

COMPARATIVE STUDIES ON THE ROOT SYSTEM OF STEM CUTTING AND BUDGRAFT OF RUBBER AT 15 YEARS GROWTH

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The current conventional method of propagating clones of *Hevea* is by budgrafting on to the seedling stock. Effect of root stocks in improving growth and productivity of scion is considerable. But a certain amount of heterogeneity is noted in the root system. Hence, variation among the plant population from a single clone can be attributed to root stock excluding the environmental variables. Development of plants on its own

root system is one of the major means to have more uniform planting materials. With this object in view, various Rubber Research Institutes in the world are engaged in experiments on rooting of cuttings.

Attempts were made to root cuttings as early as 1878. Initially researchers were able to root cuttings from young seedlings only. The cuttings taken from young rubber seedlings were

known to root quite easily, whereas shoots from mature budding or from seedlings which had reached flowering stage rooted much less easily. Due to pronounced genetic variations among the seedlings, it is more desirable to produce rooted cuttings from clonal materials, the performance of which are more predictable. Earlier attempts to produce clonal materials of *Hevea* by cuttings were not successful.

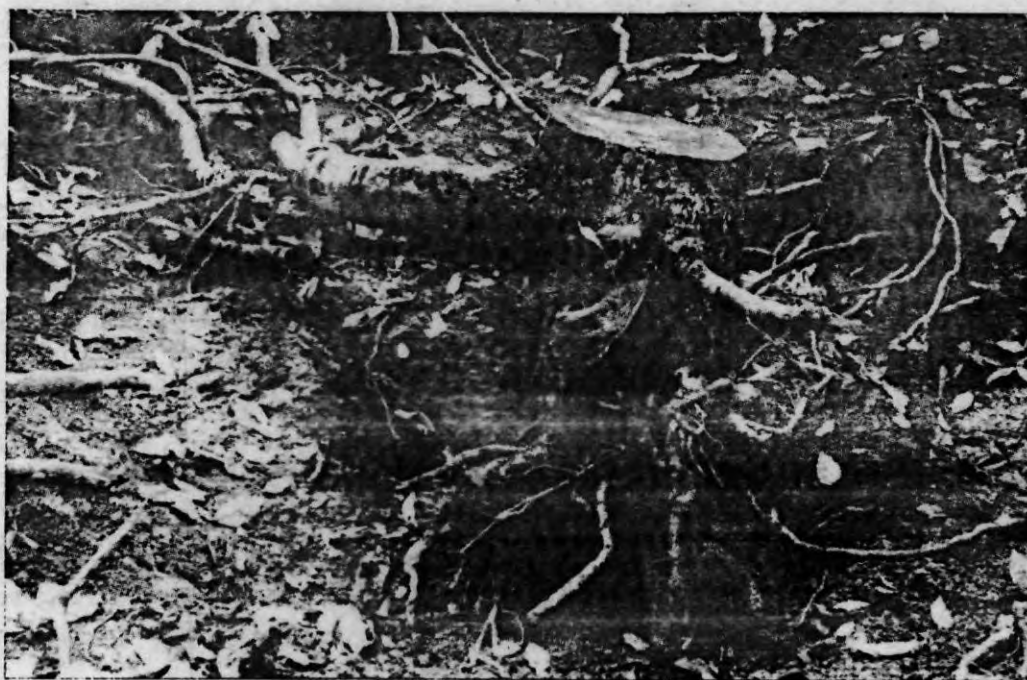


Fig 1. Root system of stem cutting at 15 year's after planting.

The successful rooting of cuttings of clones of rubber was reported first from Malaysia (Rubber Research Institute of Malaya 1959, 1962). This was made possible only by the introduction of a special technique - propagation under a mist spray. Collection of suitable cuttings from the correct source and the

comparative studies on the root system of a stem cutting with that of a budgraft at the age of 15 years after planting.

MATERIALS AND METHODS

During 1976, stem cuttings were taken from the young budgrafted plants of PB 5/51. The cut ends

RESULTS AND DISCUSSION

The root system of stem cutting and budgraft are shown in Fig. 1 & 2 respectively. Girth of the stem is more for the cutting (157 cm) compared to the budgraft (132 cm). Total number of lateral roots are 23 for cutting and 24 for budgraft. The length of main root



Fig 2. Root system of budgraft at 15 year's after planting

use of chemicals also help to induce root initials.

In order to have the full realisation of the potentialities of the clones, performance of the clones on its own root system has to be evaluated. Rooted cuttings from a single clone produce more uniform planting material for experimental and research work. However, a comparative study of the root systems of mature budgrafts with the rooted cuttings of the same age has not so far been reported. This communication deals with the

were dipped in water and then in Seradix No. 2 and planted in polybags, filled with top soil, for rooting. These plants were planted along with the normal budgrafts at Central Experiment Station, Chethackal during 1977. At the age of 15 years nature of the root system of cutting as well as budgrafts was studied by excavating the mature plants in the field. Girth of the stem 20 cm above the collar and tap root (pseudo tap root in the case of cutting) 20 cm above the collar as well as the number and girth of lateral roots were recorded.

(tap root) is more for the budgraft (127 cm) in comparison to that (pseudo tap root) of cutting (97 cm), whereas the mean girth of the lateral roots are more for the cuttings (36) compared to the budgrafted plant (32). In the stem cutting very large lateral roots are developed. In the case of cutting several roots growing parallelly and vertically downwards have grafted together forming a pseudo/false tap root doing the functions of a normal tap root. In the case of budgrafted plant tap root is very well developed

compared to that of cutting, with regard to budgrafted plants if the soil depth is very good the development of the root system is also very good. If there is any rock or hindrance to the proper development of root system, the tap root retards its growth and normally result in uprooting of the plant. In the root system of the budgrafted plant there are two well developed whorls of lateral roots.

In the case of stem cutting one or two lateral roots grow very well and support the whole tree. If the soil is deep the root system develop well as in the case of budgrafts. Eventhough the number of cuttings planted is only three no wind damage is so far noticed for these plants suggesting the proper development of the root system.

It is reported (Leong and Yoon 1984) that the rooted cuttings are prone to wind damage during 2nd and 3rd year. The major defect of rooted cuttings was the absence of a tap root to anchor the trees to the ground.

This preliminary observation indicated the possibility of proper development and anchorage of the root system of cuttings. The only thing is the success of initiation of roots on the cuttings depends on various factors. By providing mist as well as growth hormone like Indole butric acid (IBA) or Seradix the root development in cuttings can be enhanced. Since these plants are growing on its won root system interaction of stock scion is nullified. Hence these rooted cuttings are valuable research rools.

One of the most important requirement for the successful rooting of cuttings is a reliable hormone to induce rooting. Trade name along with the component chemicals of a few materials are furnished below:

Seradix No. 1 - 0.1% Indole butric acid (IBA) in talc

Seradix No. 2 - 0.3% Indole butric acid (IBA) in talc

Seradix No. 3 - 0.8% Indole butric acid (IBA) in talc

Seradix L 15 - 1.5% Indole butric acid (IBA) in talc

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Forum to Protect Genetic Resources

A joint forum of farmers' associations have demanded a Central legislation declaring India's resources as "national property" to safeguard indigenous genes and plant resources from patenting as suggested in the Dunkel Draft.

The forum, being convened by the "Gene Campaign" group, has threatened mass action by farmers from all over the country to retain control of the genetic resources belonging to India.

In a statement the forum demanded removal of the restriction on processing, movement and trade of farm products; spending of 75 per cent of the Plan expenditure exclusively on the rural sector; ban on entry of multinational companies in the agriculture sector and protection of genetic resources by rejecting patents and monopolistic forms of intellectual property protection demanded in international negotiations.

The signatories to the statement include Mr. Bhanu Pratap Singh, Mr. Nanjundaswamy of the Karnataka Farmers' Association. Mr. Lakhanwal of the Bhartiya Kisan Union, Punjab, Mr. Pishora Singh of the All-India Bhartiya Kisan Union and Ms. Suman Sahai of the Gene Campaign.