PRUNING

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INTRODUCTION

Pruning is essentially the artificial removal of the leaf bearing branches of the plant. It may involve all or more commonly most of the leaf bearing branches. The operation is aimed at keeping the size and vegetative vigour of the plant in a condition most conducive for maximum vegetative growth and cropping.

Objectives:

The main objectives of pruning tea are:

1) Maintenance of a convenient height for easy harvesting

2) Stimulation of vegetative shoot growth

3) Maintenance of a healthy frame

4) Effective utilization of the hectarage and stabilization of crops

Styles of Pruning:

Pruning can be of several styles, each one imperceptibly leading into another, covering the full range but three broad categories may be recognised:

Style	*Height*	*Frame sanitation*
1. Clean prune	10 -16 in. (25 - 40 cm)	Partial - complete
2. Rim lung prune	16 - 22 in. (40 - 55 cm)	Partial - complete
3. Cut across prune	22 - 28 in. (55 - 70 cm)	Nil

In pruning terminology low, deep, hard, or heavy are synonymous with extensive frame removal and high or light with less frame removal.

Until very recently pruning in Sri Lanka has been indiscriminate and hard especially in the up country where the height of prune ranged from almost collar level to about 10 in. This was because of the mistaken belief that the harder the prune the more will be the vegetative vigour of the plant. Hard pruning has, however, been shown to result in delayed recovery, poor root growth, reduced thickening of the collar, poor frame development, debilitation and in some cases death of plants.

Thus over several cycles of hard prune our teas have been extremely debilitated resulting in poor frames. This has led to deterioration of the soil due to exposure to the sun and also to erosion of top soil by rain.

More recently lighter forms of pruning as suggested above have been recommended. It must be pointed out that these are general guidelines and no one style or height of pruning is applicable under all situations or for all types of tea.

Consequences:

Pruning removes substantial amounts of leaves and branches which result in a drastic reduction in photosynthesis which curtails the amount of food that is transported to the roots; besides, the roots, particularly the feeder roots, also consume large amounts of carbohydrates by respiration.

Pruning exposes the bark of the frame which has been shaded for 3 - 5 years. Such tissues are liable to scorch after short periods of exposure to direct sun, due to rise in bark temperatures which can be about 10 to 15° C above ambient air temperatures. Shaded leaves when exposed to the sun after pruning also get scorched within a few hours. Removal of shade trees can therefore accentuate scorch of branches and leaves. Thus, over several cycles of pruning which has been generally hard under Sri Lankan conditions

the scorched areas can increase and effectively reduce the number of emerging buds leading to a weakening of the bush, wood rot and reduced crop. Low bending adopted earlier also renders the frame more liable to sun scorch after pruning, particularly in the absence of shade.

Carbohydrate reserves:

Pruning may be considered somewhat similar to the natural seasonal shedding of organs such as leaves or even branches, common in temperate trees but in the case of the latter the plant prepares itself for this change by accumulating sufficient carbohydrate reserves so that recovery and subsequent growth will not be impaired. In pruning tea, if we are interested in sustained cropping, we should also prune at a time when root carbohydrate reserves are at its maximum so that recovery and vigour of the plant will not be impaired. By pruning at this time we tend to lose some crop, as this is also the time when rush crops are obtained. This temporary early loss of crop is negated when one considers the long term health and production of the plant.

In Sri Lanka, total carbohydrate reserves in the tea roots are around 10% just above sea level and this progressively increases upto about 30% at about 7000 feet. Reserves are therefore most important for tea at the low elevations where the presence of lungs serve to augment the generally low root reserves and aid in recovery. It is also now considered useful and sometimes necessary for high grown teas for satisfactory recovery and hence one should not unduly deplete this by wrong pruning practices and debilitate the plant. Hence even in the up country it may be desirable to leave 3 to 5 healthy lung branches at the periphery carrying in all about 200 - 300 leaves per bush to facilitate bud-break and minimize dieback. The lungs should be removed at the correct time following recovery of the pruned branches to allow rapid growth of the new shoots as well as permit bud

growth which have been suppressed till now lower down on the lung branches because of apical dominance. Lungs should therefore be removed when the majority of the recovering shoots have produced 3 - 4 leaves and when they become self supporting. It should be noted that too early or late removal of lungs should be avoided for the reasons stated above.

Time of Pruning:

Most estates in Sri Lanka receive the SW (April - July) and the NE (October - December) monsoons but the SW monsoon is the more assured one. Pruning therefore should be undertaken around April - May, when root reserves are high, after a few showers and when there is sufficient soil moisture, although it will involve some loss of crop. If all the earmarked fields cannot be pruned at this time for practical reasons then the major portions of the better fields should be pruned in April - May and the rest during the NE monsoon in September - October. In areas receiving only the NE monsoon, pruning should be undertaken, again after a few showers and when there is sufficient soil moisture, in September - October.

As a general rule pruning into the drought is not advocated and should be avoided but in marginal moisture areas, dry weather pruning may be carried out to conserve moisture and minimize casualties. However, dry weather pruning leads to enormous incidence of sun scorch on the upper surfaces of the frame leading to poor recovery, debilitation and wood rot and if done for any reason steps should be taken to minimize this by spreading the prunings over the frames. This is particularly important in the absence of shade.

In fields earmarked for infilling, pruning may be advanced a little into the tail end of the drought to accommodate infilling early at the correct time which is also the normal pruning time. If this is not possible, infill in the following main planting season.

Length of Pruning Cycle:

The extent pruned each year will depend on the length of the pruning cycle and to even out crops over the years equal extents of good, average and poor teas should be pruned. There are a number of factors which need consideration in determining the length of pruning cycles, the chief among which are jat, elevation and cropping pattern. Pruning height should also be suitably adjusted to suit the length of the pruning cycle. In general, a cycle length of two years is adopted for tea just above sea level with progressively longer cycle lengths of upto 6 years for tea upto about 7000 feet elevation. Once a pruning cycle length has been decided upon, depending on the above factors, no *ad hoc* changes should be done as it will upset the other cultural programmes and inputs which may not have been estimated for. In the Low-country, we now recommend that the pruning cycle should be three years instead of two years.

Recovery from Pruning:

Satisfactory recovery from pruning and productivity of the bush will depend on the style and severity of prune, state and activity of the root system and its reserves, time of pruning in relation to crop, state of health/ debilitation of bush which is a reflection of previous pruning practices, nutrition of the bush, condition of the soil, rainfall distribution, etc.

Tipping height:

It has been the normal practice in Sri Lanka to tip the shoots at a height retaining 2 mature leaves above the height of prune. This is also a rather severe treatment considering the hard prunes adopted earlier because it has been shown that the upper two or three leaves in a shoot normally supply food material to the shoot above while the lower leaves in a shoot will supply food material to the root system and augment root reserves. Thus, leaving only 2 leaves at tipping time will result in the photosynthates

moving to the developing axillary shoots and in the root reserves being depleted due to root respiration. Recently we have recommended that the shoots be tipped leaving 4 to 6 mature leaves above the pruning cut. Early tipping or plucking-in should be discouraged as this will retard thickening of the stems although some early crop may be obtained by doing so. Delaying tipping or resting after pruning will help in developing much sturdier stems thereby contributing to future crop. In cases of debilitated tea, resting before pruning will generally help in improving root reserves and thereby improving the chances of recovery following pruning.

Time of Fertilizer Application:

The quantity of fertilizer applied should be related to the crop. Therefore the quantities applied at the first application after pruning and at the last application before the next prune should be lower than those given in the rest of the years when production is high. It is recommended that fertilizer application be suspended 2 - 3 months prior to and following pruning. Under Sri Lanka conditions no special fertilizer mixtures are now used to aid recovery and frame development. This may merit consideration.

PRUNING OF OLD SEED TEA

Pruning of old tea deserves special treatment compared to the more recently planted clonal teas because of the extreme debilitation and wood rot which has resulted over several cycles of hard pruning. Hence in ageing seed tea areas, not earmarked for replanting in the near future, appropriate pruning methods should be employed as a means of bush renovation. Rejuvenation pruning had at one time or another been suggested as a means of overcoming bush senility and renovating the plant. Rejuvenation pruning would serve the purpose of frame renovation with reasonably healthy high jat bushes on better soils as was shown

under South Indian conditions but the operation is too drastic and may result in a high percentage of deaths in addition to delayed recovery with our predominantly low jat seed tea on shallow, eroded soils.

Plantations in the high country have over the years pruned the tea at 20 - 30 cm which delayed recovery, resulted in poor frames and even caused death of bushes. To avoid casualties and obtain quicker recovery a lighter form of pruning at 40 cm is advocated for high grown tea. Where there is an accumulation of wood rot and cankered branches due to faulty pruning in the past, it may be difficult and not desirable to clean out the frames in one operation. In such instances, the renovation should be phased over 2 or 3 cycles. Thus while maintaining a height of prune of about 40 cm throughout the field, individual bushes with extensive wood rot and dieback could be pruned low or the affected branches removed or a combination of both practices adopted effectively with advantage without much loss of crop. Once renovation of primary branches has been effected in this manner successive prunes have to be done at a higher level so as to increase the cropping potential by increasing the length of stem on which the buds could develop and which will increase the number of flushing points thus contributing to higher crop. A lower prune should then be resorted to only when there is sufficient justification to do so perhaps after 3 or 4 prunes when the height becomes unmanageable.

Unnecessary reduction of frame, either by a lower prune or by removing good healthy branches, is inadvisable.

Bush sanitation:

In the management of perennial pests like the Shot-hole Borer and the low-country live-wood tea termite timing of pruning, bush sanitation and the painting of pruned cuts with fungicidal paints and water sealers are advocated, in addition to the use of tolerant clones.

Labour requirement:

The labour requirement for normal pruning will be about 40 - 60 men per hectare but when extensive cleaning out or sanitary pruning has to be done, the labour requirement will be higher.

RENOVATION PRACTISED IN INDIA

In South India it has been claimed that increased crops have been obtained by a combination of several practices such as judicious rejuvenation pruning at which time the cavities in the bush, if any, are filled with mortar and pruned cuts painted with a slurry of copper fungicides in raw linseed oil, spraying of lime, proper tipping height, special manure mixtures following pruning to aid frame development with high levels of potash, eg. 1:1:2 NPK mixture, infilling, timing of pruning and the leaving of sufficient lungs at low elevation, bush sanitation, spreading of chopped prunings between tea rows, use of herbicides etc. However, it must be pointed out that rejuvenation pruning in South India results in only a very small percentage of casualties (about 5%!) as compared to the high casualties which result under our conditions.

In South India with the widespread incursion of blister blight infection in 1946, dry weather pruning was resorted to minimize infection. This resulted in severe sun scorch of the frame followed by infection by *Hypoxylon* species which caused deep cankers and wood rot on the frames of otherwise sturdy bushes. The necessity for rejuvenation pruning in South India arose as a result of high percentage of infection by *Hypoxylon* species upto 60% which resulted in wood rot on otherwise apparently healthy bushes on good soil. Under Sri Lanka conditions this is apparently not so and the bushes have been debilitated over the years by a combination of several factors and therefore an indiscriminate rejuvenation prune does not prove satisfactory and results in high casualties.