THE NEED FOR SOIL REHABILITATION WITH GRASSES PRIOR TO PLANTING TEA IN THE LOW COUNTRY

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INTRODUCTION

Any land that is to be planted to tea, whether it is an uncultivated new land or one that has been under continuous cultivation of tea or rubber, should in the first instance be suitable for a crop like tea by qualifying in respect of certain basic requirements. These basic requirements include an adequate depth of soil (50 to 100 cm), an acceptable gradient with a reasonable amount of top soil and the absence of surface gravel, slab rock, boulders and stones (Alwis et al., 1980). The inadequacy of any one of these basic needs would impose severe restrictions to the growth of tea.

Having qualified in respect of the above basic requirements, the nutrient status, the organic matter content as well as the physical characteristics of the soil, such as crumb structure, tilth, infiltration, water holding capacity and soil aeration, should all be reasonably good for the establishment of young tea. The establishing young V.P. tea is very demanding in respect of the aforesaid soil conditions. During the early period of establishment of the young tea plants, they are very vulnerable to various forms of set-back to growth, particularly in respect of proper root penetration and development, which in turn help in the efficient uptake of moisture and soil nutrients for good growth and healthy frame development. The rigours of drought are felt to a great extent, with the consequent high casualties, in soils that are marginal in respect of the above characters.

The young tea that manages to survive such harsh conditions, may even appear to grow satisfactorily and could even yield up to average expectations in the early years of harvest. But, with time, with the onset of further stress conditions, they would either collapse soon or become susceptible to diseases such as stem canker caused by *Macrophoma* (Arulpragasam, 1984) or suffer extensive dieback following pruning, followed by live-wood termite attack and thereafter progressively decline and die (Sivapalan et al., 1977). There are a very large number of such cases of early failure of replanted tea in the low country. Many such new clearings have failed even within 10 to 15 years from planting, whilst the expected minimum economic life span of such clonal tea fields in the low country is around 25 years.

LAND PREPARATION AND ESTABLISHMENT OF YOUNG TEA

Reconditioning of the soil under a suitable grass cover crop is recommended to offer maximum advantage for the establishment of young tea plants by providing the required soil conditions for effective root penetration and development and the consequent efficient nutrient uptake for healthy field establishment. Grasses such as Guatemala and Mana have deep penetrating root systems that help to significantly improve the physical characteristics of the soil by improving the crumb structure, tilth, aeration, infiltration and drainage and the retention of soil moisture and also contribute very substantially towards increasing the organic matter content, all of which very significantly assist the ready establishment of young VP tea. It is no doubt understood that the large amount of organic matter provided by the grass is of an ephemeral nature, but would last sufficiently long enough to help establish the young tea and enable them to overcome the rigours of unfavourable weather during the early critical period of field establishment (Sandanam et al., 1976, 1982 a, 1982 b; Sandanam and Ananthacumaraswamy, 1982).

When a land is cleared for tea planting, there is severe exposure of the land surface and the prevailing high temperatures rapidly destroy whatever organic matter left in the exposed soil. The high rainfall experienced in these areas lead to surface runoff and sheet erosion of valuable top soil particularly in those lands having limited moisture infiltration capacity, as is the case with most lands selected for planting tea.

It is the recommendation of the TRI to thatch the exposed surface of all new clearings to minimise erosion during heavy rains and to conserve soil moisture during the onset of the dry weather (Anon, 1980). There is an alarming dearth of such thatch material in low-elevation tea areas and there are also inadequate areas suitable to establish "thatch banks". In order to provide adequate thatch for new clearings, one would require approximately twice the land area that is in tea, in grasses.

SOIL RECONDITIONING AND THE BENEFITS TO YOUNG TEA

During the past 30 years, several agronomists, soil chemists, plant physiologists, plant pathologists and nematologists of the TRI have all been checking on the virtues of soil rehabilitation prior to the establishment of young clonal tea. The overall assessments made over the years have been in favour of soil rehabilitation prior to planting tea.

It is now an established common practice in the up country tea areas to rehabilitate all old tea lands, by planting either Guatemala or Mana grass for a period of two years. However, this has sadly become the exception than the rule in low elevation tea areas. It has also been erroneously believed that rehabilitation under grasses is done primarily to eradicate eelworms *(Pratylenchus loosi)* or *Poria* root disease! This is definitely not so. The primary reason is soil improvement, whilst the control of pests happens to be only an incidental benefit.

As is always the case with any cultural practice, there are bound to be a few exceptions to the general rule with regards to the obvious beneficial effect. However, the rare exceptions should not prevail upon and influence a policy decision that is based on several years of experimentation and field observations.

When yield data from experimental plots of maturing tea are used to ascertain the benefits of a cultural practice that is most beneficial to the establishing young tea, such assessments could sometimes be misleading and deceptive. Even when there is a yield advantage in the rehabilitated plots, such an advantage may appear to diffuse away with time. It is a known fact that any land planted to tea suffers varying numbers of casualties and such deaths are expected to be continuously replaced with good, healthy and vigorous, specifically-grown nursery plants. Under experimental conditions such monitoring and infilling is done very carefully and promptly. Having continuously filled all such vacancies and subsequently when the yield data from such established infilled plots are determined to carry out an overall assessment for yield differences, there have been instances where such differences have not been statistically significant. Such a situation could indeed be misleading! The real advantage of the initial stage of soil rehabilitation is in respect of the early establishment and early growth of the newly planted tea and this beneficial effect is expected to carry over for a very long time.

If one is to measure the early growth and determine the actual number of casualties during this period of establishment, there is a significant difference, with a greater number of casualties in the unrehabilitated land. This difference is very pronounced in average lands (irrespective of whether such lands had been under tea or rubber) and less obvious in exceptionally good lands. The monitoring and resupplying of large areas planted to tea is a very tedious, time-consuming and expensive exercise that is often difficult to cope with.

Furthermore, in the unrehabilitated land there are a significant number of plants that do not die immediately but continue to remain as weaklings that pack up later, especially during unfavourable weather. This could again be deceptive in the early assessment of casualties. There is no guarantee that the supplies that go into such unrehabilitated areas would themselves survive for too long.

RECENT FIELD OBSERVATIONS

A carefull inspection of several areas in the low country have shown that the newly planted clearings, planted to areas that had not been rehabilitated, have suffered very badly, especially during droughts. Further, young tea plants growing under stress conditions readily succumb to stem canker. Since of late, we have come across many cases of tea into rubber areas with no rehabilitation, where the incidence of stem canker and death amongst the replanted tea have been alarmingly high. This may well be as a result of the inadequacy of the basic soil requirements, or due to the lack of adequate soil renovation prior to planting tea.

CONCLUSION

With all the above experience and knowledge gained over the years, it would be unwise and unscientific to change or even vary the policy with regard to soil reconditioning under a grass cover crop, prior to replanting tea. There are always bound to be a few rare exceptions to the general rule and we cannot vary our policy simply because of a few exceptional situations. On the other hand, if we are to relax our policy by allowing direct planting under very special situations, we would be inundated with claims and requests for inspections of such areas. This would be impracticable.

The staff of the TRI recently inspected 175 locations of old rubber lands earmarked for planting into tea (tea x rubber). Of this number, 78 locations were pronounced as unfit for tea under any circumstances, whilst of the remaining 97 locations, 92 very definitely needed soil reconditioning.

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