RUBBER PLANTING
INDUSTRY
ASHPLANT
RECENT DEVELOPMENTS

in the

RUBBER PLANTING INDUSTRY

with special reference to

BUDDING,

BROWN BAST TREATMENT, MANURING OF

RUBBER, Etc.

by

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FOREWORD.

This report is the outcome of a recent visit to Ceylon, Malaya, Sumatra and Java, undertaken mainly with the object of getting first-hand information on the new Keuchenius Treatment for Brown Bast, and the more recent progress in Budding and Hevea Seed Selection. On the latter question, many conflicting rumours and so much irresponsible talk had been current, that it seemed desirable to learn the actual facts.

As the Ceylon experience of Manuring is the subject of frequent discussion in this country, I have added a chapter to the section on the Manuring of Rubber, dealing with the results of Manuring in Ceylon, so far as I have been able to ascertain these.

Of all the rubber areas visited none produced so much useful information as the Plantations of the General Rubber Company in Sumatra (H.A.P.M.) Kisaran, the headquarters of these Plantations, has become the Mecca of all planters who wish to keep abreast of recent rubber research. It is astonishing to find how many of the familiar problems of rubber planting have been satisfactorily settled during the last few years by the researches of the H.A.P.M. Scientific Staff.

I should like to acknowledge here my very great indebtedness to the H.A.P.M. authorities for the opportunity of revisiting their estates and for all the information they have ungrudgingly given. To Mr. W. J. Gallagher and Mr. J. Grantham especially are my thanks due for their generous hospitality and kind assistance in regard to the matters discussed in this report. Finally, a word of thanks is due to Mr. H. C. Pinching and the other Scientific Officers of the R.G.A., at Kuala Lumpur, whose ready assistance greatly facilitated my enquiries and lightened my path in the F.M.S.

MUNDAKAYAM, S. India, September, 1924.

H. A.
GENERAL IMPRESSIONS.

DECADENT RUBBER.

One of the things which have most impressed me in re-visiting Malaya and the Dutch East Indies, after five years' absence, is the deterioration of much of the Rubber. Estates which, in 1918, were vigorous and full of promise, have visibly gone back in rate of growth, bark renewal, and general appearance. Altogether I must have seen in the countries mentioned two or three hundred thousand acres of rubber which can only be classed as decadent.

The falling off noted, is not due, primarily, at any rate, to over-tapping, or soil wash, though these factors have obviously contributed, but to unsuitable soil. The remarkable adaptability of Hevea, as displayed in its ability to grow in almost every type of soil, has led to an under-estimation of the importance of the soil factor, and land of any kind has, in the past, been considered good enough for rubber. Up to the eighth or tenth year, most of the land planted certainly had every appearance of being good enough. Time, however, is gradually revealing the inherent poverty of some of these soils, and it is becoming increasingly evident from the decline in vigour and general appearance of the trees that large areas now under rubber are not permanent rubber soils.

Lest this statement be misconstrued, I ought, perhaps, to say that there is no likelihood of this rubber suddenly going out. It has, in all probability, years of life before it, but it has passed its prime, and only by resort to expensive manuring will the trees be retained in heart, and yields kept up.
GOOD YIELDERS REMAIN GOOD.

POOR YIELDERS REMAIN POOR.

Although for some years past, it has been evident from general observations that good or bad milking qualities are a permanent endowment of a Hevea tree, no regular quantitative records of individual tree yields over a long period of years have been available, and statistical confirmation of the permanence of yield capacity has, up to recently, been lacking.

Data on this question are now forthcoming from two sources. On the H.A.P.M. Plantations, accurate yield measurements of individual tree yields from 1,500 trees have been regularly made daily since 1917. The records obtained show that, disease apart, trees which were high yielders in 1917 are, in 1924, still high yielders. Similarly, poor or moderate yielders have remained poor or moderate yielders.

The other observations on individual tree yield mentioned, were made at Peradeniya, Ceylon, by Messrs. Bryce and Gadd, and form the subject of a recent bulletin. The Ceylon investigations are less valuable than those of the H.A.P.M., in that the behaviour of the trees has been followed for two years only. Whilst during this period the position of the individual trees was not always rigidly maintained, to the extent that No. 1 tree persistently ranked as No. 1, it was found that as a class, the good yielders remained good, and the low yielders remained low. What is more interesting, is the fact to which reference is made under another head, viz., that the high yielding trees show a greater percentage yield increase with age than low yielders. Whereas the best class of trees increased their yield in one year by 30 per cent., the group classed as “low yielding” by previous measurements only showed an increase of 9 per cent.

The fact that trees with initially low yielding capacity do not appear to improve in yield with age to the same relative extent as do trees which are good yielders from the start, emphasises the importance of Hevea selection, and any planter who has been led by seasonal fluctuations in tree yield to look upon relative yield capacity as a variable thing, susceptible to considerable change with age or under manurial stimulus, should now realize that the permanence of yield characters has been established beyond all doubt.

I shall return to the question of manuring and rubber yield presently. I will only note here, that, on the basis of their experiments, Messrs. Gadd and Bryce agree with the conclusions of other writers that yield is an inherent character. Their view is that “a tree is in general born a good yielder or a bad yielder, and will always remain such.”
HEVEA SELECTION.

Investigations carried out during the last few years have brought home to us the widely differing yield capacities of our rubber trees. We now know that the yield capacity of a tree is a relatively fixed character of composite origin, but dependant mainly upon intrinsic anatomical or constitutional peculiarities. The observations already quoted in this report show that over a period of seven years, which is long enough to permit of a safe judgement, good yielders have been found to remain good yielders and bad yielders to remain bad yielders. This is true under all manner of soil conditions, and though it is possible by appropriate cultural methods to stimulate within narrow limits the yields of trees, the art of rubber cultivation knows of no alchemy which will enable us to transform a bad yielder into a good yielder.

In the propagation of high yielding Hevea stock, two methods are open to us, e.g., Seed Selection and Budding. Budding, since it seems to offer a quicker path to our goal, has, so far, been the method most favoured, and progress with this is well advanced. Seed selection is a slower business. It is, moreover, a method which calls for special facilities, and a knowledge of heredity and science not usually possessed by the planter. Hence outside the experimental stations and one or two estates, which are really only beginning the work, nothing has been done.

With regard to the progress made with budding, conflicting rumours have got about, and it was, as already stated, one of the main objects of the writer's recent tour to ascertain the true facts. As he has visited most of the budded areas in Sumatra and Java and F.M.S. and has had an opportunity of looking into the actual yields, etc., he is, perhaps, able to speak with some knowledge on the question.

BUDDING.

When the subject of budding Hevea first attracted the attention of planters, the enchanting possibilities of yield enhance-
H. A. P. M. Experiments of Manuring.

Some important results have recently become available from the Holland-America Plantations Company (H.A.P.M.), a subsidising company of the United States Rubber Company, which will clearly necessitate a modification in the attitude just described. During the past five years the H.A.P.M. Scientific Staff have been testing the effects of manures on the rubber on their various properties. A number of different soil types were embraced in the experiments, the type calling for special mention being a whitish clay cement like soil common in the flat coast districts of the country. On this soil, the growth of the rubber was at first satisfactory. Soon after the commencement of tapping, however, deterioration set in, becoming more pronounced year by year.

It is essential to know something of the type of soil and to appreciate the condition of the trees described, since it is on such soil, and on trees of such condition that the striking success with manuring, to be recorded was obtained.

Space does not permit of fully describing the precautions taken against error in the H.A.P.M. experiments, but I should emphasize here, since so much uncontrolled manuring passes as "scientific," that these experiments are in a class by themselves. Every manure was tested out in ten or more plots, interspersed with an equal number of controls. The results quoted are the average results from all plots in the respective series after all likely errors have been allowed for. No such thorough manuring experiments have previously been carried out in rubber.

Of the manures tried, positively favourable results were given only by those containing Nitrogen, e.g., Sodium Nitrate, Ammonium Sulphate, Calcium Nitrate, etc. Applications of Potash to the different soils were found to scarcely effect the crop to a measurable extent.

The response to Super-Phosphates on the white clay soil was astonishing. Far from improving the trees in any respects, Super-Phosphates had, instead, a noticeably detrimental effect on their growth and general appearance, and for some time after the manuring, the trees bore unmistakable signs of a set-back.

With regard to the Ammonium Sulphate and inorganic Nitrate manures mentioned, within two or three months of their application, the foliage showed distinct signs of betterment. No effect on yield was noticeable for about eight months, but from then onwards, increases were recorded and maintained, or more than maintained throughout the duration of the experiment. The actual amount of improvement in yield is so striking as to be incredible to those of us
APPENDIX.

BROWN BAST.

Since the writer's visit to the H.A.P.M., a slight modification in the method of treating light cases of Brown Bast has been introduced. The modification has to do with the fresh cases met in routine inspection only, and not with the arrears of advanced cases which have to be dealt with first on all old estates.

The treatment prescribed for such early detected cases depends upon the position of the infection.

(a) When a small infected area is found at either end of the tapping cut, the isolation is effected as described earlier on, e.g., first with gouge knife, and subsequently with penknife.

(b) All other small cases more towards middle of tapping, cut are isolated by means of a V-shaped cut, the top of V being left open. In making these cuts, a penknife or sharp-pointed knife only should be used (not tapping knife).

The cuts must reach to the wood.

The object of this form of isolation (which is found to be satisfactory for the special cases described) is to permit of tapping being carried out over the entire length of the cut, just as on undiseased cuts.

It is important that the coolie employed in the routine detection and treatment of new cases should follow close behind the tapper, and inspect the cuts before the latex has ceased running.

It is desirable to say that the modifications introduced do not affect the mode of treatment for the outstanding arrears of Brown Bast, which should be dealt with in the manner already described.

As it is difficult to explain clearly, without diagrams, the procedure to be followed in all the special cases encountered in routine inspection for new infections, a separate circular setting forth this will be issued later on to South Indian Rubber estates.