

SOME PRACTICAL ASPECTS OF REHABILITATION AND REPLANTING

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In view of the large expenditure we have incurred on St. Coombs in our efforts at rehabilitation and subsequent replanting, it is perhaps opportune now to review the success and failure we have had and the problems we still come across in establishing a fair cover of clonal tea on land which has grown tea for a number of years. This review should enable us to select uneconomic tea land that could profitably be replanted at reasonable cost and abandon other areas where clonal planting would not prove as economic or successful.

The first replanting was done in No. 10 field which had been under tea for about 20 years. The tea was uprooted with a monkey grubber and trenches were cut on the contour, the soil being heaped above the trenches. Guatemala grass was then closely planted between the trenches which were periodically filled in with the loppings. The grass was left for a period of approximately 2 years, during which period it was regularly manured. At the end of this period of rehabilitation, the grass was cut to ground level and used to fill the trenches. Different clonal blocks were then established in the trenches. This clearing has been a definite success. A good cover of tea was established in about 4 years and the yields anticipated this year will be in the region of about 1,800 lbs. for most of the clones, as against a yield of about 1,000 lbs. per annum from the original seedling tea in this field.

Encouraged by this success the same replanting scheme was put into operation in No. 1 field, where the annual yield had previously been of the order of about 550 lbs. The results here were very disappointing for the first 2 years, and the expenditure incurred was so heavy that it is to be doubted whether the replanting of this area was an economically sound proposition. The growth of the clonal tea here has been much more encouraging recently, but whether the expenditure earlier incurred is justified is a matter of controversy.

A detailed examination of the two areas shows that No. 10 area had been under tea for about 20 years, while No. 1 field had originally been planted in 1885 and had possibly been under coffee previously. An analysis of the soils in the two fields has shown that No. 10 field is rich in organic matter and the soil firm in texture, while soil in the No. 1 area was low in organic matter and of a powdery texture and liable to dry out much faster, indicating a deteriorated soil with low fertility and no crumb structure.

Various other adverse factors contributed to the poor results in No. 1 field. The area is steep and badly windswept particularly during the South West Monsoon. Much damage was caused by winds following a spell of dry weather when even well-grown plants tended to be seriously shaken up and sometimes uprooted on account of the poor structure of the soil. In fact the conditions prevailing in the No. 1 clearings with reference to the essential requirements of soil fertility, lie of land, exposure to wind, freedom from root diseases, etc., have been far from favourable for the successful replanting of tea.

Perhaps the 2-year period of rehabilitation of this area was also not long enough. The uprooting of the tea here had been done by a powerful winch, which operation had disturbed the sub-soil to a depth of 4 to 5 feet. The subsequent trenching of the tea rows would have caused more disturbance and exposure to the top soil. Until a good cover of Guatemala grass was established, which process takes about 1 year on a poor soil, the top soil was further exposed to alternate wetting and drying and the quantity of loppings that went into the trenches was perhaps insufficient to alter the soil structure. Under the poor conditions of soil and other adverse factors mentioned, it can be understood why these clearings made such poor progress during the first 2 years.

In view of these problems it is safe to assume that not all uneconomic tea land could be replanted economically or on the identical principles. Caution should therefore be exercised to see that land selected for replanting should not be too steep and not too badly exposed to wind. Areas to be replanted should have soils of at least reasonable depth and medium fertility, and should be free from root diseases and pests, such as eelworm. If *Poria* has been known to be present in a field that is to be replanted, such areas should be treated before rehabilitation. It is also advisable before replanting is undertaken to have soil tests done for pH in areas where limestone is known to exist.

I shall now suggest certain modifications in the scheme of replanting in the light of our experience on St. Coombs, with a view to helping others to avoid or remedy the mistakes we seem to have made.

Rehabilitation

I have already suggested an extended period of rehabilitation but if this is considered impracticable, it is suggested that more generous applications of manure be given to the Guatemala grass to enable it to give back to the soil the large quantity of organic matter so essential to recondition the soil. Three applications of Guatemala manure at the rate of 4 cwts. per acre per application per year is the present recommendation. As an indication of the benefits of rehabilitation I should quote two areas in the No. 1 clearings which were replanted in 1954. One block of Clone 2025 which was rehabilitated for 2 years has yielded this year up to the end of October 1,118 lbs. per acre, while the other block which was planted without any rehabilitation with clone 2024, which is also a high yielder, has yielded only 572 lbs., though the applications of manure for both the areas and other treatments have been identical. One or two small patches in the latter area had to be uprooted again due to the incidence of *Poria*, but the beneficial effects of rehabilitation are obvious in the high-yielding block.

Trenching

Trenching of the future tea rows before rehabilitation is now not recommended and might profitably be avoided to minimise the ill-effects of soil exposure and consequent loss of organic matter and also to avoid the formation of terraces of loose soil which tend to break up later and damage the young plants. The Guatemala grass could be lopped and used as a surface thatch rather than as material for filling the trenches. Holing or trenching, if necessary, could be done just before planting the young tea.

Planting Distance

A mistake we seem to have made in the No. 1 clearing on St. Coombs which is steep land, is to adhere strictly to the recommended spacing of 5 feet between the rows. The soil being poor here the growth was slow with the result that until a perfect cover of tea was established a larger surface of soil was left exposed. On such land therefore it is perhaps advisable to adopt a closer spacing than the present distance of 5 ft. \times 2 ft. A planting distance of $4\frac{1}{2}$ feet \times 2 feet or

4 feet \times 2½ feet will perhaps offer more protection against wind, erosion and exposure of the soil. It is conceded that under normal conditions of soil and lie of land, a planting distance of 5 feet \times 2 feet is desirable both from the point of view of obtaining a reasonable density of bushes and affording sufficient space between the rows for subsequent operations of cultivation, harvesting, etc. But the close planting is suggested in exceptional cases of low soil fertility and exposure to wind, more with a view to the early establishment of the young plants against heavy odds. Moreover, by the selection of clones with smaller frames and subsequent judicious pruning, closer planting could be undertaken without detriment to subsequent cultivation operations.

V.P. Supplies

A number of estates are now well versed in the methods of growing healthy V.P. plants in nurseries. But I would like to emphasise that only well-grown healthy V.P. plants will thrive on a rehabilitated soil. It is therefore suggested that the best soils be used in nurseries, after fumigation against eelworm if necessary, and only the best basket plants are put out in the field, using the weaker ones as hedge plants above drains and road sides. The use of balled plants has proved a failure, while transplanting with a Hersall transplanter has been a comparative success.

Trenching and Manuring

One of the more serious mistakes we seem to have made, though unavoidably due to lack of material, is that since the young clonal tea was planted, the soil was left bare without any thatch for over 2 years, with the result that the exposure may well have reduced the benefits of rehabilitation. It is, therefore, advisable to plan ahead and have sufficient thatch available in an adjacent area to keep the clearings continually supplied with material for thatching. Uneconomic tea land which is not suitable for replanting could well be uprooted and put under Guatemala grass for this purpose. We have also found that the application of compost and well-rotted cattle manure has helped considerably the establishment of young plants on poor soils. It is also our experience that plants grown in this type of soil benefit more from regular applications of Sterameal 'A', rather than the T.175 mixture we have used in the past which tend to kill some of the roots if supervision during manuring is insufficient. It is therefore more beneficial to use Sterameal 'A' until the plants have been about 1 year in the field.

Bringing into Bearing

The method of bringing the young tea into bearing by thumb-nail pruning till the young plants have thrown out sufficient branches and then cutting across to a plucking level has proved a failure in a clearing with poor soil. Bending over and pegging down when the plants are about 1½ feet high and of pencil thickness has proved more successful. This practice has promoted quicker root growth and a quicker cover is established, if the new lateral branches are bent over repeatedly and one or two branches showing a tendency to shoot upwards are cut down to about 4" from the main stem.

Shade Trees

We have also noticed that the establishment of such green manure trees as dadap and albizzia was a slow process in the No. 1 clearings, although the soil was reconditioned. Under such conditions we have found that *Sesbania cinerescens* has grown vigorously even in the No. 1 clearings and has afforded sufficient shade and

protection from wind until the commoner varieties of shade trees have established themselves.

Finally it has been observed that certain clones have established themselves better on poorer soils than others. These are only observations and it will be many years before they can be proved and accepted as conclusive. For instance, clone 2024 has shown a marked inability to adapt itself to the adverse soil conditions in the No. 1 area, while clone 2025 and 777 seem to have done comparatively well, though growing on adjacent blocks. Perhaps some of these blocks are more sheltered from wind than others, but the adaptability of some clones to certain soil conditions is well worth further study and observation.