

REMEDIAL MEASURES TO IMPROVE THE PRODUCTIVITY OF LOW-LYING TEA LANDS

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Tea cultivation by smallholders has seen a rapid expansion in the low country during the last two decades. Unfortunately, in this process, a sizeable extent of seasonally ill-drained, low-lying land has been planted with tea. The main reason for this, no doubt, is the shortage of suitable land for cultivating tea. Another contributory factor is the perception among smallholders that tea is more profitable than any other annual or perennial crop, even in low-lying land. In fact, tea often appears to do quite well on low-lying land (Plate 1).

Recent surveys reveal that low-lying lands could yield around 6000-8000 kg/ha/yr by the second pruning cycle. However, these yields are not sustained and there is a rapid decline owing to the high rate of casualties. In well-drained tea fields on high ground, the productivity remains at a high level over several cycles (Fig. 1).

Clearly, it is not possible to advocate the planting of tea in low-lying land, although as mentioned above a considerable extent has already been planted with tea. The incidence of bush debilitation and casualties, in both young and mature clearings in low-lying land, has increased steeply during the last few years.

This paper attempts to raise the awareness of tea growers on the limitations of low-lying lands and their soils for tea cultivation and their adverse effects on the tea, and also to set out remedial measures to minimize these adverse effects and improve productivity.

Characteristic features of low-lying lands and their soils

Soils of low-lying lands are mostly alluvial. Alluvial soil is clayey in texture and has a very fine structure. Well-compacted layers of clay, resulting from the vertical movement and accumulation of clay particles, may occur in the subsoil.

The soil layers are often interspersed with gravel, and these compacted soil layers form hard pans which act as a barrier to root penetration and seepage. The well-aerated topsoil layer is very shallow, and the underlying hard pan retards seepage which could lead to a perched water table in the shallow top soil.

Low-lying lands in valley bottoms are also vulnerable to flooding during heavy rains. These conditions adversely affect the development of the root system of tea bushes, the

roots being limited to the surface layers. This combination of shallow root systems and shallow soils leads to heavy casualties even during a mini dry spell.

Symptoms shown by tea in ill-drained and low-lying lands

The most striking features of affected tea bushes are a thin plucking table and bushes with weak and sparse canopies, which are the result of defoliation and failure to produce new leaves. Other symptoms observed are the excessive formation of dormant shoots (called 'banji'), stunted growth, discoloured foliage, and profuse flowering and fruiting. When the conditions are more severe, the bushes could defoliate completely, and all of them do not fully recover. Recovery from pruning is also generally poor.

In most cases, the bushes are shallow-rooted, and some roots tend to grow towards the surface making the root system resemble an inverted umbrella. Roots become swollen and brittle. The development of feeder roots is typically poor and confined to the surface layers of the soil. Lenticels, which facilitate gas exchange between the atmosphere and the internal tissues, are pronounced and are a common feature in the collar region of the affected bushes..

Measures to improve tea productivity in low-lying lands

Remedial measures are generally directed towards strengthening the root system. Therefore, in planning remedial measures, it is necessary to ascertain how the root systems have been weakened. If the root system is shallow, the causal factors are either water logging or a shallow soil. If it is water logging, the drainage should be improved. A poor lateral spread of roots points to unsatisfactory physical conditions of the soil. Soil physical conditions can be improved by adopting an integrated package of good agricultural practices (GAPs).

Tea in low-lying areas, showing the symptoms of debilitation described above, will benefit from the following GAPs which will help to improve soil conditions, and thereby minimize the casualties and increase the productivity of such lands:

- Rest the bushes and adopt light plucking until the affected bushes recover completely.
- Drain off excess water by constructing drains, about 3'-3.5' in depth (90-105 cm).
- Loosen the compacted soil layers by frequent envelope forking in alternate inter-rows. Clods should not be turned over to minimize disturbance to the feeder roots. Fork only when the bush has developed sufficient foliage. Forking should not be done during, or prior to, the onset of dry weather.
- Incorporate compost material into the soil during envelope forking. Thatch forked area with grass or shade tree loppings to minimize the loss of moisture. This will also improve soil fertility.
- Apply a drenching spray of a suitable fungicide to the frame of a tea bush, every 2-3 months, to prevent any pathogenic infection.
- Maintain a good stand of shade trees. This will reduce casualties.
- Avoid hard pruning. Practise lung pruning after resting the bushes for 2-3 months.

- All weak and dead plants should be uprooted, and vacant patches planted with mana or Guatemala grass for a minimum period of two years, before infilling.
- Only healthy and vigorous nursery plants, of recommended cultivars, should be used for infilling.
- Avoid planting TRI 2026 which performs poorly under low-lying conditions. Cultivars which are characteristically shallow-rooted, like TRI 2023, perform better in low-lying areas than cultivars with deeper root systems (TRI 2026). Hence the selection of cultivars is of paramount importance for sustaining productivity in low-lying areas.

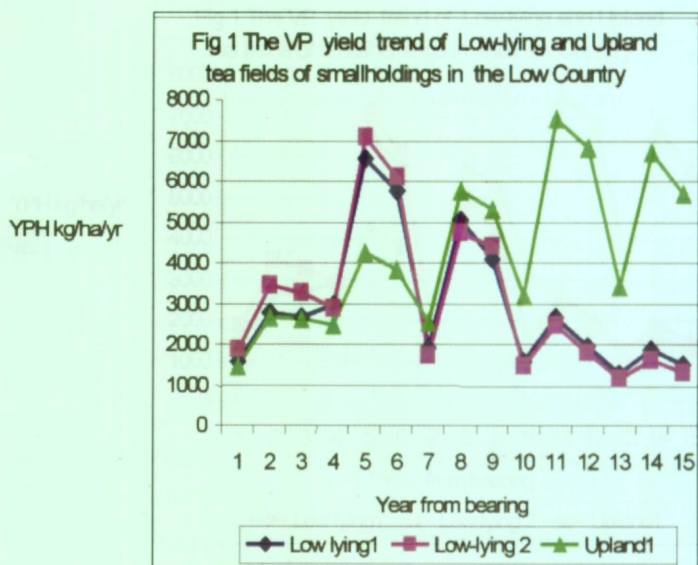


Plate 1. Low Lying VP Tea Field of Small Holding in the Low Country