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Short Term Techniques for Boosting Rubber Productivity*

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Natural rubber(NR)is produced in India from 415,000 hectares of rubber plantations raised in agro-ecologically suitable areas in different states. As at the close of 1988-89, the plantations that were mature and under production extended over 266,000 or 64 per cent. The total production recorded during 1988-89 was 259,000 tonnes which worked out to an average yield of 973 kg per hectare of productive area. Productivity-wise, India is second only to Malaysia amongst major rubber producing countries (Malaysia-1,230 kg, Indonesia-661 kg, Thailand -776 kg, Sri Lanka - 732 kg, China-733 kg).

The cultivars of rubber grown in India and other countries are more or less the same. While a few of the recently evolved new clones are yet to be imported into India, we have developed and widely popularised the clone RRII 105 which can stand comparison with the best in commercial scale cultivation anywhere in the world both in high yield and secondary characters. The reasons for the lower productivity of plantations in India as compared to those of Malaysia are indentified as the following:

i) Climatic factor-Moderate, well distributed rain fall in Malaysia which suit rubber best as against over-abundant but highly seasonal rain fall in India. The excessive rains interfere with tapping of rubber trees causing loss of production for 40 to 60 days per year in India. The tree also suffers in growth aspects owing to dry, unfavourable weather experienced annually for 4 to 6 months.

ii) Wide spread prevalence of Abnormal leaf fall disease in India during South West Monsoon season.

iii) Relatively conservative tapping practices adopted in India.

iv) Delay in replanting old and low yielding plantations.

v) Preponderance of holdings of very small size.

India, however, enjoys the following advantages over Malaysia:

i) The nutrient status of our rubber growing soils are relatively better than those in Malaysia although most of our lands involved are undulating and steep and subject to heavy soil erosion and degradation whereas in Malaysia the bulk of the areas planted with rubber has flat or gently slopy terrain.

ii) The small growers in India are relatively more eduated and enlightened and are therefore keener to absord and adopt new technologies than their counterparts in Malaysia.

Malaysia and other major growing countries produce rubber mainly for exports. India, on the other hand, makes use of the entire indigenous production of rubber for domestic consumption and depends on imports for bridging the widening demand supply gap. Increase of production is therefore of crucial importance to us for reducing the drain of foreign exchange on the sizeable imports.

The strategy adopted for increasing production towards attainment of self sufficiency is two pronged, namely, long term measures such as expansion of cultivation, replantation of uneconomic plantations, developing or importing improved cultivars and popularising their use etc and short term measures comprising employment of improved technologies already available for generation and extraction of extra crop from trees existing on ground. Both are being given equal weightage. However, the latter involves reaching, educating & motivating lakhs of growers to adopt the appropriate technologies.

In the matter of spreading the technological concepts also, effective approaches are necessary. Out of of the total area of 41,5000ha under rubber only 76,000 ha are under large estates of 20 ha or more extent. The number of such estates is only 370. Eighty

per cent of the total area or 332,000 ha are distributed over 370,000 small holdings. Their average area works out to about 0.90 ha. Yet 77 per cent of the total production is contributed by the small holdings. About 85 per cent of the holdings are of the category of upto 5 ha in extent. This shows clearly the weak nature of the group. At the same time, in view of the large numerical size, there are immense practical difficulties for the Rubber Board's few hundred extension staff to reach them effectively. By and large, only mass contact programmes which comprise of publication of articles in newspapers and journals, telecasting/broadcasting features through TV and radio, conducting exhibitions, seminars, study classes etc. are feasible in the context. These are not penetrating deep enough amongst the target community to bring about the desired results. The Board has therefore been organising small, grass root level groups of small growers by the name "Rubber Producers' Societies" or RPSs which are registered under Charitable Societies Act. Each of these societies provides a forum where member growers meet frequently along with the Board's extension officers of the area and discuss technical innovations and development problems. There are at present nearly 800 RPSs registered and recognised by the Board. They have a total membership of about 80,000 small growers. It is proposed to increase the number of RPSs to 3,000 and their membership to 300,000 by the close of the Eighth plan period.

Well maintained plantations raised with high yielding cultivars both in small and large sectors are yielding 1,500 to 1,800 kg per hectare per year. It is possible to raise the national average yield to 1,250 kg by 2000 AD and 1,500 kg by 2010 AD.

The following are the short term measures readily available for boosting productivity of rubber plantations:

1. Discriminatory fertiliser application based on soil and leaf analyses of individual holdings.

Only about 50 per cent of the mature rubber plantation area is at present given fertiiser application in any systematic manner. The types and dosages of fertilisers are either based on Board's general recommendations or based on suggestions given by fertiliser dealers or decided upon by the growers themselves. Mostly, these prove to be imbalanced, inadequate or excessive, all resulting in adverse effects on growth of trees as well as their yield. The scientific method advocated by the Board is to determine the nutrient requirements after subjecting each holding to soil and leaf analyses. Soil testing helps to ascertain only the nutrient status of the soil. This should be supplemented by examination of what the tree is capable of actual absorption. This is done by analysing nutrient status in leaf samples. The method has proved to be both economical and effective. This requires to be got universally adopted by all growers, large and small.

2. Systematic plant protection operations such as spraying of fungicides etc.

As stated already, rubber trees in high rain fall areas in India are annually ravaged by Abnormal leaf fall disease caused by the fungus Phytophthora spp during South West Monsoon. Effective control of this is possible through prophylactic spraying of copper fungicides, either water based or oil based. Large and medium estates undertake systematic aerial spraying of their rubber trees for the purpose. Small, scattered holdings cannot be sprayed aerially and require spraying from ground either manually or with power sprayers. Manual spraying involves use of large quantities of water which is often, impracticable during the dry spraying season and climbing up of individual trees and therefore deployment of a large labour force. Power sprayers cost as much as Rs. 14,000 per unit and can be ill afforded by individual small growers. The possible course of adoption is therefore assisting RPSs to purchase the power sprayers and helping them to carry out spraying of members' holdings through trained workers' squads.

Apart from the leaf fall disease, rubber trees are subjected to a number of other fungal diseases which affect stem and bark. Bark diseases at the tapping panels are particularly crippling to efficient production. Panel protectants and other prescribed fungicides also therefore require to be regularly applied.

3. Efficient crop exploitation through improved methods of tapping.

Tapping is a skilled job. Correct timing, maintenance of proper angle of incision and deep yet damage-free tapping are all important for full exploitation of yield potential. Most of the tappers are, however, not generally initiated to the scientific aspects involved. They have to be systematically trained in the art. Tapping knives used in India (tha Michie Golledge

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type) are designed for precision tapping and are therefore time consuming in their use. They are also fit only for tapping at low heights. Jebong type knives widely used in Malaysia and other countries are useful for easy and quick tapping and therefore enable coverage of larger tasks per tapper per day - upto 500 trees in place of the normal 300 trees in India. Fitted with special long handles, they also enable higher level tapping without the aid of cumbersome laddars.

4. Rain-guarding of rubber trees for enabling production during monsoon seasons.

After excluding weekly holidays and National and Festival holidays, it should be possible to carry out tapping of rubber trees for about 300 of days in a year. The period of refoliaton of trees after annual wintering coincides with the extremely dry period of Febr-uary when latex production and flow are at their lowest. It is customary for estates to close down their normal activities during this period and to take up various annual maintenance work required. The workmen are also allowed to avail of annual leave at this time. The total number of tapping days in a year can thus get further reduced to 280 in large estates. On standard alternate daily tapping system, each tree or block of trees is therefore tapped for 140 days. In small holdings, in general, tapping gets suspended during the days of heavy rain as well as for longer rest allowed for summer. Total tapping for them is therefore confined to 170 to 190 days. For this as well as other reasons, most of them resort to daily tapping at least for certain parts of the year. This intensive system on the one hand proves highly injurious to trees and on the other raises the labour input per unit of rubber produced. Furthermore, the production gets concentrated to the general flush crop season of September to January when market prices for the produce is also generally low. This pernicious situation can change only if small growers follow the example of large estate in rain-guarding their rubber trees and undertaking tapping through the rainy season. Rainguarding makes it possible to tap each tree for an extra 30 to 40 days per year under once in two days system. Surprisingly enough, the small growers entertain various wrong notions about the practice and keep away from doing it. They fear that uncontrollable tapping panel diseases would occur following rain-guarding.

The recommended fortnightly treatment of the panel with Emisan would however effectively keep away any such disease. Another fear is about damages to bark that might be caused by pasting the polythene cover to it. The fact, however, is that standard adhesives are perfectly inert and harmless. The per tree expenses being Rs. 2.50 per year also prove to be a deterrent for them. All these inhibitions require to be overcome through appropriate group approach.

5. Chemical stimulation of yield in older plantations.

Chemical stimulation of latex flow of rubber tree is an effective modern management tool with planters for enhancing crop output at a desired times. The chemical used is ethepon (2- chloro ethyl phosphonic acid). It is generally recommended for trees which have been in tapping for more than 10 to 15 years. Large growers adopt it quite extensively to their advantage. Small growers, however, are mostly ignoran of its benefits and disist from its application on the plea of high cost. The Rubber Board intends to get chemical yield stimulation systematically popularised and got adopted extensively by small growers.

It can be reasonably estimated that the beneficial effects of each of the methods suggested are to the following extents, depending upon the existing state of growth and maintenance of rubber trees, varieties of rubber trees, age of trees, climatic factors prevailing at the time of operation etc.

Sl.No	Technological input	Possible yield increase (%)
1.	Discriminatory fertiliser application	10 to 20
2.	Effective plant protection	20 to 30
3.	Effective tapping	10 to 15
4.	Rainguarding	10 to 15
5.	Yield stimulation	20 to 50

The country is now annually importing NR to the extent of 50,000 tonnes costing over Rs. 100 crores in foreign exchange. The estimated requirements of NR for 1989-90 is 340,000 tonnes whereas the production would be only 290,000 tonnes. The demand by the end of Eighth Plan would go up to 430,000 tonnes when again the imports would have to be of the order of 50,000 tonnes. Thereafter, the import requirements would make a quantum leap as the demand by 1999-2000 is projected to rise

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collect scrap and the other two companies that produce centrifuged latex will collect latex from the members of their own member societies. Of the total production of each, small grower, 20-25% is scrap rubber. Once the factories are commissioned, scrap rubber would get a higher price. If 1000 kg of rubber is produced per hectare per year, 200 kg. would be scrap which consists of cup lumps, tree laces etc. If it gets an extra price of Rs. 1.50 per kg, the extra returns for the entire quantity of 200 kg in the first year itself will be Rs.300/- For the centrifuged latex factory, latex could be collected from members of the Rubber Producers Societies. This will help to overcome the difficulties in converting the latex into sheets and save the excess expenditure of Rs.1.50 per kg for processing.

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to atleast 575,000 tonnes. Apart from rising price trends in the world market, there would be also availability problems in respect of NR at global level.It is therefore essential for India to adopt a dynamic production policy aimed at achievement of self sufficiency at least by the close of the century.

* Paper presented at the "Seminar on Rubber Productivity" organised by the Mundakayam Planters' Association on 5th October 1989.

Objectives

The objectives of the companies are not limited to processing of low grade rubber or latex alone. They should explore the possibilities of utilizing the unexploited areas of product manufacturing in Kerala where 92% of the natural rubber is being produced and less than 10% is converted to products. The basic infrastructure of the Rubber Producers Societies with an approximate 5000 elite families could actively participate in this venture creating a sizable impact on the employment possibilities. For example, compounded rubber could be produced in tne company which can be distributed to the member families for conversion into moulded or other rubber products in their houses and brought back to the company for centralised marketing.

The so called labour problem prevailing in Kerala can not hamper this concept of product manufacture in tiny, distributed family units. The total power requirement also gets distributed which is a welcome step towards solving the complicated problem confronted by the distribution system of the Electricity Board.

The project now drawn up is on an experimental basis and it can very well be defined as one which stands "for the farmers, by the farmers" and of the farmers". No doubt the venture will be a grant success and it marks the beginning of a new industrial eara heralding a totally changed concept unfamiliar to the heitherto unorganised sections of the rubber growers of the state.

WATER PUMPED BY THE SUN

The German companies Siemens and AEG claim leading positions on the international photo-voltaic market. Siemens is now planning a new solar cell factory at Wackersdor in Bavaria to enhance development prospects.

In recent years, there has been growing demand for solar cells. Chances for solar modules. above all, exist in countries which get plenty of sun and which have "weakly built-up infrastructures"—is what participants on a study trip to Israel found out. At the Afro-Asian Institute of the Histadrut in Tel Aviv. Israeli development aid experts, who collaborate with German authorities, explained practical means of applying solar technology. For example, light buoys at sea can operate independently of other sources, or solar plants for irrigation purposes at remote settlements in the Negev Desert or-something which is common in Israel–the utilisation of solar energy for street lights in regions without power.

The costs for solar technology for major plants are still too high. Siemens engineers believe that "thin-layer" technique contains the required potential to reduce costs to achieve progress in using solar energy.

Water management is one of the most important application techniques of solar energy supply. As smaller villages in the developing countries are frequently not connected to proper electricity supply. AEG specialises in building water pumping systems which operate with solar energy. Modern water pumping systems have solved water supply problems in sunny countries such as Jordan, Egypt, Kenya, Indonesia and China, to mention only a few. □