. The seed fall pattern could have been influenced by the rainfall pattern to a greater extent because the mechanism of seed fall by dehisce explosion requires dry weather. Though the seed fall generally last 4-6 weeks the length and the peak period may depend on the clone and also on the prevailing

weather. Even during the peak period of seed fall, it has been observed that, seed fall stops if the weather changes to be wet. Further, this could have affected the quality of the seeds in the latter part of the seed fall.

Therefore, the pattern of seed fall which show differences from region to region can also show differences from year to year depending mainly on the weather pattern.

Similarly, the number of seeds and also the percentage of good quality seeds can be affected by climatic factors. However, the number of good quality seeds is always higher in drier areas such as Kegalle, Gampaha with compared to that of Kalutara and Ratnapura (Fig. 4).

Further, epidemics of folier diseases such as *Oidium* and *Phytophthora* also occurs according to a pattern (Jayasinghe & Jayaratna, 1996) which can also be the pattern of a weather condition favourable for the spread of such diseases.

CONCLUSIONS AND RECOMMENDATION

1. The seed production in wet region is low and also unpredictable. Though the production in dry regions is generally high this may vary from year to year. However, the total production in dry areas is far too higher than the whole countries requirement.
2. Seeds should be collected during the early seed fall, which can some times be as short as 2 weeks.
3. The viability of seeds is generally less than 3 weeks from the day of falling from the trees. The date of falling is difficult to detect unless the area is well cleaned and also the seeds are collected frequently. Therefore, seeds should be placed on germination beds soon after collection.
4. A certain percentage of seeds can be inferior in quality. This amount cannot be predicted for the clone or the region. Therefore a higher amount should be used in germination beds.
5. The seeds should not be exposed to high temperature or enclosed in polythene sacks when transporting or storing.

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