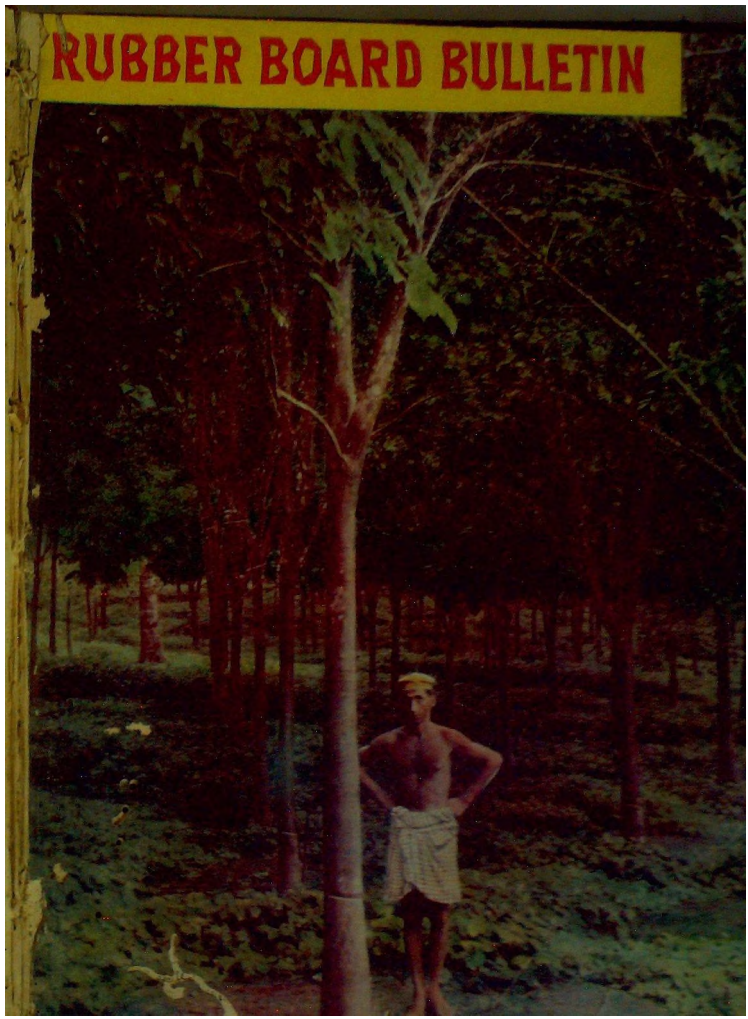
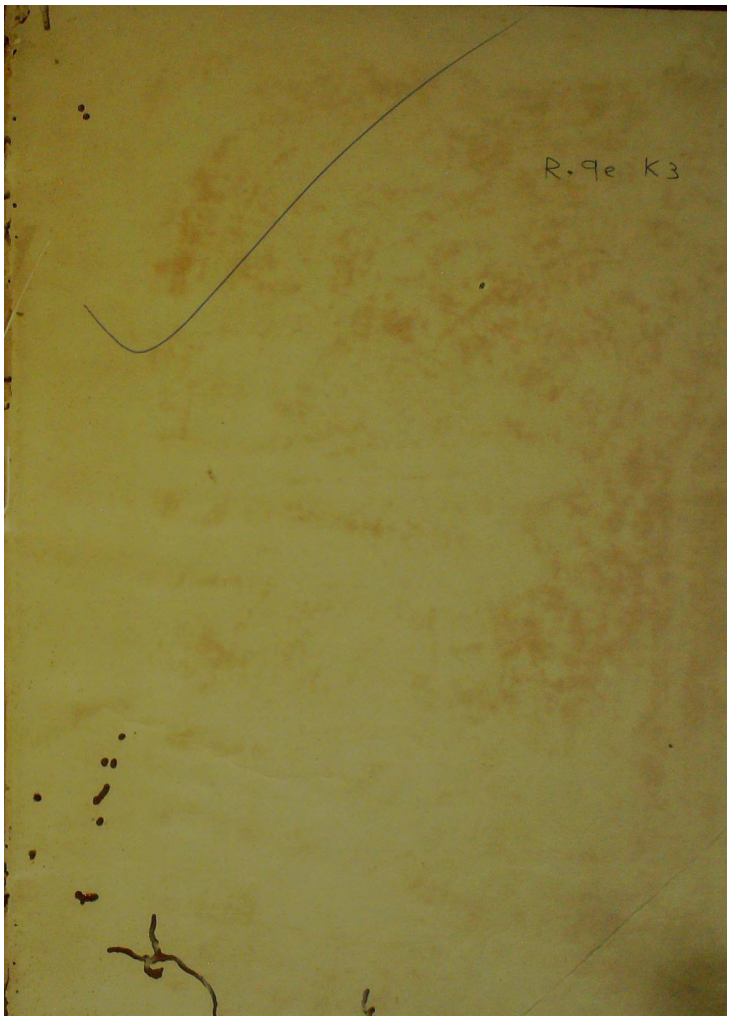
RUBBER BOARD BULLETIN





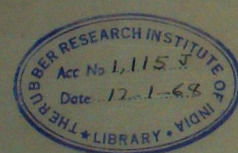
rubber board bulletin

Vol. VII

1963-'64

Annual Subscription :

Inland : Rs. 2.00 Foreign : Rs. 3.00



Published by
THE RUBBER BOARD
Kottayam-9,
Kerala, India.

PRINTED AT THE C. M. S PRESS, KOTTAYAM.

CONTENTS

No. 4

ARE YOU WEARING Colour-Chem ?

Look around. It's just possible that COLOUR-CHEM is in your clothes, or on the painted walls of your room, or in the fascinating tapestry of your drawing room, and may be in these very printed words you are now reading.

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Vol. VII
No. 1

rubber board bulletin

JULY—SEPTEMBER 1963

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our cover : a replanted small holding.

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RUBBER BOARD BULLETIN,
Rubber Board P. O.,
Kottayam, Kerala State.

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New Inspection System

One of the reasons attributed to the slow progress of replanting is administrative delays in granting the permit, completion of inspections, and payments of instalments of subsidy. The Board examined this and has taken certain steps to remove such complaints. One of the difficulties the Board's officers have been facing in the past when they go for inspection, was the non-completion of the work prescribed for each year. That led to second and third rounds of inspections. The Board has, therefore, drawn up an inspection programme region-wise in advance and it is being intimated to the parties so that they can complete the work before the inspecting staff goes there. The co-operation of growers is essential for this. As an experiment, small committees of planters have been formed in selected areas to assist the inspecting staff at the time of inspection. The replanting programme is for the benefit of the grower. To make him appreciate it, and to make it dynamic, not only in conception, but also in execution, the planter has to remain in the centre. For that, the replanting has to be conceived as a movement of the planter. It is as a first step in that direction the small committees have been formed to assist the inspecting staff. Eventually, such committees will have to be entrusted with greater responsibilities in making the replanting programme work efficiently.

Replanting Subsidy Applications for 1964

Applications are invited from owners of registered rubber estates for subsidy for replanting in 1964. Subsidy will be paid at the rate of Rs. 1,000 per acre, payable in seven annual instalments. Subsidy is eligible for replanting only unselected low yielding rubber planted in or prior to 1956 and registered with the Board before April, 1958 and situated below an elevation of 1,500 ft.

Applications in duplicate accompanied by two copies of certified survey plan of the *actual area to be replanted*, should reach the Secretary, Rubber Board, Rubber Board P. O., Kottayam, Kerala State on or before 31st December, 1963. Applications received without the necessary details and the survey plan and also those received after the due date are liable to be rejected.

Application forms can be had free of cost from the Secretary, Rubber Board, Rubber Board P. O., Kottayam, Kerala State, the Field Officer, Rubber Board Sub-Office at Calicut, Moovattupuzha, Kottayam North, Kottayam South, Trivandrum or from any of the Offices of the Rubber Instructors of the Board. Application form and leaflet regarding the scheme will be issued from 1st November, 1963.

SECRETARY,
Rubber Board.

19-10-1963.

Speech Delivered at 45th Meeting of the Rubber Board

Dr. Rama Varma Stresses need for Systematic Replanting

Friends,

It is with great pleasure I welcome you to the 45th meeting of the Board. Before we take up the agenda for today's meeting for consideration, I would like to make a few observations. At the last meeting I mentioned to you that our replanting programme is lagging behind. The total area which had been fixed for replanting from 1957 i.e. the year in which the Subsidy Scheme was introduced, to 1962 was 45,000 acres and the actual area replanted was 23,980 acres. Of the total of 23,980 acres replanted, the area belonging to estates was 11,956 acres out of an eligible area of 77,106 acres or 15.5 per cent and to small-holdings 12,024 acres out of an eligible area of 1,13,883 acres or 10.6 per cent. One of the reasons attributed to the slow progress of replanting was that the subsidy granted till 1960 was unattractive. It is also stated that after the enhancement of subsidy rate in 1960, the estates above 50 acres have put their areas under slaughter tapping and the replanting programme will get momentum from 1964 onwards. This may be partly true but in the case of small-holders that cannot be the main reason. It is also stated that the administrative delays in making payments of subsidy instalments after the completion of work is a source of discouragement to small-holders for replanting. There is no doubt that there were administrative delays. Rules have been laid down for the grant of permits for replanting and also to make payments. The inspecting staff have to satisfy themselves that the conditions laid down are satisfied before they recommend the issue of permits or the grant of subsidy. The Planting Committee examined at its meeting held on 17th September 1963 whether any relaxation or modification of the existing rules was necessary and it came to the conclusion that no major changes were desirable in the existing rules. If people abide by the rules, it is easy to process the cases. But it has been often experienced by the inspecting staff that after getting reports that the work had been completed and that the party was ready for inspection, it was found that the work would not have been completed when they actually went for inspection. Such cases would require re-inspection which meant delay. I am not citing this as an

example to justify the avoidable delays on the part of the office staff. I am only mentioning it to show that a little more promptitude is necessary on the part of the planters also. The following steps have been taken to speed up the inspections and payment of subsidy this year. Four more Junior Field Officers have been added for the inspection work. A new Sub-office will be opened at Moovattupuzha to expedite inspections in Ernakulam District. The inspection programme for different areas is being worked out and the planters will be informed the date fixed for inspection of their estates at least 15 days in advance and when the field staff goes to a particular area they will be asked to complete the inspections of all the cases in that area to avoid a second and third visit to the same area The programmes of the inspecting staff will be given wide publicity and if any area in a locality is omitted, the permit-holders concerned can report the matter to the Sub-office for inclusion of their areas also in that round of inspections. It has also been decided to fix the date for calling of receipts after the inspection is over, the date of payments after the receipts are received and to inform the planter of those dates. If those dates are not adhered to, the planters can report the matter to the Chairman or the Secretary, so that corrective action can be taken immediately. I am mentioning these details of administrative arrangements that have been made, to ensure that the planters would co-operate fully at the time of inspections and subsequent stages. The inspections are expected to start by the first week of October and to complete by the end of January and the payments by 31st March, 1964. Those who do not complete the work in time and those whose cases are complicated will have to wait for the first round of inspections to complete, before their cases are taken up again.

I want to make it clear once again—the repetition of it can never be overdone—that the future of this industry would depend on replanting with high yielding planting material. The Board is now in a position to supply almost all the high yielding planting material available in other rubber producing countries and I would request every planter to draw up his programme for systematic replanting of all low yielding areas. That alone will help this industry to meet the demands of labour for fair wages and better amenities and to keep the cost down to compete with synthetic rubber successfully.

The first factory to produce synthetic rubber in the country has come into production. Its licensed capacity is 30,000 tonnes. It is not expected to reach the full capacity this year. When it goes into full production next year the demand also would increase sufficiently to ensure a market for both natural rubber and synthetic rubber that would be produced in the country. Further the price of synthetic rubber produced in the country at present is Rs. 4.40 per kg. which is about one rupee more than the control price of natural rubber inclusive of cess. That would mean that the synthetic rubber produced in the country is not likely to compete directly with natural rubber in the immediate future. Nor the synthetic rubber produced in the country has any technical superiority to challenge the natural rubber at its present price. The natural rubber industry has, therefore, got time to

replant with high yielding planting material and bring down its cost to be ready to meet any challenge from synthetic rubber.

Further, India with its vast area and population continues to have the lowest per capita consumption of rubber at 0.29 lb in spite of the fact that the consumption in the country increased by 190 per cent during the past decade. In 1961, the per capita consumption of rubber in the United States was 18.65 lb. The next highest was the United Kingdom with 12.19 lb closely followed by Canada 11.62 lb, Australia 11.14 lb., France 10.84 lb and West Germany 10.21 lb. The per capita consumption in Japan was 6.18 lb. and in Brazil 1.81 lb. India is now at the bottom of a rising curve of demand. And the natural rubber production in the country by itself would not be able to meet rapidly increasing demand. The demand for natural rubber as a general purpose rubber will continue to last, provided the cost could be kept under control. Though the analogy may not be quite correct, I may point out that the demand for cotton fabrics has not diminished, in spite of the tremendous advances made by man-made fibres like rayons, nylons, etc.

At the last meeting of the Board some of you suggested that the cost of aerial spraying is going up. This is a matter on which I would like to make the position of the Board clear. The Board has taken a stand from the beginning that aerial spraying to be tried on a large scale should be preceded by experiments carried on a scientific basis. This suggestion of the Board was not welcome to planters. They preferred to keep the initiative in their own hands and to negotiate the rates with fungicide manufacturers and the air company which got the helicopters. At a meeting held on 27th October, 1962, in the Board's office, to assess the results of that year's spraying and to decide the arrangements necessary for spraying in 1963, the representatives of one of the leading planting companies, an Oil Company, fungicide manufacturer and of the Company which had the helicopters, agreed that when spraying was undertaken in 1963 experiments would be laid out in consultation with the Board's Pathologist to find out effective methods of spraying. I am told that some fungicide manufacturers were allowed to carry out experiments in some estates, but the Board was neither kept informed of those experiments nor was it given an opportunity to lay out experiments. I am just placing these facts before you only to show that certain interests are working to keep the Board out of its normal scientific activities. I do not think that it is in the larger interests of the Industry. I may add for your information that I am informed that one more company in Delhi has been allowed to bring helicopters to undertake spraying of agricultural crops.

While on the question of spraying I am glad to inform you that the Board's scheme to encourage co-operative societies to undertake spraying by supplying sprayers has good response. In 1962 when it was first started only 16 societies took advantage of it and the area sprayed was not more than 2,400 acres. This year 39 societies took advantage of it and also with the sprayers supplied through the field staff 10,000 acres were sprayed. The Board is prepared to extend the supply of sprayers to all co-operatives which are prepared to undertake spraying.

It is also trying to arrange the supply of copper sulphate at concessional rates.

The response to the Board's Scheme to encourage co-operatives to start smoke-houses for the benefit of small-holders is encouraging. Subsidy has been sanctioned to 7 societies to set up smokehouses and a few more applications are under examination. The Government has also approved the Board's Scheme to encourage co-operatives to undertake marketing of rubber and also the supply of essential stores for the small-growers. In this connection I am glad to inform you that the Trivandrum District Rubber Planters' Co-operative Society which started functioning in January this year has so far transacted business worth of Rs. 2,45,000/- and this society has been able to ensure a fair price to the small-grower in that area.

With more and more new areas coming into tapping it is becoming difficult to get experienced tappers. We have now a scheme to start the training of tappers. In the first instance we are recruiting six tapper demonstrators who will be given sufficient theoretical training and posted to different centres to assist the small growers to improve the tapping methods. By April it is proposed to start a regular training school to give instructions in planting methods including tapping. I hope the big estates will come forward to give practical training to those trained in our office and Experiment Station.

At the last meeting of the Board, it was decided that a small unit should be established in the Board's office to undertake research on labour problems. I discussed this with the Director of Bureau of Economic Studies of the Kerala Government. He has agreed to extend his co-operation and in consultation with his officers, to begin with two studies have been planned. First is on the family budget of workers and second on the scope and extent of amenities to labour provided by Statute.

I am glad to inform you that appointments to the senior posts in the Research Department are almost over and the entire staff including the Director of Research will be in position by the end of the year. And I am sure that in the coming years our Research Institute will play an important role in the development of the rubber plantation industry in the country.

Before I conclude I would like to express my thanks to the officers and staff of the Board who gave their unstinted co-operation in carrying out the various activities of the Board which have considerably expanded during the last year.

Meeting of the Board

The 45th meeting of the Rubber Board was held at 10.30 AM on Thursday, the 19th September, 1963, at the Board's office at Puthupally.

The following members were present :

1. Dr. Rama Varma (Chairman)
2. Sri K. V. Thomas (Vice-chairman)
3. Dr. S. L. Kapur
4. Dr. V. R. Narayanan Nair
5. Sri T. Jayadev
6. Sri K. Srinivasan
7. Sri K. M. Philip
8. Sri K. Karunakaran
9. Sri P. Ramalingam
10. Smt. Rosamma Punnoose
11. Sri V. J. Kurian
12. Sri M. M. Muthiah
13. Sri Joseph Jacob
14. Sri George John
15. Sri Michael A. Kallivayalil

Welcoming the members, the chairman delivered the presidential address which is published elsewhere in this Bulletin.

The important decisions taken by the Board at the meeting are given below.

Sri M. P. Cherian

The Board placed on record its deep regret on the untimely death of Sri M. P. Cherian, member of the Board, and authorised the chairman to convey its sympathy to Mrs. M. P. Cherian.

Constitution of *Ad hoc* Committee

The Board resolved that an *ad hoc* committee be formed with Sarvashri K. V. Thomas, Michael A. Kallivayalil, George John and Dr. V. R. Narayanan Nair, and the Deputy Rubber Production Commissioner, Member / Secretary, to study and report on the question of amending the Replanting Subsidy Rules to achieve the maximum progress with reference to :—

(1) allowing replanting of rubber with other crops and to what extent;

(2) recommending what steps should be taken to speed up a systematic replanting programme so as to attain the target.

Budget Estimates for 1964—65

The Board approved the Budget Estimates of expenditure amounting to Rs. 92,86,600 for the financial year 1964—65.

Expenditure from the Pool Fund

The following estimates of expenditure from the Pool Fund of the Board have been included in the Budget for 1964—65.

Newplanting Loans (restricted to small growers)	Rs. 3,67,500
Financial assistance to rubber growers' co-operative societies	Rs. 60,000
Loans for upkeep of immature rubber areas (restricted to small growers)	Rs. 1,00,000

Loans to co-operative marketing societies taking up marketing of rubber Rs. 1,80,000

Assistance to Indian Rubber Manufacturers' Research Association

The Board sanctioned payment of Rs. 5 lakhs to the Indian Rubber Manufacturers' Research Association as financial assistance for undertaking scientific research on rubber, as provided in the Rubber Rules.

Grant of Educational Stipends

The Board approved granting of educational stipends to 384 applicants for 1963—64 absorbing an estimated amount of Rs. 55,415, under the scheme for grant of educational stipends to children of workers employed on registered rubber estates.

Financial Assistance to Hospitals

The Board also approved payment of a total amount of Rs. 21,210 to three hospitals as financial assistance for construction of wards etc. as a part of its Labour Welfare Schemes.

Workers on the Board's Experiment Station

The Board resolved that the benefit of leave with wages with effect from 1-4-1961 and Provident Fund benefits with effect from 1-4-1964, be sanctioned to the permanent workers of the Experiment Station of the Board, though these workers are not covered by the provisions of the Plantation Labour Act.

The meeting concluded at 1.40 P M with a vote of thanks to the chair.

Patch Canker or Bark Canker

caused by
Phytophthora palmivora Butl.
and *Pythium vexans* De Bary

T. S. Ramakrishnan
Pathologist
Rubber Research Institute of India, Kottayam

This disease was first recorded from Ceylon in 1903. Since then it has been observed in other countries also. At the present day it is prevalent in all countries where *Hevea* is grown. The disease is more in the wetter regions and during the rainy season.

Patches of the bark of varying sizes are involved and hence the name 'patch canker.' It may occur anywhere on the main stem or some of the bigger branches. Mature and immature trees are liable to be attacked. It has been recorded even in budwood nurseries in this country. The tap-root and lateral roots of immature trees below the ground level are also affected.

The visible external symptom consists of the exudation of discoloured latex or of a reddish or purplish liquid from the affected bark. This dries forming dark streaks. On scraping the bark, the internal tissues exhibit discolouration. In the early stages, the tissues are yellowish grey in colour with a brown border. But later they become dirty red darkening to purplish red on exposure to the atmosphere. Healthy bark usually has a translucent reddish colour. The infection spreads throughout the tissues of the bark and may extend to the cambium also. The wood in the affected area may be discoloured. The bark splits and gaping wounds may be formed. When the infection is at the collar or on the roots, a girdling effect may be produced and the plants die sooner or later. Underneath the bark, pads of foul-smelling coagulated latex may accumulate, raising the bark into conspicuous bulges. If the infection is near the tapping panel the yield of latex may be reduced or even stopped. Thus the damage may be slight or extensive and the trees may be lost.

Opinions regarding the causal agents of canker vary. According to Hilton (1959) the electrical discharges during lightning are responsible for initiating the trouble and the two fungi, *Phytophthora palmivora* and *Pythium vexans* usually associated with canker, are later secondary invaders. But others consider that these two fungi are independently capable of causing canker.

This is borne out by the results of artificial inoculations. Both the views may be correct. In some instances lightning damage may serve as infection courts. In others the fungi may initiate the trouble. The fungus associated with the cankered bark may differ in different regions. In south India, Ceylon, Malaya, Borneo, Congo and Costa Rica, *Phytophthora palmivora* has been observed. In the South-east Asian countries mentioned above *Pythium vexans* also has been found. In Ceylon and Indonesia mixed plantations of *Hevea* and *Cacao* have been raised. *P. palmivora* causes canker in *Cacao* also. In the mixed plantations a high incidence of canker in *Hevea* has been recorded, the fungus having passed on readily from *Cacao* to *Hevea* (Sharples, 1936).

Both these fungi are widely distributed in regions where *Hevea* is grown. They persist either on *Hevea* or numerous other alternative hosts growing in the vicinity or even in the soil. In *Hevea* plantations in this country *P. palmivora* is present on the fruits, foliage and shoots of *Hevea* and in the soil. *Pythium vexans* is present in the soil or on the other hosts like ginger, *Piper longum*, *P. betle* and several other cultivated plants in the region. Both the fungi produce numerous reproductive bodies readily and so inoculum is always available during the rainy seasons.

Inoculations with pure cultures of the fungi on healthy bark produced the symptoms of patch canker. Wounds on the bark help in quicker infection. In nature infection may progress from tapping cuts or other wounds, during the rainy season. Grooming of trees in wet weather leads to higher infection.

Canker occurs on seedling trees and budded clones. In many holdings in South India the disease has been observed in clonal seedlings of Tjir 1 also. The clones Tjir 1, PB 86, PR 107 and PB 186 have been attacked in several holdings. In Ceylon the susceptible clones are PB 86, PR 107, Wagga 6278 and Mil 3/2. All clones susceptible to abnormal leaf fall caused by *Phytophthora palmivora* may be affected by canker also.

The control of the disease can be achieved by completely scraping away the affected tissues and protecting the exposed portions with a good fungicide. Generally water-borne fungicides are in use. Therefore after the fungicide has dried out, a water-proof wound cover is applied over it so that the fungicide may not be washed away by rain and bark renewal may be satisfactory. The scraped tissues are collected and burnt. Many fungicides have been recommended. For the treatment of young trees which are not under tapping Bordeaux paste can be safely used with good results. The usual composition of Bordeaux paste is one part of copper sulphate, one part of quick lime and 20 parts of water. This paste can be used even on mature trees excepting when the infection is adjacent to the tapping panel. Fylomac 90 (0·28%) is another proprietary preparation (I. C. I.) which has satisfactorily controlled the disease. It is not available in India. Water-miscible organo-mercury compounds like Ceresan-wet and Aretan have also controlled the spread of infection. Ceresan wet is a proprietary product of Bayer, marketed by M/s A. V. Thomas & Co. Ltd.

in South India. This is mixed in water in the proportion of 1 : 160 and the solution is brushed or sprayed over the treated part. Aretan is manufactured by I. C. I. and marketed by them. This is mixed with water in the proportion of 1 in 400 and used as in Ceresan. The solutions are better carried in bottles of polythene or glass. The wound cover may be any petrolatum product.

In Ceylon, a mercury-based water-proof preparation called 'kankerdood' is recommended. This is brushed over the treated surface. Another formulation, also mercury-based called Antimucin (Sandoz product) has given good control in Ceylon. This is water-miscible and requires water-proof coating over it. The concentration recommended is 1 in 160.

In Malaya, Izal is used, the strength varying from three to five per cent. This is water-borne and must be covered by some petrolatum product. Izal is not available in India at the present day.

All the treatments are effective when the diseased tissues have been completely eradicated and are carried out in the early stages of infection.

References

HILTON, R. N. 1959 Maladies of Hevea in Malaya. Rubb. Res. Inst. Malaya, Kuala Lumpur. 101 pp.

SHARPLES, A. 1936 Diseases and pests of the rubber tree. Macmillan & Co., Ltd. London. xx + 480 pp.

ADVISORY CIRCULAR 1958 Bark rot and canker of Hevea, *Phytophthora palmivora*. No. 64, Rubb. Res. Inst. Ceylon.

Corrigendum

Report of the Delegation to Malaya

The last sentence of Paragraph No. 10 on Page 7 may be read as follows:—

"It has its offices in USA, UK, Malaya, Australia, South Africa, New Zealand and India (Bombay)."

The Experiment Station of The Rubber Research Institute of India, Kottayam

V. K. BHASKARAN NAIR
Rubber Research Institute of India, Kottayam

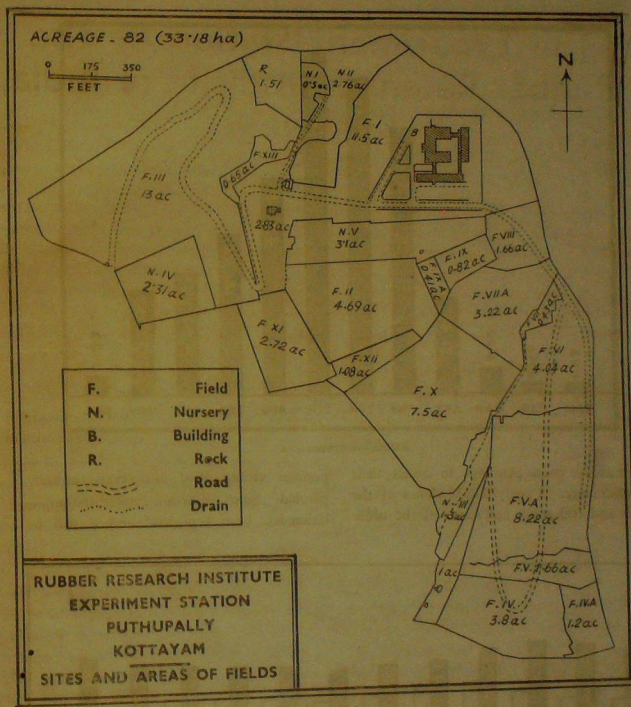
The Rubber Research Institute of India is located in the suburbs of Kottayam and about five miles distant from it. The Institute is housed in a spacious building situated on the top of a small hillock about 73 metres in height above sea level. Attached to the Institute is the Experiment Station about 82 acres in extent. At the time of acquisition, this area was planted with *Hevea*, cashew and coconuts, with some portions under tapioca cultivation. From the Institute buildings the land slops to the east, south and west, gently in some portions and steeply in others. Excepting for a compact area of four acres of old rubber the rest has been cleared, laid out into field plots and planted with *Hevea*. The first planting was done in 1956.

The soil is lateritic gravelly loam varying in depth from 45 to 100 cm. In some areas laterite sheets and boulders are present near the surface. In one portion, over an area of 1.5 acres an outcrop of soild granite occurs. The soil is acidic and the reaction varies from pH 4.4 to 5.2. The fertility status of the soil is low analysing 0.150 to 0.222 per cent of N, 0.045 to 0.060 of P (as P_2O_5) and traces of potash. The water sources consist of a spring at the south-eastern edge of the boundary and a smaller one at the top.

The climatic conditions prevalent on the Station are akin to those of central Travancore and both the monsoons are received. The meteorological data are being regularly recorded (rainfall, temperature and relative humidity). The average data for the last five years on the Station are presented separately on page 16.

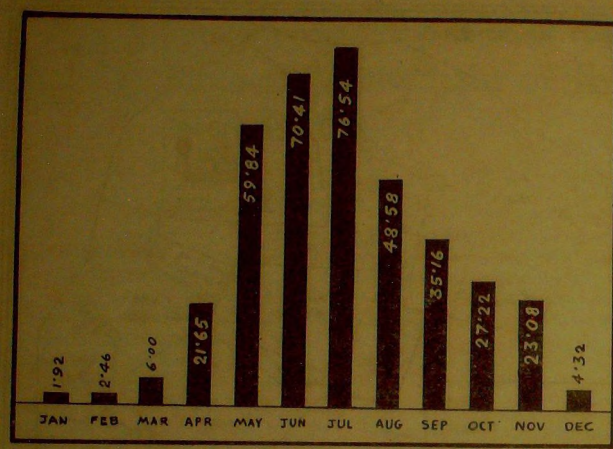
Plantings

About 10 acres have been utilised for maintaining nurseries. Seedling nurseries of clones Tjir 1 and PBIG were laid out for use on the Station and for distribution to small holders. The area under these has been considerably reduced after 1962 when a bigger nursery was opened at Erumeli. Budwood nurseries of some of the popular older clones (Gl 1, PB 86, PR 107, LCB 1320, Tjir 1, AVROS 255 etc.) and the newly introduced RRIM clones (24 in number of the 500 and 600 series), and a few other foreign clones, are being maintained. Budwood of these clones is being used on the Station or for planting in the Government plantations of Kerala and Madras and for distribution to growers.



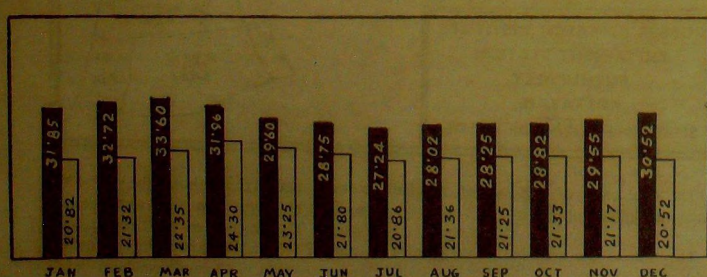
The total length of budwood distributed from the Station till now is 11385 m.

The rest of the area has been planted with different types of planting materials. Hand pollination was being carried out between selected clones during the years 1954 to 1959 in cooperation with some private estates. The progeny of these crosses consisting of 1431 seedlings have been planted in a compact area. Clones have been made from 1219 of these and established in another



Rainfall in centimetres

area as five point plantings to assess their performance. Twenty RRIM clones of the 500 and 600 series and some of the older popular clones have also been similarly planted. Since the area is limited the population has been kept low and it will be



Maximum and minimum temperature in degrees centigrade

TABLE 1

Hand Pollination: 1954—59 Series

Summary of Results

	1954	1955	1956	1957	1958	1959	Total
Number of parent clones used	11	12	9		15	10	57
Number of successful combinations	14	14	8		25	8	69
Number of legitimate new families obtained	14	13	8		22	4	61
Number of seedlings trans-planted in fields at the Experiment Station	456	261	77		554	83	1431
No. of new clones produced from these seedlings and planted at the Station	439	230	71		420	59	1219

necessary to test these out on a larger scale when space becomes available.

Abnormal leaf fall caused by *Phytophthora palmivora* is the most destructive disease of *Hevea* in Kerala. In order to assess the extent to which field resistance to this disease exhibited by some seedlings in some holdings could be relied upon, budded plants of such mother trees have been established. Eight such clones have been planted out and are under observation. In addition, three other clones reported to be tolerant to this disease have been imported, two from Malaya (F and FX series) and one from Ceylon (IAN 45-717). These have been multiplied and planted out and are under observation.

To investigate the mutagenic effects of irradiation on *Hevea* seeds, about 1000 PBIG clonal seeds were subjected to gamma rays at the Atomic Energy Commission's laboratory at Trombay for different periods in 1957. These were sown in nursery beds at the Station soon afterwards. Those that were exposed for 30 seconds exhibited 40 to 50 per cent germination while those exposed for one minute had only 1.7 to 8.3 per cent germination. From among these only 81 seedlings were available for transplanting. These have been planted in a separate group and are under observation. Exposure for more than one minute proved fatal.

The land at the Station being sloppy, planting was carried out along the contour. Terraces were raised where the gradient was high. The spacing adopted is either 22×11 ft. or 20×10 ft. Stump planting was adopted throughout.

The maintenance of the plants was carried out as per schedule with adequate manurial applications twice in a year, timely protection against diseases and pests, weeding and maintenance of cover crops.

All the important diseases that affect *Hevea* are prevalent in this area as evidenced by their occurrence in the old area. Shoot rot and abnormal leaf fall caused by

Phytophthora palmivora appear every year in June. But the immature plants were always given protective spraying and saved from the disease. Comparative trials with Bordeaux mixture, water miscible fungicides, dust formulations of copper fungicides and different brands of oil-based copper or organic fungicides were carried out on old mature and new immature trees. The efficacy was tested by actual assessment of leaf retention. The results proved that Bordeaux mixture was the best among the water-borne fungicides. Oil-based copper fungicides proved to be superior to other organic formulations. Dust formulations were the least effective. *Oidium heveae* has been prevalent for the last three years. If sulphur dusting is not carried out in February and March heavy defoliation occur. Pink disease is another serious affection of the immature plants. The presence of mango and cashewnut trees on the station has helped in increasing infection as most of them are affected. Many of the affected trees have been saved by the application of Bordeaux paste or copper sulphate-quick lime-linseed oil paste in time. In the first two years many plants were lost as a result of sun-scorch. But after the adoption of lime-washing of the stem, further deaths have been eliminated. It has been demonstrated that by timely adoption of protective measures it is possible to maintain satisfactory growth of the plants. The reaction of different clones to diseases was not assessed as they were all protected.

A satisfactory growth of cover crops has been maintained from the time of planting. Many species have been tried but *Pueraria phaseoloides* was found to be the most vigorous satisfactory cover. Mixtures of *P. phaseoloides*, *Centrosema pubescens* and *Calopogonium mucunoides* were sown but in the course of a couple of years *Pueraria* was found to keep down the others. *Stylosanthes gracilis* and *Mimosa invisa* were raised in the earlier years but these had to be eradicated as they began to compete with rubber. The latter plant does not give protection in summer as it strech all its leaves. *Psophocarpus palustris* which is reported to do well in Sumatra was planted in a small plot but its growth was slow and the area covered very small under local conditions.

From the third year of planting, girth measurements were recorded. Measurements were made once in a year in September at a height of 125 cm from the ground level in the case of seedlings and from the bud union in buddings. Other secondary characters of the different new clones are also being recorded.

The seedlings planted in 1956 have attained the tappable size and were opened in April 1963. Each tree is tapped on a half-spiral cut twice a week. Test tappings are made twice in a month to assess the yield and the weight of rubber recorded by cup coagulation. The yield obtained during the first four months are given in Table 2.

The available space on the Station for planting being limited and the planting materials so varied and numerous, the population of each clone is low for correct assessment of yield or other characters. Therefore some of these clones have been planted out in replicated plots in the Government plantations at Kodumon, Kerala and in Kanyakumari district, Madras, since 1961.

TABLE 2

Legitimate Seedling Crosses 1954

Planted 1956. Tapped S/2. Two tappings per week 59 % from April 63. Yields— May to August (4 months)

Compared with control Tjir 1 seedlings as percentage

		No. of trees	Gm/tree	%
AVROS 255	× Gl 1	3	15.25	101·7
C H M 3	× BD 10	3	20·8	138.7
Tjir 1	× Gl 1	88	16·0	106·7
,,	× AVROS 255	33	24·4	162·7
,,	× CH M. 3	48	18·9	126 0
,,	× Mil 3/2	45	24 0	160 0
,,	× HC 28	91	16·4	109·3
Mil 3/2	× Gl 1	23	16·6	110 7
,,	× CHM3	4	7.08	47·2
,,	× HC 28	105	16 0	106·7
,,	× PB 5/60	6	20·9	139·3
,,	× PB 5/139	1	20·0	133·3
,,	× RSY 23	4	12 2	81·3
HC 28	× Mil 3/2	2	15 0	100 0
Clonal Tjir 1 seedlings	control		15·0	100·0

Preliminary Observations on the Use of Weedicides in Rubber plantations in South India

Rubber plantations are usually raised on the slopes of low hills in South India. Heavy rainfall contributes to soil erosion and removal of the top soil. To prevent this and for maintaining soil moisture and keeping down the soil temperature during the hot months, a cover crop is raised in most of the plantations. Leguminous plants are preferred for this purpose as they fix atmospheric nitrogen in the root nodules and thus help in raising the nitrogen content of the soil. Perennial plants are needed, as a continuous cover is to be maintained. Low growing creeping plants make better covers than bushes. *Pueraria phaseoloides* is a quick growing creeper forming a dense growth and is the most satisfactory cover crop in this country. Under shade, its growth is arrested. But resowing or planting cuttings after the first crop has died down enables the cover to come up again. In many mature plantations in this country the plant is thriving well. The greater danger to covercrop is from grazing cattle or actual removal of the plants for feeding cattle.

T. S. Ramakrishnan &
P. N. Radhakrishna Pillay
Rubber Research Institute of India, Kottayam

When the cover crop is established in time it is able to smother the growth of noxious weeds but if the establishment of the cover crop is delayed, the weeds gain the upper hand and may keep down the cover. Clean weeding is not recommended now in rubber plantations but non-leguminous weeds if they are allowed to establish may compete with rubber for the available food materials and moisture in the soil and adversely affect the growth of immature rubber. Hence it is better that such weeds are eradicated in the early stages before they become a menace. Weeding can be accomplished by employing manual labour or by the application of selective weedicides which will destroy the particular type of weeds prevalent in the locality. The cost factor, the efficiency of the method and the availability of labour will decide the method to be adopted.

The weeds in South India are many, but the most persistent and quickly spreading ones are the Siamese weed (*Eupatorium odoratum*), and two grasses *Imperata cylindrica* (lalang) and *Pennisetum polystachyon*. The first named weed occurs all over the rubber growing areas and spreads rapidly as it produces innumerable achenes and so is disseminated far and wide. Lalang is more

prevalent in the southern regions, from Punalur downwards and is very common in Kanyakumari district. *Pennisetum* occurs from Kottayam towards the north and is aggressive in Kozhikode district. All these are perennial and may become very troublesome unless checked in early stages. Lalang has a persistent underground stem and unless this is completely removed fresh growths will continue. *Pennisetum* produces numerous tillers bearing ears. Hence quick spread occurs.

Chemical weedicides were tried on these three weeds. These were Dalapon, Weedone LV4, Weedazol TL, Amchem granular, Tafapon, Tafazine, Gramoxone and Regelone. The materials (except dalapon) were supplied by M/s Agromore Ltd., Tata-Fison and I.C.I. respectively. The treatments were carried out at the Experiment Station on adult plants growing between rows of 4 year old rubber. Two methods of application were tried. In one, the formulations were sprayed with the help of a hyject sprayer. In the other, a micronizer was used. From the preliminary trials it was observed that application through the hyject sprayer was more effective. Wherever possible each material was used in replicated two-cent plots. The trials were made in the month of May when rains had just commenced. The results are detailed below.

Dalapon

This was used on an extensive scale as grasses were troublesome. The material was applied at the rate of 3.5 kg in 150 litres per acre. The grasses commenced to dry from the second day onwards and dried down in a week. The treated area was conspicuous and stood out clearly from the untreated area. The grasses involved were *Pennisetum polystachyon, Themeda quadrivalvis, Heteropogon contortus* and *Ischaemum aristatum*. All were scorched and this condition was maintained for four weeks after which new shoots began to appear from the clumps. In ten weeks the growth was as bad as before the treatment. The same material was used in a plot full of lalang in Kanyakumari district. Here also the leaves were scorched but within four weeks new shoots grew out of the clumps. Thus on adult perennial grasses, the aerial portions alone are scorched and no damage is caused to the basal or underground parts, so that there is only a temporary set-back to the growth of the grass. The material costs about Rs 18/– per kg.

Tafapon

This was supplied by M/s Tata-Fison and is allied to dalapon. This was applied on a two-cent plot containing *Pennisetum, Heteropogon* and *Themeda*. In the course of a week the leaves of the grasses turned yellow and the upper portions withered. But the withering was much less than with dalapon. Fresh growth occurred from the treated clumps in a month.

Tafazine

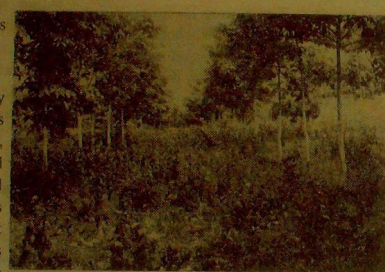
This was specially recommended for *Eupatorium*. A two-cent plot of pure stand of *Eupatorium*, which was not in flower was sprayed with Tafazine. There was no change evident for two weeks. Later a few plants exhibited drying of the margins of some leaves. But the rest remained

Weedazol after 12 days

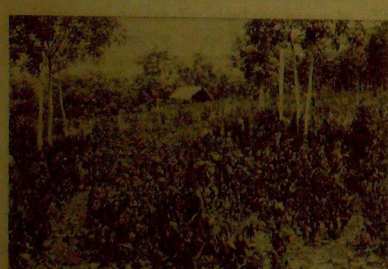
formulation. This was used at the rate of 6 litres in 270 litres of water per acre. A combination of the two in equal proportions was also used. Agral 90 was added as the wetting agent. The plots sprayed with Weedazol and those with a mixture of the two were affected after a week. *Eupatorium* wilted and dried and the grasses turned yellow and wilted. But this effect was only for a fortnight after which new sprouts appeared and in six weeks good growth of *Eupatorium* green. During this period showers were received on five days.

Weedone LV 4 etc.

This product was supplied by M/s Agromore Ltd. It contains low volatile butoxyethanol ester of 2, 4—D acid and it was recommended against *Eupatorium*. This was sprayed at the rate of 2 litres in 270 litres of water per acre. Another product supplied by the same firm was Weedazol TL, an amino triazole



Control



Weedone after one week

and grasses reappeared. Weedone by itself caused wilting of *Eupatorium* but there was no complete kill and fresh shoots were formed in three weeks. On grasses only slight yellowing was caused. *Pennisetum* was not damaged to any appreciable extent. Amchem granular, another product was broadcast in the plots at the rate of one pound in 5 cents. No change was noticed even after two months. These weedicides are not very effective on adult weeds but only temporarily check

them by scorching the aerial shoots. The new growths appear to be more vigorous. *Puereria* is also scorched by Weedazole and the mixture.

Gramoxone

This was supplied by M/s I. C. I., Madras. The same weedicide goes under the name of 'Paraquat' in Malaya. This was sprayed at the rate of 4 pints in 40 gallons of water per acre (2.27 litres in 180 litres of water) with Agral 90 as wetting agent. Within six hours the leaves of *Eupatorium* and grasses were scorched and in two days the aerial portions were completely killed. But the base of the stem of *Eupatorium* remained green. Wherever the weedicide contacted the green portions, the tissues were scorched. But there was no evidence of translocation of the material in the real sense of the term. The weedicide is not carried to the roots or the soil. Many of the other weeds like *Mimosa pudica*, *Borreira hispida*, *Ageratum conyzoides*, *Wedelia corymbosa* were also killed. Some *Sesamum* plants were not affected. *Hevea* seedlings were killed outright. The drift falling on some young rubber plants caused the formation of brown spots. But the spray does not cause any damage if it falls on brown bark of the stem. Six weeks later new shoots commenced to develop from the base of the scorched weeds.

Sprayed with Gramoxone. After 6 hours. Shoots killed.

Regelone, another allied weedicide supplied by M/s I. C. I., Madras, was similar in action to Gramoxone. When tried at the Government Rubber Plantations at Kanyakumari also it scorched the green aerial parts of *Eupatorium* and lalang but after four to six weeks new sprouts grew out of the treated plant.

In all the trials it was found that the weedicides caused only temporary damage to the weeds. Gramoxone was the quickest and produced spectacular results. Repeated applications are necessary to keep down the weeds effectively. Further, cover crops are also affected by such weedicides as gramxone, regelone, and weedazole. Dalapon has no adverse effect on cover crops. It has been suggested that the weedicides may be used to keep the tree rows free from weeds. But such restricted use is not enough, for the weeds growing between the rows will encroach on the cleared space. These weedicides are all of foreign manufacture and are not easily available in the country. The economics has also to be worked out and compared with manual weeding. It is proposed to conduct some large-scale trials before arriving at any conclusion. If more attention is paid to the establishment and proper maintenance of cover crops from the time

of planting the weed problem may not become serious.

We are thankful to the various organisations who supplied the weedicides free of cost for these preliminary trials, and to the Manager, Government Rubber Plantation, Kanyakumari district for his co-operation in the conduct of the trials in that plantation.

NEWS AND NOTES

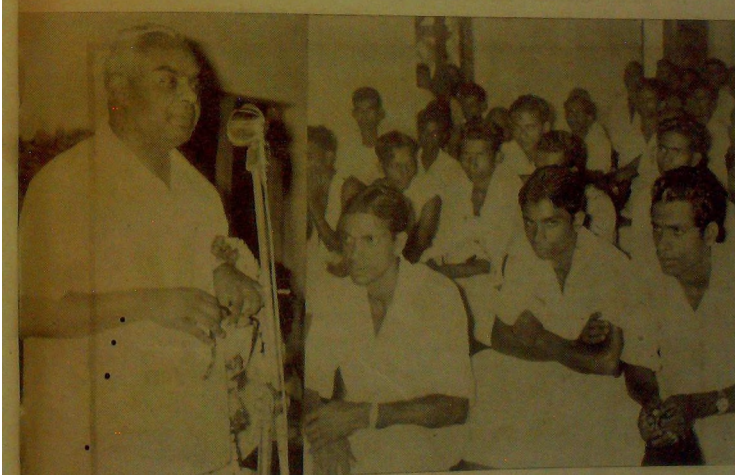
Rubber Growers' Seminars

(1) Arunoottimangalam

The third, in the proposed series of 20 Rubber Growers' Seminars, was conducted at Arunoottimangalam, a village near Kaduthuruthy, on 25th August 1963 under the joint auspices of the Arunoottimangalam local committee and the Rubber Board.

Speaking at the concluding public meeting of the Seminar Dr. Rama Varma, Chairman, Rubber Board, explained to the rubber growers how cooperative organisations could effectively help them solve all their problems. He spoke on the various developmental schemes the Board has envisaged with a view to helping the small holders. Unless the growers extend their unstinted cooperation, he added, it wouldn't be possible for him to successfully execute these schemes.

The function started with the hoisting of the national flag at 8 A. M by Rev. Fr. Mathew Chellakkandathil. The Rubber Board had put up a small exhibition—"Natural rubber : from seed to latex"—which attracted the growers assembled.



Dr. Rama Varma, Chairman, Rubber Board, addressing the public meeting held at Arunoottimangalam

Study classes on various aspects of rubber cultivation were held from morning till evening, led by the experts of the Rubber Board.

At the concluding public meeting which was inaugurated by Dr. Varma, Shri M. V. Cherian presided. Shri Thatchetan welcomed the gathering. Shri K. R. Narayanan, Ex-MLA spoke. A memorandom, detailing the needs of the local growers, was submitted to the Chairman by Shri Thomas Manalel.

The meeting concluded at 8 P. M.

(2) Palai

The Rubber Growers' Seminar, held at the St. Thomas High School, Palai, on 22-9-1963, was the fourth in the series. It stands out from other seminars so far held as it was well-planned and largely attended.

The seminar started with the hoisting of the national flag by Sri M. S. Gopalan Nair at 10 AM. This was followed by study classes on topics covering the various aspects of rubber cultivation. Sri A. K. Rajapadmanabhan, who spoke first, dealt at length with the various rubber development schemes. Sri K. M. Joseph, Sri P. Mukundan Menon and Sri M. O. Joseph gave lectures on planting materials and planting. Sarvashri P. N. Radhakrishna Pillay, C. M. George and V. K. Bhaskaran Nair led discussions respectively on diseases of rubber, manuring and tapping.

Dr. Rama Varma speaking at the Rubber Growers' Seminar at Palai

Dr. Rama Varma, Chairman, Rubber Board inaugurated the concluding public meeting. Speaking on the occasion Dr. Varma said that the increase of population in unassuming proportion has created many economic and social problems. But at the same time land does not account for any increase, he added. He suggested that intensive cultivation with high yielding materials is the only remedy for this. Small rubber growers, he said, if to be free of their burdens, should unite on co-operative basis and make self help efficient. He also said that the Board had chalked out programmes to start training courses for tappers and small rubber growers very shortly.

Sri George Thomas Kottukappally presided and Sri K. M. Chandy addressed the gathering. An elocution made by Baby Valsamma Mathew attracted everybody. Earlier Sri K. P. Gopalan Nair, Advocate, welcomed the gathering.

The Rubber Board had put up a small exhibition, which was well appreciated by rubber growers for its instructive value.

Upasi Conference and Exhibition

The United Planters Association of Southern India celebrated their 70th Anniversary at Coonoor on 9th September 1963.

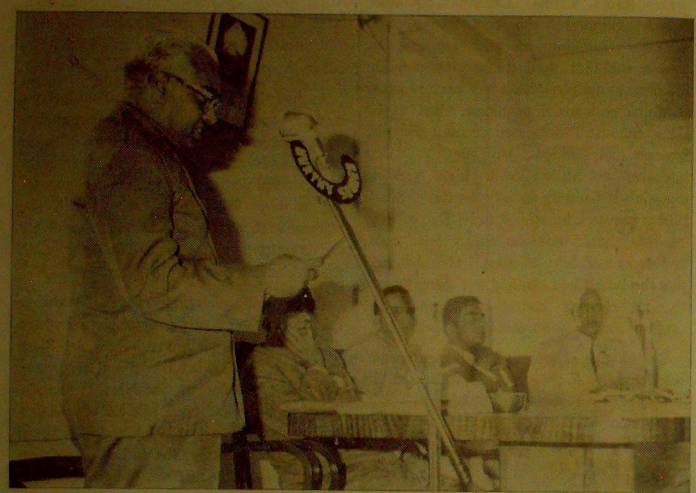
Sri Manubhai Shah, Union Minister for International Trade, speaking on the occasion called upon tea, coffee, rubber and cardamom growers to increase their production to meet the growing demand both at home and abroad. With the standard of living going up everywhere, Sri Shah said, there was no need for the planters to fear that increased production would lead to a fall in the price of their produce.

As regards rubber, the minister said, there was no conflict whatsoever in simultaneously increasing the production of both natural and synthetic rubber as the internal and external demand for rubber was increasing at very fast pace. Along with the increase in the production of synthetic rubber the country would have to double or triple the production of natural rubber.

Emphasising the importance of growing rubber in States other than Kerala where climatic conditions are suitable, Sri Shah said that the Rubber Board had completed a survey of Andaman and Nicobar Islands, Tripura and Swantvadi district in Maharashtra for rubber growing. The Board would be completing before the end of December surveys of areas that would be suitable for rubber in Goa and Assam and also additional areas available in Madras and Mysore States.

Stressing that replanting with high yielding rubber plants must get the highest priority, Sri Shah said that the subsidy allowed for replanting at the rate of Rs. 1,000 per acre was comparable with similar assistance given in Ceylon and Malaya.

One significant feature in the development of rubber industry during the past decade, Sri. Shah said, was the emergence of the small holder as an important force. There were at present more than 66,000 small holders and they accounted for 2·21 lakh acres out of a total of 3·61 lakh acres under rubber. In framing future plans, the



Dr. Rama Varma addressing the 70th UPASI conference. Sarvashri H. Sitarama Reddy, Manubhai Shah, U. K. Lakshmana Gowda and General K. S. Thimmayya can be seen on the dais.

requirements of the small holders would have to be specially studied.

He expressed the hope that the planting community of South India, which had always set and achieved high standards, would rise to the great tasks ahead in the matter of healthy development of the plantation industries and contribute significantly to exports and to the progress of the country's economy.

Sri Lakshmana Gowda, President of the Association, in the course of his address said that the plantation industry needed a new deal if it was to continue to play a leading role as the country's export earner.

Sri Gowda, in the course of his speech, paid a tribute to the dynamic leadership of Sri Manubhai Shah for quickly recognising the key role of the plantation industry in the national economy.

Later in the evening the chairmen of the Commodity Boards—Sri A. S Bam, Chairman, Tea Board, Sri H. Seetharama Reddy, Chairman, Coffee Board and Dr. Rama Varma, Chairman, Rubber Board also addressed the session.

Panels exhibited by the Rubber Board at the UPASI Exhibition

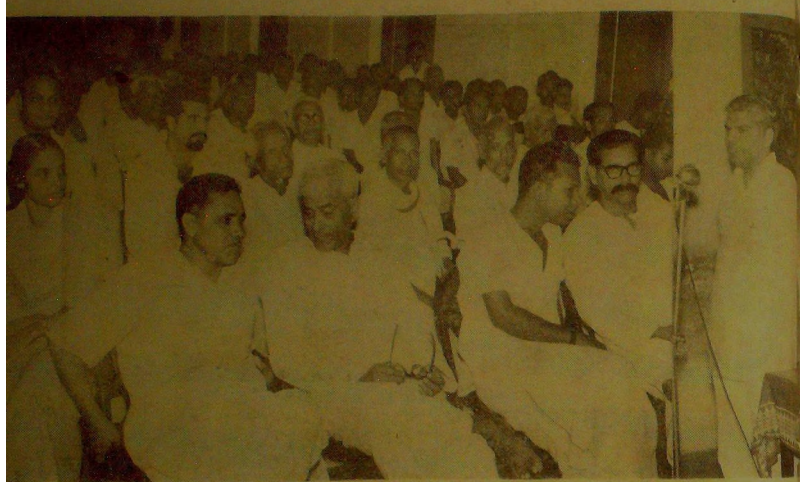
On 10-9-1963 the business meeting of the UPASI was held and Mr. Henshaw was elected president and Sri U. K. Lakshmana Gowda was elected the Vice President for the next term of one year.

The UPASI Tea Scientific Conference was held on 11-9-1963. Sri K. C. Ananth, Dy. Director (Agronomy), Rubber Research Institute of India, represented the research wing of the Rubber Board at the Conference.

At the upper lawns of 'Glenview' the UPASI had put up a U shaped exhibition stall where arrangements had been made to fix up exhibition panels. The Rubber Board had put up three exhibition panels. Tea Board, Coffee Board, FACT, and other commercial concerns had also put up exhibits. It was well appreciated by visitors.

Board's New Sub-Office at Muvattupuzha

A new sub-office of the Rubber Board has been opened at Muvattupuzha, to serve the rubber growers in the Thodupuzha, Kunnathunad, Alwaye, Muvattupuzha, North Parur and Kanayannur taluks of Ernakulam district.



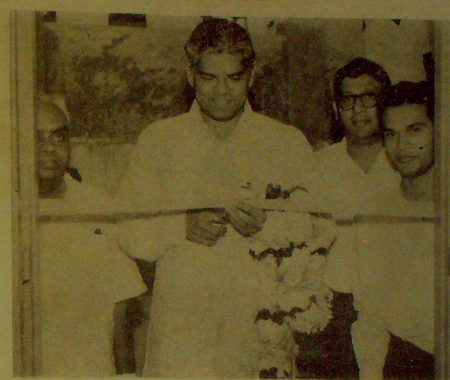
Sri A. M. Thomas addressing the gathering

The formal opening of the sub-office was performed by Sri A. M. Thomas, Union Deputy Minister for Food, on 25th October 1963, at a well-attended function at Muvattupuzha.

Speaking on the occasion, Sri Thomas expressed his thanks for inviting him to partake in such a happy function in his constituency. He recalled his connection with the rubber industry and the Rubber Board and paid warm tributes to the services rendered by the Board in the interests of the industry and in boosting the production of natural rubber at a time when demand for raw rubber in the country was increasing at a much faster rate than what the industry could produce. He assured rubber growers that there was no cause for alarm as far as any possible competition from indigenously produced synthetic rubber was concerned.

The Minister added that though the production of synthetic rubber in the country was expected to go up from the present 20,000 tonnes to 30,000 tonnes per annum within a year, the demand for natural rubber as a general purpose rubber would continue. If the natural rubber industry could get an average yield of 1000-1200 lbs. per acre, it could successfully compete with synthetic rubber, he said.

Welcoming the Minister, Dr. Rama Varma, Chairman, Rubber Board, expressed his appreciation for the interest Sri Thomas



C tting a tape to mark the formal opening

Lighting a *bhadradeepam*

Prayer

Dr. Rama Varma, Chairman, delivering the welcome address

had been showing in the affairs of the Board, even though it did not strictly come under his portfolio. Dr. Varma spoke on the various developmental activities of the Board and invited rubber growers to co-operate with the Board in their successful implementation.

Sri A. K. Rajapadmanabhan proposed a vote of thanks.

Meeting of the *Ad hoc* Committee

A meeting of the *ad hoc* committee appointed by the Board at its 45th meeting held on 19th September 1963, to explore ways and means for speeding up replanting among small holders was held at Palai on 16-10-1963. The following members attended the meeting.

Sri K. V. Thomas (Vice-chairman),
Sri Michael A. Kallivayalil,
Sri George John,
Dr. V. R. Narayanan Nair, and
Sri A. K. Rajapadmanabhan (Member / Secretary).

Photo taken on the occasion of the meeting of the *ad hoc* committee at Palai

Front row from left to right :
Sri V. Haridasan, Economic Assistant, Sri P. P. Cherian, Assistant Development Officer, Sri Michael A. Kallivayalil, Dr. Rama Varma, Sri K. V. Thomas, Sri George John and Sri A. K. Rajapadmanabhan.

Rubber Control

Notification

In exercise of the powers conferred by clause (d) of sub-section (3) of section 4 of the Rubber Act, 1947 (24 of 1947), read with sub-rule (4) of rule 3 of the Rubber Rules, 1955, the Central Government have nominated Dr. A. Seetharamiah, Industrial Adviser, Directorate General of Technical Development, Ministry of Economic and Defence Co-ordination, in the place of Shri M. P. Cherian, as a member of the Rubber Board with effect from the 31st July, 1963 and up to the 5th November, 1964.

ESTATE CALENDAR

For Rubber Growers

October — Weeding and manuring may be continued. Dead woods should be removed. Tapping panel should be given protective treatments.

November — Mulching should be done in nurseries and round young plants. Young plants should be guarded against sun-scorch. Stems of young plants, 2-7 years old and of older plants should be lime-washed if exposed to sun.

December — Lime-washing and mulching is continued if found necessary. *Calopogonium* seeds are collected during this month.

January — In the northern regions wintering may commence. This is the time when annual tapping rest is adopted and the panels protected with prowax or rubberkote-prowax mixture. Felling and clearing for newplanting or replanting is done at this time. Time for collection of *Pueraria* seeds is also on.

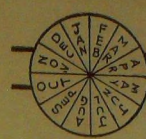
February — Wintering spreads effectively in most of the areas. The trees wintered earlier will start to refoliate. This is the time when sulphur dusting against powdery mildew has to be commenced. Many of the estates are allowed to enjoy tapping rest. Marking for the next season tapping can be done. Preparation of the land for planting is continued. Collection of cover crop seeds are also continued.

March — Tapping rest is discontinued and tapping commenced. Young areas are opened for tapping. Sulphur dusting rounds against powdery mildew is continued. Weeding is done in immature areas. Manuring is started. In nurseries budding is done. Towards the end of the month spraying of fungicides against abnormal leaf fall is started in large estates. In areas where planting has to be done, terracing, lining, pitting etc. are done. Stimulants may be applied on trees 20 or more years old.

Rubber Control

Notification

In exercise of the powers conferred by clause (d) of sub-section (3) of section 4 of the Rubber Act, 1947 (24 of 1947), read with sub-rule (4) of rule 3 of the Rubber Rules, 1955, the Central Government have nominated Dr. A. Seetharamiah, Industrial Adviser, Directorate General of Technical Development, Ministry of Economic and Defence Co-ordination, in the place of Shri M. P. Cherian, as a member of the Rubber Board with effect from the 31st July, 1963 and up to the 5th November, 1964.



ESTATE CALENDAR

For Rubber Growers

October — Weeding and manuring may be continued. Dead woods should be removed. Tapping panel should be given protective treatments.

November — Mulching should be done in nurseries and round young plants. Young plants should be guarded against sun-scorch. Stems of young plants, 2-7 years old and of older plants should be lime-washed if exposed to sun.

December — Lime-washing and mulching is continued if found necessary. *Calopogonium* seeds are collected during this month.

January — In the northern regions wintering may commence. This is the time when annual tapping rest is adopted and the panels protected with prowax or rubberkote-prowax mixture. Felling and clearing for newplanting or replanting is done at this time. Time for collection of *Pueraria* seeds is also on.

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Loan to small growers for upkeep of immature rubber areas

Applications are invited from owners of registered rubber estates, whose total holding of rubber area range from 1 to 15 acres, for interest free loans for upkeep of immature rubber areas. The loan will be granted only to areas planted in 1957 and subsequent years, with high yielding planting materials approved by the Board.

The maximum loan shall be limited to Rs. 475/- per acre payable in six annual instalments. The loan or such instalments of the loan will be paid for the number of years that the new planted immature rubber will still take to come into maturity for tapping, taking the second year of planting as the basis of eligibility for grant of loans.

Application forms and details of the scheme can be had free of cost from the Secretary, Rubber Board, Rubber Board P. O., Kottayam, Kerala State ; the Field Officer, Rubber Board Sub-Offices at Trivandrum, Kottayam South, Kottayam North, Moovattupuzha and Calicut ; or from any of the Offices of the Rubber Instructors of the Board. The applications duly filled up in triplicate, supported by the necessary documents should reach the Secretary, Rubber Board, Rubber Board P. O., Kottayam, Kerala State on or before 15th December 1963.

Rubber Board P. O.,
Kottayam,
16th November 1963.

SECRETARY,
RUBBER BOARD.

A Preliminary Report of the Permanent

MANURIAL EXPERIMENT ON RUBBER*

(Vaikundam Estate)

C. M. GEORGE**

I. Introduction

Quite a large number of fertiliser experiments on young rubber plantings have been carried out in the foremost rubber growing countries of Asia during the last quarter of the century. The applicability of the results obtained from these exotic experiments for rubber growing in India, is somewhat limited because the climatic and edaphic conditions obtaining in our country are different. It has therefore been felt necessary to conduct fertiliser trials under our conditions for obtaining valid results to formulate sound manuring programmes. With this end in view, as a first step 4 trials each of which is a 3^3 factorial design in respect to the three primary nutrient elements, nitrogen, phosphate, potassium were laid out in 1956 in four important planting districts of Southern India. The experiment described and discussed in this note is, one among the four, which was laid out at Vaikundam Estate in the Kanyakumari District.

II. (a) Topography and Soil

The experimental area is situated on the eastern slopes of a hill. The land is almost undulating with a low lying somewhat flat area towards the middle. The soil is a lateritic gravelly loam, derived from granite. The soil is deep and fairly rich in nitrogen and phosphates but poor in potash. The soil reaction varies from pH 5.7 to 6.2. The whole area is well drained.

(b) Experimental Details

Layout of the experiment: The design is a 3^3 confounded factorial NPK experiment in three blocks of 9 plots each, having 20 trees in a gross plot. Each factor occurs at three levels 0, 1 and 2. Nitrogen is applied in the form of ammonium sulphate nitrate at 0, 30 and 60 lb. per acre. Phosphate is applied in the form of rock phosphate at 0, 40 and 80 lb. of P_2O_5 per acre and potassium is applied as muriate of potash to give 0, 40 and 80 lb. K_2O per acre.

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* Contribution from the Agronomy Division, Rubber Research Institute of India, Rubber Board P. O., Kottayam, Kerala.

** Senior Research Assistant (Agronomy)

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(b) Experimental Details

Layout of the experiment: The design is a 3^3 confounded factorial NPK experiment in three blocks of 9 plots each, having 20 trees in a gross plot. Each factor occurs at three levels 0, 1 and 2. Nitrogen is applied in the form of ammonium sulphate nitrate at 0, 30 and 60 lb. per acre. Phosphate is applied in the form of rock phosphate at 0, 40 and 80 lb. of P_2O_5 per acre and potassium is applied as muriate of potash to give 0, 40 and 80 lb. K_2O per acre.

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* Contribution from the Agronomy Division, Rubber Research Institute of India, Rubber Board P. O., Kottayam, Kerala.

** Senior Research Assistant (Agronomy)

(c) Method and time of application of fertilisers

The programme of manuring followed is as given below:

1st Year 1956 at 1/4 full doze (One application in September–October)
2nd Year 1957 at 1/3 full doze („ „)
3rd Year 1958 at 1/2 full doze (in two equal instalments in April–May and Sept.–Oct.)
4th Year 1959 at 2/3 full doze (in two instalments)
5th Year 1960 at 3/4 full doze („ „)
6th Year 1961 at full doze („ „)
7th Year 1962 at full doze (in two equal instalments during April–May and Sept.–Oct.)

In subsequent years the fertiliser application will be continued at full doze in two equal instalments during pre and post monsoon periods.

In the first year the fertiliser application was made around the base of each plant on the contour terraces which have been kept clean of weeds, in annular bands of 18 inches or more in diameter and then lightly forked into the soil. The distance of the annular bands was progressively increased in subsequent years as the plants grew. The two annual applications are being made during April–May, soon after the summer showers and in September–October during the break in the monsoon.

(d) Planting

The experimental area is a newplanting on a land cleared from virgin jungle and the planting was done during July–August of 1955 with unselected seeds, following contour system. The planting distance is 22×11 ft. The seedlings were budded with PB 5/139 during April–May, 1956. Thick ground cover of *Pueraria phaseoloides* was established in the first year of the planting itself and the cover crop became patchy when the rubber trees have closed up.

III. Experimental findings

The first set of girth measurements was started from the experimental plots in January, 1959 and later girth measurements are being recorded during January, every year. The girth measurements are taken at a height of 50″ above the union of stock and scion. The mean girth of the plants in inches of all the trees in net plots under different treatment combinations taken from 1959 are reported in Table I.

IV. Discussion

The results which have been reported cover a period of six years following the first application of fertilisers in the programme. In the period which have been covered, the effect of nitrogen application on growth of the plants although not very marked in the initial years became more noticeable with time. A positive significant effect due to nitrogen is observed only by the fifth year of the trial and this positive effect is still greater in the subsequent year. Thus we find that the response to nitrogen application on growth increases steadily from the first to the final year of recording.

A beneficial effect on girth increment due to applications of phosphate was noticed in

the third year of the trial. In the following years the beneficial effect was greater and reached statistical significance at 5 per cent level by the fifth year of the trial. By the 6th year the P effect on growth became highly significant. Thus the main response occurring in growth during the period of immaturity is due to applications of phosphoric acid and this fact probably emphasises the major role played by phosphoric acid in improving the growth of young rubber trees during their years of immaturity.

The results presented show no significant beneficial effect due to application of potassium alone for the character studied in any of the years. Examining the data showing the K effect in different years, we find that there is no appreciable increase in the response.

None of the interactions assumed significant values except in the sixth year of the trial when the NK interaction became significant. The NP interaction effect although positive in all the years and increased steadily, in no year the effect is statistically significant. It would therefore appear from the results that the interdependence of applied N and P in their effects on growth of rubber is not generally important.

But from the results presented it is noticed that the NK interaction effect was developing more gradually. Positive effects are observed in all the 4 years of recording. The effect became most noticeable in the final year of recording and has become statistically significant. The interdependence of N and K effects on growth of rubber may therefore be important.

There is no marked PK interaction effect in any one year. The effect of application of one of these nutrient elements (P or K) on the girth increment of rubber is independent of the presence or absence of the other.

Summarising the evidence discussed above, it is found that the chief responses in terms of character studied of rubber plants are due to phosphoric acid, nitrogen and NK interaction. Hence for the desired girth increment in rubber, the requirement of phosphates, nitrogen and application of potassium in presence of nitrogen are indicated. It would therefore appear that the most effective treatment, is a mixture that provides nitrogen, phosphoric acid and potassium, for young rubber plants grown under the edaphic conditions detailed in this note.

V. Summary

This preliminary report deals with the results of 3^3 NPK factorial experiment on rubber which is being carried out in order to study the optimum requirements of nitrogen, phosphoric acid, and potash on a virgin soil of lateritic gravelly loam. The preliminary findings of this experiment are :

1. The main response occurring in growth characteristics studied of rubber plants is due to application of phosphoric acid at lower levels.

2. There is a consistent positive benefit from nitrogen manuring. The evidence suggests that application of nitrogen at higher levels may result in increased girth.

3. No significant girth increase has been shown by applications of potash alone. But in presence of nitrogen potash application may be beneficial as the interdependence of N and K effects on growth is indicated.

VI. Acknowledgements

The writer is indebted to Dr. C.K.N. Nair, Ex.-Agronomist of the Rubber Board who planned and laid out this experiment. Thanks are due to Sri S. S. Swaminathan, Statistical Officer of the Rubber Board, who helped in the analysis and interpretation of the results. Acknowledgements are due to M/s Potascheme, Parry & Co. Ltd., and Rhur Stick Stoff for the free supply of fertilisers to conduct this experiment satisfactorily so far. Further, the writer wishes to thank the management of Messrs. Vaikundam Estates Ltd., for rendering necessary help to conduct this experiment successfully and without whose willing co-operation the results achieved and reported, could never have been possible.

TABLE I

Girth data of 3^3 NPK factorial experiment at Vaikundam Estate (New planting)

(Average girth measurement in inches)

Treatment	*1959*	*1960*	*1961*	*1962*
NPK				
000	3.944	6.264	9.361	12.432
001	5.222	8.153	11.625	14.666
002	3.775	5.785	9.173	12.313
010	6.150	9.700	14.050	17.075
011	5.800	8.375	11.800	14.812
012	5.417	8.688	12.656	15.917
020	5.542	8.740	12.604	15.906
021	5.333	8.688	13.375	16.589
022	3.812	5.958	8.969	12.133
100	4.632	7.557	11.864	14.966
101	3.792	6.417	9.260	12.177
102	5.896	9.083	13.146	15.896
110	5.750	9.432	13.807	17.102
111	5.977	9.000	13.455	16.625
112	4.167	6.563	10.750	14.044
120	5.042	7.906	11.875	14.943
121	5.667	9.063	13.510	16.948
122	5.545	8.648	13.318	16.659
200	5.125	8.463	12.938	16.212
201	6.000	9.615	14.000	17.396
202	4.437	7.344	10.969	13.823
210	3.750	6.167	9.510	12.531
211	6.500	9.729	14.330	17.261
212	6.792	10.177	14.688	17.613
220	5.682	8.966	13.432	16.698
221	5.207	7.927	12.000	15.104
222	5.750	9.550	14.017	17.217
Mean	5.213	8.221	12.240	15.373
SE	0.193	0.237	0.244	0.217

Approval of Tjir 1 clonal seed collection areas

The Board will continue to accord approval for suitable areas on private estates for collection and sale of selected Tjir 1 clonal seeds during 1964 also. The areas to be approved should be planted with trees of clone Tjir 1 and should be free from contamination by cross pollination by seedling trees or budded trees of undesirable clones.

If seedling trees of undesirable parent clones are present either within or near about (a radius of 5 chains) the proposed collection area such trees would either have to be pollarded or cut down well before the flowering season to eliminate chances of cross pollination.

Estates having areas already satisfying the above conditions or which are prepared to effect the required improvements may apply to the Board for recognition of the areas as approved source of supply of Tjir 1 clonal seeds. Applications should be accompanied by sketches of the estates, drawn to scale and showing details relating to the year of planting, planting materials used, extent, etc. particularly of the areas proposed for seed collection and their boundary fields. *The last date fixed for receipt of applications is 10th December 1963.*

Estates which had obtained approval earlier should apply again enclosing their latest sketch maps for approval during 1964.

Rubber Board P. O.,
Kottayam,
16th November, 1963.

SECRETARY,
RUBBER BOARD.

Bumper production of Natural Rubber

The production of natural rubber in India for the first five months of the current financial year has shown a good sign of attaining the Board's estimated production of 41,000 tonnes during 1963–64. Production for the first five months of 1963–64 is 14,547 tonnes as against 12,099 tonnes and 9424 tonnes in the corresponding periods of 1962–63 and 1961–62 respectively. It is expected to increase at a still higher rate in the near future. The figures of production of natural rubber for 1961–62, 1962–63 and the first five months of 1963–64 are given in the following table.

TABLE
Production of Natural Rubber
(Metric tonnes)

Months	1961–62	1962–63	1963–64
April	2,100	2,277	2,675
May	1,943	2,195	2,879
June	1,300	2,917	3,276
July	2,010	2,130	2,757
August	2,071	2,580	2,960
September	2,698	2,900	
October	2,800	2,902	
November	3,200	3,644	
December	3,477	3,965	
January	2,828	3,142	
February	951	1,152	
March	2,068	2,435	
Total	27,446	32,239	

The production has recorded a steep increase during the first five months of 1963–64, viz. 20.23% over the corresponding period of 1962–63 and 54.36% over 1961–62.

There are number of reasons for this high increase in production Firstly the weather conditions have been favourable for the natural rubber industry. Secondly the areas replanted with high yielding planting material under the Rubber Board's replanting scheme started in 1957, has come to tapping during this season.. There are clones which can give about 1000 pounds and more per acre under proper care. The active encouragement given by the Board for aerial as well as ground spraying to control the leaf disease is also responsible for the increase in yield.

The Rubber Board has estimated the consumption of natural and synthetic rubber during 1963–64 as 72,000 tonnes. The estimated consumption for the first five months of 1963–64 is 30,047 tonnes which compares favourably with the Board's annual estimate. The increase in consumption is rather at a faster rate than the production of natural rubber. The constantly widening gap between the two is, therefore, to be filled by the locally produced synthetic rubber and imports.

RUBBER STATISTICS

TABLE I

Area Under Rubber as at the End of Each Year

Year		Area in acres
1950–51	...	170,506
1951–52	...	171,191
1952–53	...	172,786
1953–54	...	173,643
1954–55	...	176,647
1955–56	...	207,239
1956–57	...	234,351
1957–58	...	261,998
1958–59	...	286,567
1959–60	...	305,452
1960–61	...	321,002
1961–62	...	348,121
1962–63	...	361,142

TABLE II

Planted Acreage Under Different Planting Materials as at the End of 1962–1963

(Area in acres)

Planting materials	Newplanted area	Replanted area	Total area
Ordinary	211,888	4,184	216,072
Budded	37,679	17,555	55,235
Clonal	77,798	12,037	89,835
Total	327,365	33,777	361,142

TABLE III

Classification of Holdings and Estates According to Size as at the End of 1962–1963

(Area in acres)

Groups	No. of units	Area
A. Small Holdings (50 acres & below)		
5 Acres and below	57,524	110,998
Above 5 acres and upto and including 10 acres	5,428	40,041
Above 10 acres	3,410	69,698
Total	66,362	220,737
B. Estates (above 50 acres)		
Above 50 and upto & including 100 acres	305	22,113
,, 100 ,, 500 ,,	232	46,842
,, 500 ,, 1000 ,,	32	22,081
,, 1000 ,, 1500 ,,	18	22,056
,, 1500 ,, 2000 ,,	6	10,179
,, 2000	7	17,134
Total	600	140,405
GRAND TOTAL	66,962	361,142

TABLE IV

Statewise Distribution of Area at the End of 1962–1963

(Area in acres)

STATES	HOLDINGS (50 acres & below)		ESTATES (Above 50 acres)		TOTAL	
	No. of units	Area	No. of units	Area	No. of units	Area
1. Kerala	65,658	215,085	548	125,211	66,206	340,296
2. Madras	683	5,305	41	10,945	724	16,250
3. Mysore	21	347	10	3,827	31	4,174
4. Andamans	...	...	1	422	1	422
Total	66,362	220,737	600	140,405	66,962	361,142

TABLE V

Statewise Production of Natural Rubber (In Metric Tonnes)

States	1958–59	1959–60	1960–61	1961–62	1962–63
Kerala	22,062	21,890	23,175	24,954	29,057
Madras	1,665	1,814	2,040	2,060	2,695
Mysore	425	437	452	402	447
Andamans	17	32	30	30	40
Total	24,169	24,173	25,697	27,446	32,239

TABLE VI

Production, Import and Consumption of Natural and Synthetic Rubber

(In Metric Tonnes)

Year	Production of Natural Rubber	Import			Consumption		
		Natural Rubber	Synthetic Rubber	Total	Natural Rubber	Synthetic Rubber	Total
1958–59	24,169	12,538	4,229	16,767	35,767	3,477	39,244
1959–60	24,173	15,287	5,718	21,005	40,491	4,964	45,455
1960–61	25,697	23,125	8,097	31,222	48,148	7,397	55,545
1961–62	27,446	22,528	10,121	32,649	48,410	10,186	58,596
1962–63	32,239	23,360	10,297	33,657	53,553	10,276	64,276

TABLE VII

Reclaimed Rubber Acquired and Consumed by Manufacturers

(In Metric Tonnes)

Year	Acquired	Consumed
1958–59	3,973	4,102
1959–60	5,177	4,989
1960–61	5,183	5,453
1961–62	6,422	6,046
1962–63	6,839	6,850

TABLE VIII

Stock of Natural Rubber at the End of Each Month (In Metric Tonnes)

Month	1958–59	1959–60	1960–61	1961–62	1962–63
April	8,723	10,035	8,571	9,696	11,003
May	9,106	9,067	8,186	9,716	10,937
June	8,756	8,138	8,128	8,462	12,193
July	8,710	8,545	8,067	8,256	12,475
August	8,619	8,968	8,489	9,235	12,218
September	8,322	8,995	9,157	9,744	12,723
October	9,523	9,810	10,265	11,291	13,917
November	11,007	10,467	10,742	12,120	15,059
December	11,587	10,793	12,993	13,359	16,334
January	11,715	10,496	13,036	12,990	15,940
February	10,438	9,533	11,185	11,511	13,879
March	10,233	9,201	9,875	11,439	13,485

"Rubber Ridley"

Mr. Henry N. Ridley was chiefly responsible for the many advances in the field of Rubber Plantation Industry which is the main source for the various rubber industries throughout the world. In the earlier days when he was the Director of Botanic Gardens, Singapore, he carried out extensive work on the plantation of rubber, devised a very satisfactory tapping system which did not kill the trees and also developed methods for control of various diseases which afflicted the trees. At that time many people laughed at his ideas and ridiculed him by calling him as "Mad Ridley" or "Rubber Ridley." In fact the then Governor reprimanded him for "wasting his time." Only due to his experimentation the damage to the tree has been reduced to the minimum. The modern plantation industry owes all its benefits to this great man for his perseverance and the said 'mad' pursuit. Only recently people realised the great contributions he had done to the Rubber World and started honouring him for the wonderful work he had carried out 43 years back. Now today his name is written in gold letters throughout the Rubber World.

NATURAL RUBBER PRICES

The current controlled maximum and minimum prices, exclusive of sales tax, for various grades and qualities of rubber and latex of different concentrations excluding the cost of container.

Grade of rubber	Quality of rubber	F. O. B. Cochin for 50 kilograms	
		Maximum price Rs.	Minimum price Rs.
(1)	(2)	(3)	(4)
Group 1	R. M. A. IX	162.60	161 50
	R. M. A. 1	162.60	161.50
Group 2	R. M. A. 2	160 95	159.85
	R. M. A. 3	159.30	158.20
	Cuttings No. 1	151.03	149.93
Group 3	R. M. A. 4	155.44	154.34
	R. M. A. 5	151.03	149.93
	Cuttings No. 2	144.42	143.32
Group 4	Precoagulated Crepe	168.67	167.57
	Pale Latex Crepe IX	166.46	165.36
	Pale Latex Crepe 1	164.26	163.16
	Pale Latex Crepe 2	163.16	162.06
	Pale Latex Crepe 3 FAQ	162.06	160.96
Group 5	E. B. C. Super IX	157.64	156.54
	Estate Brown Crepe IX	153.23	152.13
	Estate Brown Crepe 2X	149.93	148.83
	Smoked Blanket	153.23	152.13
	Remilled Crepe 2	144.97	143.87
Group 6	Estate Brown Crepe 3X	141.11	140.01
	Remilled Crepe 3	138.91	137 81
	Remilled Crepe 4	132.84	131.74
Group 7	Flat Bark	123.47	122 37
Normal latex up to 35% concentrates		Rs. 162.60 plus a premium of Rs. 19.29 per 50 Kilograms of D. R. C.	Rs. 161.50 plus a premium of Rs. 19.29 per 50 Kilograms of D. R. C.
Latex concentrates of 36% to 50% (both inclusive)		Rs. 162.60 plus a premium of Rs. 36.38 per 50 Kilograms of D. R. C.	Rs. 161.50 plus a premium of Rs. 36.38 per 50 Kilograms of D. R. C.
Latex concentrates of 51% to 60% (both inclusive)		Rs. 162 60 plus a premium of Rs 47.40 per 50 Kilograms of D. R. C.	Rs. 161.50 plus a premium of Rs. 47.40 per 50 Kilograms of D. R. C.

Loan for Newplanting

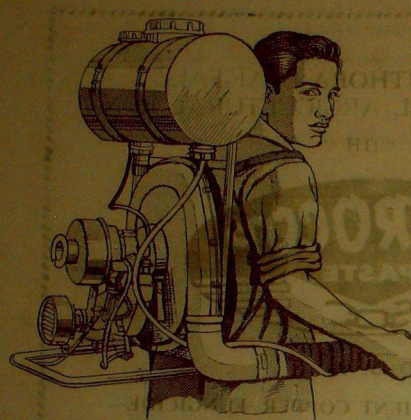
Applications are invited from registered small holders of rubber for grant of loan for newplanting of rubber in 1964. The loan will be interest free and will be limited to Rs. 750/- per acre for newplanting to raise the existing holdings to 5 acres and above and upto 15 acres in a contiguous plot or within 5 miles of the existing estate. Loan will be sanctioned only against sufficient security worth Rs. 1,000/- per acre and will be distributed in 6 annual instalments. The first and second instalments will be Rs. 300/- and Rs. 150/- respectively and subsequent 4 instalments Rs. 75/- each. The loan will be repayable in 6 annual instalments of Rs. 125/- each commencing from 10th year after planting. The loan assistance is limited to 2,500 acres in one year. Application forms and further details of the Scheme can be had free of cost from the Secretary, Rubber Board, Rubber Board Post, (Via) Kottayam or from the Board's Sub-Offices at Kozhikode, Moovattupuzha, Kottayam North, Kottayam South and Trivandrum or from the Rubber Instructors stationed at various places.

Application in the prescribed form supported by the following documents should reach the Secretary on or before 15th December, 1963.

1. Plotted and certified survey plan of the estates and the area intended for new- planting in 1964. (in duplicate).
2. Certified sketch of the property offered as security.
3. Encumbrance certificate for the last 13 years of the property offered as security.
4. Certified copy of the Thandaper relating to the property offered as security.
5. Latest tax receipt in respect of the property offered as security.

Kottayam,
28th Oct., 1963.

SECRETARY,
RUBBER OARD.



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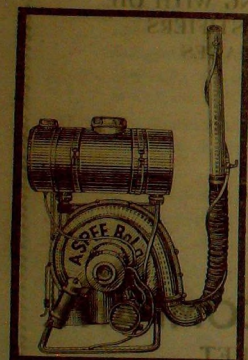
Economical, Effective & Quick Control of Pests & Diseases of Crops.



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- Change over from Mist Blower to Duster needs 5 minutes.
- Simple & Robust Construction.
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Agents at all State Headquarters.

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MIST BLOWER
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"A solemn and public pledge," *said Tata-Fison.*

"To create!" *said Rallis, thinking of fertilizers.* "To grow healthy crops—ensure bumper harvests—to feed the hungry millions."

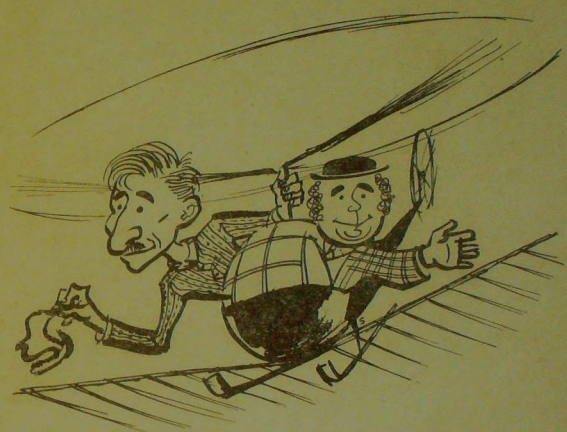
"To destroy!" *thundered Tata-Fison thinking of pesticides.* "We'll exterminate scurvy pests, villainous insects and strangling weeds."

"In short," *they said together,* "a public pledge to cover the field!"

Tata-Fison and Rallis have combined their separate marketing organisations into a single, unified service. For the future, all Tata-Fison products will be marketed by Rallis Fertilizer and Pesticides Division. The merger will prove of immense benefit to the Indian farmer. For the first time, one integrated service will provide advice and products covering both crop growth and crop protection throughout the country...a notable contribution to the cause of agricultural progress.

TATA-FISON AND RALLIS COVER THE FIELD!

TATA-FISON RALLIS

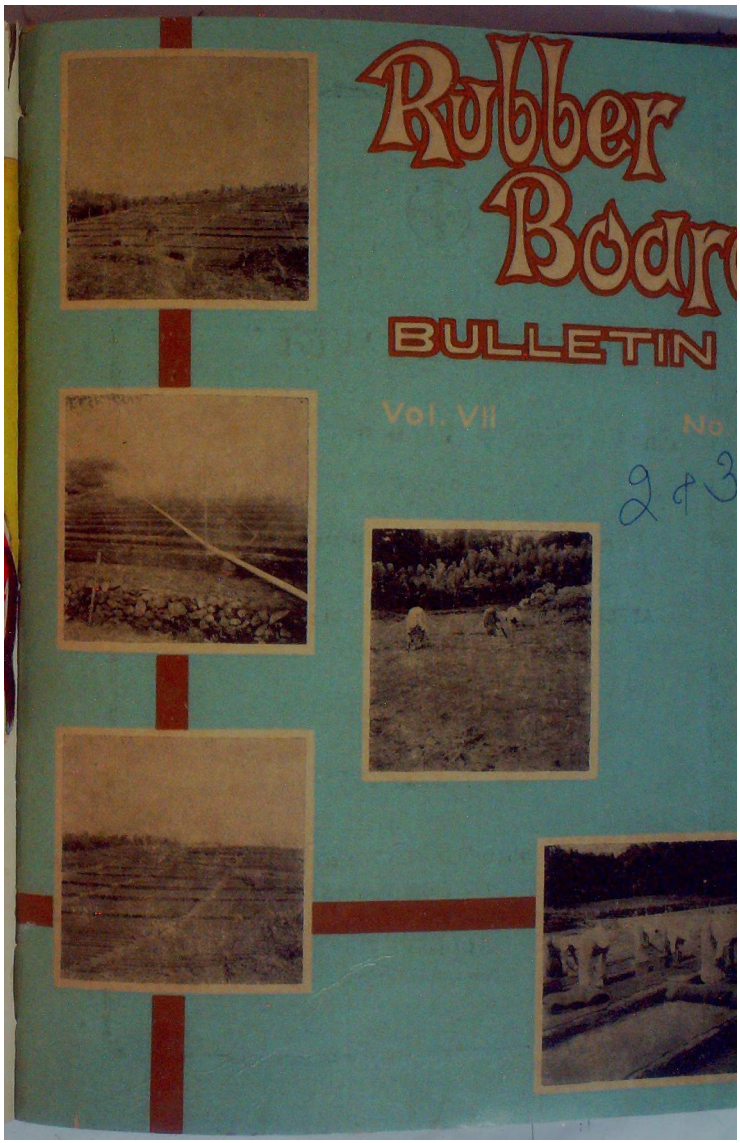


LOOK! **no phytophthora!!**

(*said Fison*)

Simple, my dear Fison,
TATA + FISON + FYCOL-8 + Helicopter
(*said Tata*)

Edited and Published by P. K. Narayanan, Editor-Cum-Information Officer, Rubber Board, Kottayam and Printed at the C. M. S. Press, Kottayam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Vol. VII
No
2 & 3

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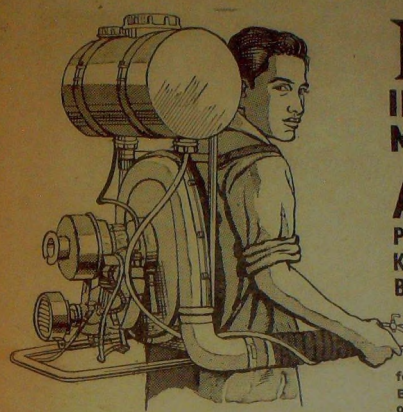

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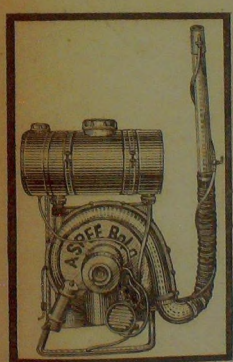

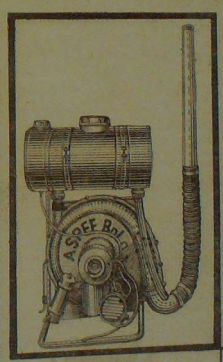

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MALAD - BOMBAY 64

rubber board bulletin

Vol. VII, No. 2 & 3, October 1963—March 1964

OVER THE PAGES

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ADVERTISEMENTS

"The woods are lovely, dark and deep,
But I have promises to keep
And miles to go before I sleep,
And miles to go before I sleep."

SHRI JAWAHARLAL NEHRU

The light has gone out. The bright and luminous star that has presided over the destinies of the 440 million people of India for the past 17 years has suddenly and rather unexpectedly faded into eternity. Death claimed the foremost son of Mother India on that ominous afternoon of the 27th of May 1964. Shri Jawaharlal Nehru is no more.

It is not easy to assess the variegated qualities of the head and the heart of such a gifted, towering and multi-faced personality as Jawaharlal. Only future historians will be able to evaluate his successes and his failures. We, of the present generation, are too near to him to do anything of the sort. But we are sure of one thing. No other leader in world history had enjoyed the unquestioned affection and love of millions and millions of people as Shri Nehru did. He wielded unlimited power over the masses of India. But, being a democrat both in thought and action, he not for once allowed power to go to his head. His one and only ambition in life was to see India great, to raise the millions of his countrymen from poverty, ignorance and degradation to a nation of educated, healthy and civilized people and thus to a fuller life. For him India and its teeming millions counted more than his life.

Few men in our time, perhaps at any time and at any place, have striven for and achieved so much in the all-round advancement of their country as Shri Nehru did in the case of India. He kept the country united, democratic and secular. From very early times Shri Nehru had the firm conviction that India could rise and become a modern nation only by the advancement of Science and Technology in the country. And he laid her firmly on the road to economic development and

technological advancement during the last 17 years of his stewardship of India.

Shri Nehru as the Chairman of the Planning Commission since its inception in 1950 till his passing away, has laid strong foundations for the economic stability and industrial progress of the country. After independence, his attention was mainly concentrated on the rapid economic building up of the country through a series of plans. He threw his great weight into the campaign for gearing up agricultural production through the application of modern technology. He had visualised that agricultural development should be the basis for further advancement of India and he emphasised the importance of increasing production through the application of technology and popularising the idea of co-operation. While he welcomed training and research institutes, he was also particular that special attention should be paid to the practical side. Shri Nehru always emphasised that scientific research should have close contact with the practical problems that we have to deal with.

Shri Nehru's views on this subject have particular significance to the rubber plantation industry in India. It has been proved beyond doubt that by adopting modern scientific methods and practices of cultivation, the total production and the per acre yield of rubber in the country can be considerably increased from their present levels. This would not only achieve the immediate object of saving scarce foreign exchange but in the long run it would also help in the industrial and economic advancement of the country for which Shri Nehru strived all through his life.

This would be the most fitting memorial that we in the rubber plantation industry could raise to the memory of the departed leader. Let us solemnly affirm that we will strive our best and dedicate ourselves for achieving the lofty goals for which our dear Jawaharlal spent the whole of his valued life.

Obituary

We record with deep regret the sad demise of Shri K. V. Mathew, Kollamkulam at Trivandrum on 5th January 1964. He was 71.

Shri Mathew has served the natural rubber industry for long in close association with the Rubber Board in various capacities as Chairman of the Indian Rubber Licencing Committee, member of the Rubber Board, and member of the Board's various Sub-Committees. The industry has lost by his death an ardent worker who had always its cause at heart.

Shri Mathew's fields of activity were multifarious. He was a leading planter, industrialist, banker and public worker. Many a plantation company had the fortune of having him on their director board. His inspiring leadership and guidance will be missed everywhere.

We mourn his death and extend our heart-felt sympathy to the members of the bereaved family.

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46th Rubber Board Meeting

Speech delivered by Dr. Rama Varma, Chairman, Rubber Board, at the 46th meeting of the Board held at the Rubber Board Office on 7-2-1964

Chairman announces concessions to growers

Gentlemen,

It is with great pleasure I welcome you to the 46th meeting of the Board. This time we have two new members in Shri Sankaranarayanan, Secretary to the Department of Agriculture, representing Kerala Government and Shri Vasu Panikker representing labour. I am sure that their knowledge and experience will be of great assistance in our deliberations.

After we met last, the most significant event has been the announcement by the Finance Minister in the last session of the Parliament Government's decision to decontrol the price of natural rubber along with fifteen other articles. It would appear that this is part of Government's general policy to remove irksome controls and to stimulate production. So far as natural rubber is concerned, the subsequent decision to continue the minimum price as it has been prevailing till then, has given the necessary assurance to the producer, that Government is prepared to protect his interests. At the same time, the decision to remove the statutory maximum to the price should be welcome to the producer. Contrary to expectations, it is reported that the cost of production of synthetic rubber, produced for the first time in India is about 80 nP. higher than the natural rubber produced in the country. If that is the case, there is no reason why the natural rubber producer should not get the higher price.

Another development, that should be welcome to the natural rubber producer is that with the production of synthetic rubber in the country, direct impact of slight excesses in imports on the price of natural rubber will be reduced. When the domestic demand was fully met by

the domestic production of natural rubber and imports, any excessive imports led to reduction in offtake and down grading of quality. Hereafter domestic demand will be largely met by domestic production of natural and synthetic rubber. And as long as the synthetic rubber price rules higher than that of natural rubber, the impact of imports will first be felt by the synthetic rubber. If the Synthetics and Chemicals, can produce its full rated capacity of 30,000 tonnes, the need for imports next year will not be more than 3000 tonnes.

From the short term point of view the prospects for natural rubber are quite bright. It is for the Board to ensure that the full benefit of the changed circumstances is used for the development of the industry. When I say industry, I take it in the larger sense, the estates, small-holdings and labour. In a labour intensive industry like plantations the role of labour is most significant and without his willing co-operation it would be difficult to increase productivity per worker and production per acre and to reduce cost.

It is a little hazardous to express views on the long term prospects of any industry and more so of an industry like rubber plantation. But a close study of facts would reveal that in India natural rubber has good prospects in the foreseeable future. Indications are that so long as the country is dependent on foreign technical know-how and imported plant and machinery, the cost of synthetic rubber produced in the country is going to be more than double that of similar product produced in United States or Europe. Secondly in a country like India, with its vast area and population, the potential demand is large. In the circumstances, I do not find any reason why natural rubber should have any fear about its future, if there is a co-ordinated policy for the development of synthetic as well as natural rubber. That co-ordination is absolutely essential, if any imbalance between the production of natural and synthetic rubber should be avoided. On this particular aspect, one of the members wants to move a resolution and I do not want to make any further comments on it.

I am glad to inform you that during the current year, upto the end of November, an increase in production of 20 per cent over that during the corresponding period of last year has been recorded. It may be mentioned that only a little over two lakh acres are under tapping out of a total planted area of 3,61,142 acres. In the coming years more new areas will be coming into tapping which will continue to maintain the rising trend in production. This year's crop is estimated at 40,000 tonnes. Next year it may go up to 46,000 tonnes and in the last year of the 3rd Plan, it may reach 50,000 tonnes, 5,000 tonnes more than the target fixed for the industry. It has been proved by the trials conducted by

the Board that by better cultural practices the yield from existing areas could be increased by 25 to 35 per cent. And it may not be difficult to produce 70,000 tonnes by 1970.

Of late, considerable work is being done in important natural rubber producing countries to replace or to improve upon the present system of visual grading of rubber. Researches are also being carried out to find out a better method of presenting the product to the consumer. I am glad to inform you that Indian Standards Institution has formed a sub-committee on raw rubber to evolve suitable Indian Standards. The first meeting of the Committee was held in the last month and its programme of activities have been drawn up. I am also informed that the various sub-committees of the International Standards Organisation will be meeting in Delhi in November this year and a task force has been constituted for raw rubber.

During the last few days, the various sub-committees of the Board have been meeting. The Committee appointed by the Board at its last meeting to review the progress of replanting of smallholders has submitted its report. Some of the important recommendations of the various Committees relate to the steps to be taken to expedite replanting of smallholdings.

Those are :—

(a) supply of good planting materials free of cost to holdings below 10 acres,

(b) advance payment of subsidy as a loan on personal security at the rate of Rs. 200/- per acre and up to a maximum of Rs. 1,000/- for holdings below 10 acres,

(c) extending the supply of manure at half cost up to 10 acres.

There is also a proposal to give 25 per cent rebate on the cost of copper-sulphate to co-operatives undertaking spraying under the Board's programme. The area expected to be sprayed this year is 20,000 acres as against 10,000 acres last year. This will be mostly holdings below 10 acres.

I am glad to inform you that by April as many as 13 smoke-houses sanctioned by the Board will be in operation. Plans for seven more are under consideration. Six co-operative marketing societies, two in Kottayam district and one each in Trivandrum, Quilon, Ernakulam and Calicut will start functioning from March with the assistance given by the Board. Another scheme of the Board which will be implemented from March is instruction in tapping and tapping demonstrations in different centres.

Before I conclude, I want to thank you all for the excellent co-operation I have been getting from you. I also want to take this opportunity to express my appreciation of the good work that is being done by the officers and staff of the Board, though at times my demand on them have been heavy.

46th Meeting of the Rubber Board

The 46th meeting of the Rubber Board was held at 10.30 AM on 7th February 1964 at the Rubber Board's headquarters at Puthuppalli, Kottayam. The following members were present.

1. Dr. Rama Varma (Chairman)
2. Dr. V. R. Narayanan Nair
3. Shri. V. J. Kurian
4. ,, George John
5. ,, A. T. Mathyoo
6. ,, K. M. Philip
7. ,, P. Ramalingam
8. ,, K. K. Vasu Panikker
9. ,, C. H. S. London
10. ,, K. Karunakaran
11. Smt. Rosamma Punnoose
12. Shri M. M. Muthiah
13. ,, Joseph Jacob
14. ,, Michael A. Kallivayalil
15. ,, K. V. Thomas
16. ,, Ebrahim Sulaiman Sait
17. ,, K. Srinivasan
18. ,, K. C. Sankaranarayanan
19. ,, Mathew Maniangadan
20. ,, A. V. Raghavan

Important decisions & Resolutions

Sri Mathew Maniangadan, M. P., moved the following resolutions and passed by the Board :—

(1) "This meeting of the Rubber Board requests the Central Government to stop the present system of granting licences direct to manufacturers for import of natural rubber and to direct that import licences for rubber be issued in favour of the Rubber Board and that the Board be authorised to allocate and recommend to the Government against applications from consumers such quantity as may be assessed as necessary from time to time"

(2) "This meeting of the Rubber Board feels that issue of licences for starting new factories or for expansion of existing capacity for production of synthetic rubber will affect adversely the interests of Rubber Plantation Industry and will defeat the efforts of the Board to develop the Industry and requests Government that such licences should be issued only in consultation with the Rubber Board."

Import

The total requirement of rubber for 1964—65 is estimated to be 81,000 tonnes and production 46,000 tonnes and the overall shortage 33,864 tonnes. Considering the production of synthetic rubber in the country the balance to be imported during the year will come to only about 3800 tonnes.

Labour

The Board sanctioned a payment of Rs. 1,04,970 as stipend for children of rubber estate labourers in respect of 718

applications. This is in addition to the sanction of Rs. 56,415 already sanctioned for 1963—64 as stipend.

Additional assistance to small-growers of rubber

Subsidy paid for contour terraces or edakkayalas, silt trenches or silt pits and supply of manure at half the cost, all these assistance which are now given to small growers having 5 acres or below, have been extended to growers having not more than 10 acres of rubber.

Payment of one half of the 1st instalment of subsidy for replanting at the rate of Rs. 200 per acre to small growers having not more than 10 acres of rubber has been granted. The advance is to be paid on the personal security of the permit holder and of another approved surety. The maximum amount so payable will be Rs. 1000.

Decided that small-growers having 10 acres and below should be supplied with planting materials (seeds, seedlings, budded stumps and budwood) other than imported materials free of cost. Imported GG 1 and GG 2 seedlings will be supplied to small-growers at a subsidised rate of Re. 0.75. The same will be available to large-growers at Re. 1 per seedling.

The Board has decided to meet 25% of the cost of copper-sulphate required for spraying, to those growers who do the spraying through co-operative societies composed of such growers. The estimated expenditure for subsidising the cost of copper-sulphate, Rs. 1,03,500, has been sanctioned by the Board.

Brown Bast

T. S. RAMAKRISHNAN*
and
P. N. RADHAKRISHNA PILLAY**

Brown bast is a physiological disorder affecting the tapping cut and bark in *Hevea* and resulting in a gradual or sudden reduction and ultimate stoppage of the flow of latex. This disorder is prevalent in all countries where *Hevea* is cultivated. During the years 1913 to 1923, it caused great alarm in India, Malaya and Indonesia. Soon after the introduction of Ridley's tapping system, there was a certain amount of over tapping and the disorder became conspicuous. In the early years there was a suspicion that it was caused by pathogenic organisms either fungi or bacteria. But further investigations have shown that no pathogen is involved and that the disorder is closely linked with the tapping intensity. In some quarters there is still a suspicion that bacteria may be responsible. After the commencement of tapping large numbers of bacteria are noticed in the latex vessels.

Damage to bark at the base

The earliest symptom indicating the development of brown bast is the falling off the d. r. c. of latex. Late dripping is also prevalent. This is followed by the drying of a part or whole of the tapping cut. Sometimes the outer rows of latex vessels alone may go dry while the inner ones continue to yield. In the affected portions the tissues of the bark turn dark brown in colour and become succulent. As the disease progresses the flow of latex ceases and the tree goes 'dry.' The discolouration of the bark extends downward and laterally along the latex vessels into the tissues below the cut. Wound gum deposits can be observed around the affected latex vessels. The spread of the disorder may be limited to a short distance below the cut or may extend to the base of the trunk. In advanced stages short or long cracks are developed in the outer bark, preliminary to scaling. Hard woody burrs and swellings may also develop. In some trees, the basal portion is irregularly swollen reminding of elephantiasis. In rare instances clusters of hard outgrowths mostly in the bark region may be seen from the upper

* Pathologist, Rubber Research Institute of India, Rubber Board P. O., Kottayam.
** Senior Research Assistant (Pathology), Rubber Research Institute of India, Rubber Board P. O., Kottayam.

Irregular swellings at the base of stem

portions of the stem. Several layers of cork may be seen superimposed on one another due to the formation of repeated layers of meristematic cells in the bark. Secondary cambium is formed near the latex vessels and new tissues are produced resulting in the thickening of the bark, formation of burrs and hard swellings.

Different forms of the disorder can be recognised :

1. reduced d. r. c. of latex ; reduced or irregular flow and stoppage of latex
2. besides reduction in latex or its stoppage, formation of cracks in the bark below the cut associated with necrosis of bark.
3. cessation of latex flow and formation of woody growths on the stem or swelling of the basal portion.

Peculiar outgrowths on diseased plants

In the affected tissues, tannins and crystals of calcium oxalate can be seen in plenty. Stone cells occur in large numbers in the soft bark. Depletion of starch from the cells is also evident.

In most of the *Hevea* plantations some trees go ' dry.' There is no need to worry if the incidence is low. The dry trees can

be rested for some months. All clones and seedling trees are liable to be affected to a greater or lesser degree. High yielding trees are more prone to this disorder than low yielding ones. Among the clones liable to be affected to a greater extent are Gl 1, BD 5, 10, CH 30, CH 31, AVROS 255, RRIM 628. On account of the high incidence of brown bast, Gl 1 has now been withdrawn from among the recommended clones in Malaya. Proneness to brown bast is inherited. Seedlings are also liable to be affected. Higher incidence is common during dry seasons. Symptoms akin to those of brown bast have been observed on some trees which have not been tapped.

Since the discovery of the close relation between brown bast and the tapping intensity, the disorder is sought to be avoided by adjusting the intensity of tapping. Tapping clonal seedlings through a half spiral cut alternate daily results in a high incidence of brown bast. But when tapped every third day the incidence is kept low. In some holdings in this country, daily tapping is followed with the result that brown bast appears within a year of the commencement of tapping.

When the incidence of brown bast exceeds ten per cent of the population, the tapping practice in the holding will have to be completely changed so that further extension of the disorder may not occur. The length of the cut has to be reduced from half to one third of the circumference or in other ways. The frequency of tapping is to be lowered from alternate daily to third daily. The affected trees are to be rested for three to six months or more depending on the intensity of the disorder. When the affected

Layers of tissues on proliferated parts

bark is left on the tree, the disorder may spread to adjacent areas. Hence it is advisable to tap away the affected bark if it is limited. When the area is extensive it is recommended that this may be isolated by cutting deep grooves on either side and then removed. The exposed area is protected by applying petrolatum products to hasten healing. The treated trees may recover in course of time. When the bark is swollen and large burrs or swellings have developed at the base, the trees are beyond treatment. In such cases, tapping of the bark higher up the stem with the help of inverted cuts may be adopted. In several holdings this method

is being followed to collect latex from such trees. Tapping on the bark opposite the affected part may also give latex. Rest is the most important factor in the treatment.

In Indochina, copper sulphate is injected into brown-bast-affected trees which do not exhibit trunk distortion. Four grams of copper sulphate are given per tree. Holes are made with an augur and the material kept in the hole and then plugged. With two or three repetitions of this treatment at intervals of six months each, the trees are reported to be cured. But the response varied from tree to tree.

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A note on

The Trends of Manuring Mature Rubber

K. C. ANANTH *

Outlook

The seeming discrepancy between excellent performance of the young rubber for manuring and the very unfavourable comments of 'no response' to fertiliser treatment of mature and old rubber presents an interesting subject of discussion which requires elucidation. Nevertheless, it is evident that quite considerable quantities of plant nutrients are needed for the building up of an acre of mature rubber. Though, it is quite often stated that the amount of plant nutrients removed with the latex is very small, it may be argued that to produce a given quantum of latex the trees may utilise high levels of different nutrient elements.

The only controversial point is the oft repeated 'no response' of mature rubber to fertiliser applications under field condition, contrary to expectations based on experimental findings and analytical results of these soils.

The explanation for this phenomenon is presumably that in deep soils the mature rubber tree is able to develop such extensive root system that it can tap a much greater volume of soil than young plants. Apart from this, it can be stated that thick stand of rubber is virtually a re-afforestation that restores and maintains organic matter status.

Field Study

The above explanations may be considered plausible without taking any inventory and appraisal of soil deficiencies especially under conditions of intensive cultivation coupled with high production. On the other hand, when considering low soil fertility status of rubber growing tracts, once again the arguments set above cannot be taken as sanguine. Further, fertiliser experiment with mature rubber conducted in field plots and reported by George (1962), has given definite yield responses, ranging from 12.8 per cent to 35 6 per cent, over untreated check plots.

Therefore, a logical study of the fertiliser programme in vogue was made and the following points were noted which

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may have a significant bearing on the problem of manuring, a stand of mature rubber.

Observations

1. At present manurial schedule though expressed for a unit area, the practical recommendation and field application are for individual trees. The individual plant dose might possibly work as long as the original density or population is at constant level or the decrease is not significant. With the present fertiliser application methods a unit area of one acre under seedling rubber, with 240 plant positions, gets more fertiliser mixture than budded rubber with only 180 plant stand.

2. Further, as an example, 180 tree stand of an acre on the sixth year after planting gets the full recommended dose of 720 lb. of 8 : 12 : 12 NPK mixture (calculated @ 4 lb. per plant). That is, the acre unit with 180 tree stand gets 57.6 lb. N, 86.4 lb. P_2O_5 and 86.4 lb. K_2O per year. On the other hand the acre unit is entirely forgotten and the fertiliser mixture is applied according to the stand in an acre at the rate of 4 lb. per tree. Thus an acre stand of 90 trees of old rubber at the age of 20—25 years would get only (90 × 4) 360 lb. of 8 : 10 : 12 NPK mixture supplying 28.8 lb. N, 36.0 lb. P_2O_5 and 43.2 lb. K_2O per acre per year, which is almost the rate of manuring, incidentally followed at the fourth year after planting into the field. Therefore, it can be seen that the present procedure inadvertently brings in a decreasing rate of manuring over a unit area which in turn cannot be expected to give positive response of old trees for manuring.

Comments

1. The accepted low fertility status of our soil based on the results of chemical analyses and the belief of 'no response' of mature rubber to manuring are paradoxical.

2. The positive results obtained in experimental plots are indicative to emphasise, that given adequate doses of fertiliser mixture over a unit area, supporting average stand, the mature rubber may respond favourably to fertiliser applications. With the present system of manuring, the response of mature rubber for fertiliser application appears to be density dependent.

3. The belief of 'no response' of mature rubber to manuring or the inconsistent results obtained may have to be attributed to the decreasing rate of field application adopted in manuring mature and old rubber. It may be noted that a very low rate of fertiliser application is made for a unit area under rubber without considering the requirements of such mature and old trees for latex production, bark renewal and extensive annual dry matter production at its extremities.

4. The fertiliser requirement of a crop should always be assessed and expressed for a unit area. The volume of soil containing roots continues to be the same and so no reduction of fertiliser should be aimed at for decreasing density upto certain critical limits. For the convenience of application of fertilisers, the total quantity recommended per acre is divided by the existing stand and fertiliser mixture dose per tree is thus ascertained.

Reference

GEORGE C. M. (1962): Mature Rubber Manuring: 'Effect of fertilisers on yield,' Rubber Board Bulletin, Vol. V., No. 4., pp. 202—08.

Note: The planters' past and present experience of manuring rubber, in the light of this note, may please be communicated to us for further evaluation and study.

Brown Root Disease in Nurseries

T. S. RAMAKRISHNAN*
and
P. N. RADHAKRISHNA PILLAY**

Brown root disease caused by *Fomes noxius* occurs sporadically in *Hevea* plantations in most of the districts in Kerala and in Kanyakumari district of Madras State. Immature plants in the field, four to six years of age are commonly attacked. Sometimes mature trees are also invaded. In recent years the disease has been found to occur in nurseries also and was particularly severe in some nurseries in Kozhikode, Kottayam and Quilon districts. Seedlings, 18 to 24 months old were affected, causing several casualties.

Abortive sporophores

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Affected plants with new roots

The external symptoms of infection can be noticed in the foliage of the affected plants. The growth in height is arrested. The leaves become dull. Red yellow or purple tints are seen in the mature leaves. Some of the leaves are shed while others commence to dry. Meanwhile abortive sporophores of the fungus begin to appear at the base of the stem above the soil level. These are water-soaked and vary in colour from tawny to purplish brown. They appear as irregular growths and do not assume the bracket shape.

On uprooting a diseased plant, the tap root is invariably found to be dying. The cortex at the tip is completely rotten and sloughs off easily exposing the stele. Higher up the bark surface is overgrown by rhizomorphs which are tawny brown or purplish brown in the earlier stages and black later. Over the rhizomorphs a hard mass of soil and small pebbles stick fast to the surface. This is the most characteristic sign of the disease. The colour of the soil cover will depend on the colour of the soil used in making the nursery bed. The bark on the tap root is damaged. The mycelial mat grows over the surface of the base of the stem and appears as a thick pad ending in the concavo-convex or convex abortive sporophores 3 to 5 cm above the soil level.

In plants which had the abortive sporophores two degrees of damages were noticeable. Some had only few damaged roots and the leaves were either shed or drying. Others exhibited profuse formation of lateral roots above the damaged portion of the tap root and these had green leaves. The new lateral roots were probably helpful in maintaining the vitality of the plant. The close stand of the seedlings in the nursery bed enabled the rapid spread of infection to a large number of plants. The source of initial infection was traced to some rotting stumps near the bed.

To control the disease in the nursery, the severely damaged plants have to be eradicated first. After this, repeated drenchings of the soil with solutions of Aretan (1 in 400) or Ceresan wet (1 in 160) are to be given. The solutions may be poured down the stem so that they wash the surface of the roots. The drenching will inactivate the fungus present in the soil of the bed and prevent further spread of infection. Being a nursery it is not feasible to expose the roots of individual plants and treat them as is done with older plants.

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First meeting of the Raw Rubber Sectional Committee, CDC 42.

Standardisation of Natural Rubber

[*Report of ISI Meeting*]

The rubber goods manufacturing industry in India produces a wide variety of rubber goods. They may be broadly classified into (i) Rubber goods for automobile industry, (ii) Cycle tyres and tubes, (iii) Miscellaneous rubber goods like footwear, power transmission belts, conveyor belts, hoses, foam products, sports goods, surgical goods etc. Raw Rubber is the main raw material of this industry. The demand for raw rubber is partly met with the natural rubber available within the country and the rest by imports. During 1962–63 India produced 32,239 tonnes of natural rubber.

The natural rubber produced in the country is broadly divided into seven principal groups by the producers. There is no distinct watertight compartment between these grades. Various manufacturers have their own grading, packing and marking system. More often one grade is easily played into the other and the manufacturers complain that they are handicapped by not getting their material of choice. Assured internal market supply, visual examination methods of grading etc. have all contributed to a confused situation. Much attention is being paid these days on the important aspects of grading and packing of natural rubber throughout the world. The various associations of natural rubber

producers and manufacturers of rubber goods have put forward suggestions from time to time to standardise the production of natural rubber and its packing.

It is in the circumstances enunciated above that the Indian Standards Institution has set up the Raw Rubber Sectional Committee, CDC 42, on the request of the Indian Rubber Industries Association and the Rubber Board. The Committee has now taken up this problem of laying down standards for grading and packing of Indian produced rubber in the interest of the trade for quality production.

Much of the work on standardisation of rubber at the international level has been accomplished by the International Standards Organisation/Technical Committee 45—Rubber—which functions through various working groups. The Raw Rubber Sectional Committee plans to co-ordinate its work with the ISO/TC 45 which is scheduled to meet at New Delhi in November 1964.

The Raw Rubber Sectional Committee has on it representatives of important Planters' Associations, Manufacturers' Organisations, Dealers' Associations, the Rubber Board and the Rubber Research Institute of India, the National Chemical Laboratory and the Director General of Technical Development. The scope of this committee has been kept wide to deal with the following aspects of standardisation of the raw rubber industry, namely, (i) Sampling and methods of test for natural and synthetic rubber, (ii) Packing and packaging codes for natural and synthetic raw rubber, (iii) Marking and issue of ISI Certification Marks when desired by the industry. Its immediate aim is, however, to rationalize the grades and to prescribe simplified packing and packaging codes for internal transit and shipment, if necessary.

The First Meeting of the Raw Rubber Sectional Committee was held on the 22nd January 1964 in the Conference Hall of the Rubber Board at Kottayam. Dr. Lal C. Verman, Director of the Indian Standards Institution, inaugurated the meeting.

In his inaugural address Dr. Verman acquainted the members with the working of ISO/TC 45-Rubber. He said that at the instance of India, ISO/TC 45-Rubber-had agreed to set up a special task group under working group 'C' Unvulcanised Rubber, to prepare specifications for natural rubber. He also informed the members that the ISO General Assembiy would meet in New Delhi in November 1964 for the first time in the East, at the invitation of India, which was a matter of national pride and during the same period, the ISO/TC 45 along with the special task group would also meet in New Delhi. Dr. Verman added that the problem of grading of natural products like mica, jute, ores etc. was always difficult and this problem was generally tackled better at consumers' level. Such work at our

national level had always posed problems. The grading of natural rubber had, however, been initiated at the national level through the present committee and any solution of the problem by the committee would be most welcome. He stressed the need for close co-operation of the Rubber Board, industry and other interests concerned in this important work of CDC 42. In conclusion, he said that ISO/TC 45 had already made substantial progress in developing ISO. Recommendations on methods of sampling and tests for latex and natural rubbers, and these methods should pave the way for the preparation of specifications for natural rubber. He suggested active participation of the committee in the work of ISO/TC 45, with particular reference to its work on natural and synthetic rubbers. He assured the Chairman and the members that in this connection ISI Directorate would do everything possible with the assistance of all interests concerned including the Rubber Board, and then declared open the newly constituted CDC 42.

Shri Lalit Mohan Jamnadas, Chairman of the Raw Rubber Sectional Committee, extended a hearty welcome to the members and invitees present. He said that much attention had not been paid to the work on preparation of technical specifications on natural rubber even at international level. He was, however, glad that at India's request a special task group has been set up by ISO/TC 45 under WG C. He complimented Messrs. Synthetics and Chemicals Ltd., and the ISI Directorate for the technical notes and information submitted apprising the committee of the present position regarding work on standardisation of synthetic and natural rubbers. He said that the present system of grading of natural rubber as practised in the country was very unsatisfactory and unscientific as it quite often led to disputes between the producers and users. He added that rationalisation of grades and the replacement of the present visual classification of grades by technical classification similar to the one adopted in Malaya and other natural rubber producing countries would be in the interest of both the producers as well as users. He suggested that for technical classification, it would be necessary to collect data based on inter-laboratory tests on indigenous samples.

Dr. Rama Varma, Chairman, Rubber Board, who attended the meeting as an invitee, stressed the need for standardisation of sampling, grading, packing and packaging procedures of natural rubber. He said that standardisation of products from big producers did not pose much difficulty but the real problem was with the production from small planters who were more than 50,000 in number having less than 10 acres of cultivable land per head. In overseas countries, the problem of grading and packing of natural rubber was still complicated, because the grading and packing were more often

dictated by the consumer interests of natural rubber from other countries. Though India did not export natural rubber, yet the problem of grading and packing posed considerable difficulty, as a vast majority of the growers were from small holders. He said that he was happy to note that this work had been taken up by ISI under the able guidance of Shri Lalit Mohan Jamnadas. He mentioned that all possible attempts were being made by the Rubber Board to improve the quality of natural rubber as well as yield. He added that a rational approach by producers was necessary and appealed for co-operation of the industry and the members in the uphill task of the committee in putting up something concrete before the next meeting of ISO/TC 45, which was scheduled to meet in New Delhi in November 1964.

After holding a preliminary discussion on various matters within its purview and taking some important decisions, the meeting concluded with a vote of thanks to the Chair and to the Chairman, Rubber Board for the excellent arrangements made for the meeting. The Committee decided to hold its next meeting in Delhi in September 1964.

Later in the evening of the 22nd January, 1964, Dr. Lal C. Verman addressed a press conference at the Rotary Club Hall, Kottayam. Introducing Dr. Verman, Dr. Rama Varma, Chairman, Rubber Board, said that Dr. Verman was not merely the Director of the Indian Standards Institution but he was also the father of the ISI, one of the post-war institutions which had done very creditable service to the country.

Dr. Lal C. Verman thanked the Chairman, Rubber Board for the kind words spoken about him and then explained in detail the aims for which the Indian Standards Institution had been set up and its mode of working. He said that the ISI, which was established in 1946, was a national institution. It was neither a Government nor a non-Government institution. It was a peculiar establishment in which all shades and types of interest directly participated at the administrative, official and technical levels. The ISI had been associated in its working with Governments, private and public sectors, scientific and technological institutions in the country, traders and bankers and in fact with everybody who had any interest in the progress and development of the country. The ISI stood on an equal footing with any other standards organisation in the world.

Continuing, Dr. Verman explained that no standards committee set up by the Institution would be considered a constitutional one unless the respective consumer interests were not predominantly represented on it. After all the object of standardisation itself was to serve the consumer and that meant serving the producers and others as well. The object for which the ISI worked was the development of the Indian economy on sound

lines. Every man was a producer or a consumer at some stage or other. A smooth flow of products was essential for the well-being of a civilised society. The products should fit each other and also the requirements of every consumer. Standardisation assumed great importance in this respect.

No standard could be laid down for any material unless the consumers were fully agreed, Dr. Verman added. All standards fixed by the ISI were produced by standards committees on which the trade, scientific and technological institutions as well as consumer interests were represented. There were many such committees functioning under the framework of the ISI. Each committee had full authority to frame standards after consulting all the national interests concerned. The committee prepared draft standards on the basis of research standards adopted in other countries, as well as on the basis of international agreements concluded, for study by a very wide circle of interests in the country. Comments offered by all interested parties were collected and collated every three or six months. Some of the suggestions offered would have to be rejected after research and investigation. Sometimes it might take six years or more to arrive at a standard, from the stage of preparation of the draft to the stage of publication of the adopted one, just to ensure that it was really a national document. The idea behind all these efforts was that any standard laid down should be acceptable to producers, dealers and consumers alike. To help the common man to select quality products, a scheme of standardisation marking had been introduced under an Act of Parliament. A product having the ISI Marking ensured that it had the ISI guarantee. The ISI had an inspectorate which inspected factories and occasionally bought goods from the open market to check whether proper quality was maintained.

Dr. Lal C. Verman then dealt with the question of standardisation of raw rubber for which the Raw Rubber Sectional Committee had been set up by the ISI. He said that an international committee of the ISO had been set up for standardisation of rubber and that committe had been in existence for the last sixteen or seventeen years. It had produced international standards mainly dealing with the testing of rubber and rubber goods. The Rubber Board and the rubber manufacturers who consume most of the raw rubber produced in the country had demanded that proper standards should be evolved for grading, packing etc. of rubber. Dr. Verman added that there were 31 grades of rubber in the market as fixed by the Rubber Manufacturers' Association of America. America produced very little rubber but that country was the largest consumer and they had laid down an international standard. But the rubber manufacturers in India had demanded that we should have a simpler method of grading suited to our local conditions. It was with this view that

the Raw Rubber Sectional Committee, CDC 42, had been set up.

At its first meeting held on that day, Dr. Verman continued, the committee had decided to go into the question of standardisation of rubber in a very detailed manner. It felt that in addition to grading, the technical classification of rubber had also to be looked into. The Committee decided that experiments had to be carried out before going into the technical classification of rubber. Another task which the committee had programmed to undertake was the publication of authoritative standards for the various grades of raw rubber as well as latex. Packing and packaging were other items which required standardisation.

In conclusion Dr. Lal C. Verman said that the need for proper standards in the grading, packing, packaging and technical classification of raw rubber had at the present time been accepted by all, and according to the wishes of the interests concerned the ISI had moved in the matter and had set up the Raw Rubber Sectional Committee. The committee had started its work. Dr. Verman concluded expressing the hope that various interests directly concerned like producers, manufacturers, dealers, scientists and technologists would co-operate whole-heartedly with the committee in evolving acceptable standards for raw rubber.

[TNVN]

Cock Chafer Grubs

T. S. RAMAKRISHNAN*
and
P. N. RADHAKRISHNA PILLAY**

Cockchafers are mostly large horny beetles. The adults cause no damage to rubber. But the grubs which remain inside the soil feed on the roots and cause considerable damage. These grubs are polyphagous feeding on the roots of several cultivated and wild plants The infestation is more in sandy or loose soils where the grubs can move easily These insects are common in S. India and have been reported to damage seedlings and young *Hevea* in some plantations.

The grubs of many species of cockchafers are known to attack the roots of *Hevea* in S. E. Asian countries Among these are *Holotrichia bidentata, H. javana, H. leucophthalma, Psilopho'is grandis, P. vestita, Leucopholis rorida* and *Lepidiota pinguis and L. Stigma.* The adults can fly and the female lays eggs in burrows in the soil in new areas. The grubs hatch out of these in 2—4 weeks. They live and move about in the soil, voraciously feeding on the roots of plants. The body is whitish, fleshy and incurved with 3 pairs of legs. The head is brown and the mouth parts are powerful. The hind end is dull black owing to the colour of the contents. The pupal stage is passed in small cavities in the soil. The adult beetle emerges from the pupa in about a month.

Cockchafer Grub

On *Hevea* the damage is more in the nursery and in young plants in the plantations. Nurseries situated near jungles

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Tap root of seedlings cut by the grubs

or forests are more liable to be attacked. The tap root and the main laterals are cut. The affected seedlings suddenly droop and fall over. In older plants though some of the finer roots may be cut the plants are not visibly affected.

The roots of cover crop plants are also damaged and they may die in patches.

In nature, the grub population is kept down by their natural enemies. Among these are many birds, pigs, scolid wasps and an entomogenous fungus [*Metarrhizium anisopliae* (Metsch.) Sor.] Where these natural enemies are rare or the biological balance has been upset, the cockchafer population increases and it becomes a menace. Under these conditions other control measures are called for. Various insecticides have been used with good effect for the control of cockchafers. In the nursery, water emulsions of DDT (0.1 per cent) may be poured into the soil at the rate of 4.5 litres per 16 sq. m. of the area. Benzene hexachloride (gamma) formulations at 0.4 per cent strength can also be applied to the soil with good effect. Heptachlor is another preparation which is effective against these grubs. Aldrin (Aldrex 2, 1 in 200) and dieldrin (Dieldrex EC 18, 1 in 400) formulations are also applied to the soil for controlling these grubs. These two persist in the soil for longer periods and hence the residual effect is of longer duration. In the field, the solutions may be used for drenching the soil round the plants to a radius of 20—30 cm. These insecticides will control the grubs and also the emerging adults.

In regions where cockchafers are known to be prevalent, the soil may be mixed with the solutions or dust formulations of these insecticides at the time of formation of nursery beds as a preventive measure. In the planting pits in the field also, the soil may be treated just prior to planting.

These insecticides may not be feasible to destroy the grubs living under the cover crops. Adults may emerge from these areas and infest new locations. In order to catch and destroy the flighting adults, light traps have been successfully

used. A light trap fitted with an ultra-violet 125-Watt bulb has been used successfully in Malaya. The traps are set up at dusk and continued for some hours. One limiting factor in the use of this trap is the supply of electric energy. Hence it can be tried only within reach of electric supply. However other sources of light may be used instead.

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NEWS AND NOTES

Rubber Growers' Seminars

(1) Edamon

"The interests of smallholders of rubber are safe in the hands of the Rubber Board," said Prof. P. A. Mathew, ex-member of the Rubber Board, presiding over the concluding public meeting held at Edamon, Punalur, in connection with the Rubber Growers' Seminar organised there on the 8th December, 1963. Prof. Mathew added that on their part the rubber growers should co-operate with the Board in implementing the various development schemes drawn up by it.

Earlier, the technical officers of the Board conducted study classes on the various aspects of rubber cultivation for the benefit of rubber growers participating in the seminar. The seminar was organised jointly by the Edamon Service Co-operative Bank and the Rubber Board.

(2) Elamkulam

The Rubber Board participated in the Agricultural Exhibition organised by the Pampadi NES Block and the Elikulam unit of the Bharat Sevak Samaj at Elamkulam on the 26th, 27th and 28th of December 1963. The FACT, the Agricultural Department, the Pampadi NES Block, Shaw Wallace & Co., and the Social Welfare Board were some of the other participants. The exhibition was declared open at 10 A. M. on the 26th December 1963 by Shri S. Parameswaran, District Collector, Kottayam

Visitors at Board's stall

Another view of the stall

3. Alakode, Nediyanga and Kanhangad

Three Rubber Growers' Seminars were conducted during the month of February, 1964 at Alakode, Nediyanga and Kanhangad in Cannanore district.

The seminar at Alakode was organised at the Alakode Secondary School Hall on the 23rd February 1964 under the joint auspices of the Alakode Multi-purpose Co-operative Society and the Rubber Board. Presiding over the public meeting held at the conclusion of the seminar, Dr. Rama Varma, Chairman, Rubber Board, said that the Board was engaged in planning and executing major development schemes for the betterment of the large number of small rubber growers and he expressed the hope that the whole-hearted co-operation of the rubber growers would be forthcoming for the successful implementation of the schemes. If the small rubber growers would organise themselves into small, compact and well-knit co-operative societies and if they see to it that those societies function efficiently, that would make it easier for the Board to render the growers necessary help and thus to improve their condition. Dr. Varma stated that there were great possibilities for the development of rubber plantations in that area and that the Board would extend all possible help and encouragement for the purpose.

Welcoming the gathering, Sri P. R. Rama Varma Raja thanked the Rubber Board for the help and facilities offered by it for the development of the rubber plantation industry on sound and scientific lines. A memorandum setting forth the urgent needs of the local rubber growers was read and presented on the occasion to the Chairman, Rubber Board by the Secretary of the Alakode Multi-purpose Co-operative Society.

The venue of the rubber growers' seminar at Nediyanga was the Cherupushpa U. P. School Hall, Chempathotty. It was held on the 25th February, 1964. The seminar was organised by the Nediyanga Service Co-operative Bank with the co-operation of the Rubber Board and was inaugurated by Shri T. P. Balagopalan, Block Development Officer, Irikkur.

The seminar at Kanhangad was held on 27th February, 1964 at the Kanhangad Kailas Theatre under the joint auspices of the Rubber Board and a local committee.

The technical officers of the Board attended all the seminars and spoke on different aspects of rubber cultivation and took study classes. A small-scale exhibition had also been set up by the Board at the venue of each seminar for the benefit of the rubber growers. All the seminars were well attended and the growers showed keen interest in the exhibition organised by the Board.

Membership of the Board

In exercise of the powers conferred by clause (c) of sub-section (3) of section 4 of the Rubber Act 1947 (24 of 1947), read with sub-rule (3) of rule 3 of the Rubber Rules, 1955, the Central Government has notified that Sri K. S. Menon,

Managing Director, Plantation Corporation of Kerala, Kottayam having been nominated by the Government of Kerala as a member of the Rubber Board in place of Dr. M. S. Nair, has been appointed with effect from the 17th February, 1964 up to the 5th November, 1964 as a member of the Board to represent the Government of Kerala.

Appointments

A new post of Development Officer has been created under the Rubber Board and Shri T. Nambi Nair, erstwhile joint secretary to the Government of Kerala, has been appointed to the post. He joined duty on the 12th December 1963.

The following new staff appointments have also been made:

Shri P. John Jacob	Senior Research Assistant (Chemistry)
Shri P. K. Zacharia	Junior Research Assistant (Agronomy)
Shri M. Mathew	Junior Research Assistant (Agronomy)
Shri P. Sivasankaran Nair	Artist-Photographer
Shri George C. Varghis	Rubber Instructor
Shri P. Kumaran	Rubber Instructor
Shri V. K. Joseph	Rubber Instructor
Shri V. A. Abraham	Rubber Instructor
Shri John Joseph	Rubber Instructor
Shri V. Radhakrishna Menon	Rubber Instructor

Visitors

Estimates Committee of Kerala Legislature

The Estimates Committee of the Kerala Legislative Assembly visited the Rubber Research Institute of India and the Offices of the Rubber Board on the 12th December 1963. The members of the Committee went round the Experiment Station of the Board and had discussions with the Chairman and other officers. Later they also visited a rubber estate at Kottayam.

Members of Parliament

The Department of Parliamentary Affairs, Government of India, had organised a tour of Members of Parliament at the end of the Winter Session of Parliament to provide opportunities of on-the-spot study of the achievements, targets and problems of the various public sector undertakings. The party consisting of the following members visited the Rubber Board on the 2nd January 1964. (1) Shri H. Siddanjappa (2) Shri S. K. Pottekkat (3) Shri N. R. Laskar (4) Shri P. R.

Chakravertti (5) Dr. M. M. S. Siddu (6) Dr. A. Subba Rao (7) Shri Y. P. Mandal (8) Shri Shankar Alva (9) Shri Dwarka Das Mantri (10) Shri T. A. Patil (11) Shri L. V. Valvi (12) Shri G. K. Jedhe. Shrimati and Shri Kailas Chandra and Shri S. A. L. Narasimham, officials of the Department of Parliamentary Affairs, accompanied the party.

The members had a very fruitful and lengthy discussion at the Rubber Board with Dr. Rama Varma, Chairman of the Rubber Board and studied the problems of natural rubber and rubber plantations in the light of problems posed by the Synthetic rubber industry. The Members were glad to learn that the production of natural rubber in India was steadily on the increase and that the Rubber Board expected that the target of production of 41,000 tonnes of natural rubber by 1963-64 would be achieved. They felt that the rapid industrialisation of the country would make a much heavier demand on rubber and it was likely that the requirements would multiply themselves manifold. Unless the production of natural rubber was increased substantially the country would have to depend upon synthetic rubber and imports. The Members expressed the view that the Government should take urgent steps to step up the production of natural rubber so as to avoid as far as possible its import in large quantities. It was possible to step up production by educating the planters on the use of proper manures, improved varieties of planting materials and scientific methods of upkeep.

The members visited some rubber plantations and the Board's Experiment Station in the company of the Chairman. They, however, felt that as the time at their disposal was very short, they could not have a more detailed examination of the problems of the rubber industry. Dr. M. M. S. Siddu, Member, Rajya Sabha, thanked the Chairman and officers of the Board for providing necessary facilities for the visit.

Office of the Dy. Rubber Production Commissioner

The Extension Wing of the Development Department of the Rubber Board has been shifted from the headquarters of the Board at Puthuppally to the "Ancheril Buildings" (the building where the Office of the Board had been functioning previously), Kottayam and has commenced functioning in that building from the 19th February, 1964. The Deputy Rubber Production Commissioner will be in direct charge of the office. The following officers have shifted to the new premises: (1) The Deputy Rubber Production Commissioner, (2) the Assistant Development Officer and (3) the Officer on Special Duty (Co-operation).

Supply of Fertilizers to Permit Holders

The Board has decided to supply fertilizer mixtures at half the cost to all current subsidy permit holders who have replanted their rubber in or after 1958 under the Board's Replanting Subsidy Scheme and who own 10 acres of rubber or less, irrespective of the permissible intercrop. Only permit holders owning 5 acres of rubber or less who had not cultivated any intercrop were eligible for the supply of fertilizer mixtures at concessional rates, in previous years.

Permit holders who are eligible to get fertilizer mixtures at the concessional rate have to apply immediately to the concerned sub-office of the Board.

LALAM AGRICULTURAL EXHIBITION

A six day Agricultural Exhibition was held at Pravithanam (Lalam) from 13th to 19th March 1964 in connection with

A view of the Board's stall at the Lalam exhibition

the inauguration of the new building of the Lalam N. E. S. Block. Those who participated in the Exhibition in addition to the Rubber Board included M/s. F. A. C. T., Shaw Wallace & Co., Kerala Agriculture Department, Kerala Animal Husbandry Department, Indian Central Coconut Committee, Khadi and Village Industries Commission, Erattupetta N. E. S. Block, Madappally N. E. S. Block etc.

The entrance to the exhibition ground was restricted by 10 nP. ticket. The organisers estimate that more than 20,000 people have witnessed the exhibition.

On all the days there were variety entertainments at night.

The Block building was inaugurated on 13–3–'64 at 6 P. M. by Sri K. A. Damodara Menon, Minister for Industries and Commerce, Kerala State.

The concluding function on 19–3–1964 was presided over by Sri T. A. Thomman, Revenue Minister, Kerala State.

The exhibition was a great success.

Womenfolk also showed keen interest in the exhibits

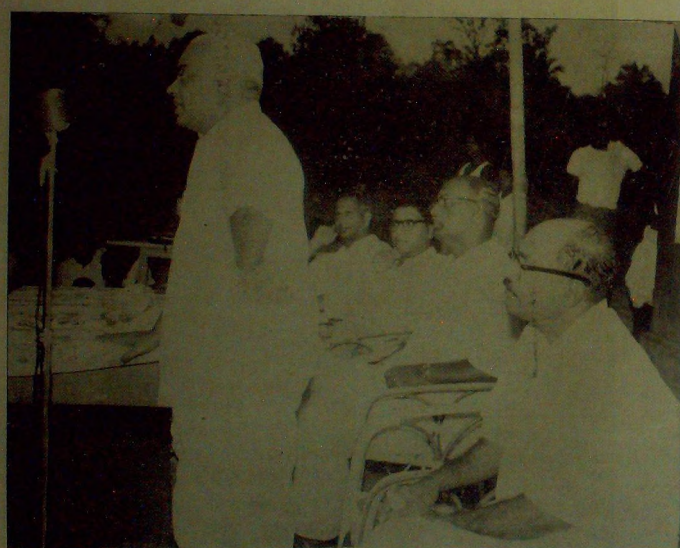
NALUNNAKKAL SMOKE HOUSE

Declaring open the smoke house, constructed under the Board's aid programme, by the Nalunnakkal Service Co-operative Bank, on 31-3-1964 at a public meeting held at Nalunnakkal, Dr. Rama Varma, Chairman, Rubber Board reiterated his confidence in the co-operative movement which he would suggest as the only remedy for all the problems of the small holders of rubber.

Lighting the bhadradeepam to mark the inauguration

The Board could do very good service, he added, through the co-operatives in the field of plant protection, acid distribution, organising seminars, constructing smoke houses, co-operative rubber marketing etc. If growers' societies came up all over rubber growing areas, he added, he had a doubt why even the Board's subsidised replanting programme could not be operated through the societies.

Sri V. J. Skaria presided over the meeting. Sri P. M. Chacko welcomed the gathering and Sri P. C. John, retired Co-operative Dy. Registrar, who had been in the service of the Rubber Board for a few years, spoke on the occasion complimenting Dr. Varma for the efficiency with which the Rubber Board was functioning under his stewardship.



Dr. Rama Varma, Chairman, Rubber Board, speaking at the inauguration of the smoke house at Nalunnakkal

The Nalunnakal Service Co-operative Bank was given an amount of Rs. 4800/- by the Rubber Board for constructing and equipping the new smoke house.

SMOKE HOUSE OPENING AND SEMINAR AT CHOTTANIKKARA

Dr. Rama Varma, Chairman, Rubber Board, inaugurated on the 14th April, 1964, the smoke house constructed at Chottanikkara by the Kanayannoor Service Co-operative Society with the Board's aid. Speaking on the occasion, Dr. Varma expressed gratification at the good response from the rubber growers' side for the various development schemes of the Board. He hoped that they would continue to extend their co-operation in the execution of the schemes.

Shri M. K. Menon, ex-M. L. A., presided over the function and Shri Paul P. Mani spoke on the occasion.

A seminar was also held in connection with the inauguration of the smoke house. The technical officers of the Board took study classes on various aspects of rubber cultivation at the seminar in which about hundred rubber growers participated. The Board had organised a small-scale exhibition for the benefit of the rubber growers of the area.

Mulakkulam

Under the joint auspices of the Mulakkulam Service Co-operative Society and the Rubber Board a seminar and exhibition was held at Mulakkulam on 21st March 1964. Study classes on various topics related to modern methods of rubber cultivation were held by the experts of the Rubber Board.

Later in the evening a public meeting was conducted to mark the conclusion of the seminar. Presiding on the occasion, Shri M. V. Cherian, B. A., L. T., ex-M. L. A., who is also one of the leading growers of the area, praised the services rendered by the Board in improving the condition of the rubber-growers. Messrs. C. Paulose, K. C. Pailo and George Isaac spoke on the occasion.

Sub-Group Meeting

A meeting of the Sub-Group on Rubber—Working Group for 4th and 5th Five Year Plans—was held at Cape Comorin on 11th January 1964.

The following members were present :—

1. Shri C. S. Ramachandran—Chairman
   Joint Secretary,
   Ministry of International Trade.
2. Dr. Rama Varma,
   Chairman, Rubber Board.
3. Dr. A. Seetharamiah,
   Industrial Adviser (Chemicals).
4. Dr. V. R. Narayanan Nair,
   Member, Rubber Board.
5. Shri B. Krishna Murthy,
   Under-secretary,
   Ministry of International Trade.
6. Shri A. K. Rajapadmanabhan,
   Dy. Rubber Production Commissioner.
7. Shri K. Venkitakrishnan,
   General Manager,
   Madras Rubber Plantations.
8. Shri T. Nambi Nair,
   Development Officer, Rubber Board.
9. Shri T. S. Ramakrishnan,
   Pathologist, Rubber Board.
10. Shri I. L. Sankara Narayanan,
    Section Officer,
    Ministry of International Trade.

TRIP TO THEKKADY

The Staff of the Rubber Board went on a pleasure trip to Thekkady, the famous tourist resort on the banks of the Periyar, on the 8th February 1964. The trip was organised under the auspices of the Rubber Board Staff Association. The party started from Kottayam at 7 A. M. in the Board's bus. At Thekkady they had a peep at wild life in its true natural settings, an exhilarating boat journey in the Periyar Lake and an instructive visit to the Periyar Dam. They returned to Kottayam by 11 P. M. on the same day, refreshed, revived and ready to work with renewed

The group

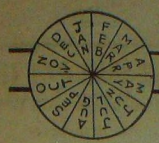
Down from the bus and into the shade

Concentration

The herd marches on leaving behind the limpy one

The last lap

Photographs by
V. K. Bhaskaran Nair.



ESTATE CALENDAR

For Rubber Growers

April — Weeding and manuring are continued. Spraying against leaf fall also is continued. Budding in nursery and field is carried on. Preparation of land for planting is continued. The natural undergrowth is slashed. Dead wood is removed from the trees.

May — Spraying is continued. Budding can be continued if necessary. Slashing of undergrowth is carried on. Sowing of cover crop seeds can be commenced.

June — New flushes of young plants have to be sprayed. Nurseries are to be sprayed. The pits are filled and planting started. The tapping panels are disinfected with fungicides and waterproofing with prowax or waxtextreseal is done. If needed the beds for sowing seeds can be prepared. Cover crop seeds are sown or cuttings planted.

July — New flushes in nursery and young plants are sprayed. Planting is continued. If trees are tapped during this month panel protection should be given. Seed collection is done if available. Treatment of pink affected trees is carried out.

August — New flushes in nursery and young plants, in regions where shoot rot is prevalent, are sprayed. Treatment against pink disease is continued. Seed collection is continued. Panel protection is given in areas where tapping is done. Rubber seeds are sown.

September — This is the time for weeding and manuring. Sowing of seeds can be continued. Repeated inspection and treatment of pink disease should be done. Young rubber buddings planted out during June—July should be given shade. Yield stimulants may be applied on trees 20 or more years old.

Tjir 1 Clonal Seed Collection Areas Approved for 1964

In the case of indigenous clonal seeds to be used for planting as such (without budding) the Board at present recommends only Tjir 1 mother seeds collected from areas approved by it. A list of the areas approved by the Board for the year 1964 along with detailed sketch maps has been prepared. The areas selected and approved have been closely examined by the Board and adequate steps have been taken to ensure that contamination of the areas by cross pollination from unselected seedling rubber has been eliminated or reduced to the minimum.

The approved areas will be marked out prominently by the estates during the seed fall season by painting 4 inch wide yellow circular bands at a height of 5 feet from the ground on trees at regular intervals along the boundaries of the collection areas. Intending purchasers of seeds should take note of the fact that Tjir 1 seeds collected from unapproved areas will not differ in appearance from those of approved areas. They would therefore, do well in satisfying themselves that the seeds obtained by them are collected from the approved areas.

Rubber Board P. O.,
Kottayam, SECRETARY,
1st April, 1964. RUBBER BOARD.

Scheme for subsidising cost of Copper Sulphate distributed by Co-operative Societies to small growers

1. The Rubber Board, at its 46th Meeting, has approved a scheme for subsidising distribution of copper sulphate by co-operative societies to small rubber growers for spraying their rubber holdings during the 1964 spraying season

2. The co-operatives will make their own arrangements to procure the required quantity of copper sulphate for distribution to the members.

3. The subsidy shall be limited to 25% of the cost of copper sulphate distributed by the societies, calculated at a rate not exceeding Rs. 96/- per 50 kg.

4. The aggregate amount of subsidy granted under the scheme shall be limited to a total area of 20,000 acres in 1964.

5. The subsidy shall be granted only to small growers who are members of co-operative societies and have registered their holdings with the Rubber Board. The grant of subsidy shall be within the absolute discretion of the Chairman, Rubber Board.

6. The maximum quantity of copper sulphate to be supplied per acre will be limited to 20 kg. in the case of mature rubber areas and 15 kg. in the case of immature rubber areas.

7. Copper sulphate should be issued only in multiples of 5 kg.

8. Application in the prescribed form duly recommended by an officer of the Board not below the rank of a Rubber Instructor having juris liction in the area, should be submitted by the rubber growers in triplicate to the Society.

9. Officers of the Board not below the rank of a Rubber Instructor having jurisdiction in the area, are authorised to recommend the issue of copper sulphate by the Co-operative to the applicants.

10. The required number of prescribed application forms shall be printed and supplied by the Board to the Co-operatives. Application forms will be available in the Board's office, Sub Offices and Rubber Instructors' offices for supply to interested growers.

11. On receipt of the application, the Society will supply to the applicant the quantities of copper sulphate recommended for issue by the officer authorised by the Board.

12. The Society shall obtain acknowledgement of the receipt of the copper sulphate by the rubber grower on the application itself.

13. One copy of each application against which copper sulphate is issued and receipt of the same duly acknowledged, should be kept by the Society. One copy should be sent to the Rubber Instructor for verification and the third one should be sent to this office.

14. The Rubber Instructor will inspect and verify whether the copper sulphate supplied to the grower has been properly utilised and if so, record a certificate to that effect on his copy of the application. The copy of application should then be returned to the Society.

15. The Society shall submit to the Rubber Board their bills, in the prescribed form in duplicate for the fortnight or for the month or for the whole season as desired, for claiming the subsidy on the cost of copper sulphate distributed by it. The bills should be supported by the copy of the application returned by the Rubber Instructor and referred to in para 14 above. The payment of subsidy will be made by the Board on the basis of the above documents.

Secretary,
Rubber Board.

PS. All correspondence relating to this scheme should be addressed to the Deputy Rubber Production Commissioner, Rubber Board Development Section, Ancheril Buildings, Kottayam–1.

The reference number : DEV. B/Co. Su. Sub/64 should be quoted in all correspondence relating to this scheme.

IMPORTANT

(Section 17 (1) of the Rubber Act 1947)

No person shall plant or replant Rubber except under and in accordance with the conditions of a special licence issued by the Board.

(Such licences are granted for planting with high yielding planting materials only. On failure to comply with the above conditions the registration of the estate is liable to be refused or cancelled if already registered, besides attracting other penalties under the Act and Rules.)

NOTICE

Directory of Rubber Estates & Holdings in India

The Rubber Board has published a Directory of Rubber Estates and Holdings in India in three volumes.

2. The Directory contains the following particulars in respect of estates and holdings viz., name of the taluk in which the estate or holding is situated, register number and name of the estate or holding, the name and address of the proprietor, the area of the estate or holding and the village in which it is situated. The particulars are compiled from the registration records available with the Board and may not be complete and up to date, as subsequent to the registration, changes might have taken place in ownership, possession and extent on account of alienation, inheritance or extension of plantation. There may also be cases where the estate or holding might have ceased to be planted with rubber or abandoned rubber. New rubber estates and holdings may not have also been registered with the Board. It is, therefore, necessary to make the Directory up to date and complete.

3. The Board accordingly invites owners or persons in possession of rubber estates and holdings to verify the entries in the Directory and if necessary to suggest corrections to the entries therein. The corrections may be suggested in the prescribed form available in the Sub-Offices or in the Offices of Rubber Instructors. The Directory will be available for inspection in the Offices of Rubber Instructors and the Sub-Offices.

4. Under Section 10 of the Rubber Act, 1947 every person owning land planted with rubber has to get himself registered with the Rubber Board and under Section 17 of the Act, every person planting rubber has to obtain a licence from the Board for such planting. These are statutory obligations the contravention of which entails the penalty prescribed in Section 26 of the Act. Owners or persons in possession of estates or holdings who have not registered themselves with the Rubber Board or have not obtained the licence for planting or replanting are therefore requested to take advantage of this opportunity and apply to the Board for registration and licence. Forms of the application can also be obtained from the Rubber Instructors or the Sub-Offices or the Office of the Rubber Board. Applications may be presented to the Rubber Instructor or the Field Officer or sent to the Board direct. The application for registration should be sent in duplicate. A licence fee of Re. 1/- has to be paid for every licence and this should be remitted by money-order. The M. O. receipt should be attached to the application for licence.

5. The Rubber Board expresses the hope that owners of rubber estates and holdings will extend their whole-hearted co-operation to the Board in this important task, so that, in the interest of the Rubber Industry, registration data may be kept correct and up to date.

FORM

Corrections to the Directory of Rubber Estates & Holdings in India

I/We, the owner/owners of the undermentioned estate requests/request that the following corrections may be made in the entries in the Directory of Rubber Estates & Holdings in India :—

Vol. No. of the Directory, Page No. & Regn. Number.	Corrections proposed	
	(1) Correction of Registration Number.	
	(2) Correction of name of Estate	
	(3) Correction of name & address of the proprietor	
	(4) Correction of Taluk or Village	
	(5) Correction of acreage	*Correct acreage*
	(a) Due to new-planting	
	(b) Due to abandonment of plantation	
	(c) Due to inheritance, gift, partition, purchase, sale etc.	
	(d) Due to acquisition of land for public purposes	
	(e) Due to any other cause	

Note: When corrections are proposed to the area of the estate a plotted survey plan of the land should be enclosed.

Name and address

Place :

Date : *Signature*

RUBBER STATISTICS

TABLE I

Area Under Rubber as at the End of Each Year

Year		Area in acres
1950–51	...	170,506
1951–52	...	171,191
1952–53	...	172,786
1953–54	...	173,643
1954–55	...	176,647
1955–56	...	207,239
1956–57	...	234,351
1957–58	...	261,998
1958–59	...	286,567
1959–60	...	305,452
1960–61	...	321,002
1961–62	...	348,121
1962–63	...	361,142

TABLE II

Planted Acreage Under Different Planting Materials as at the End of 1962–1963

(Area in acres)

Planting materials	Newplanted area	Replanted area	Total area
Ordinary	211,888	4,184	216,072
Budded	37,679	17,556	55,235
Clonal	77,798	12,037	89,835
Total	327,365	33,777	361,142

TABLE III

Classification of Holdings and Estates According to Size as at the End of 1962–1963

(Area in acres)

Groups	No. of units	Area
A. Small Holdings (50 acres & below)		
5 Acres and below	57,524	110,998
Above 5 acres and up to and including 10 acres	5,428	40,041
Above 10 acres	3,410	69,698
Total	66,362	220,737
B. Estates (above 50 acres)		
Above 50 and up to & including 100 acres	305	22,113
,, 100 ,, 500 ,,	232	46,842
,, 500 ,, 1000 ,,	32	22,081
,, 1000 ,, 1500 ,,	18	22,056
,, 1500 ,, 2000 ,,	6	10,179
,, 2000	7	17,134
Total	600	140,405
GRAND TOTAL	66,962	361,142

TABLE IV

Statewise Distribution of Area at the End of 1962–1963

(Area in acres)

STATES	HOLDINGS (50 acres & below)		ESTATES (Above 50 acres)		TOTAL	
	No. of units	Area	No. of units	Area	No. of units	Area
1. Kerala	65,658	215,085	548	125,211	66,206	340,296
2. Madras	683	5,305	41	10,945	724	16,250
3. Mysore	21	347	10	3,827	31	4,174
4. Andamans	...	...	1	422	1	422
Total	66,362	220,737	600	140,405	66,962	361,142

TABLE V

Statewise Production of Natural Rubber (In Metric Tonnes)

States	1958–59	1959–60	1960–61	1961–62	1962–63
Kerala	22,062	21,890	23,175	24,954	29,057
Madras	1,665	1,814	2,040	2,060	2,695
Mysore	425	437	452	402	447
Andamans	17	32	30	30	40
Total	24,169	24,173	25,697	27,446	32,239

TABLE VI

Production, Import and Consumption of Natural and Synthetic Rubber

(In Metric Tonnes)

Year	Production of Natural Rubber	Import			Consumption		
		Natural Rubber	Synthetic Rubber	Total	Natural Rubber	Synthetic Rubber	Total
1958–59	24,169	12,538	4,229	16,767	35,767	3,477	39,244
1959–60	24,173	15,287	5,718	21,005	40,491	4,964	45,455
1960–61	25,697	23,125	8,097	31,222	48,148	7,397	55,545
1961–62	27,446	22,528	10,121	32,649	48,410	10,186	58,596
1962–63	32,239	23,360	10,297	33,657	53,553	10,723	64,276

TABLE VII

Reclaimed Rubber Acquired and Consumed by Manufacturers

(In Metric Tonnes)

Year	Acquired	Consumed
1958–59	3,973	4,102
1959–60	5,177	4,969
1960–61	5,183	5,453
1961–62	6,422	6,046
1962–63	6,839	6,850

TABLE VIII

Stock of Natural Rubber at the End of Each Month (In Metric Tonnes)

Month	1958–59	1959–60	1960–61	1961–62	1962–63
April	8,723	10,035	8,571	9,696	11,003
May	9,106	9,067	8,186	9,716	10,937
June	8,756	8,138	8,128	8,462	12,193
July	8,710	8,545	8,067	8,256	12,475
August	8,619	8,968	8,489	9,235	12,218
September	8,322	8,995	9,157	9,744	12,723
October	9,523	9,810	10,265	11,291	13,917
November	11,007	10,467	10,742	12,120	15,059
December	11,587	10,793	12,993	13,359	16,334
January	11,715	10,496	13,036	12,990	15,940
February	10,438	9,583	11,185	11,511	13,879
March	10,233	9,201	9,875	11,439	13,485

NOTE

During the period from April to December 1963 production of natural rubber in India was 30,471 tonnes while consumption of natural, synthetic and reclaimed rubber was 45,787, 8,758, and 5,934 tonnes respectively. The quantity of natural rubber imported during the period was 20,145 tonnes. The quantities of synthetic and reclaimed rubbers acquired or imported during the period were 10,040 and 6,280 tonnes respectively. Stocks of natural, synthetic and reclaimed rubbers at the end of December 1963 were 18,314, 3,871 and 1,505 tonnes respectively.

NATURAL RUBBER PRICES

The Central Government has fixed, for all classes of business, the following minimum prices, exclusive of sales tax, for the various grades and qualities of rubber and latex of different concentrations, excluding the cost of container. These prices have come into force as from the 19th December, 1963.

Grade of rubber	Quality of rubber	F. O. B. Cochin for 50 kilograms Minimum price Rs.
(1)	(2)	(3)
Group 1	R. M. A. IX	161.50
	R. M. A. 1	161.50
Group 2	R. M. A. 2	159.85
	R. M. A. 3	158.20
	Cuttings No. 1	149.93
Group 3	R. M. A. 4	154.34
	R. M. A. 5	149.93
	Cuttings No. 2	143.32
Group 4	Precoagulated Crepe	167.57
	Pale Latex Crepe IX	165.36
	Pale Latex Crepe 1	163.16
	Pale Latex Crepe 2	162.06
	Pale Latex Crepe 3 FAQ	160.96
Group 5	E. B. C. Super IX	156.54
	Estate Brown Crepe IX	152.13
	Estate Brown Crepe 2X	148.83
	Smoked Blanket	152.13
	Remilled Crepe 2	143.87
Group 6	Estate Brown Crepe 3X	140.01
	Remilled Crepe 3	137.81
	Remilled Crepe 4	131.71
Group 7	Flat Bark	122 37
Normal latex up to 35% concentrates		Rs. 161.50 plus a premium of Rs. 19.29 per 50 Kilograms of D. R. C.
Latex concentrates of 36% to 50% (both inclusive)		Rs. 161.50 plus a premium of Rs. 36.38 per 50 Kilograms of D. R. C.
Latex concentrates of 51% to 60% (both inclusive)		Rs. 161.50 plus a premium of Rs 47.40 per 50 Kilograms of D. R. C.

Statement about ownership and other particulars about newspaper
RUBBER BOARD BULLETIN

FORM IV

(See Rule 8)

1.	Place of Publication	—Kottayam, Kerala State
2.	Periodicity of its Publication	—Quarterly
3.	Printer's Name	—P. K. Narayanan
	Nationality	—Indian
	Address	—Editor-cum-Information Officer, Rubber Board, Rubber Board Post Kottayam, Kerala State
4	Publisher's Name	—P. K. Narayanan
	Nationality	—Indian
	Address	—Editor-cum-Information Officer, Rubber Board, Rubber Board Post Kottayam, Kerala State
5.	Editor's Name	—P. K. Narayanan
	Nationality	—Indian
	Address	—Editor-cum-Information Officer, Rubber Board, Rubber Board Post, Kottayam, Kerala State
6.	Names and Addresses of individuals who own the newspaper and partners or shareholders holding more than one per cent of the total capital.	The Newspaper is owned by the Rubber Board, Kottayam, a statutory body constituted under the Rubber Act, 1947.

I, P. K. Narayanan, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Date. 15 May 1964.

(Sd.)
(Signature of Publisher).

Services of Tapping Demonstrators

With more and more new areas coming into tapping, it is becoming difficult to get experienced tapppers. The Rubber Board has a scheme to start the training of tappers. In the first instance, the Board has recruited six tapping demonstrators who have been given sufficient theoretical training and posted to different centres to assist the small growers to improve the tapping methods. Those rubber growers who would like to obtain the services of the tapping demonstrators for getting necessary advices and for practical demonstration at the time of opening of new areas for tapping or marking replanted holdings are advised to contact the nearest Rubber Instructor's office, Sub-office of the Board or the Head Office of the Board.

LOOK! **no phytophthora!!**

(*said Fison*)

Simple, my dear Fison,
TATA + FISON + FYCOL-8 + Helicopter
(*said Tata*)

Edited and Published by P. K Narayanan, Editor-Cum-Information Officer, Rubber Board, Kottayam and Printed at the C. M. S. Press, Kottayam.

rubber board bulletin

Vol. VII

No. 4

TATA-FISON AND RALLIS— everywhere at once!

"U.P., Bihar, Bengal..." *said Tata.*

"Madras, Kerala, Mysore..." *interrupted Fison.*

"Maharashtra, Gujerat," *cried Ralli, not to be left out.*

"North, South, East and West—we're everywhere at once," *they said together.* "We're really very good in the art of distribution."

Tata-Fison and Rallis have combined their separate marketing organisations into a single, unified service. For the future, all Tata-Fison products will be marketed by Rallis' Fertilizer and Pesticides Division. The merger will prove of immense benefit to the Indian farmer. For the first time, one integrated service will provide advice and products covering both crop growth and crop protection throughout the country... a notable contribution to the cause of agricultural progress.

TATA-FISON RALLIS

COVER THE FIELD!

TFRY-4

a solution for RUBBER

Rubber requires fertiliser! And FACT has three tailor-made solutions for the fertiliser problems of planters

(a) *For nursery stock:* NPK 8:12:10 grade— To produce strong planting material, apply this mixture—between rows—at the rate of 85 gms. to the running yard.

(b) *For young rubber:* NPK 8:12:12 grade. From two applications of eight ounces each of this mixture during the first year — dosages should progressively be increased. In the sixth year, it can be two applications of up to two pounds each.

(c) *For tapping trees:* NPK 8:10:12 grade.

The dosage is four pounds per tree per year—two pounds during March–May and two pounds during September–October.

These three grades of fertiliser mixture are based on the recommendations of the Rubber Board.

If you have any special problems, consult our Agronomist. His service includes free soil-testing and free inspection. And he may help you tap more out of your trees than you think is possible!

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FT-193

rubber board bulletin

Vol. VII, No. 4, April—June 1964

OVER THE PAGES

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single copy: Re. 1

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ADVERTISEMENTS

Demand for Rubber

The post-independence period has witnessed phenomenal expansion in the sphere of natural rubber industry. The establishment of more and more rubber consuming industries and the expansion of the existing industrial units have boosted the consumption of rubber. This has further widened the already existing gap between production and consumption.

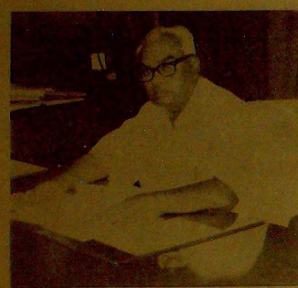
A perusal of the rubber statistics also vouchsafes that the demand for rubber in India has been steadily increasing in the past few years, at times even outstripping the estimates. Since the declaration of national emergency, this has been greater. For instance the consumption of natural rubber alone increased by 16% in 1963 over 1962 while consumption of all types of rubber marked an increase of 15% in 1963 over that of the previous year.

In 1959 the production of natural rubber was 23,772 metric tonnes. It went up to 37,200 metric tonnes in 1963. The consumption of 39,282 metric tonnes in 1959 became 60,209 metric tonnes in 1963. This trend, no doubt, is sure to be maintained in the foreseeable future. The synthetic rubber produced in the country would also be able to contribute something to narrow the gap.

The fact that India enjoys the unique advantage of having an expanding domestic market for rubber, unlike Malaya, Ceylon and Indonesia is worth mentioning in this connection. The manufacturers in India are in a position to consume the whole of the natural rubber produced in this country. The rising trend in natural rubber production will continue to be maintained, as more and more new areas planted with high yielding planting material are coming into tapping every year.

The growers of this country should be alive to the favourable situation prevalent in the country and should leave no stone unturned in increasing the production from the existing units. A fair price and sure market are awaiting their produce.

Former and Present Chairmen



Dr. Rama Varma

Shri P. S Habeeb Mohammad I. A. S.

Dr. Rama Varma

Dr. Rama Varma relinquished charge of the post of Chairman, Rubber Board, on 15th July, 1964, after serving the Board, for three years. He had assumed the chairmanship on 24th July, 1961.

During his tenure in the Rubber Board, Dr. Varma led a delegation of the Board to Malaya to study the various aspects of the Rubber Plantation Industry and the organisational set up for the development of the industry in that country. He also attended as India's representative the 17th meeting of the International Rubber Study Group held in Tokyo in May, 1964.

Shri P. S. Habeeb Mohamed

Shri P. S. Habeeb Mohamed, erstwhile Director of Industries, Orissa State, succeeded Dr. Rama Varma as Chairman of the Rubber Board. He took over charge of the new assignment on 15-7-1964.

Shri Habeeb, born at Kottarakkara in Kerala on 16-11-1930, had a very brilliant academic career and he took his Honours in Literature from the University College, Trivandrum in 1951. He served his *alma mater* from 1951 to 1954, as lecturer in English and later worked as Income Tax Officer, Calcutta for a brief period of three months in 1954 (February to April).

Shri Habeeb Mohamed entered the Indian Administrative Service on 1-5-1954 and was allotted to the State of Orissa where he served in various capacities as Assistant Collector, Sub-Collector, Under-Secretary, Deputy Secretary, District Collector and Additional Director of Industries.

Dr. Rama Varma Bids Farewell

Speech delivered at 47th meeting of the Rubber Board

A view of the Board meeting held on 7th July 1964.

"*Gentlemen*,

I welcome you to the 47th Meeting of the Board. You might have known by this time that I am relinquishing charge shortly i. e. on the 15th of this month (July 1964)

I wanted to share with you my thoughts on the future of natural rubber in India. Unfortunately I was taken ill last month and I had to rush to Delhi also. I propose to write a note in the next two days and will circulate it to all of you for your information. (Published elsewhere—*Ed.*)

When I came here in 1961, Government had licensed for the manufacture of synthetic rubber, two parties. And I was also a little doubtful whether natural rubber industry will have much future if Synthetic rubber comes in a big way. But my 3 years' experience here has convinced me that there is no need for fear for natural rubber in the foreseeable future; especially in India we have got a domestic demand sufficiently large and it is also increasing at a fast rate, and it has also now proved beyond doubt that Synthetic rubber could not be produced at a price comparable to that of Natural rubber in India. These are the two predominant things.

I do not want to add anything more today. I want to thank you all for the co-operation

(*continued on page 134*)

Bright Future for Natural Rubber

DR. RAMA VARMA

This is an attempt to examine the future of natural rubber in the background of our existing knowledge of synthetics and the possibilities of developing them here. Natural rubber is a versatile product. To make comprehend its versatality, the opening paragraphs of an article published in the *National Geographic Magazine*, is annexed to this. That article appeared 25 years ago. Since then there has been considerable developments in the manufacture of synthetic rubber. Today more than 50 per cent of the world demand is being met by synthetic rubber.

No need for concern

It is estimated that there are more than 52,000 uses of rubber. In an automobile alone, there are 280 to 330 rubber parts, and new uses of rubber are being regularly found. In India the potential demand for rubber is large. We are on the threshold of an industrial revolution. The per capita consumption of rubber in an industrially advanced country like the U. S. A. is 18 lbs. while in India it is as low as 0.3 per cent. Still in India, the gap between demand and the domestic production of natural rubber is at present about 35,000 tonnes. By 1970, the demand is estimated to increase to 167 thousand tonnes, while the domestic production of natural rubber may reach 62,000 tonnes. By adopting better cultural practices including effective plant protection measures, it may perhaps, be possible to step up the production by 8,000 tonnes more. Still the gap between demand and domestic production of natural rubber will remain large. To meet this gap only one synthetic plant with a capacity of 30,000 tonnes has been established so far. A letter of consent has been issued to a party to explore the possibilities of establishing another plant with a capacity of 25,000 tonnes. The details of technical collaboration, foreign exchange requirements etc., of the project have not been finalised. This plant is not likely to go into full production before 1968 by which time the demand is expected to increase to 148 thousand tonnes and the natural production to 57 thousand tonnes. Even if both these synthetic plants are in full production in 1968, the gap between demand and the production of synthetic rubber will be 93 thousand tonnes, whereas the domestic production of natural rubber would only be 57 thousand tonnes. There is, therefore, no need to get concerned about the market for natural rubber in the country.

Natural and Synthetic

Purely from a technical point of view also natural rubber has certain advantages over the types of synthetic rubber that would be available in India. The unit now in production is manufacturing SBR and the new unit expected to be licensed is to produce Polybutadiene. The tyre industry consumes about 65 per cent of the total consumption of rubber. In India the ratio of car tyres to truck tyres is 33 : 67 while the corresponding ratio in the U. S. A. is 90 : 10. SBR is mostly used for passenger

car tyres. There were expectations that it would be possible to use polybutadiene in increasing quantities for truck tyres. The latest technical assessment indicates that though the tread-wear rating of truck tyres are excellent in highway services, on rough and unpaved roads, serious chipping and chunking occur which are more severe, the higher the polybutadiene content of the blends. It is calculated that the potential displacement of natural rubber by polybutadiene is unlikely to exceed 13 per cent of the total natural rubber consumption and the present displacement is likely to be less than half of it. With the high ratio of truck tyre production in the country, neither SBR nor polybutadiene at their present state of development is going to be a real threat to natural rubber.

Cost

There is also the cost angle. There are certain handicaps for the manufacture of synthetic rubber in the country. We do not possess the necessary technical know-how. Large foreign capital may be required to import plant and machinery and our refining capacity is also limited to undertake large scale expansion of petro-chemical-complex. As long as these handicaps last, any new synthetic plant which is likely to be put up, is going to have high capital cost as compared with similar plants in the industrially advanced countries. That would reflect on the cost. The price of SBR has been quoted by the unit which has come into production at Rs. 4/- per kg. while the price of natural rubber produced in the country is Rs. 3.24 per kg. Perhaps, the company may be able to reduce its cost when conditions become favourable to produce to its full capacity and if it could get raw materials at a cheaper cost. Still its price is not likely to go down below the natural rubber price. In this connection it is to be remembered that the Indian price of natural rubber itself is 50 to 60 per cent higher than the price in Malaysia and Ceylon. As the economy of the South East Asian countries are largely dependent on rubber, it may be difficult to stop imports from those countries completely without repercussions on our exports to those countries particularly when natural rubber prices in those countries are gradually declining. At one stage the economics of expanding the capacity for synthetic rubber at any cost, vis-a-vis import of natural rubber at considerably lower price will have to be examined more closely. Either from the demand side, or from the technical point of view or from the cost angle, the market for natural rubber would appear to be assured in the forseeable future.

Be on the alert

However natural rubber producer has to remain on the alert. The Development and Trade Committee of the International Rubber Study Group which met in Tokyo last May, drew pointed attention to the considerable expenditure on research and development in the synthetic rubber industry. Though it has not significantly changed the present competitive relationship between natural rubber and synthetic rubber, it has served to consolidate an enhanced acceptability of synthetic rubber in many usages. To a consumer, the synthetic rubber offers two advantages. First, he can get his raw material at a uniform quality. Further, the synthetic rubber producer sells his product

direct to the consumers and offers better technical service. Secondly synthetic rubber prices are not subject to wide fluctuations due to speculative buying and selling.

Rubber fabricators

Another point that has to be borne in mind is that the rubber fabricators are getting directly interested in the manufacture of synthetic rubber and today 38 per cent of the world capacity for the production of synthetic rubber is owned by rubber fabricators. The plant which has been established in India is in collaboration with a tyre company. The close tie up between producers of synthetic rubber and the rubber fabricators will give synthetic rubber an edge over natural rubber when keen competition starts.

Price policy

It is also possible that when there is no strong competition, synthetic rubber producer may be able to adopt a price policy by which he can depreciate his assets in a shorter period than at the normal rate, and later bring down his price to meet any competition which may eventually arise. In the natural rubber industry as labour cost constitutes 46 per cent of the total cost of production, writing down of capital cannot have the same effect on prices as in a capital intensive industry. In an industry like rubber where there is such a large number of small holders, it is not reasonable to expect that depreciation will be provided and such amounts set apart for replanting when prices are highly favourable. High prices will only help to raise the standard of living of small holders.

Versatility of Natural Rubber

As stated in the beginning, natural rubber is a versatile product. Considerable progress has been made in developing high yielding plants. There are clones which could yield as high as 3,000 lbs. an acre. To reach an average estate yield of 1,500 lbs. is not a difficult thing with the different planting materials available at present. In India itself we have instances of getting more than 1,500 lbs. per acre where high yielding planting material is used. One medium size estate of about 300 acres which is maintaining its records properly has reported an average estate yield of 1,300 lbs. There are small holdings who have replanted under the Board's subsidy scheme getting a yield of 800 lbs. in the second year of tapping. If a 1,000 lbs. yield could be obtained in an estate, it should be possible to bring down the cost to about 1.10 Ps. per kg. On the basis of that cost, if natural rubber could be sold at Rs. 2/- per kg. there is no possibility of synthetic rubber competing with natural rubber. But for that replanting should be done systematically and new planting should be done only with high yielding planting material.

Replanting programme

The replanting programme has not progressed satisfactorily. But it is now getting momentum and I will not be surprised, if the target fixed for each year is exceeded from 1965 onwards. This year itself the applications received for replanting is for 8,788 acres. It is slightly lower than the target fixed for the year. Though the tempo for replanting is increasing, a disconcerting feature about it is that while some estates

replant on a fast rate, others hardly do any replanting. This is going to create problems later. If the present trend is allowed to continue, either those who are slow in replanting will have to go out later or the price will have to be fixed on the basis of their cost. As our objective is to keep down cost, it is necessary either by persuasion or by other means to make everybody to fall in line with the programme of replanting.

Marketing

The marketing of rubber is equally important as the stepping up of yield per acre and reducing cost. The present method of visual grading to determine quality has serious limitations. Unless natural rubber is sold to technical specifications, it will not be possible to guarantee quality. Researches are being done in the Rubber Research Institute of Malaya and elsewhere to make it possible to sell natural rubber according to technical specifications. The developments in this field will have to be watched closely and adopted without delay.

Before I conclude I would like to draw your attention to the changing pattern in structure of the industry. The following statement gives the number of estates and holdings according to size in 1959 and 1963, and the percentage of increase of area under each category.

Classification	1959		1963		
	No. of estates	Area (acres)	No. of estates	Area (acres)	increase of area %
Estates					
(above 50 acres)					
Public Limited Companies	129	74,753	132	74,143	(—) 0.8
Private Limited Companies	9	2,013	19	4,324	(+) 114.8
Individual	359	47,440	449	61,938	(+) 30.5
Holdings					
(50 acres & below)					
Above 10 acres and upto & including 50 acres	2,537	52,291	3,410	69,698	(+) 33.3
Above 5 acres and upto & including 10 acres	3,843	27,920	5,428	40,041	(+) 43.4
5 acres and below	43,405	82,150	57,524	110,998	(+) 35.1
Total	50,282	286,567	66,962	361,142	(+) 26.0

Increase in area

It will be seen from the above statement that between 1959 and 1963, the area under rubber increased by 26 per cent. The increase has taken place in the non-corporate sector. The area under corporate sector has slightly declined and was only 74,143 acres or 20 percent of the total area. It is the non-corporate sector which is now becoming important. In this sector constant

sub-divisions and fragmentations are taking place due to family partitions. Very little attention has been devoted to the economic consequences of it. In 1963, there were 57,524 small holdings of 5 acres and below, the average size of which was less than 2 acres. How to keep the non-corporate sector together without disintegrating is a basic problem facing this industry. The solution to the problem cannot be found by mere legislation. Here is a human problem arising out of the pressure of population on land.

Transition

We are passing from a feudal to an industrial economy. The impact of large scale industrialisation on the basic values of life will have to be faced. In a labour intensive industry like plantations, employer-employee relationship is most important. The joltings of transition are already being felt. In an industrial society which we are trying to build up, the progress of this industry like that of all other industries will depend on how science could be brought to its aid. For that, a new outlook is necessary.

The natural rubber industry has a future. It may have to face problems. But people here, who use land so meticulously, should be able to face and slove any problem.

Note circulated by Dr. Rama Varma, among members of the Rubber Board, on the eve of his laying down office of Chairman, Rubber Board.

Annexure

Our Most Versatile Vegetable Product

Rubber Drops from Millions of Tropical Trees Are Transformed by Geni Chemists into Myriad Articles, from Tyres to Teething Rings.

J. R. HILDEBRAND

In an Akron, Ohio, rubber factory I watched machines punch out from a big sheet of rubber, paper-thin disks that looked like Lilliput doughnuts.

"They 're cap-liners for fingernail polish bottles," the operator explained. "They are thinner than a horse's hair, it takes a hundred to weigh an ounce."

Another machine was lathe-nutting speck-like washers for electric refrigerators. The manufacturer wanted 3,084 of them, which total weighed in at exactly three-quarters of a pound.

A Passaic, New Jersey, plant has a cathedral-like room higher than a 3-storey building, with more floor space than New York's Grand Central Station waiting room, so over-head-track cranes can shuttle about rolls of conveyor belting that weigh 30,000 pounds and measure 12 feet in diameter. Wound on one roll may be more than a quarter of a mile of 5-foot-wide belting.

Such a conveyor belt is the biggest thing in rubber and the costliest. You can order one for the price of about 20 luxurious limousines.

Of course when a customer wants nine miles of belting, such as that which carries

coal through a 4½—mile tunnel beneath a mountain near Pittsburgh, from nine mouth to river-bank tipple, the factory has to send out experts to splice the 15—ton pieces.

At a latex plant I saw cans of specially compounded liquid rubber addressed to a Hollywood movie studio.

"What for?" I asked.

The foreman did not know, but the studio director promptly wired back: "To make the saber cut on Ronald Colman's face in *The Light That Failed*. We used latex on Akim Tamiroff's eyelids to give him a Chinese make-up in *The General Died at Dawn*.

"Also, to keep Claudette Colbert dry in *Midnight*-even her silk stockings were waterproofed. The axes in *Union Pacific* were rubber, also the alligator heads that appeared out of the swamp to snap at Bob Hope in *The Cat and the Canary*."

Rubber dinosaurs and cobwebs

Consider the chameleon versatility of rubber products gossamer threads for cobwebs and palm-tree leaves on movie sets, mammoth balloons to help scientists explore the stratosphere, rubber horn protectors for pedigreed bulls, a rubber gasket that clamped the chamber to the sunken submarine *Squalus* to rescue 33 brave men, rubber dinosaurs for museums de-icers for airplanes, and hunting boots literally more kinds of rubber things than there are words in *Alice in Wonderland*.

One company alone, B. F. Goodrich, makes 32,642 rubber products, if you count all the sizes, colors, and styles. No man in the organization knows all of them; no catalogue contains them all, because no individual or corporation could conceivably be a customer for all the classifications.

Possibly the manufacturers who have put from 280 to 330 rubber parts in your automobile or 400 pieces in a two-engine airplane might be interested in gulf balls. But an insulation engineer would not be buying jinricksha tires, nor would a surgeon customer for rubber gloves be a prospect for sand-blasting helmets or 600 rubber horses (seven inches high) for *The Charge of the Light Brigade*.

From diving helmets to football face guards.

A reconnaissance stroll through a mechanical goods and sundries plant hinted at the enormous diversity of rubber products. The superintendent, like a train dispatcher was scheduling his foremen to start on 600 orders for that day.

Here, under one roof, you see them making rubber parts for dishwashing machines and plate racks for restaurants, door seals, storage battery containers, diving helmets and face guards for football players.

Rubber gloves ranged from tissue thinness, nine thousandths of an inch, for surgeons, to sturdy electricians' gloves, nearly a tenth of an inch thick, tested to withstand 16,000 volts.

Piles of odd-looking parts were for electric refrigerators; there are from 4 to 30 rubber parts in your "electric icebox," depending on the make. They save one violent complaint from a lady who said here purchase "don't make no ice at all;" it developed she had put in no water. "The

(*continued on page 133*)

Farewell to Dr. Rama Varma

On the evening of the 7th July, 1964, the members, officers and staff of the Rubber Board met at the Mammen Mappillai Hall, Kottayam, to bid farewell to Dr. Rama Varma who laid down office of the Chairman, Rubber Board on the 15th July, 1964. A large number of invitees was also present. Shri K. V. Thomas, Vice-Chairman of the Rubber Board, presided over the function. Shri T. V. Joseph, Secretary of the Board, welcomed the gathering.

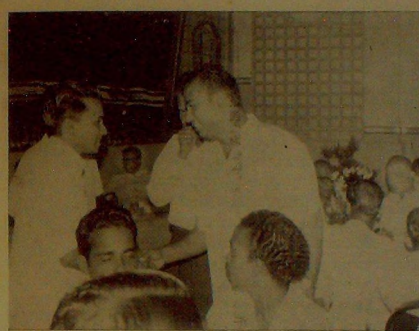
On behalf of the members, officers and staff of the Rubber Board, Shri P. Mukundan Menon, President of the Rubber Board Staff Association, presented an address to Dr. Rama Varma [the text of which will follow.]

Presenting the farewell address

In his presidential remarks Shri K. V. Thomas said that he wished to associate himself with the sentiments expressed in the address. The achievements of Dr. Rama Varma as chairman of the Board were many and significant and his services to the rubber industry would be remembered for a long time to come by those in the industry. The three years of his chairmanship of the rubber board was a period of great changes and developments for the industry. Shri Thomas expressed the hope that Dr. Varma would continue to take interest in the future development of the rubber plantation industry and to offer help and guidance even though he was not officially associated with the Board.

Dr. Varma replying to the farewell address

Shri K. Srinivasan, Dr. V. R. Narayanan Nair and Shrimathi Rosamma Punnoose, members of the Board, Shri A. K. Rajapadmanabhan, Deputy Rubber Production



The new chairman, Shri P. S. Habeeb Mohamed, being introduced to representatives of the press

Commissioner, Dr. N. H. Sivaramakrishnan, Deputy Director, Rubber Research Institute of India and Shri R. V. Panicker, Secretary, Rubber Board Staff Association, spoke on the occasion about the personal qualities of Dr. Varma and about his services to the Rubber Industry.

Dr. Rama Varma replying to the address, expressed his thanks for the kind words spoken about him and acknowledged with gratitude the co-operation and help rendered by the members, officers and staff of the Board during his tenure in the Board.

Shri V. K. Bhaskaran Nair proposed a vote of thanks.

Dr. Varma was presented with an album of photographs of different facets of the rubber plantation industry and of the activities of the Rubber Board, as a memento.

Farewell Address

Sir,

We, the members, officers and staff of the Rubber Board, have assembled here this evening to offer you our tributes and to bid you farewell.

Sir, you assumed the chairmanship of the Rubber Board at a very crucial period in the history of the Rubber Plantation Industry in India. Many were the problems that hindered the progress of the industry on healthy and sound lines. The threat of competition from synthetic rubber loomed large on the horizon. Insufficient internal production, high cost of production, low productivity, proliferation of uneconomic holdings, tardy progress of expansion schemes, all these created a situation where uncertainty and doubt prevailed. Within the short span of three years of your efficient

The man in writer's dress is Shri C. K. Mani, Dist. Convener, B. S. S.

and farsighted stewardship of the Board, you could with rare insight, diagnose the maladies afflicting the industry, prescribe suitable and effective remedies and lead it on to the path of healthy development and progress.

You knew, as it were, through a sixth sense, what was important and what was practicable : yet, you approached each issue with an understanding of the larger whole of which it formed a part.

In whatever you did, there was the earnest approach of an informed and studious mind, a penetrating insight, an ability to seize whatever you knew to be essential. In your dealings with various interests and people, you always showed the willingness to resolve doubts and difficulties with courtesy, friendliness and good judgement. These are among the qualities which marked your work in the Rubber Board for three years. Your contribution to the development of the rubber plantation industry is not merely outstanding ; it is singular and unmatched.

It is not as though your interests are limited to any single field or subject. Sir, you are one among those rare men whose fields of interests and activities are wide, large and multifarious. With the same thoroughness and sincerity as when dealing with the most recent developments in the world of the synthetic rubber, you could talk on modern trends in the world of art and literature. Even in the midst of pressing official work, you could find time to devo te attention to such varied subjects as the intricate philosophies of Vivekananda or Tagore, the nuances of the Kathakali dance or the work of Marechal Lyautey, the great North African pacifier and developer.

In recalling the events of the last three years since your coming over to the Board, we are only too conscious that here is a man of large proportions, of rare talent and wisdom, always modest, kindly and generous, a most conscientious worker, a person wholly committed to the progress of the rubber industry and those engaged in it and one who spent himself according to his own lights, in constructive service of the highest quality. You had always a soft corner for those who worked under you. The work of such men lives, yet remains unfinished. Both in what they achieve and in what they leave to others to fulfil, their lives are a challenge and a guide to those who follow.

May we, Sir, in taking leave of you, wish you health and happiness and still greater opportunities to serve the country and the people in the years to come.

We, Sir, who have been associated with you in one way or other will always cherish the sweet memories of the times when you were in our midst.

Adieu,
Ever Yours,
The members, Officers and Staff of the Rubber Board.

REPORT

17th Meeting of the International Rubber Study Group

1. The Seventeenth Meeting of the International Rubber Study Group, held in Tokyo under the Chairmanship of H. E. Ambassador Toshio Urabe, Leader of the delegation of Japan, opened on May 18th and ended on May 22nd 1964. The Vice-Chairmen were Mr. C. Chanmugan, Leader of the Ceylon delegation and Mr. R. Verhagen, Leader of the Netherlands delegation.

2. The Meeting was attended by delegations from Australia, Austria, Belgium, Brazil, Cambodia, Canada, Ceylon, Czechoslovakia, Denmark, France, Federal Republic of Germany, Hungary, India, Indonesia, Italy, Japan, Liberia, Malaysia, Netherlands, Nigeria, Thailand, United Kingdom, United States of America and Viet-Nam.

Observers from the following countries and organisations were also present: Argentina, Poland, South Africa, Sweden and Switzerland; Commission of the European Economic Community, the International Bank for Reconstruction and Development, the International Institute of Synthetic Rubber Producers and the International Rubber Research and Development Board.

3. The Group considered that a major factor in the present world supply and demand position for all rubbers appeared to be the existence of substantial surplus production capacity for synthetic rubber. This has led to intense competition between the various competing synthetic rubbers which in turn has been a significant factor in depressing the price of natural rubber.

In the coming years there was every prospect of increasingly severe competition between natural and synthetic rubber and between the various types of competing synthetic rubbers and, in consequence, of a slow decline in the price of both natural and synthetic. The impact of this decline in price would be of particular concern where the natural rubber industry is a major source of foreign exchange earnings and government revenue besides being the major source of employment and income to a large percentage of the population.

The Group had no doubt that an efficient producer of natural rubber could compete with any synthetic rubber producer in the foreseeable future. The essence of the problem was the rapid raising of the general level of efficiency of the natural rubber producing industry as a whole. In this

context "efficiency" covers all aspects of the production, processing and "marketing" of natural rubber so that the product is offered to the consumer in a manner which is competitive.

While recognising the essential functions of the established market system for natural rubber the Committee considered that this was in need of critical examination so that improvements could be made.

The development, as yet in its pioneer stage, of crumb rubber well packed and sold to a technical specification was of particular interest. Production of natural rubber in this form is already taking place in some producing countries in moderate quantities and the processing and marketing aspects are being studied intensively.

This development has important implications which call for appraisal by producers, traders and consumers. Thus the acceptability of this form of rubber to consumers, its technical specifications and the preferred size of bale have to be decided. The group therefore authorised the Secretary-General to invite major consuming interests to cooperate with the Group to give clear and precise guidance in these matters.

In spite of these developments the Group considered that a major proportion of natural rubber would continue to be sold on the present basis for some years. Accordingly attention to the improvement in present marketing practices must be intensified.

The Group noted that there had been no increase in the volume of trade in International Grades and stressed the necessity of conformance to existing standards by maintaining and strengthening the regulation of trade practices and quality control on shipments.

The Group noted with concern the difficulties in obtaining sample material being experienced by the International Rubber Quality and Packing Conference and recommended that the Conference Secretariat should take whatever steps are necessary to resolve this problem.

The very considerable expenditure on research and development in the synthetic rubber industry has led to continuing technical advances which, while not significantly changing the present competitive relationship between natural and synthetic rubber, are serving to consolidate and enhance the acceptability of synthetic rubber in many usages.

Perhaps the most important modification to the assessment made at the last meeting of the Group in Washington is the fact that the major impact of competition from Polybutadiene has not been felt by natural rubber in the truck tyre field but by SBR in the passenger tyre field. However oil-extension of synthetic rubbers now assumes greater importance than anticipated at that time and is offering a particular economic challenge to the natural industry.

When the new EPR synthetic rubber will eventually be used on a large scale for tyres cannot yet be determined, but it seems probable that in the first instance it will compete with other synthetic rubbers, particularly butyl, rather than with natural rubber.

The continuing existence of substantial excess synthetic rubber production capacity

is of equal concern to both natural and synthetic rubber producers. The decision to create new capacity or expand existing capacity is one for companies or, in certain cases, governments to make but the Committee felt it desirable that before taking such a decision due consideration should be given to the present and prospective supply and demand position, and the effect on the economies of natural rubber-producing countries.

The Committee agreed that there was scope for greater liaison between the natural and synthetic rubber industries, particularly in the field of promoting consumption of all rubber, and recommended that both natural and synthetic rubber producers should consider where co-operation would be mutually beneficial. Joint efforts in the field of development and publicity should be considered.

4. The Group examined the statistical position of rubber and made estimates for natural and synthetic rubber requirements and supply during 1964. It was estimated that the world might consume, i. e., turn into manufactured goods, some 2,255,000 long tons of natural rubber, and 2,545,000 long tons of synthetic rubber. In regard to production, it was estimated that world production of natural rubber would be 2,135,000 long tons and synthetic rubber production would be 2,690,000 long tons. In addition it was estimated that some 95,000 long tons of natural rubber would be delivered from government stockpiles. The estimates for synthetic rubber production and consumption do not include allowances for synthetic rubber produced in China and in non-member countries in Eastern Europe. The tables of estimates made by the Group are attached.

5. The Symposium on the Japanese Rubber Industry, organised by the Japan Rubber Manufacturers Association and Rubber Trade Association of Japan under the auspices of the Group, took place on the 20th and 21st May. The papers presented at the Symposium, together with the discussion that followed, gave a comprehensive review of the Japanese rubber industry.

TABLE I

Estimated Natural and Synthetic Rubber Consumption in 1964

(in 1,000 long tons)

Territory	*Natural*	*Synthetic*	*Total*
United States of America	435	1,355	1,790
Japan	207	138	345
United Kingdom	170	155	345
Federal Republic of Germany	153	160	313
France	123	133	256
Italy	90	107	197
Canada	39	92	131

Territory	*Natural*	*Synthetic*	*Total*
Czechoslovakia	49	32	81
India	62	16	78
Brazil	30	44	74
Australia	38	34	72
Netherlands	21	16	37
Belgium and Luxemburg	17	19	36
Indonesia	30	—	30
Austria	12	14	26
Malaysia	13	1	14
Denmark	6	5	11
Hungary	10	1*	11
Other countries	750	223	973
	2,255	2,545	4,800

* Excluding synthetic rubber produced in China or non-member countries in Eastern Europe.

TABLE 2

Estimated Natural Rubber Supply in 1964

(in 1,000 long tons)

(A)—Production	
Territory	
Malaysia	876
Indonesia	600
Thailand	191
Ceylon	108
Viet-Nam	71
Nigeria	66
Liberia	44
India	44
Cambodia	42
Brazil	23
Burma	12
Territory of Papua and New Guinea	5
Other countries	53
Total pr duction	2,135
(B)—Deliveries from strategic Stockpiles	
Total Deliveries	95
Total new supply	2,230

(*continued on page 132*)

Further Studies on the Copper Sulphate, Lime and Linseed oil Paste,used in the Control of 'Pink Disease' of Rubber*

C. M. GEORGE and K. C. ANANTH **

Introduction

Sporadic complaints from rubber planters and Extension Officers, regarding the indifferent and injurious results obtained in some cases by the use of copper sulphate, lime and linseed oil paste in the control of 'Pink disease,' necessitated investigation of admixture and chemical problems of such a paste by the authors with the co-operation of Pathology and Botany divisions of this Institute. Further, while trying to detect the possible and cheap adulterants, one of us (KCA) came across the significant information that the linseed oil is sold in the world market in four forms or types as 1. Raw linseed oil, 2. Boiled or Double boiled pure linseed oil, 3. Blown linseed oil and 4. Stand oils. It was found that "Raw linseed oil is the refined oil obtained from flax seed or linseed, generally by hydraulic pressing. For use in paint etc., to obtain quicker drying qualities, raw oil may be heated with very small amounts of certain 'driers' such as oxides of Lead, Manganese, Cobalt, etc. Oil thus prepared is called boiled linseed oil." This reference, coupled with a personal communication received from the Director of the Commonwealth Mycological Institute, London, emphasised the use of raw linseed oil for plant protection sprays. Further, Hough, (1951), while describing a Bordeaux paint developed at the Oregon Experiment Station, has indicated the use of 1½ pints of raw linseed oil with 1 pound of any commercial brand of Bordeaux powder. Even such a paint was recommended to be applied to tissues already callused and the oil was reported to injure the cambium if applied to fresh cuts. Here, it may be pointed out that lime in Bordeaux mixture nugates the toxic effects of copper sulphate on plants. Lime converts the soluble copper sulphate into insoluble copper compounds which are not phytotoxic. The reaction of copper sulphate and calcium hydroxide is not simple and its chemistry is very complex. But recent researches have revealed that a series of basic sulphates which are not definite compounds, are produced in the reaction. The variety of colours exhibited by the precipitates and suspensions, of basic sulphates formed, should be indicative of this complex reaction. The more basic sulphates are blue and the less basic ones are greenish blue to green in colour. In a mixture of copper sulphate, slaked lime powder and linseed oil, no colour variation is seen

[*continued on page 122*]

* Contribution from the Agronomy Division, Rubber Research Institute of India, Kottayam.

** Senior Research Assistant and Deputy Director (Agronomy) RRII, Rubber Board P O., Kottayam, respectively.

The chief guest, Shri C. R. Pattabhi Raman and Dr. Rama Varma being received by the members of the Association at the Mammen Mappillai Hall.

Shri P. Mukundan Menon, President o chief guest and el

THE 5th ANNUAL
OF THE
BOARD STAFF

The Fifth Annual Day Celebrations of the Rubber Board Staff Association were conducted on the 11th April, 1964, at the Mammen Mappillai Hall, Kottayam, under the presidentship of Dr. Rama Varma, Chairman, Rubber Board. Shri C. R. Pattabhi Raman, Deputy Minister for Labour, Employment and Planning, Government of India inaugurated the function.

The Hon'ble Deputy Minister was given a rousing reception by the members of the Association on his arrival, Shri Mukundan Menon, President, Rubber Board Staff Association, welcomed the Deputy Minister and other guests. The Deputy Minister in his inaugural

Shri C. R. Pattabhi Raman, delivering the inaugural address.

Mrs. T. V. Joseph champions' cup Viswanathan who ed the best sportsm at the annual sporti

the Association welcoming the
ner invitees

CELEBRATIONS
RUBBER
ASSOCIATION

presenting the
Shri M. K.
d been adjudg-
an of the year
meet.

Shri Murkoth Ramunni, Administrator, Laccadive, Minicoy and Aminidive Islands speaking to the members of the Association

Shri N. V. Krishna Varrier of the "Mathrubhumi," addressing the gathering.

speech spoke on the progress of planning and development in the country.

Shri N. V. Krishna Varrier, "Mathrubhumi," Kozhikode and Shri Murkoth Ramunni, Administrator, Laccadive, Minicoy and Aminidive Islands, also addressed the gathering. Mrs. T. V. Joseph distributed prizes to winners in the sports items conducted in connection with the anniversary. Shri K. N. G. Menon proposed a vote of thanks.

There was also a programme of variety entertainments in the night.

(*contd. from page 119*)

confirming the absence of the usual reaction. With this background and available information, the work undertaken and the results obtained are presented in the following pages.

Laboratory Investigations

A paste consisting of one part of copper sulphate, (finely powdered) two parts of slaked lime powder and three parts of double boiled pure linseed oil, was made. Along with this, another set was prepared with required quantity of water for making a paste before the addition of the linseed oil. The reaction between copper sulphate and lime is exothermic (a reaction which involves the liberation of heat). When finely powdered copper sulphate and lime were intimately mixed, there was no change in temperature. On addition of the required quantity of linseed oil with proper mixing, the temperature of the mixture rose to 33°C from the initial reading of 30°C. On the other hand, a paste prepared with the above components by the addition of sufficient water and then adding linseed oil with constant agitation, recorded a rise in temperature of 9.5°C from the initial reading of 30°C. The usual colour changes obtained in Bordeaux preparations were also exhibited by this second set. This difference in rise of temperature and colour change between the two sets confirmed that the reactions of usual nature occurred in the second set.

There was also marked difference in physical properties between the first and second product. In the first, copper sulphate and lime particles remain separate

Treatment C
Copper sulphate + Linseed oil

Treatment D
Linseed oil alone

and there was no homogenity. It is possible that such a paste may cause phytotoxic symptoms due to the presence of free copper sulphate or free linseed oil or due to any possible chemical reactions taking place on the bark tissues after application. On the other hand, the second paste was founp to be homogenous and smooth without any visible free copper sulphate or linseed oil.

Field Studies

As an extension to the laboratory studies on the admixture and chemical aspects of copper sulphate, lime and linseed oil paste, the following work was undertaken during October 1963, for field observations. The treatments were given to 1959 planted young rubber in field No. 10, at Rubber Research Institute of India, on October 17, 1963, and these were :

A. Paste consisting of one part of copper sulphate, two parts of lime and three parts of linseed oil,

B. One part of copper sulphate, two parts of lime, required quantity of water for making a paste and three parts of linseed oil,

C. Mixture of copper sulphate and linseed oil, and

D. Linseed oil alone.

Note. Double boiled pure linseed oil was used.

There were two trees for each treatment and the treatments were given as usual at the forking points, but now on apparently healthy trees. However, out of the two trees under each treatment, the painting was done for one tree without scrapping and for the other after superficial scrapping.

Observations

The periodical observations were continued to be recorded and these are detailed below :

1. Rubber trees treated with linseed oil and copper sulphate mixture (C), and linseed oil alone (D) were found to ooze out latex from the treated points and the upward extension branches. The paste A, changed its hue to greenish blue from its original oily-greenish colour. There were no visible symptoms from the trees under treatment B. (after 15 days.)

2. Except B, (Paste consisting of one part copper sulphate, 2 parts lime, required quantity of water and 3 parts of linseed oil), other treatments showed definite leaf symptoms, and oozing latex to varying degrees. The activity of the vegetative buds just below the treated portion was evident in all the trees under the treatments C, (mixture of copper sulphate and linseed oil) and D (linseed oil alone.) (after 30 days.)

3. The signs of bark injury were quite evident in A, C and D treatments. After initial leaf yellowing and wilting the death of treated portions and the upward extension branches were brought about simultaneously under treatments C and D after 6 to 7 weeks from the date of the imposition of the treatments. (See Photo-plates.) The trees under treatment A, showed signs of leaf yellowing and leaf scorching, but later recovered during March 1964. There was no visible phytotoxic symptom in the trees under the treatment B.

4. The treatments were imposed on the evening of 17th October, 1963. After incorporation of the different treatments, there

was a total precipitation of 18.57 cm in 7 subsequent rainy days. Further, November 1963 also registered a total rainfall of 32.41 cm in 15 rainy days.

5. At the close of the experiment, the treated portions and upward extension branches of treatments C and D were found completely dead. An invasion of saprophytic fungi was also noticed in the affected dead branches.

Comments

1. From the above observations, it is possible to conclude that the linseed oil used in this experimentation (treatment D) was responsible for the death of treated branches and their upward extensions. Further, it indicated that a quick drying linseed oil, *in a free state*, if applied to bark tissues, chronic injury may result by the plugging of the inter cellular spaces and the surrounding of the plant cells with oil, preventing normal physiological function of the cells.

2. It is also revealed that a paste prepared with water before the addition of linseed oil appears to completely nugate the bad effects of this oil on plant tissues. This may be due to emulsification and partial saponification of the free oil in such preparation.

3. The paste made of copper sulphate and lime with water and then linseed oil added to it, appears to have more homogenity and persistency when applied to the bark tissues. Fungicidal properties of such a paste would be easily comparable with usual Bordeaux paste.

4. It may not be out of place to mention here that the quantity of linseed oil to be added is governed by the total solids in a Bordeaux preparation. Accordingly, it is recommended to be used at the rate of 1 oz. of linseed oil for every pound of total solids present in Bordeaux preparations, which should be acceptable on economic grounds also.

Acknowledgement

We are indebted to Dr. K. T. Jacob, Director, Rubber Research Institute of India, for giving kind permission to publish this work.

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Question Corner

Question : What are the principles to be borne in mind in the fertiliser treatment of young rubber ?

Answer : The following are the most important points to be followed in the fertiliser treatment of young rubber.

1. Maintaining and increasing the organic matter by growing suitable cover crops and adoption of soil erosion control methods.
2. A well balanced fertiliser according to the plant requirement in relation to the soil condition.
3. Adequate but split applications of nutrients can help in the better utilisation of the applied food and are not exposed to the danger of leaching or washing.
4. Fertilisers should not be applied during hot weather period or during heavy rains.
5. For young plants fertilisers are applied in a circle round the stem, the circle widening with the age of the plants. When the canopies meet, the fertilisers may be broadcast between the rows and forked in (September-October) or covered with available leaf mulch (March-April).

Question : For planting pits, can we put superphosphate instead of rock phosphate ? Which of the above will be better ? How much quantity we have to apply ?

Answer : Several characteristics of the soil system are responsible for determining phosphorus availability to the plants. Soil pH may influence P availability to plants in several ways. Among them are the effect of pH on physiological changes in the permeability of root membranes, the behaviour of soil phosphorus and competition with other ions, silicate and organic anions for plant uptake. The phosphorus in water-

soluble phosphates when applied to acid soils is fixed by reacting with soluble iron and aluminium which may be held in exchangeable form and cannot be utilised by plants immediately. The more acid the soil the quicker will be the fixation. Because of these reasons, it would be economically advisable to apply ground mineral rock phosphate in the planting pits.

At the time of filling the pits, addition of 1 kerosene tin of compost or well rotten cattle manure and 225 gms. (8 ozs) of mineral rock phosphate per pit, thoroughly mixing the same with the top 9–10 inches of soil are recommended.

Question: For young rubber plants super or rock phosphate do you recommend?

Answer: We recommend phosphate, in the form of rock phosphate, for immature and mature stand of rubber in the field.

Question: In the Bordeaux mixture we are spraying for young rubber plants, will it be beneficial if we add Urea and Muriate of Potash?

Answer: Urea should be added to a neutral Bordeaux mixture only. In estate practice it is seldom possible to prepare a neutral Bordeaux mixture and the mixture prepared is invariably on the alkaline side. Hence any addition of urea might result in the loss of nitrogen, depending upon the degree of alkalinity of the Bordeaux mixture used. However, muriate of potash can be mixed with Bordeaux and sprayed. It is advisable to use 0.5 per cent strength, for urea and muriate of potash, in terms of individual concentration i. e. 2 lbs. of urea and 2 lbs. of muriate of potash can be added to 40 gallons of 1 per cent Bordeaux mixture. The foliar application of macro nutrients and its utility to rubber planted into the field should be considered limited in its scope.

Question: What is leaf fall in rubber due to?

Answer: Two types of leaf fall are usually encountered in rubber grown in South India, one, *normal*, due to the deciduous habit of the tree and the other, *abnormal*, resulting from parasitic infections. The annual shedding of leaves occurring usually during December-January period is considered normal and is induced by the inherent deciduous nature of the rubber tree itself.

Leaf fall may occur during off seasons also, due to the inroads of various fungal pathogens infecting the foliage of the rubber tree. To

differentiate from the normal seasonal leaf fall, the leaf-fall occurring in off seasons and resulting from fungal infections is termed as abnormal leaf-fall. *Phytophthora palmivora* Butl. and *Oidium heveae* stein. (Powdery mildew) are two fungal pathogens which are mainly responsible for abnormal leaf-fall in rubber in South India. Abnormal leaf fall caused by *Phytophthora* infection is prominent during the rainy months of June and July. Incidence of powdery mildew and the resulting leaf-fall occurs mainly during January–March period, when the rubber tree refoliates after wintering. Foliage infection by two other fungi viz., *Colletotrichum heveae* and *Gloeosporium alborubrum* may also occasionally cause abnormal leaf-fall to limited extent. In young rubber incidence of *Helminthosporium heveae* and *Corynespora cassiicola* under favourable conditions cause considerable abnormal leaf-fall.

Question : Why it is advised to allow tapping rest to rubber trees during wintering season ?

Answer : Wintering trees are advised rest as soon as new flushes of leaves are seen and till leaves attain maturity. The period of leaf formation results in the utilisation and subsequent exhaustion of starch reserves in the tree. Consequently the intensity of rubber formation is considerably lowered. Tapping the trees during the period, naturally would result in a certain amount of drainage of the tree.

Good storage of starch reserves follows the establishment of a good foliage. Taking these factors into consideration from a practical point of view it is desirable to advise rest to trees in tapping for over a month. The general behaviour of the trees and the daily yield data should serve as a guide for deciding upon the period of rest to be adopted.

NEWS AND NOTES

Appointments

Dr. K. T. Jacob

Dr. K. T. Jacob, erstwhile Director of the Jute Agricultural Research Institute, Calcutta, took over as Director of Research of the Rubber Research Institute of India, Kottayam on 25-6-1964.

Dr. Jacob had served previously as Botanist of the Bose Research Institute, Calcutta, for over 18 years.

In 1955 the Government of India deputed him to foreign countries to study how radio isotopes could be utilised in Agricultural Research.

Dr. Jacob, who has made very valuable contributions to Agricultural Research, hails from Aymanam, near Kottayam.

Shri K. V. George

Shri K. V. George, M.Sc. (Ag) who was Mycologist under the Coffee Board, Bangalore, has taken over as Dy. Director (Pathology) under the Rubber Research Institute of India, Kottayam on 15-7-1964.

Resignations etc.

Shri T. S. Ramakrishnan

Shri T. S. Ramakrishnan, relinquished charge of the post of Pathologist of the Rubber Research Institute of India, on 20th May 1964 prior to retirement from service. Shri Ramakrishnan served the natural rubber industry as its "malad healer" for over 7 years and his contributions in this field are not a little.

Shri T. P. Peter

Shri T. P. Peter, Cost Accountant under the Rubber Board, resigned from service to join the F. A. C. T., Alwaye, as Assistant Financial Manager.

Shri S. S. Swaminathan

Shri S. S. Swaminathan resigned from the post of Statistical Officer under the Board and proceeded to the U. S. A. for higher studies at the Chicago University.

Shri T. N. M Namboodiri

Shri. T. N. M. Namboodiri, Comptist, Rubber Board left the services of the Board to work as Statistical Assistant, Farm Management Study Centre, Trivandrum.

New Rubber Board Sub-Office

To cater to the needs of the rubber growers in a more effective manner two more sub-offices of the Board have been opened; one at Palai and the other at Pathanamthitta. The Palai Office would have jurisdiction over Vaikom and Meenachil Taluqs while the Pathanamthitta Office would have control over Thiruvalla, Pathanamthitta, Mavelikara, Karthikappally, and Kunnathur Taluqs. Kottayam (North) sub-office is abolished with this and the Kottayam (South),

sub-office is to be known only as sub-office.

Shri M. O. Joseph, will be Field Officer, Pathanamthitta, and Shri P. S. Kuriakose is posted Field Officer, Palai.

New Rubber Instructor's Office at Thamarassery

Shortly a Rubber Instructor's Office will start functioning at Thamarasseri in Calicut District.

Rubber Growers' Seminars

(1) Melukavumattam.

Under the joint auspices of the Melukavu Service Co-operative Bank and the Rubber Board, a rubber growers' seminar and exhibition were held at Melukavumattam on 18–4–'64. Over 200 rubber-growers participated in the seminar as delegates.

As usual study classes on topics from Planting to Tapping of Rubber were held by technical experts of the Board.

(2) Elamkulam.

The Rubber Growers' Seminar held at Elamkulam was arranged by the Multipurpose Co-operative Society at Koorali. About 250 delegates from different parts of the village participated in this seminar, which was held at the St. Mary's High School hall, Elamkulam on 17–5–'64.

(No exhibition was arranged with the seminar as sometime back the Board had put up a small exhibition for three days in the same hall, in connection with the Block Level Agricultural Exhibition arranged by the local N. E. S. Block authorities)

Technical experts of the Board led discussions at the seminar on various aspects of improved rubber cultivation.

Speaking at the concluding function Shri M. J. Joseph, President of the Society, declared that benefits that have been obtained by the growers of that area from the Board were innumerable, and he was confident that the Board would utilise their society as a medium to assist growers. M/s K. T. Sebastian and A. V. Thankappan Nair, local Rubber Instructor also spoke at the meeting.

(3) Kallooppara.

Making a brief speech to the delegates attending the Rubber Growers' Seminar at Kallooppara, Dr. K. T. Jacob, Director, Rubber Research Institute of India, said that he was highly impressed by the interest shown by growers in knowing more about improved cultural practices. Dr. Jacob, informed the gathering, that he will be always happy to receive growers at the R. R. I. I. and explain to them the various activities of the Institute.

The Rubber Growers' seminar held at the Puthusseri English High School on 20–6–'64 was arranged by the Kallooppara Multipurpose Co-operative Society.

Discussions and study classes on the various aspects of rubber cultivation were held by the technical experts of the Board. Over 300 delegates had participated in the seminar.,

Shri M. M. Mathai, M. L. A., speaking at the concluding public meeting appealed to rubber-growers to pay heed to the advices of the Board and increase the production of rubber, which we are in short supply of.

Shri K. V. Varghese presided and Shri A. Maret spoke on the occasion.

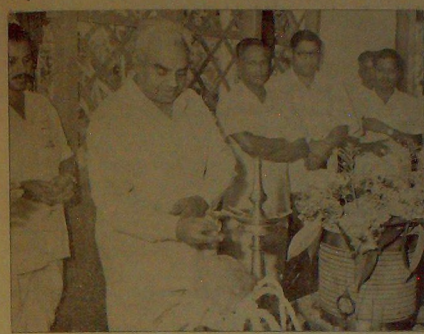
(4) Thottakkadu.

On 27–6–64 a seminar of rubber growers was held at the St. Thomas Auditorium at Thottakkadu under the joint auspices of the Thottakkadu Plan Information Forum and the Rubber Board.

Over 150 delegates attended the seminar. The deliebrations started with the opening of the discussion by Shri A. K. Rajapadmanabhan, Dy. Rubber Production Commissioner. Study classes continued till evening, and with a public function held at the end, presided over by Shri C. K. Mani, the programmes concluded. The public meeting was inaugurated by Shri Rajapadmanabhan, Dy. Rubber Production Commissioner and M/s K. Sukumaran Nair, Field Publicity Officer and P. K. Gopalakrishnan, District Information Officer spoke on the occasion.

The programmes of the Seminar were covered by the All India Radio.

Planting materials are distributed by the Rubber Board from different centres during the planting season. This picture was taken when clonal seedlings were being supplied to rubber growers from the Board's Office at Kottayam



Dr. Rama Varma lighting a *bhadradeepam* to mark the opening of the smoke-house at Karur, Palai

Opening of Smoke-houses at Palai

Dr. Rama Varma, chairman, Rubber Board expressed the view that only through co-operation and unity the small growers of rubber could successfuly solve their problems. He was speaking on the occasion of the formal opening of the two smoke-houses constructed by the Meenachil Taluk Rubber Growers' Co-operative Society on 12th July 1964. The smoke-houses have been constructed at Karur and Kizhathadiyoor, near Palai, with the financial aid given by the Rubber Board. Messrs. Mathew Maniyangadan, (M. P.), A. K. Rajapadmanabhan and K. V. Joseph spoke on the occasion. Shri P. J. Thomas welcomed the guests and Shri K. P. Gopalan Nair proposed a vote of thanks.

Opening of the smoke-house at Kizhathadiyoor, Palai

A view of the smoke-house constructed by the Meenachil Taluk Rubber Growers' Co-operative Society at Kizhathadiyoor, Palai

(*continued from page 118*)

TABLE—3

Estimated Synthetic Rubber Production in 1964

(in 1,000 long tons)

U. S. A.	1,610	Netherlands	90
Canada	185	Brazil	37
United Kingdom	175	Australia	20
Federal Republic of Germany	140	Other countries *	59
France	128		
Italy	125		2,690
Japan	121		

* Not including China and non-member countries in Eastern Europe

Dr. Rama Varma addressing a press conference after his return from Tokyo. At Tokyo he had represented India at the 17th meeting of the International Study Group held in May, 1964.

Dr. Rama Varma with the representatives of the press. He met them at a press conference on 15th July 1964, before laying down office as chairman, Rubber Board.

(*continued from page 111*)
salesman said electricity done it all," she wrote, still disappointed.

Men feed batches of blue, red, and yellow rubber between crunching calender rolls to make mottled designs for beach balls, bathing caps, and decoys.

Suddenly you come upon a menagerie-ring-tailed monkeys, elephants, geese, leering crocodiles, and gawky giraffes. You see items for the seasonal trade, red devils for Halloween and Easter bunnies. In July here it is Christmas, with mounds of Santas and rubber dolls.

From glad to gruesome you keep on, and see cadaver sacks, headrests for coffins, and shoes for corpses. Then surgical goods: rubber bulbs, syringes, catheters.

"Sixty-five regular kinds of bulbs and syringes," the manager tells you.

"What item do you put out in largest numbers?"

"Rubber bands. Sometimes 12 million a day. We make 150 standard kinds; many more varieties on special orders."

A rainbow of rubber bands

Rubber bands would cost more if human hands had to lay 50 or 100 side by side and then tie them with another rubber band.

Instead, there is a bundling machine into which they dump bushels of bands of many colours. They fall through slits of a revolving drum; some catch on a spiral wire, others drop on a belt that feeds them into the drum again.

From the spirals they drop on to a collecting wire, mounted on a pivot and balanced by a weight. When the loaded wire topples off a bundle, a girl grabs them and deftly wraps a band around their middle.

"What's your most delicate job here?"

"Piston cups for hydraulic brakes on automobiles," the manager replied. "If a cup is wrong, your brake won't work. Then, may be, sudden death."

The parts are only a quarter of an inch thick, about 1¼ inches diameter; a hundred of them weigh 2½ pounds. Here they make some 16,000,000 a year.

There are seven ingredients in the compound. Each ingredient must pass four tests. They mold the cups between shiny chromium and stainless steel.

Each must be accurate to two-thousandths of an inch—less tolerance is allowed them than anything else in rubber, except golf balls. They must fit a ring gauge for exact diameter and pass a micrometer test for height. Each must withstand up to 600 pounds' pressure to the square inch suddenly applied when you throw on your brakes.

In a scientifically lighted room alert, keen-eyed girls peer through microscopes and throw in a "no—go" basket every piece that has the tiniest nick, blister, or speck of dirt. The good ones go into a dark room for X-ray examination.

And after all that they sell for a factory price of from 1½ to 3 cents apiece!

On we walked, past recoil bands for butt ends of shotguns; "acid fingers," which are acid-resisting rubber tips for laboratory instruments; canners' gloves, including special prick-proof "pineapple mittens" for

Hawaii; masks for beauty parlors; myriad tiny tires, down to a half-inch diameter for toy autos, and then into toyland. Here is a paradise for any child—50,000 toys a week; one week they molded 25,000 Ferdinand the Bulls.

Buying rubber unawares

So swiftly crowd in new uses of rubber that day by day we are purchasing rubber unawares.

Buy salt, cocoa, bread, canned vegetables and fruit now and you may be buying rubber, too. For rubber film on pasteboard replaces the tin that once kept salt pouring and the cocoa flowing.

Rubber sup-plants soldering to keep the vacuum in tins and jars so that you may eat asparagus in January and California cherries in Maine or Manila.

"Why in the world don't they invent rubber type, so we can squeeze everything in?" joked an editor.

They have done so, although you can't compress it. Rubber-coated paper, printed with rubber type, protects your daily bread loaves.

Posters, Christmas cards, popcorn bags, paper napkins, even a couple of novels now on sale, have been printed from the new rubber-type plates.

From "idea men" and inventors pour in requisitions for new articles they propose to make of rubber. One was for rubber covers on watches, another for a rubber-tired hoop. There were orders for rubber doorsills, rubber kneeling pads for churches, rubber washers for communion glass holders on the backs of the pews, sheep masks for rams so they can't see their rivals but still can eat.

Rubber is a key industry not only because it is the ally of steel, petroleum, and glass production for automobiles. It is the hand-maiden of practically every modern electrical device—lights and telegraph, radio and power lines, vacuum cleaner and refrigerator. It enters amazingly into farm and factory, what with belting for driers and conveyors, hose for spraying crops, fighting fires, drilling for gold, and stopping trains; linings for tank cars, and mountings for heavy machinery.

(*National Geographic Magazine*)

(*continued from page* 105)

and timely advice you have given to me in the discharge of my duties.

I am also grateful to my staff from whom I have got the best of co-operation. In fact when I was to come here from Bombay many people told me "you are going to a place where all reputations will be laid at rest." Of course my experience here is that you cannot get a better type of staff anywhere else. I have worked in various offices and I have seen in my office here that they have been giving me the best co-operation.

I also want to express my thanks to the Planting community; I had to introduce many changes. All these changes were discussed freely and they have accepted them without any agitation or whatever word you may use.

By and large these three years have been very happy for me and I will always remember these days as the best periods in my official carrer.

The Deliberations of the meeting was started expressing deep regret and sorrow at the death of shri Jawaharlal Nehru.

Shri K. V. Thomas was elected Vice-Chairman of the Rubber Board unanimously for the next term.

ESTATE CALENDAR

July — New flushes in nursery and young plants are sprayed. Planting is continued. If trees are tapped during this month panel protection should be given. Seed collection is done if available.

August — New flushes in nursery and young plants, in regions where shoot rot is prevalent, are sprayed. Treatment against pink disease is done. Seed collection is continued. Panel protection is given in areas where tapping is done. Rubber seeds are sown.

September — This is the time for weeding and manuring. Sowing of seeds can be continued. Repeated inspection and treatment of pink disease should be done. Young rubber buddings planted out during June-July should be given shade. Yield stimulants may be applied on trees 20 or more years old.

October — Weeding and manuring may be continued. Dead woods should be removed. Tapping panel should be given protective treatments.

November — Mulching should be done in nurseries and round young plants. Young plants should be guarded against sun-scorch. Stems of young plants, 2—7 years old and of older plants should be lime-washed if exposed to sun.

December — Lime-washing and mulching is continued if found necessary. *Calopogonium* seeds are collected during this month.

RUBBER STATISTICS

TABLE I

Area Under Rubber as at the End of Each Year

Year		Area in acres
1950–51	...	170,506
1951–52	...	171,191
1952–53	...	172,786
1953–54	...	173,643
1954–55	...	176,647
1955–56	...	207,239
1956–57	...	234,351
1957–58	...	261,998
1958–59	...	286,567
1959–60	...	305,452
1960–61	...	321,002
1961–62	...	348,121
1962–63	...	361,142
1963–64	...	377,938

TABLE II

Planted Acreage Under Different Planting Materials as at the End of 1963-1964

(Area in acres)

Planting materials	Newplanted area	Replanted area	Total area
Ordinary	209,822	4,228	214,050
Budded	40,614	18,914	59,528
Clonal	88,942	15,418	104,360
Total	339,378	38,560	377,938

TABLE III

Classification of Holdings and Estates According to Size as at the End of 1963-1964
(Area in acres)

Groups	No. of units	Area
A. Small Holdings (50 acres & below)		
5 Acres and below	60,957	118,640
Above 5 acres and up to and including 10 acres	5,679	41,897
Above 10 acres	3,514	73,685
Total	70,150	234,222
B. Estates (above 50 acres)		
Above 50 and up to & including 100 acres	320	23,199
,, 500 ,, 500 ,,	235	47,291
,, 100 ,, 1000 ,,	31	21,422
,, 1000 ,, 1500 ,,	19	23,328
,, 1500 ,, 2000 ,,	4	6,578
,, 2 00	9	21,898
Total	618	143,716
GRAND TOTAL	70,768	377,938

TABLE IV

Statewise Distribution of Area at the End of 1963-1964
(Area in acres)

STATES	HOLDINGS (50 acres & below)		ESTATES (Above 50 acres)		TOTAL	
	No. of units	Area	No. of units	Area	No. of units	Area
1. Kerala	69,309	227,974	565	128,372	69,874	356,346
2 Madras	815	5,836	41	10,977	856	16,813
3. Mysore	25	392	11	3,945	36	4,337
4. Andamans	...	...	1	422	1	422
5. Tripura	1	20	...	...	1	20
Total	70,150	234,222	618	143,716	70,768	377,938

TABLE V

Statewise Production of Natural Rubber (In Metric Tonnes)

States	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64
Kerala	22,062	21,890	23,175	24,954	29,057	33,792
Madras	1,665	1,814	2,040	2,060	2,695	3,176
Mysore	425	437	452	402	447	468
Andamans	17	32	30	30	40	51
Total	24,169	24,173	25,697	27,446	32,239	37,487

TABLE VI

Production, Import and Consumption of Natural and Synthetic Rubber
(In Metric Tonnes)

Year	Production of Natural Rubber	Import			Consumption		
		Natural Rubber	Synthetic Rubber	Total	Natural Rubber	Synthetic Rubber	Total
1958–59	24,169	12,538	4,229	16,767	35,767	3,477	39,244
1959–60	24,173	15,287	5,718	21,005	40,491	4,964	45,455
1960–61	25,697	23,125	8,097	31,222	43,148	7,397	55,545
1961–62	27,446	22,528	10,121	32,649	48,410	10,186	58,596
1962–63	32,239	23,360	10,297	33,657	53,553	10,723	64,276
1963–64	37,487	26,275	12,382*	38,657	61,155	11,959	73,114

* Includes indigenous production also.

TABLE VII

Reclaimed Rubber Acquired and Consumed by Manufacturers
(In Metric Tonnes)

Year	Acquired	Consumed
1958–59	3,973	4,102
1959–60	5,177	4,969
1960–61	5,183	5,453
1961–62	6,422	6,046
1962–63	6,839	6,850
1963–64	8,251	7,982

TABLE VIII

Stock of Natural Rubber at the End of Each Month (In Metric Tonnes)

Month	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64
April	8,723	10,035	8,571	9,696	11,003	12,818
May	9,106	9,067	8,186	9,716	10,937	12,894
June	8,756	8,138	8,128	8,462	12,193	14,003
July	8,710	8,545	8,067	8,256	12,475	14,824
August	8,619	8,968	8,489	9,235	12,218	14,239
September	8,322	8,995	9,157	9,744	12,723	14,302
October	9,523	9,810	10,265	11,291	13,917	15,605
November	11,107	10,467	10,742	12,120	15,059	17,142
December	11,587	10,793	12,993	13,359	16,334	18,314
January	11,715	10,496	13,036	12,990	15,940	18,381
February	10,438	9,553	11,185	11,511	13,879	16,437
March	10,233	9,201	9,875	11,439	13,485	16,092

NATURAL RUBBER PRICES

The Central Government has fixed, for all classes of business, the following minimum prices, exclusive of sales tax, for the various grades and qualities of rubber and latex of different concentrations, excluding the cost of container. These prices have come into force as from the 19th December, 1963.

Grade of rubber	Quality of rubber	F. O. B. Cochin for 50 kilograms Minimum price Rs.
(1)	(2)	(3)
Group 1	R. M. A. IX	161.50
	R. M. A. 1	161.50
Group 2	R. M. A. 2	159.85
	R. M. A. 3	158.20
	Cuttings No. 1	149.93
Group 3	R. M. A. 4	154.34
	R. M. A. 5	149.93
	Cuttings No. 2	143.32
Group 4	Precoagulated Crepe	167.57
	Pale Latex Crepe IX	165.36
	Pale Latex Crepe 1	163.16
	Pale Latex Crepe 2	162 06
	Pale Latex Crepe 3 FAQ	160.96
Group 5	E. B. C. Super IX	156.54
	Estate Brown Crepe IX	152.13
	Estate Brown Crepe 2X	148.83
	Smoked Blanket	152.13
	Remilled Crepe 2	143.87
Group 6	Estate Brown Crepe 3X	140 01
	Remilled Crepe 3	137.81
	Remilled Crepe 4	131.74
Group 7	Flat Bark	122 37
Normal latex up to 35% concentrates		Rs. 161.50 plus a premium of Rs 19.29 per 50 Kilograms of D. R. C.
Latex concentrates of 36% to 50% (both inclusive)		Rs. 161.50 plus a premium of Rs. 36.38 per 50 Kilograms of D. R. C.
Latex concentrates of 51% to 60% (both inclusive)		Rs. 161.50 plus a premium of Rs 47.40 per 50 Kilograms of D. R. C.

LOOK! **no phytophthora!!**

(*said Fison*)

Simple, my dear Fison,
TATA+FISON+FYCOL-8+Helicopter
(*said Tata*)