RUBBER.

PERIODIC TAPPING WITH PERIODICITY OF FLOW PREVIOUSY ASCERTAINED.

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THE EXPERIMENT AND ITS RESULTS.

Bally conducted an experiment* on Kroewoek Estate in order to compare the results of tapping in alternate months and in alternate days.

A preliminary trial was taken during a period of four months, when all necessary precautions were observed as regards tappers, tapping height, etc. The experiment proper ran from March, 1924, to December, 1925, in that period divisions I 4, J 5, J 7, I 8 and I 9 were tapped in alternate months and J 4, I 5, J 6, I 7 and J 9 in alternate days.

From the yields in the flow-periods of I 4, J 5, J 7, I 8 and I 9, I found that after about 15 to 16 days the maximum daily average occurred, I argued

* The results of this experiment will be published in detail later. A preliminary statement was made at the General Meeting of the Malang Experiment Station on 26th February, 1926.

theoretically that tapping in alternate periods of 15 days must yield about 12 to 13 per cent. more than tapping in alternate months.

When the termination of Bally's experiment showed that no reliable difference could be found between tapping in alternate periods of 30 days and alternate-day tapping, I determined to have tapping done in I 4, J 5, J 7, I 8 and I 9 in alternate periods of 15 days in order to see whether an increase of 12 to 13 per cent. would actually be found. This difference it would not be possible to establish in comparison with tapping in alternate months, but with alternate-day tapping in the same divisions, namely J 4, I 5, J 6, I 7 and J 9, which may in any case be considered to give nearly the same results as I 4, J 5, J 7, I 8 and I 9 with alternate-monthly tapping.

I did not, of course, expect an increase of exactly 12 to 13 per cent., as that percentage was determined under conditions that differed totally from the conditions of the experiment of alternate 15-day periods. But, speaking generally, an *increase* was expected, which had to correspond to the index of 12 to 13 per cent.

This expectation, based from the beginning on theory, has now been proved perfectly sound in practice.

In the period January to June, 1926, the percentage difference in yields between divisions tapped in alternate periods of 15 days and divisions tapped alternate-day has been found experimentally to be $20{\cdot}6 \pm 4{\cdot}99$. (From March to June it averaged $29{\cdot}1 \pm 3{\cdot}63$.)

In the preliminary experiment the difference was $1{\cdot}6 \pm 1{\cdot}23$.

The difference of 19 per cent. with a probable error of 5·13 to the advantage of 15-day periods over alternate-day may thus be considered not to be accidental. (In the last four months the difference averaged $27{\cdot}5 \pm 3{\cdot}83$).* The favourable effects of 15-day tapping only began to manifest themselves in the third month; the trees were probably still under the influence of the earlier 30-day rhythm in the first two months.

Although there is an advantage in 15-day tapping over alternate-day to be deduced from this experiment, one must above all not lose sight of the fact that the results were obtained in a plantation of about 12 years on light Kloet soil (elevation 1,600 feet). For the present, therefore, tapping in alternate periods of 15 days may be applied in plantations of an entirely *similar* class, with a certainty of an increased yield. The most economical flow-period for such a plantation, although not positively established, has been obtained with a good degree of approximation.

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* Since the termination of the experiment at the end of June, the results of July and August have come in showing differences of 20·2 and 39·9 per cent. respectively

The differences for the respective months were as follows:

January 1926	0·9 per cent.
February	6·1 ,,
March	37·2 ,,
April	32 ,,
May	20·2 ,,
June	26·9 ,,
July	20·2 ,,
August	39·9 ,,

Bark consumption in the 15-day and alternate-day divisions amounted to about 13 cM in 7 months. Length of tapping-cut ½ circumference.

This experiment is comparatively a " random " one. It is one of the large number of experiments, that as I have already explained are necessary in order to establish the most economical periodicity of flow in a given class of plantation, that is to say according to age, soil and elevation.

In no case can the results be declared to be applicable with any guarantee of correctness for other plantations.

The practical planter cannot however await the results of systematic experiments, so that we must for the present be satisfied with an approximate calculation of the economic flow-period. As appears from the experiment, that approximation can always give a considerable increase in production, so that for the present a rough calculation of the periodicity must suffice.

SUMMARY AND CONCLUSIONS.

An economic flow-period of 15 days (theoretically determined out of 30-day periods) was experimentally compared with alternate-day tapping. The divisions tapped in alternate periods of 15 days for the purpose of this experiment had been tapped in 30-day periods in a previous experiment, while in both the experiments the same divisions were tapped alternate-day. In the earlier experiment to compare 30-day and alternate-day tapping, the two methods did not show any advantage, the one over the other. From the yields of the 30-day periods, however, I *calculated* that 12 to 13 per cent. more production would result if tapping was done in alternate 15-day periods.

The experiment instituted to check my theoretical calculations by a comparison of alternate-day and alternate 15-day periods showed an advantage of 19 per cent. for the latter in six months' time. In the last four months of the experiment the difference averaged as much as 27 per cent. The difference between the theoretical and actual figures* must be explained by conditions of production and weather.

It can be deduced from the above that if *periodic tapping* is applied it is desirable to ascertain from totals of yields just when the *highest daily average* occurs. *In this way it is possible to establish a periodicity* by means of which one might employ most economically the number of tapping days appertaining to a given tapping system, e.g., 180 tapping days in the A.B.—system, etc.

So long as systematic investigations have not been made into the behaviour of the daily average in flow-periods of various durations one cannot say with certainty whether in determining the periodicity, as I have done, one has hit the most economical flow-period. But a satisfactory approximation to it has been attained.

As regards the occurrence of the maximum daily average, one can only conclude from the experiment, in the matter of the effect of the number of resting days on it, that in halving the flow-period of the A.B.—system (30 days to 15 days) the interval before the maximum occurs is not curtailed.

In conclusion one must lay stress on the fact that the results of this experiment may be considered to be applicable exclusively to fields of about the same age, with nearly similar soil and of about the same elevation.

For other plantations an economic periodicity may be determined by a simple calculation.—*Archief Voor de Rubbercultuur*, Vol. X., No. 11.

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* The theoretical and actual figures are not strictly comparable. The 12 per cent. states the difference between divisions tapped in 30-day periods and the same tapped (theoretically) in 15-day periods. 19 per cent. is the difference between 15-day and alternate-day tapping.

As, however, Bally's experiment has shown that alternate-day tapping gives the same results as 30-day periods. we may loosely regard the 19 per cent. as the difference between tapping in 15-day and 30-day periods. Under these circumstances, a comparison between the theoretical and actual figures is justified.