

LENGTH OF PRUNING CYCLES UNDER PRESENT CONDITIONS

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The last issue of *The Tea Quarterly* contained an article dealing with the length of pruning cycles relative to plucking costs and labour shortage. Since then we have received a number of enquiries about the wider question of the effect of cessation of manuring on length of cycles. Since one of the enquiries put the issues so clearly and was quite typical of the rest we print for general information the letter of enquiry and the Agricultural Chemist's reply.

QUESTION

"I find it difficult to reconcile the oft made statement that this field or that field must have not less than 40 or 55 lb. nitrogen, if it is to be economically cropped, with the current statement that now that fertilisers are so greatly reduced (if

not cut out completely), the pruning cycle of that field or this must be reduced.

"I therefore seek enlightenment, and so that you can put my erring reasoning right, — here it is.

"Cropping of the tea tree is an unnatural process, and an exhausting one. To counteract that (apart from considerations of maximum profits) we fertilise it with chemicals. (We also pay attention to soil texture, but that does not enter into the argument). In fact, we foster it to counteract our own somewhat brutal treatment. When it refuses to yield any further economical flush, we prune it, — another most unnatural operation, which is designed to stimulate new leaf growth. Consciously or unconsciously we are aiming at forming a frame to carry the leaf

growth which means *£.s.d.* There is also a reverse action whereby the area of leaf decides the degree of frame-forming, and provided we don't strip, I believe the branch girth increase accelerates as the age from pruning increases.

Russia and to maintain the revenue of the Island should rubber slump. A further consideration is that to alter pruning cycles now may seriously disorganise estate routine, with a general shortage of labour obtaining at present."

REPLY

"I do not think there is anything irreconcilable in the conceptions outlined in your first paragraph. The explanation is rather long and perhaps a little involved, but here it is.

Apart from cultivation, the chief factors which decide the length of the pruning cycle are lat and elevation. If, under normal cultivation, we prune a field 36-monthly and decide, in view of the absence of a fertiliser, to prune it at the end of 30 months, we will be pruning immature branches, and a continuance of the process will lead to a progressive decrease in branch girth and probably to a progressive decrease in economical flushing life. We remove the natural stimulant of a fertiliser and apply, all the earlier, the unnatural and shocking stimulant of the pruning knife. Sure two wrongs, in this case, don't make a right?

"The natural growth cycle starts with a vegetative phase and gradually passes over into a reproductive one producing less leaf and a preponderance of flower and fruit. Studies have been made on fruit trees and these show that this change is accompanied by a change in the relative proportions of carbohydrate and nitrogen in the tissues of the plant; as the cycle progresses the ratio Carbohydrate/Nitrogen increases. The carbohydrate comes from the photosynthesis of carbon dioxide from the air and we have no means of altering those conditions. But by supplying nitrogen to the plant we can in fact delay the time at which a tree ceases to lay down foliage buds and produces instead flower buds. You may know that a common method of bringing an over-luxuriant fruit tree into bearing is by root pruning. This is the reverse operation and is designed to restrict the assimilation of nitrogen. It follows that a restriction in nitrogen, such as is at present inevitable, will tend to accelerate the time at which the reproductive phase becomes dominant and thus will reduce the cropping status of the latter part of the pruning cycle.

"My own opinion is that the proper thing to do is to leave the pruning cycle unaltered and to rest the tea when it ceases to yield an economic flush. Taking the case above, I would rest the field its last six months, say, and then prune it to schedule. Over the first two cycles I believe the yield of the field under an accelerated 30-month cycle might be very slightly better than of the 36-monthly one, with six months of rest each cycle. Extended to a period of, say, 15 years, which would be five and six cycles for the two methods I believe the 30-month field would show a very superior yield over the other, — both without manure, of course.

"Even in the early stages I do not believe the advantage in favour of the 30-month treatment would be more than slight, and I doubt whether tea is such an urgent necessity to warrant perhaps permanent damage to our bushes. We will need tea after the War to trade with

"Whatever interference with the process just outlined may be attempted by normal nitrogenous manuring, the time does inevitably arrive when the vegetative phase wanes in activity. We then prune the

bush in order to deprive it of the potential flowering buds which are laid down long before they become evident in mature flowers and seed. These buds are present in the younger tissues, not on the old wood. The plant is thus forced once more into the vegetative phase. You may describe this, if you like, as an unnatural process but up-country at any rate it is not an exhausting one.

"There is no point in merely resting a run out field at *high elevations*, for all you will succeed in doing is to improve the carbohydrate status of your bush, which is not desired. In this connection I have recently obtained results which show that at this elevation even when bushes are plucked to the fish leaf from tipping time onwards, there is no evidence at the end of 3 years that carbohydrate storage is depleted in comparison with that shown by bushes normally plucked carrying a much greater bulk of foliage leaf.

"As regards the building up of frames for bushes, I dissent from your idea that branch girth *accelerates* as age from pruning increases. Perhaps you mean that it goes on increasing but not necessarily at a greater rate. I have data to show that the production of wood (measured by weight of prunings) is closely correlated with foliage production, but I cannot say that the ratio of wood to leaf in a four-year cycle, for example, is higher than in a three-year one. In any event, the production of wood in the shorter cycle is affected by the fact that less severe

pruning is required, since on such cycles the bush height is not so liable to get out of control.

"Moreover by shortening the pruning cycle under present conditions one makes plucking easier and cheaper, which is a consideration these days. As an illustration of how difficulty in the plucking of long pruning cycles can affect yields, I may cite a comparison between the behaviour of an experimental area in a four-year field, and the behaviour of the field as a whole. During the first two years the part and the whole gave almost identical yields per acre. In the third and fourth years, whilst the experimental area increased steadily in yield, the rest of the field showed diminishing yields, although from the comparison in earlier years this fall would not have been expected. I am naturally able, on an experiment, to secure a measure of supervision not attainable on an estate as a whole, and I attribute the loss of yield on the rest of the field to the less stringent standards of plucking attained.

"I have examined quite a number of estate records with a view to ascertaining whether the long cycle pays in crop. The method is simple. If a fourth year is to pay, it must give at least the average of the previous three. It is remarkable how frequently this fact is overlooked on estates.

"In general therefore, I think the policy of reduction in pruning cycles is inevitable at present if crop yields are to be maintained, and I do not think the general vigour of the tea will be affected."