

COMMERCIAL EXPLOITATION OF RUM

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Presented on 27th Dec: 1966.

COMMERCIAL EXPLOITATION OF RUBBER TREES

Paper by Chacko A. Kallivayalil.

Presented to the first All India Rubber planters' Conference at Mundakayam
on the 27th of December 1966.

Gentlemen,

I had the honour of going to Malaya as a Delegate with the Rubber Board Team that visited that Country during 1962. The object of the Team's visit was to study and report back to the Rubber Board about the Natural Rubber Industry there. One of the important recommendations that we made after our visit was about the usefulness of the type of Conference we are holding here now. It is gratifying to see that after the lapse of four years, we are implementing that recommendation. Mundakayam being the birth place of commercial planting of Rubber, is the fittest venue, for the first Conference and I congratulate the Mundakayam Planters Association, and the Rubber Board, for the initiative and imagination shown in organising this Conference.

For some reason, a belated request was made to me to prepare and read a paper on the subject of commercial exploitation of Rubber Trees. The subject is so vast and at the sametime so important and I am sure there were competent persons who could have more appropriately fulfilled this role. Within the short time available to me, I have tried to gather and present before you some of the aspects covering exploitation. While I am most grateful to the organisers for conferring the signal distinction on me, it is my duty here to point out to

this representative, enlightened experienced and eminent gathering of planters who are gracing this epoch making occasion, that I may be found wanting. We are gathered here fortunately for me during the festive Season, which is the harbinger of peace and goodwill towards all and regardless of my poor performance, I am sure all of you will forgive me for any deficiencies you will find in the paper that I am presenting. I wish to add here that I do not propose to claim for any credit that you may generously confer, as this is only a re-statement of known facts, but collected together from various sources for easier understanding.

Speaking of basic things, we cultivate rubber for profit, and we derive this from the extraction of latex. Ofcourse, after the trees economic life is over, the timber is put to many uses and over the sale and distribution of firewood and sawn timber, many fortunes have been made and unmade. In fact in our fuel starved country, the rubber firewood has kept our kitchen fires burning and while we are all grateful for this incidental and for some lucrative benefit, there is really no reason for us to go into more details regarding this aspect.

We will now take up extraction of latex through tapping. I may here, be, permitted to state certain well known general aspects on tapping. Tapping may be described

as controlled wounding of rubber trees. This is done by removing thin shavings of bark at known regular intervals. The bark so removed should be of sufficient thickness to re-open the ends of all latex vessels which are blocked by coagulated latex from the previous tapping. A really sharp tapping knife helps the flow and release of latex from hydrostatic pressure.

Unnecessary wastage of bark is to be avoided. The depth of tapping is equally important. The bark of a tree when a cross section is taken, will be found to contain (a) the outer protective layer of cork cells (b) and intermediate layer consisting of a mixture of soft tissue and clusters of harder cells called stone cells separated by cork cambium and (c) an inner layer of soft bast derived from the cambium consisting mainly of paranchyma cells in which are embedded rings of sieve tubes and latex vessels.

An expert tapper will tap to an even depth of about 1 to 1½ mm from the wood. If tapping is done deeper the cambium which is extremely important as it is the growing part of the tree will be damaged. When such damage takes place it is called 'wounding'. Tapping therefore is a skilled job. When a tree is wounded, the growth is interfered with as there is no cambium on that particular spot. The result is formation of cork in that place which will interfere with tapping when renewed bark is tapped.

The stem of a budded rubber tree is almost cylindrical through out but in the case of a seedling tree it tapers to the level of the first branches. The difference in girth immediately above the union in case

of a budgraft and that at 50 inches above union will not be more than 10%, where as, in the case of seedling, this may be as high as 50%. Therefore, in seedling trees when the cut comes lower the yield also is proportionately increased owing to the increase in length of cut. In budded trees on the other hand the yield decreases as the cut comes down especially when it is near the union.

The flow of latex is due to release of internal pressure. Latex is forced out and the reduction in pressure extends progressively along the length of the vessels leading to a flow of latex towards the cut. The drop in the general pressure leads to dilution of the latex as water flows from the surrounding cells. As soon as the cut is closed pressure is again built up and the equilibrium attained.

Tapping retards growth. A tree before being brought into tapping usually increase in girth at the rate of 4 inches per year. Those giving highest yields produce the highest retardation in growth if too much latex is obtained by intensive tapping, not only is the growth retarded but it also reacts with a physiological disease of the panel known as 'Brown Bast'. When trees are so affected they are to be marked and tapping stopped and the trees rested.

Under average conditions rubber can be brought into tapping during its fifth or sixth year of life. Given special care and using some vigorous growing clones this can be further reduced. The present practice is to open up seedlings when they have attained 20/22 inches girth at tappable height. In the case of

buddings also the same girth is preferable. Having covered certain basic aspects of tapping I may now be permitted to quote certain standard recommendations which help in commercial exploitation and proper planning of the panel to be tapped.

Buddings - tapping system S/2.
d/2. 100%.

1. Open the trees when 70% of the stand has reached tappable size at 50 inches above the union. The second panel to be opened at the same height at the opposite side of the trees. No stimulation should be done. This will give 10 years of tapping of virgin bark at normal height (A 1 and B 2)
2. The third panel (A3) is opened in the first renewal bark of the first panel. No virgin bark Island should be created. Bark consumption when tapping renewed bark will be slightly greater. No stimulation should be done unless there is an urgent need for a temporarily increased crop. The forth panel (B 4) should be opened in the renewed bark of the second panel with routine half yearly application of a stimulant. The trees are then over 20 years old and will respond favourably without ill effects. A total of 9 years tapping of first renewal bark may be expected.
3. A high fifth panel (A5) tapped alternate daily should then be opened above the oldest bark of second renewal at 110 inches from the union. If no favourable response to ladder tapping is observed after three months, a yield stimulant should be applied at half yearly intervals, to be increased to quarterly applications when the cut comes

within 10 inches of the junction between virgin and renewed bark. This will give $4\frac{1}{2}$ years of ladder tapping up to the time when the cut has reached the bark of second renewal.

4. Tapping is continued into the renewed bark of the low panel (A6) but without stimulation, and at the same time a second high panel (B6) can be opened at the opposite side of the tree. Both cuts are tapped third daily 2C/2.d/3. 133%. A stimulant should be applied to the high cut when the yield shows a downward trend as the cut approaches the renewed bark below. Stimulation should be half yearly at first and later quarterly and should cease when the high cut crosses in to the renewed bark. A period of five years of third daily double cut tapping may be expected on these panels.
5. At this stage the trees have been tapped for $28\frac{1}{2}$ years and will be some 35 years of age. Such fields will probably be considered for replanting. There is still bark of first renewal on the two high panels available and one low panel with bark of second renewal. One high (A7) and one low panel (B7) could be tapped out together in four years of alternate daily double cut tapping (2C/2. d/2. 200%) with half yearly stimulant application during the final two years of tapping, leaving another high panel of first renewal.

Seedlings - tapping system S/
2.d/3. 67%.

1. Open the trees when 70% of the stand has reached tappable size at 20 inches from ground level. (A1) open the second panel at

- 40 inches from ground at the opposite side of the tree (B2)
2. The third panel (A3) is opened at 30 inches above the top mark of the first panel, hence at 50 inches from the ground level. The fourth panel (B4) is opened in the renewed bark of the second panel at 40 inches from the ground. These four panels together will give a period of 18 years of third daily tapping, during which a stimulant should be used on the fourth panel, and may be used temporarily if the yield drops when the tapping cut approaches the junction of virgin bark and renewed bark on the third panel. Certain experiments have shown a disappointing response to stimulant when the cut approaches ground level on seedling trees; it is advisable to discontinue stimulation when the cut reaches a height of one foot above the ground.
 3. When the low panels have been tapped out, a high fifth panel (A5) is opened at 110 inches from the ground, if branching allows, for third daily tapping of a half circumference cut. This should be combined with halfyearly application of a stimulant, to be increased to quarterly application when the cut comes within 10 inches of the renewed bark of the third panel. This will give six years of tapping on this panel.
 4. After the cut reaches the renewed bark at 50 inches from the ground, tapping is continued into the low panel (A6) without stimulation, and at the same time a new high panel (B6) is opened. Both panels are tapped third daily ($2C/2.d/3$, 133%). No stimulation should be done until the yield from the high panel starts to drop as the cut

moves towards the renewed bark underneath. A period of five years of double cut tapping may be expected on these panels. The high cut will then be between 15 and 20 inches above the renewed bark.

5. At this stage the tree have been tapped for 29 years and the area will probably be considered for replanting. As in the case of the budded tree, there is still bark of first renewal on the high panels and also a 15 - 20 inch strip of virgin bark above an uninterrupted panel of second renewal at normal height. One high (A7) and one low panel (B7) can be tapped out together. The tapping intensity may be increased to alternate daily ($2C/2.d/2$, 200%), with half yearly application of stimulant during the final two years of tapping and quarterly application to the low cut as the strip of virgin bark is tapped away towards the bark of second renewal.

These suggested schedules are given as a guide but cannot always be put into effect. If the quality of bark of first renewal is poor, high tapping will have to be done first, followed by tapping of renewed bark. Also if wind damage or root disease curtail the life of a stand of rubber trees, intensive tapping with stimulations will have to be done at an early stage. Economic consideration may also enforce changes of tapping policy. Simultaneous change over of tapping panels on all trees will greatly facilitate planning of tapping policy and sudden deviation from a fixed schedule. Uniformity in the field is a strict requirement for the proper execution of a programme in which stimulation and a double cut tapping system are

combined.

It would be worthwhile here to consider the observations of the Malayan Expert Team that visited this country during 1960.

About tapping, the team's view was that we give too much emphasis on careful tapping and forget the fact that a proper exploitation of the tree should be completed within the economic life span of the rubber tree which is 35 to 40 years. They told us in Mundakayam that in any case better high yielding clones and planting material are now always available and why we preserve our trees so much over the years and hand them over for contract tapping forgetting the fact that even existing stands were capable of giving higher yields per acre per harvester. As any possible higher yield per tapper, while it contributes to ones own profits, the fact that that it will reduce the cost of production, is also to be borne in mind. Most of us planters, so say, some of the Trade Union leaders with whom we have to deal with, forget the fact that we have to attune ourselves with the socialistic pattern. In the matter of the rubber trees and its exploitation at least this seems to be true. We still think of passing on our rubber trees to our grand children and that without wounds and with plenty of original bark.

I may now briefly touch up on Yield Stimulants.

The response to yield stimulation in India is no different from the response in other countries. Very satisfactory results have been obtained when 18 year old seedlings and buddings have been treated with a yield stimulant. At this age rubber trees have normally reached or pass-

ed their peak performance and there is no further build up in yield level. This would be the time when we apply stimulex not as 'Slaughter tapping practice', but as 'commercial routine'. When it is possible for the yield of old plantations to be increased through application of stimulex, it enables the planter to raise the acreage re-planted each year with high yielding clones without any undue loss of income.

I hope it will be worthwhile if we deal here with certain other problems connected with tapping and tapping costs.

It is to be borne in mind that the major cost of producing natural rubber is incurred in tapping the trees and collecting the latex and as tapping is a skilled manual operation which offers very little prospect for mechanisation in the foreseeable future, the tapper is the most important person without whose co-operation successful exploitation becomes impossible. Every thing possible is to be done to save the tapper's time and to lighten his burden and increase his earnings. It is also important to demonstrate this to the tapper. The shortage of skilled tappers is already being felt in most estates where large areas of re-planting and new-plantings are coming in to bearing, and this together with rising labour costs, make it necessary to consider utilising skilled tappers to greater advantage. By increasing the task size and utilising the tapper solely for the purpose of tapping, both the estate and the tapper benefits. It is essential to give the tappers a financial interest in the resulting increased production. Part of such incentive may be awarded for quality of tapping based on monthly inspection of tasks. The question

of increasing the tappers task to the mutual advantage of the employer and labour has to be urgently looked into. Some leadership in this behalf would be very welcome, from the Labour Department, the Rubber Board, the Trade Unions and from Employers Associations.

Some of us had foreseen this scarcity for tappers and as far back as 1962, we had made a recommendation to the Rubber Board to start Tappers Training school in two or more centres. The method of recruiting tappers from among the eligible children of older tappers is found to be insufficient to meet the requirement of tappers. Therefore, the Rubber Board may consider a training scheme to train enough tappers and Estates and large holdings should assist by readily co-operating.

I am sure the Delegates will welcome a suggestion which I am making now. It is to confine the subject to general aspects of exploitation, and cover panel planting, tapping, stimulation, training of

tappers, revision of tappers task etc. only. I am making this suggestion deliberately, as the time allotted for this paper is only one and a half hours and in my opinion both the man who presents the paper and the participants should share the time fairly, in order that we may have some very useful discussions and arrive at a few worthwhile conclusions. This course will help us in making some recommendations as well if found necessary. If I am given a chance, perhaps at the next year conference we all may together cover the left over aspects of commercial exploitation, like, processing, factory practices, manufacturing, grading, marketing etc.

I thank you all for the patient hearing and also record here my gratitude to all those persons and sources who assisted me in the compilation of this paper with advice and guidance.

JAI HIND.