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"Puncture Tapping" of Rubber Trees for early yield

P K NARAYANAN
Deputy Director (P & PR), Rubber Board, Kottayam-1.

Budded rubber trees are normally tapped when they attain a girth of 50cms (20 inches) at a height of 125cms (50 inches) from the bud union in the ground. On an average it takes 7 years for a rubber tree to attain this girth. This is considered too long a gestation period for the farmer to wait.

A recent study at the Rubber Research Institute of India categorically reveals that the rubber trees could be subjected to a new method of exploitation called 'Puncture Tapping' as soon as they attain a girth of 43 cm (17inches) i. e. one year before the prescribed girth for tapping under the conventional system is attained.

"Puncture tapping" is the process by which a needle like device is used to "injure" the stimulated bark of the rubber tree by puncturing and cause exudation of latex. While subjecting the bark to "controlled wounding" by puncturing, care should be taken to see that the needle does not injure the cambium lest it will cause swellings and uneven growth on the tapped portion of the trunk. To ensure this, the length of the needle used for puncturing is adjusted in such a way that it penetrates only up to a depth safely leaving 1 mm still to reach the cambium This optimum length of the needle is ascertained and adjusted by gauging the correct depth of the bark through a random test check among the trees in a

'Needle Knife' used for Puncture Tapping

holding, set to be tapped the new way. The length of the needle is then regulated by a hexagonal nut fixed at the base of the needle by rotating it up or down. The tip of the needle should be kept blunt and not sharply pointed. Subjecting the rubber trees to "Puncture tapping" one year early, not only does not cause any adverse effect to the trees but also brings in an extra, early yield of over 300kgs of rubber per hectare in a year, which fetches a gross income of about Rs. 5000/-. Leaving the cost to be incurred for stimulation, puncturing and processing, the net return could be anything between Rs.2500 to 3000 per hectare.

'Puncture Tapping' technique

"Puncture tapping" is recommended to be done either above or below the point at which panels for tapping under the conventional system are to be opened. Puncturing of the bark using the 'needle knife' is performed on a panel, of length 50cm and width 1.5cms. After such a panel is marked, the dry rough outer bark within that panel is gently scraped at first, to make that portion smooth. Over scraping, resulting in the bleeding of latex should positively be avoided. Then a thin film of a chemical stimulant, called Ethephon, is smeared using a brush on this panel. The stimulant should be diluted to a concentration of 2.5% by adding 3 times the quantity of water, as the chemical available in the market under the trade name "Ethephon" is of 10% concentration stimulated panel is ready for puncturing.

At a time 10 punctures are made in succession, lengthwise, in the stimulated panel. Within seconds of puncturing, latex will start oozing out of the punctured holes in the bark. The stream of latex flowing down the punctured holes should be connected so as to move down in one line and drip into the shell fixed at the bottom of the puncture tapped panel through a metallic spout.

Puncture tapping should be done only every alternate day. The points in the panel, punctured once, should not be pierced again. Every time puncturing should be done at new points within the panel. A 50cm x 1.5cm panel can be effectively puncture tapped for a month on the alternate daily system i.e. 15 days in a month.

After one month, another panel of the same size is marked, 4-5cms away from the first panel at the same level. This is stimulated and puncture tapped during that month. The same course is repeated round the full circumference of the tree. About 10 panels will have to be made one after the other for puncture tapping in one year, at the rate of one panel per month, giving allowances for periodical breaks caused due to rain and other climatic hazards.

By then, the trees would have attained the prescribed girth for tapping them under the conventional system. One of the beneficial effects of puncture tapping observed is that, when the trees are put on conventional system after one year's puncturing, the initial yield under the conventional system is found to be slightly more than what is usually realised. Also, as a result of puncture tapping, rubber trees are found to be girthing faster.

Though not practised at all in India, Puncture tapping is being adopted in Malaysia, Indonesia & Thailand. Once the rubber producers in India accepts this technique it will enable them to realise early yield resulting in reduction of the gestation period of rubber by a year. Another gainful feature of Puncture Tapping is that it does not require any special skill at all, whereas slicing of bark at uniform thickness using special tapping knives in the traditional system calls for intensive practice, training and skill.

To begin with Puncture Tapping is recommended to be adopted in the rubber plantations in our country only on an experimental basis. Wide spread practice is to be made only after the physical gains of this technique are convincingly proved, commercially ☐

POLYMER REINFORCED CEMENT

Cement bottle caps, Cement hi-fi equipment, cement springs —several English and Irish researchers are deriving new strength and versatility from an old-fashioned construction material, the glue that holds concrete together.

Compared to metals and plastics, cement is inexpensive. Marking the dry powder takes less energy than making plastics or metals and requires only cheap, plentiful raw materials-chalk and clay. Blending in a bit of water creates a mouldable paste that hardens at normal temperatures, and the final product is an incombustible solid that a three-tone truck won't crush.

Cement does have drawbacks. Bend a piece and it breaks like dry spaghetti. Drop something on it and it cracks. But abalone shells, also made of chalk, are stiffer than aluminium, as tough as plexiglass, and 10 times more resillent than cement.

Researchers at Imperial Chemical Industries (ICI) found millimetre long holes in cement which causes the lack of resillence. Abalone shells have no such holes. Their crystals are orderly and tightly packed.

JCI researchers discovered that they could copy the structure of abalone crystals by kneading unhardened cement to remove troublesome air bubbles. They add a water-soluble organic polymer that causes the cement particles to slide easily over one another, melding together. As the polymer dries, it pulls the grains in even more closely.

This new "macro-defect-free" (MDF) cement has holes no more than a hundredth of a millimetre long. Since its resilience is 30 times that of ordinary cement, a spring made of it can tolerate 300 pounds of tension. The cement is also tough: a conventional lathe can turn a block of it into a tube without cracking it. And when reinforced with nylon fibres. MDF cement can take over 1,000 times as much impact as ordinary cement.

Load-bearing floors, ceilings, and partitions of MDF cement would be strong and soundproof. Pipes and containers would be resistant to solvents, acids, and alkalies. Freezing and thawing would not harm them, either, because at very low temperatures MDF cement becomes strong but not more brittle. It fails to hold up well outdoors or in water, however: either the polymer leaches out or the solid goes soft.

At Ulster Polytechnic in Belfast, Northern Ireland, scientists reinforce cement with a fabric woven of polypropylene. Adding fibres to cement impedes the growth of cracks, inereases flexibility. and helps hold the solid together.

(PTI Science Service)