

BRANCH INDUCTION ON IMMATURE RUBBER (*HEVEA BRASILIENSIS*) PLANTS USING RAW LATEX

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To ensure high rate of girth increment in immature rubber plants, they should produce branches at a height of 2.5 to 3.0 m. In most plantations, many rubber plants have the tendency to grow high without branching at the optimum height. Techniques like leaf capping and double-blade ring-cut are conventionally applied for branch induction. In the present study, raw rubber latex was poured on apical meristem of the plants to retard its vertical growth temporarily and to induce branches. This method has been found to be superior and cost effective when compared to that of leaf capping.

Keywords: Branch induction, Immature rubber, Latex application

Immature rubber (*Hevea brasiliensis*) plants should produce branches at a height of 2.5 to 3.0 m to achieve high rate of growth and girth (Seneviratne, 1966) that in turn ensures higher productivity in the later stages. In high branching trees, girth increment has been found to be poor compared to low branching trees. Rubber trees in Tripura, which are in a cyclone prone area, invariably need optimization in branching. Obviously the clones used for planting also influence branching patterns (Punnoose *et al.*, 2000).

Generally rubber plants show branching at optimum heights naturally. Offshoots that emerge below the optimum branching heights are removed periodically to ensure that the branching is at the desirable height. But some plants show a tendency for high branching. If branches are not produced naturally at the optimum height, branching

is induced by encouraging a few lateral buds to develop into branches at the appropriate height. This is conventionally done through leaf capping or leaf folding methods. Alternatively double-blade ring-cut device is used to induce branching. The branches artificially induced should develop in different directions in an equally spaced manner to ensure a well-balanced canopy.

Leaf folding method is applied by carefully bending the plant to reach out to the apical bud and covering it by folding leaves from the whorl of leaves below and tying the folded leaves with a rubber band (Punnoose *et al.*, 2000; RRIM, 1976). In leaf cap method, three to four mature leaves are used to cap the apical bud of the tree. In plants where the terminal whorl of leaves is in the leaflet or bud break stage, the leaf cap method is recommended. These methods must place the apical meristem in dark so that apical

growth gets retarded and plant develops few lateral buds from below. Such buds give rise to new branches later (Punnoose *et al.*, 2000). The leaf cap method has an obligation of uncapping of apical bud after three to four weeks by opening the rubber band and releasing the folded leaves so that the apical bud may grow normally. There are chances for failure of this method due to wrong ways of capping of apical meristem.

If uncapping is not done at the right time further growth of terminal bud will be adversely affected. In certain cases the apical meristem gets damaged while capping it defectively. In adverse situations, apical meristem might get destroyed due to wrong approaches in capping and uncapping.

The double-blade ring-cut device has two V-shaped blades fixed 20 cm apart on a rod. Complete ringing of the bark down to the surface of the wood is done by pressing the V-shaped blades and rotating them around the trunk. The cuts are made above a cluster of leaf scars so that many of trunk shoots are produced around this region. This method can be applied only on greenish brown or brown tissues and is not suitable for young green tissues (Punnoose *et al.*, 2000). This method demands high skill and expertise in implementation without harming the tree.

Application of raw latex for branch induction involves bending of trees to lower the apical meristem, pouring of raw latex on the apical bud by using a piece of cotton for squeezing the latex out and releasing it slowly so that poured latex remains intact to cover the bud. There should not be any rain within next four to five days so that the

poured latex is not washed away. The latex, so applied, dries up and retards growth of the apical meristem. After about two to three weeks, the dried up and blackened latex coverings get naturally ruptured allowing apical meristem to grow normally.

The use of latex for branch induction was tried successfully about two decades earlier. Now a scientifically designed experiment was carried out and the results are presented here.

A young rubber plantation (1.5 ha, 650 plants) belonging to Sri Laba Telenga at Singicherra in Khowai district of Tripura planted during 2020 was selected for the experiment.

The treatments included were leaf capping on apical meristem for branch induction, latex application on apical meristem and control.

The different treatments were applied at random on plants, which did not have lateral branches. A total of 316 rubber plants, which did not have lateral branches, were marked with three different colours.

The plants with yellow marking were applied conventional leaf capping method for branch induction. The plants, with blue marking, were applied with raw latex at their apical meristem while plants with red marking were left out without any treatment, as control. The treatments were applied by first week of July. Some plants on which the leaf cap got opened up due to heavy rains were re-capped after two weeks. The final observations were recorded after one month from such re-capping.

Table 1. Effect of branch induction method on branch initiation

Treatments	No. of treated plants	No. of plants that showed branching	Success percentage (%)
Leaf capping	97	60	61.86
Latex application	120	97	80.33
Control (No Treatment)	99	15	15.15

Table 2. Effect of branch induction method on number of branches produced

Treatment	Total no. of trees (%)	No. of branches produced											
		No. of trees (%)											
		0	1	2	3	4	5	6	7	8	9	10	11 12
Leaf capping	97 (100)	37 (38.1)	1 (1.0)	4 (4.1)	13 (13.4)	11 (11.3)	17 (17.5)	4 (4.1)	4 (4.1)	1 (1.0)	2 (2.1)	2 (2.1)	0 (0) 1 (1.0)
Latex application	120 (100)	23 (19.2)	15 (12.5)	10 (8.3)	16 (13.3)	10 (8.3)	15 (12.5)	12 (10.0)	7 (5.8)	4 (3.3)	3 (2.5)	1 (0.8)	2 (1.7) 2 (1.7)
Control (No treatment)	99 (100)	84 (84.8)	2 (2.0)	3 (3.0)	2 (2.0)	2 (2.0)	2 (2.0)	1 (1.0)	0 (0)	0 (0)	2 (2.0)	0 (0)	1 (1.0) 0 (0)

Values in parentheses are percentages

Latex application method has given significantly higher percentage (80.33) of success in inducing branches (Table 1). Conventional leaf capping method was effective in 61.86 per cent of plants while only 15.15 per cent plants with no treatment showed branching.

Latex application method has resulted in induction of more number of branches (Table 2). About 62 per cent plants treated with raw latex for branch induction have given out two to eight branches while the same has been 56 per cent and 10 per cent in case of leaf capping method and for control plants respectively.

Manpower involved in latex application method has been much low when compared with leaf capping method. The treatment had to be repeated in case of leaf capping method as there were some unsuccessful cases in first attempt and torrential rains distorted capping in some plants. There was no incidence of damage of apical meristem in any of the plants under the different treatments.

The efficacy of branch induction by application of raw latex on apical bud has been found to be more than that of leaf capping method and control. This process also has advantages of less skill, time, labour and complications of damage to apical bud over leaf capping method. It leaves lesser chance of failure in the event of no rain within four to five days from the day of application, but in case of leaf capping method there is a probability of failure due to the apical bud growing further through the defectively fixed caps.

Moreover, application of latex has no requirement of time-bound follow-up. But uncapping of the apical meristem is an inevitable obligation in case of leaf capping method. Defective leaf capping method also may cause harm to apical meristem. The method of applying raw latex to induce branching is also not complicated or skill-dependent as it is in case of other branch induction methods.

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