

INFILLING TEA FIELDS

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As tea bushes become older, deaths occur for various reasons. Most of our seed tea which still constitutes about 85% of the tea area is more than 70 years old and have past their prime. Seed tea, by its very nature, shows variability in genetic constitution resulting in varying natural life spans and in differences being seen towards pests, diseases, drought, cultural operations like pruning, competition from neighbouring tea plants, etc. If a casualty occurs in a tea field, it could be due to the natural death of the bush if other causes cannot be attributed to it. These differences in behaviour will not be seen all at once. Tea, being a hardy plant can survive many adverse conditions but there comes a time when their resistance based upon their individual genetic constitution, break down for one reason or another, resulting in their death. Weak plants could succumb to many adverse conditions but pests and diseases could eliminate healthy plants as well.

Since the aim of infilling is to have an optimum stand per hectare that would result in optimum productivity levels it is imperative that vacant patches should be infilled continuously in order to achieve as complete a cover as possible and maintain productivity at the highest possible level.

Many management and cultural practices adopted in the past have affected the health of the tea bush. The low pruning practiced until recently removed a lot of good wood leading to poor frame development. Removal of leaf bearing branches at pruning exposes the bark of the frame which has been shaded for 3-5 years. Such tissues are liable to scorch after a short period of exposure to direct sun. Over several cycles of pruning such scorched areas can accumulate on the frame leading to wood-rot and weakening of the bush.

The application of high rates of fertilizer, forking, widespread use of fungicides etc in the post-war period which were geared to improve crop, affected the general crop environment and the consequent impact of some of the pests on the crop also varied in magnitude like the shot-hole borer which preferred healthy vigorous bushes. The large scale removal of shade trees in the mid-sixties has resulted in a general increase in the air temperature and has led to the mass appearance of swarming termites. Some of these shade trees were suitable alternate termite hosts which served to cushion the attack on tea. Root diseases, especially in the up-country have had an adverse effect on seed tea. During recent years recurrent droughts have become progressively more serious and this would have had an adverse effect on the weaker bushes already debilitated and as a consequence are more prone to die at pruning or during a drought. Further, the up and down planting of seed tea has led to valuable topsoil being washed away and thus the tea now existing on poor soil could not be expected to live long.

It is felt that in most instances the extent of vacancies is generally in the region of about 15-20%. Replanting as a means of increasing production will undoubtedly be of tremendous benefit in the long-term. In the short-term, the loss of crop that is inevitable as a consequence of uprooting tea and until the new tea comes into bearing will be quite enormous. It is in this context that the practice of infilling assumes a major role of sustaining and even improving yields of tea. Suppose we consider a tea field giving 1,350 kg/ha/an with a stand of about 7,400 bushes/ha. The yield per bush would thus be 0.18 kg/an. If we can resupply even 740 plants/ha which are twice as good as the original stand then it is possible to increase the yields by at least 260 kg/ha/an in 4 to 5 years time.

All estates should evolve a development programme which takes into account the totality of replanting and infilling that has to be done in the long-term in which the priorities are clearly outlined. Operations like infilling should then be carried out within this framework of development. This will involve categorization of fields which is best done on a regional basis. All high yielding seed tea with better stands where soil degradation is least would be expected to be retained for a longer period of time and would fall into

'A' category. Those giving relatively low yields on account of poor jat and the ravages of pests and diseases are the ones which would fall into 'B' category and will be the fields earmarked for replanting. It is the A category fields that should be consolidated and upgraded as they would be retained for at least 4 to 5 cycles so that we achieve optimum productivity with an optimum stand per hectare. It would be futile to infill a field that is due for replanting in about 10 years time. In practice infilling will commence from the highest yielding fields and extend through the moderate yielding fields in the A category up to the upper end of B category fields. Initially fields that need infilling should be identified on a priority basis by evaluating the extent of casualties in each field and infilling should be done according to a plan. Once a development programme is drawn up one should stick to it for its successful implementation. In the present context of high cost of replanting every effort must be made to commence infilling in a systematic and organized manner. Infilling should be done in pruned fields and an estate should undertake only what it can successfully handle. As infilling will not be done in all the fields that are due for pruning as it will entail too much of work, it should be done in only those fields that need immediate infilling according to priority. In such cases it would be preferable to advance the pruning of such fields so that by the time vacancies are ready to be supplied the prunings will not be a hindrance. If pruning could be done one to two months before the monsoon in the SW belt the infilling could very well be done before the rains tail off. It could be argued that one would like to harvest as much crop as possible during the rush period especially if the factory is geared to take in a heavy load and then prune such fields. But what is not realized is that long-term benefits are being sacrificed on the alter of immediate returns. Besides, when pruning is done at the end of the rush period, recovery will be poor as starch reserves will be low at the time of pruning. Areas in the SW belt should make an attempt to advance their pruning to March/April so that infilling could be done by June. In the Uva, it would be preferable to advance the pruning of fields where infilling is to be done to August/September so that supplying could be completed by November. However, if for one reason or another the infilling cannot be done at the above stated times, then this should be done in the following main planting season appropriate to the area.

If this be the case, then the period from pruning to infilling will extend to just over a year.

The argument in favour of early infilling is that the young plant has to compete with the already established tea for water and nutrients which would be quite exacting under adverse conditions if infilled later, unlike re-supplies in clearings where competition is with plants of comparable size. Further, if infilling is to be done later, the pruned bushes would have recovered by this time and they may smother the new plants and there would be much greater competition.

It is important that before infilling the cause for the vacancies be identified and appropriate remedial measures undertaken. Where casualties have been due to root disease or the up-country live-wood tea termite the normal practice of uprooting diseased bushes, clearing and fumigation of infected areas should be undertaken well in advance of the monsoon. A limitation to the success of the infills may be the fact that they are being supplied in patches which have not been rehabilitated. In this respect, all vacant patches should be spotted out early in the cycle and planted to a grass until the field is infilled. For this purpose Mana or Guatemala grass could be used. However, if Guatemala grass is used it must be kept in check as otherwise it usually overgrows and smothers the surrounding tea bushes. If vacant patches are left exposed, weeds are likely to grow on it and when removed some of the topsoil will be washed away with the rains. Even if the scraper is not used, this patch being exposed to the sun and rain will lose its structure and soil organic matter which can eventually have an adverse effect on the neighbouring bushes. If patches are left vacant for sometime these should be forked to aid the root growth of the young plants. Such vacant patches should receive priority before infilling double or single vacancies. High yielding seed fields would merit the infilling of single or double vacancies.

When infilling nematode infested fields, even in the case of nematode tolerant plants, care should be taken to incorporate one of the following nematicides with the soil in the planting hole. For this purpose, 7 g (1/4 oz) of either Carbofuran (Furadan, Curaterr) 3% G, Fenamiphos (Nemacur) 5% G, Fensulfothion (Terracur-P) 5% G or Aldicarb (Temik)

10% G should be mixed thoroughly with the soil in the planting hole, at the time of planting, remembering to ensure a good direct contact with the feeder roots of the plant. The use of 7 g of either Furadan or Terracur P is also advocated when re-supplying patches that have been uprooted due to the up-country live-wood termite infestation.

It is desirable to plant supplies in blocks as larger patches offer the best chance for concentrated effort when after-care operations are undertaken. All weak or low jat bushes in the vicinity should be uprooted and the entire area re-supplied rather than leaving an odd seed bush within this area, however productive it may be as the returns from the clonal supplies would more than compensate the loss from the seed bushes. As far as possible the patches should be blocked out into convenient units. Larger blocks could be planted along the contour while smaller units may be planted up and down the slope. The planting holes should be about 30 cm (1 ft) in diameter and 60 cm (2 ft) deep. The incorporation of well rotted tea fluff, cattle manure or compost in the planting hole is desirable. It is imperative that for purposes of infilling, very healthy vigorous plants are used. For this purpose it is recommended that older plants are planted as infills. In the up-country these infills should be about 15 months, in the mid-country 12 months and in the low-country nine months of age at the time of planting. Here in order to obtain plants of this age to be in readiness for planting at the appropriate time, the planting of cuttings should be accordingly advanced. These plants should be raised in larger sized polythene bags, measuring 15 cm x 30 cm (lay flat). In the nursery attention should be paid to encourage the lateral spread of the plant by disbudding when the plants have five to six fully exposed leaves.

In many instances, it is common to see substandard plants which are left overs after clearings have been planted, herded away in a corner of the nursery. These are meant to be the infills for the following year. It must be appreciated that if these plants are used for infilling they would be the first casualties at times of stress and then the vacancies have to be re-infilled. It is urged that the use of such plants be stopped forthwith and only healthy vigorous plants be used for infilling.

Another serious shortcoming is the lack of adequate after-care once the infilling is completed. As mentioned earlier the young plants have to compete with old tea under adverse conditions. Infilling is a once and for all task and these plants would, if successful remain in the field for several decades to come. They should be thatched adequately with loppings of grass and kept weed-free; if the blocks are sufficiently large they could be provided with even a low shade. The plants should be protected with baskets and sprayed against mite and tortrix pests during the dry weather and against blister blight during the wet weather. They should be regularly fertilized as for young VP tea plants in clearings with T 200 fertilizer mixture. Over hanging branches of the surrounding tea should be trimmed back periodically to admit more light to the young supplies. It is preferable to delay the bringing into bearing operation whenever possible and to treat them somewhat lightly. Plants may be centered around 23 cm (9") and later between 30-38 cm (12"-15") and tipped at 46 cm (18") and brought into bearing.

The success of infilling would depend on how well the programme has been planned out. It is desirable that a clearly defined programme is drawn up covering several years. As far as possible the number of vacancies should be estimated in advance. Proper categorization of fields is essential in order to identify the right type of field that should be infilled. This will help prevent infilling the wrong type of fields such as some of the fields in the B category as is being done in many instances.

Field evaluation and observations indicate that the following clones are suitable for infilling:

Up-country: TRI 2025, DN, CY 9, N 2, DT 1, K 145

The above clones are all tolerant to eelworm.

Mid-country:

Wet zone: TRI 2025*, CH 13**, DN, CY 9

Dry zone: TRI 2025*, DN, CY 9, DG 7, DG 39

Low-country: TRI 2016, TRI 2025, TRI 2026, TRI 2027,
DG 7, DG 39, S 106.

*Susceptible to shot-hole borer

**Resistant to the burrowing nematode *Radopholus similis*