TEA PLANTING IN RETROSPECT

P. J. C. Durrant

Retired Planter and Visiting Agent

SENIOR STAFF- In those days, large Groups, extending upto and over about 5,000 acres, were in-charge of:

	TAMIL	*SINGHALESE*
Manager ..	Peria Dorai	Loku Mahathmaya
Assistant Manager ..	– do	– do –
Superintendent ..	– do –	– do –*
Assistant Superintendent..	Sinna Dorai	Punchi Mahathmaya

The Manager was in overall charge of the Group, assisted by an Assistant Manager and Superintendents in -charge of Divisions extending upto and over 1,000 acres. A Group consisted of a number of small estates joined to an estate.

In the early 1920s, when I started planting on a large Group as Sinna Dorai or Assistant Superintendent immediately under the Manager or Periya Dorai, there were independent Visiting Agents and in this case a Director from the Agency House at Colombo visited the Group.

In addition to the Senior Staff, there was in each Division a Field Staff consisting of a Head Kangany, Junior Kanganies, a Conductor, now known as a Field Officer, and a Kanakapulle, now known as a Supervisor.

The Head Kangany was the man responsible for the recruitment of labourers, who were placed under the Kanganies, and he was paid six cents per head (pence money) to ensure that the workers turned out to work regularly. The Head Kanganies were able men and were useful to the Superintendent in dealing with the labourers and in supervisory work.

The labour force was of South Indian origin and was distributed throughout the Mid-country and Up-country estates. The Low-country estates were manned by workers from the surrounding villages. The women were excellent pluckers, but many of them are now no longer available, as some of the more educated girls prefer to obtain other employment outside the estates, and there is therefore a shortage of pluckers, especially around the Galle District.

There was a time when labourers from South India were recruited and they had to cross over to Ceylon at Talaimannar and walk to the estates from there until the railway was extended from Talaimannar to Kandy and also from Colombo to Kandy and from there to the up-country estates. Motor transport was not available at that time. The staff and the labourers had to walk to the towns and to the railway stations. I myself had to walk about 25 miles up and down. The Managers rode if they had horses.

CLERICAL SERVICE: The Head Office was in-charge of a capable Head Clerk and Assistant Clerks, who were responsible for the accounts and attended to clerical work, which come under the Manager or Superintendent of the estate.

MEDICAL: The Group provided medical service for the benefit of the staff and labourers, and there was a Divisional Hospital with about 30 beds, in-charge of a qualified Head Dispenser, who visited the Divisions and saw to the sanitation of the lines and staff quarters.

The District Medical Officer was available to assist the Dispenser when needed. He would ride up to the estate on horse back, where horses were available, and return on foot to the District Hospital. No motor transport was available then.

Staff and labourers had to walk to the towns and railway stations and back when necessary. As already mentioned, I too had to walk upto 25 miles.

SCHOOLS: A school was provided for the elementary education of the children.

WAGES: These were:

	1910	1928	1929	1930	
Men	33	45	54	54	cents per day
Women	27	40	43	43	– do –
Children	25	30	35	35	– do –
Cost of rice	4.40	6.40	64.0	6.40	per bushel

By present standards, these rates would appear to be ridiculously low in keeping with the market price for tea and other commodities. The labourers had enough to eat. The rice was eaten with chilli gravy, calledRassam, with a piece of burnt dried fish. Rice at that time was imported to Ceylon from Burma at a price at which Ceylon was unable to produce this commodity.

ACCOMMODATION: Staff and labourers were provided with well built quarters. The labourers lived in sets of Lines comprising 6 to 12 rooms 10'x12' each with leak-proof roofs of corrugated galvanised iron. As time went by, a kitchen was added to a room and the verandah was enclosed. Later, the word "Line" acquired unpopularity from those interested outside the estates. The labourers preferred to live in groups for protection and companionship.

The Line type of building could be compared with Flats in Colombo, which are built upwards as against Lines built on estates on the ground and provided with a garden behind each room and plenty of land in front for children to play.

MUSTER: One of the most important functions of the day was Muster at 6 a.m. The Head Kangany, the workers, the Field Staff and the SD (Sinna Dorai) had to be present at the Muster Ground, from where labourers were detailed to their respective works and the number present was recorded. A Muster Chit with details was sent to the Head Officer for the information of the Manager.

The Muster Ground was connected by an internal telephone to the Manager's bungalow office, and the Manager would ring up to give any instructions or to find out whether I was present at Muster. If not, an explanation would be called for after Muster. The SD and the Field Staff had to go to the fields with a copy of the Muster Chit and check the number of workers present and record it.

In the evening too there was a Muster to enter the names of the workers in the Check Roll by the Conductor and these were later sent to the Head Office to be checked and forwarded to the SD or the Superintendent, who had to transfer the names to the big Check Roll and at the end of the month complete the wages and send this to the office by the 5th morning of the following month to be checked and for the Manager's inspection before pay day. The Assistants paid the labourers, and the former had to be dressed complete with tie, in the interests of discipline.

PRUNING: My Manager, the Peria Dorai, considered pruning to be one of the more important field works, so much so that the Assistant Manager once told me that "Pruning had started and that the Manger had the 'knife' in his heart and for me to be careful". The Manager, being a perfectionist, insisted that apart from the removal of unwanted wood such as knots, snags and diseased wood, only healthy branches should be left in the pruned frame to produce vigorous bud growth, the cuts on each branch left should be perfectly levelled and the top of each branch had to be even. This was really not necessary, as, when a pruning knife is swung across a branch, the cut would be at an angle of about 45°, and this should be satisfactory. The Manager's argument was that if the cut on top was not flat, the new shoots round it would be weak, and that was that. He would place a pebble on the cut, and, if it fell, there was an uproar.

The Manager would visit the field in pruning as often as he could, but made it a point to start his inspection from where he left off the last time and go through the field to ensure that each bush was correctly pruned. The pruners were experts, and it so happened that there was a large tea bush in the field in pruning and when the Manager visited the field, he looked for this bush but could not locate it. In its place, however, he noticed a heap of prunings, which he kicked away, and, to his horror, he found that his pet tea bush had been collar pruned at ground level and had been covered with prunings. What had happened was that on the previous day, the experts among the pruners got together and pruned the bush. Then one of them noticed a branch that had been pruned rather lower than the others and the frame had to be re-pruned to a level, and, by the time the experts had finished with the bush, it had to be collar pruned and covered with prunings, hoping that the Peria Dorai would not notice it. There was, of course, the usual rumpus.

The Head Kangany of the Disvision was sent for and was made to carry the frame on his head to the Temple, with the pruners following behind, and a "Swamy-Kumbudu" (religious ceremony) was performed as a lesson to all concerned, which they would not forget.

In my opinion, a bush, at each pruning, should receive a clean sanitary prune, leaving lungs, one to each main branch, to help recovery without die-back. What is needed is a clean prune rather than a heavy one.

The pruning cycles then were, as now, 3 to 5 years within the elevation of 2000′ to 6000′. At lower elevations, where Shot- hole Borer is prevalent the new growth should be protected as now recommended by the Tea Research Institute. Tipping should be at a height of about 6" above the pruned level, on hard green wood, resting bushes slow to recover and bringing them into bearing at the existing plucking level when recovered.

FERTILIZER APPLICATIONS: As far as I can remember, fertilizer applications were based on yields and were made with Sulphate of Ammonia mixtures. At that time, Ceylon did not have a Tea Research Institute to advise the Planters. It is possible that Ceylon followed the recommendations of the Indian Tea Research Institute. I don't know, but what I remember vividly is that the fertilizer was forked deep into the soil at each application, in alternate rows, with mulch from green manure loppings pushed into furrows and in pruned fields leaves from prunings as well and the twigs left on the soil.

The Manager would, on his rounds, press his blunt walking stick into the soil and measure the depth, and it was never deep enough. This is why, perhaps that on some up-country estates the tea bushes are still standing on their toes in steep, soil eroded sections.

The present view is that fertilizer is better broadcast in both rows and forking done once a pruning cycle to break up the hard pan caused by workers walking on the rows.

The possibility of using urea as a substitute for sulphate of ammonia has been under investigation for sometime by the Sri Lanka Tea Research Institute. I quote Dr. V. P. Bhavanandan of the TRI when he addressed a symposium. On the subject of manuring he stated that the TRI was generally satisfied that urea was suitable for use in tea.

Dr. Bhavanandan also made the following points in regard to the successful use of urea:

(i) Prilled urea should be used; the crystalline variety which was the first type to be imported was unsatisfactory as it was hygroscopic and also had a high Biuret content which could result in toxicity to the plant. In prilled urea the Biuret content was less than 1%.

(ii) Urea should not be used in young tea in the first and second years as the recommended young tea mixtures contained Kieserite and urea did not mix well with this compound. However, clonal tea from its third year could be manured with urea.

(iii) The TRI recommendations so far were that urea should be applied at the rate of 40-75 lb nitrogen per acre per application. But in the light of recent experiments this should be modified and the maximum should be 60 lb nitrogen per acre per application.

(iv) The timing of application of urea was extremely important. Prolonged periods of extremely dry or extremely wet weather should be avoided. Urea should not also be applied during periods of light drizzle at the end of a dry spell. Compared with sulphate

of ammonia this was the only extra precaution required since S/A should also not be applied during extremely dry and extremely wet periods. If he were asked to elaborate on what he meant by 'moderately wet' weather, he would say that conditions were ideal if about 0.1 inch of rainfall was experienced within two to three days of the application of urea.

(v) The recommended method of applying urea was exactly the same as with sulphate of ammonia, *ie.* normal broadcasting. On estates where forking was carried out as a routine operation once in a cycle the urea could with advantage be applied at the time of forking but forking for the sole purpose of applying urea mixtures was uneconomical and was not recommended.

Dr. Bhavanandan made the following points in reply to questions asked by those attending the Symposium:

(i) If urea was applied in adverse weather conditions the loss of nitrogen could be up to 25% compared with 3% or 4% in the case of sulphate of ammonia.

(ii) There is no appreciable loss of nitrogen if urea mixtures are stored for two or three months, compared to about 2% in the case of sulphate of ammonia mixtures.

(iii) If urea is used in the form of a foliar spray, there need be no interval between the spraying and the next pluck. In fact, plucking could be undertaken even on the same day, if necessary.

(iv) Whilst the TRI was of the opinion that forking with each application of urea or forking for the sake of applying urea was uneconomic, this could give better results if urea had to be applied under adverse weather conditions. There was no danger of excessive leaching if urea was forked into the ground and in this regard it behaved in the same way as ammonium sulphate.

(v) Urea could be mixed with Gramoxone and applied in areas where weed growth was heavy or difficult to control, but this was not recommended.

(vi) Dr. Bhavanandan was asked whether in view of the increased bush cover available it would not be better to apply urea in the last year of the pruning cycle as this increased cover would minimise nitrogen loss. He stated that nitrogen losses were not significantly different under the protection afforded to the ground by bush cover and that there was therefore no particular virtue in applying urea in the last year of the pruning cycle.

(vii) Where application of urea is concerned, the amount of rainfall experienced prior to application was not as important as the weather conditions after the application.

(viii) Urea did not acidify the soil as much as sulphate of ammonia and where urea was being used additional precautions in regard to soil acidity were not required.

(ix) In reply to a question Dr. Bhavanandan stated that the potash and phosphate levels recommended by them were quite adequate and if necessary phosphate could be excluded for an year or two. Ceylon soils appeared to have adequate phosphate. In regard to potash, only moderate levels were required and experimental results tended to show that excessive potash applications depressed yields. He also stated that die-back after pruning had no connection with the phosphate levels applied.

WEEDING AND SOIL EROSION

In the 1920's we were aware that scraper weeding in the tea was harmful, in that it causes soil erosion, and steps were taken to minimise it by shortening the wooden handle of the scraper from about two feet to six inches and the metal scraper to about half an inch to reduce pressure on the soil. We also tried hand weeding without scrapers but it proved costly and had to be given up. At that time there were no herbicides, and so scraper weeding became well established.

Herbicides are now available and are tending to replace the ever more costly manual methods of weed control. The scientists have selected the herbicide Gramoxone as suitable and harmless for tea. The rate of application recommended is 1/4 to 1/2 pint of Gramoxone mixed in 50 gallons of water sprayed on growing weeds of about 5" in height. As control is gained, the Gramoxone could be reduced to 1/4 pint in 50 gallons of water and spot sprayed. Gramoxone should never be sprayed on bare soil, as it becomes inactivated and wasted and with other organic matter on the soil surface will not only lessen erosion but run-off could be reduced, soil stays put and keeps tilth, and infiltration improves, all of which add up to better growing conditions. High yields require large quantities of water. Any run-off is especially costly during periods when crops need more water for root development and to hold moisture between tea rows. It should never be forgotten that water is the limiting factor for top yield production. Without water, no fertilizer will do any good. Weeds also compete for moisture, and it is necessary to maintain the tea weed-free during dry periods with herbicides.

To make a success of herbicide control of weeds, the estate should have sufficient sprayers and trained labour.

DRAINING

Drains should be provided with pits to hold rain water to infiltrate into the soil. All contour drains and the pits should be maintained free from silt if they are to be of any use.

BURYING PRUNINGS

As now, some estates buried prunings in trenches 18" deep and others left them on the soil. This is no longer possible as labourers take the prunings for firewood. In those days we preferred to fork in the leaves with green manure loppings and left the woody twigs on the surface of the forked row. Both these operations have assisted to minimise erosion, improve moisture retention and have helped the tea to withstand dry periods.

INFILLING SEEDLING TEA

In the early days, infilling was carried out, as a matter of policy, with well grown plants from high yielding Seed Gardens available then on some up country estates, in holes 12"x18", until the idea of replanting came into being with VP Tea. It is to the credit of the earlier planters that they continued to infill vacancies in pruned fields every year and so maintained the stand per acre, and it is possible that some of the supplies are the ones we now see in plucking. I consider we should continue infilling vacancies even in VP tea. I happened to visit an estate recently where I had the pleasure of introducing VP tea some 12 years ago, and found that this particular block had vacancies and needed removal of useless debilitated bushes. Plants supplied need aftercare such as protection and thatching around them to afford moisture, manuring with T 200 Mixture and resupplying with clonal plants each pruned year, to maintain a near full stand of healthy tea.

The good practices detailed above depended on profitable prices, and, when a slump was experienced, the former were the first to be suspended and sometimes were not resumed. In the 1930's I remember there was a severe slump in both tea and rubber prices at the same time, and the staff voluntarily agreed to a reduction of their salaries, and labour rates were reduced. If I remember right, the annual averages for tea and rubber were about 30 cents and 12 cents per lb respectively, and even at these prices a few estates averted a loss.

DIVISION OF ESTATE

My preference would be to divide the acreage of the estate into four units to suit the following requirements :

1. New plant where suitable land is available;
2. Rejuvenate high yielding seedling tea;
3. Replant the medium yielding seedling tea on suitable land ;
4. Plant fuel trees on land unsuitable for tea.

In this programme I have included the planting of fuel trees because of its economical importance to the tea industry.

The acreage required is comparatively low.

For instance, a 1,000 acre estate, giving a yield of 1,200,000 lb annually, will require only 1,500 trees. Each tree would produce an average of two yards of fuel and each yard would fire an average of 400 lb of made tea or 800 lb per tree or 1,500 trees the annual crop of 1,200,000 lb made tea.

Fuel trees planted at a distance of 8' x 8' or 680 trees per acre will require 2.2 acres and if planted for fifteen years in rotation to maturity, will need 33 acres. On an estate of 1,000 acres, this acreage would not be difficult to find if fuel trees are planted along boundries, ravines

and in areas of rocky out-crops, etc. Loss of crop from tea land rejected would be compensated for by higher yields obtained from replanted and rejuvenated seedling tea.

I have also included the rejuvenated and heavily infilled higher yielding tea in order to check and increase the falling yields. The work of rejuvenation should include there moval of the moribund and dying bushes. The bushes should receive a clean sanitary prune, leaving only healthy branches providing, a lung on each main branch to avoid die-back. Re-cut and deepen the contour drains and pits to hold water, not silt. Replace overgrown shade and green manure trees and then carry out intensive infilling with well grown one year old plants. Protect the plants and thatch the ground around them to help retain moisture during dry periods Give regular aftercare and fertilizer applications with TRI mixtures and supply vacancies. Employ a regular gang of older men to undertake these works. Women are better for planting and application of fertilizer.

REPLANTING

Seedling tea with a high percentage of vacancies may be considered for replanting with the popular all rounder TRI clone 2023. It is needless to say that with a fast growing VP plant, all works connected with the replanting need timely attention. Replanting has been in practice for some years and the staff and labourers are familiar with the work involved and its importance and the organisation which is necessary to carry this out efficiently and smoothly.

All preparatory works leading to planting, replantings and infilling of vacancies in rejuvenated fields should receive timely attention to start planting with the onset of the south-west or the north-east monsoon applicable to the district, bearing in mind that monsoons have recently been short-lived and followed by longer spells of dry weather.

Weeds too need moisture and heavy growth following monsoons should be avoided by the use of weedicides to kill the weeds and leave the residue on the soil to check erosion and retain moisture to benefit the plants during dry spells.

MANUFACTURE

This is considered to be an art by those who are not conversant with the highly scientific and technical aspects of manufacture. I would suggest to the young planters and others interested in the subject, that they study the excellent book on Tea Manufacture written by Mr. E. L. Keegel, the first, Technologist of the TRI. They will then realise that there is more science than art in manufacture and they will certainly need all the knowledge and skill they possess to meet the market requirements of Sri Lanka tea.

Up-Country

Without going into details, the requirements here are a well twisted black tea, even in size, free from flakes and stalk with a bright liquor of good strength and quality.

Flavour

This is a combination of smell and taste that develops in the high elevations, particularly in the Uva district during the months of July and August, when fine weather, cold nights, dry winds and the absence of rain all combine to produce this desirable quality in the teas, which is highly valued by the trade. Unfortunately, the tea is bought for blending with teas from other neighbouring countries, to give it "a touch of Sri Lanka".

The Superintendent of an estate in the Uva once showed me a Barometer installed on the roof of his bungalow and said that when the needle pointed at a particular direction in the sky, conditions would be favourable for flavour to develop in the teas.

In order to achieve the above, a very high standard of leaf is required.

Low-Country

These teas are sold mainly on appearance. They should be black, have a good twist, be even in size and show absence of stalk and presence of tip.

Tip

High prices are paid by the trade for tippy low-country grades and their value depends not only on the length of the tip but on its characteristic golden colour. This is achieved when light pressure is carefully applied in the first two rolls to extract enough juice for its disposition on the hairs of the tips. If pressure is not applied, tips tend to be pale in colour and light in liquor and will not command the high prices which the trade is willing to pay.

Plucking

The requirements of a good standard of tea start in the field, as the saying goes that "Tea is made in the field", and one of the chief factors is plucking. The leaf has to be harvested before it becomes coarse and hard. To achieve this, plucking intervals have to be within seven days for seedling tea and 4/5 days for the fast growing VP tea. What is important is that the leaf should be succulent and soft at harvesting, to obtain a wither of about 46% for up-country teas suitable for harder rolling to produce a well made black tea and a coloury liquor with good strength and quality and for the low-country, a lighter wither for appearance of the teas and presence of tip. A correct wither imparts a hard twist to the leaf in the rollers and the dhools ferment evenly and produce a well fired tea with a moisture content of not more than 3%, essential to preserve the keeping qualities of the tea.

These are the standards observed during all these many years and the trade is used to the quality which has made Sri Lanka teas so popular. Another way to do this is through tourism, by ensuring that hotels provide tourists with cups of well brewed quality tea. Who could be better ambassadors than the tourists themselves to campaign for a cup of Sri Lanka tea?

The Manager of a Group once told me that he had a visitor from America who had never been to a tea estate. The Manager took him round the fields and the factory and the visitor's reaction was that he did not know that there was "so much in a cup of tea."