



Module No.

3

TEA RESEARCH

Institute of Tanzania



Tea Plucking



Staff Training to improve Tea Quality

**Training Module
on
TEAPLUCKING AND QUALITY CONTROL**

February 2002

FOREWORD

This is the third of a series of training modules prepared by the Tea Research Institute of Tanzania (TRIT). The TRIT occasional Paper No 1 of April 2000 titled 'Shoot Growth plus Plucking equals Profit' described how the tea shoots developed and highlighted the ways of exploiting this growth to enhance profits. This training module moves a step further in translating this information into practical use. It is intended for tea growers, and managers, extension workers and students. It is available in both English and *Kiswahili*.

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INTRODUCTION

Target Group for the module

This module has been prepared for Trainers/ Facilitators to conduct theoretical and practical sessions on Tea plucking courses.

The guidelines are also developed for subject matter specialists, supervising officials and trainers of field staff, to facilitate the training of front line extension and development agents.

Participants of the course can therefore be selected by the training organizers from a wide range of experts who are directly, or indirectly, involved in Tea plucking.

Some chapters need to be tailored to meet the education level of target groups and in house rules of particular companies.

The objectives of the training courses are:

- To establish a realistic plucking output.
- To train new pluckers and retrain, where necessary, existing pluckers in order to achieve the required plucking standards and hence.
- To improve individual performance in plucking to the benefit of the individuals in particular and the company in general.

The topics are presented in chapter form to facilitate understanding the course materials presented in the module. The trainers should refer to the chapters as a basis for the participants to understand the tea Plucking subject.

This module contains:

- Instructions for course organizer & Trainers (Presented in Annexes).
- Seven (7) chapters containing theoretical & practical materials on Tea plucking and Quality control.

Although considerable material has been made available, the trainer must base on the participants' existing knowledge to decide on the appropriate subject matter, practicals, visits etc., before conducting the courses.

The main text of each Chapter can be used as background material for the trainer but is also suitable for reproduction as handouts. These should preferably be given out at the end of each session. They can also be compiled together as books for the trainer for later reference.

DEFINITIONS OF TERMS USED IN PLUCKING

Objectives

At the end of this chapter participants will be able to:

- Define plucking standards.
- Know their effect on quantity and quality of plucking.

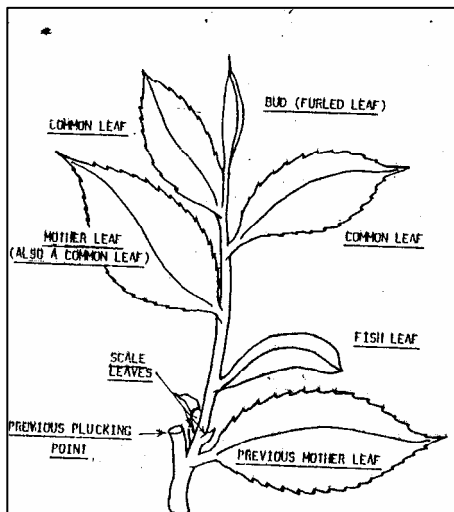
Terms used in plucking

Plucking

The skillful process of removing targeted tea shoots (2-3 and a bud) by hand. Various terms are used to differentiate types or intensities of plucking.

When plucking all the shoots that grow on the bush are taken into account, because:

- The majority of the shoots arise from the **plucked origin**. i.e. Transfer of dominance by plucking.
- There are always some shoots that appear from **un plucked origin** i.e. the growth of bud from low on the frame or a Banjhi shoot breaking dominance.



Plucked Origin

A tea shoot that has developed from the axillary bud of the leaf immediately below the point of abscission of a harvested shoot, following the removal of apical dominance.

Un plucked Origin

A shoot that has developed from a bud without the removal of apical dominance.

Figure 1: Parts of a tea shoot

Apical dominance

A growing shoot is dominant over all the buds occurring in the axils of the leaves lower down on the stem and none of these buds will grow as long as the terminal bud or top bud is present.

Plucking removes dominance and transfer it to the bud in the axil of the top most leaf on the stem immediately below the plucked point.

The axillary bud starts to grow although in a very slow pattern in the early stages but it manages to exert its dominance over all the buds lower down the stem

Selective Plucking:

The pluckers are encouraged to harvest only shoots of a specified maximum length and stage of development

This normally applies during the start of flush, which is the period of transition from cold and dry period to warm and wet period

Non Selective Plucking:

The pluckers are expected to remove all the shoots above the level of the table regardless of the size or stage of development. It is also referred as plucking black, a reference to the dark colour of maintenance foliage when all the young shoots have been removed, or hard plucking

Fine Plucking

Harvesting 2 leaves or less and a bud. Is done to produce a high quality tea and hopefully high prices, but yields will be reduced, by up to 40% compared with 3 leaves and a bud. Labour productivity will also be reduced.

Course plucking

Harvesting more than three leaves and a bud. It is used when gross yield is more important than quality.

Light plucking

Leaves some new foliage above the previous plucking level

There is a faster rise in the plucking table and hence shortening pruning cycle

Maintenance foliage is increased.

N.B. Plucking should not be too light because the plucking table will rise very quickly and there fore will cause wastage of the potential crop by leaving pluckable leaf

Hard plucking (Plucking Back)

The shoots are plucked right down to the previous plucking level regardless of their size or stage of development. No new maintenance foliage can develop. Gives high crop at the beginning followed by a depression in crop

Advantages:

- The labour does not necessarily have to be skilled
- Large yields
- High labour productivity
- The rate of increase in height of the table will be reduced compared with less severe forms of harvesting

Disadvantages:

- The risk of reducing yield if the process is taken to extremes, particularly on tea depleted in nutrients
- Low quality (Coarse, Mature, and broken leaf)
- No addition of maintenance foliage
- Delay in shoot development
- Reduction in shoot weight
- Die back of axillary buds
- More banjhi and crows feet (clusters) formation

A Banjhi shoot

Describes a shoot that is dormant and is recognized by the fact that the terminal bud is small, usually not more than 2-3 mm in length.

Reasons for banjhi formation are:

- Age of the bush from pruning
- Height of pruning
- Unfavourable weather conditions-dry spells, continuous wet weather, low temperatures
- Lack of nutrients-nitrogen, zinc
- Soon after cropping period
- Jat/clone of tea

Soft and Hard Banjhi

Soft Banjhi shoots must be plucked as soon as they rise above the plucking table, if left they might become too hard at the next plucking round. Thus hard Banjhi shoots should not normally be found above the plucking table, but if they do occur they must be plucked and discarded. (Breaking Back). Banjhi shoots below the plucking table should not be plucked, they are part of maintenance foliage. One leaf of the banjhi should be plucked to accelerate the growth

It is important that all banjhi shoots above the plucking table are plucked as soon as they appear, for three reasons:

- A soft banjhi will make a very acceptable tea. However the longer a banjhi is left the harder it becomes, with a consequent loss in its tea making properties.
- When banjhi shoots are left unplucked they remain banjhi or resting for a long time, which delays the development of new shoots. However, when plucked the effect is to stimulate the growth of new shoots from axillary bud
- Hard banjhi leaves tend to cover the plucking surface, reducing the number of plucking points, which are exposed to the light. Plucking points which are smothered by banjhi leaves are unlikely to produce new shoots.

Plucking Rounds

The interval between 2 successive pluckings.

The length of plucking rounds should be adjusted according to the rate of growth of the shoot.

Plucking rounds differ during the year because of Temperature.

Rounds should be set by leaf expansion time; time taken for 2+bud to become 3+bud.

Programmed Plucking:

The term used to describe a system of management in which the harvest interval is determined on the basis of the time taken by a generation of shoots to develop to a stage suitable for plucking. This is taken to be equivalent to one quarter of the shoot replacement cycle of the season, in the main growing season (warm wet season), is about 42 days. The recommended harvest interval is therefore alternatively 10 or 11 days

Seasonal variation of Temperatures over the year

Warm Wet Season- 10-14 days plucking rounds

Cold Wet Season- 14-18 days plucking rounds

Dry Cold Season- 18-21 days plucking rounds

Importance of plucking

To secure the maximum sustainable yield of fine quality leaf so as to give the greatest possible revenue and profit per hectare

In tea industry plucking is the most labour intensive activity and the most expensive
Leaf quality determines quality of made tea

What is the acceptable leaf quality?

Is the soft mature shoot of maximum 2-3 leaves and a bud and soft banjhi, should have tender leaves.

What is a soft leaf?

A leaf is that part of the tea plant which is normally harvested as a crop.

A soft leaf is a term which apply to the whole shoot and its stalk, should be free from fibre and when turgid breaks directly without peeling.

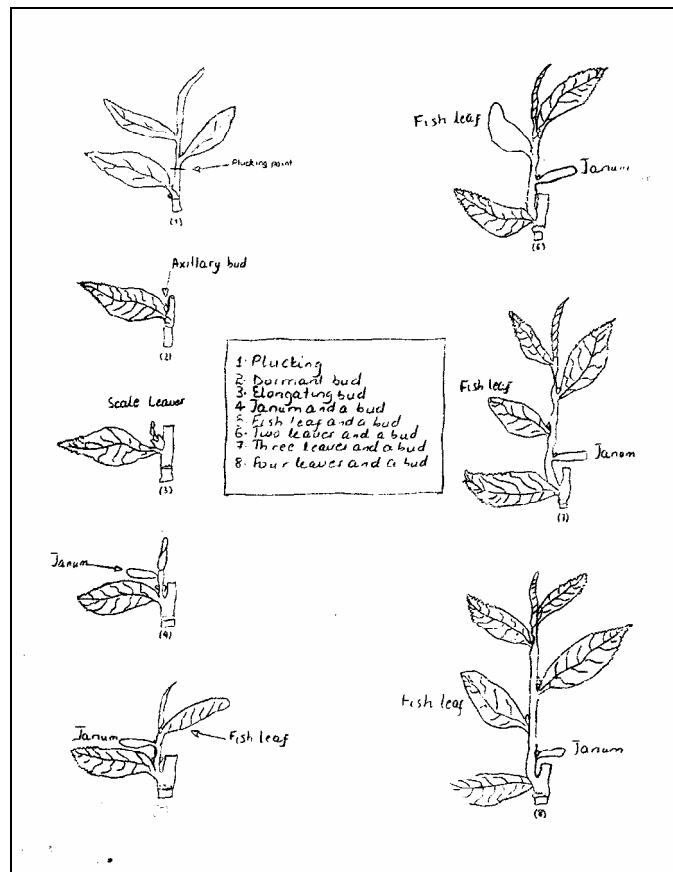


Figure 2: Stages of shoot development

Factors affecting plucking management

The plucking management is affected by:

- The climate
- The bush
- The plucker
- Plucking intervals
- Lay of the land
- Methodology adopted i.e. Hand/Shear/Mechanised

THE CONCEPTS OF PLUCKING

Objectives

At the end of this chapter participants will be able to:

- Understand the effect of environmental and management factors on the growth and yield of tea.
- Know components of yield.
- Understand the concept of plucking.

The concept of plucking

In Tea there are 3 principal components of yield.

These are:

- The number of shoots harvested (per meter squared).
- The mean shoot dry mass at harvest (g).
- The time taken for auxillary bud to grow into a shoot suitable for harvest (days) also known as *shoot replacement cycle*.

$$\text{ANNUAL YIELD} = \text{Mean Dry mass per shoot} \times \text{Number of shoots harvested per square meter} \times \text{Number of replacement cycles in the year}$$

Let us consider each of these components of yield.

Dry Mass of shoots

It depends on interaction between climate and management, the former because weather dictates the rate of growth, and the later because management decides on leaf standard.

It also depends not only on its size, or fresh mass but also on its dry matter content. The fresh mass is linearly related to the number of leaves and level of nitrogen

fertilizer applied (for clone 6/8 it ranges from 0.16-0.35 depending on the named above factors), The dry matter content of a shoot varies considerably with the season, Fertilizer and Irrigation (example, clone 6/8 from 19 to 30%).

Basal shoot population

Is the main determinant of yield. It depend on management, it varies with clone, the season, management inputs such as nitrogen fertilizer, pest, diseases, weed control, Irrigation and stage in pruning cycle.

Replacement cycles

Is a measure of time taken (day) for an auxillary bud, when released from apical dominance, to grow into a shoot suitable for harvesting.

It is mainly influenced by temperature, but also by water stress, nutrition, the dryness of air and clone.

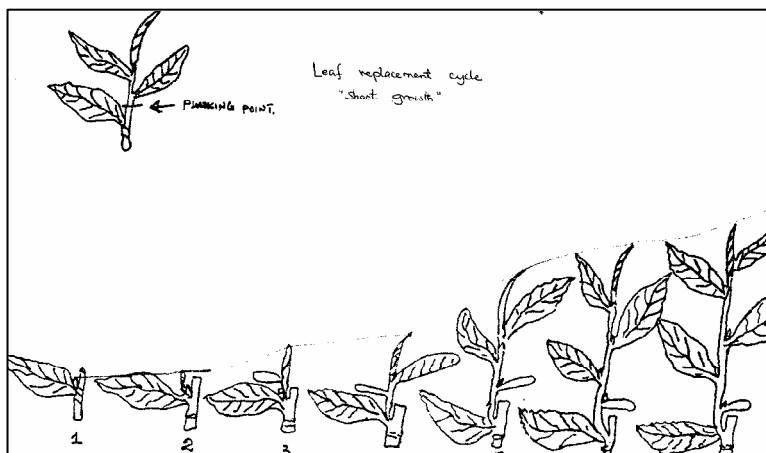


Figure 3: Shoot replacement cycle

programmed based on mean air temperature using the concept of phyllochrons. A phyllochron is the time taken for a shoot to unfurl successive leaves. A phyllochron value of 2.0 is usually equivalent to a plucking round of 14-28 days for normal growing tea depending on mean air temperature.

2) Water

Continuous shoot growth requires 1800 mm of rainfall per annum, preferably in overnight showers (150 mm per month). Areas that receive < 1150 mm of rain per year are considered to be marginal for growing tea without irrigation.

Water stress will reduce rates of shoot extension and development and, hence, extends the duration of shoot replacement cycle. It also reduces shoot length at harvest and increases the dry matter content, but has little effect on the basal shoot population density although peak densities at harvest are delayed until after the rains have started.

3) Saturation deficit

Saturation deficit is the difference between saturation and actual vapour pressure, a measure of the evaporative demand/power of the air (kPa). High humidity (≤ 2.0 kPa saturation vapour pressure deficit, (SVPD) is adequate for shoot growth. Values of SVPD higher than this inhibit the normal growth of tea.

4) Sunshine

A good growing season for tea requires long sunshine hours (11 hours 15 min). Short day lengths reduce the rate of shoot development and extension.

5) Wind

High wind are detrimental to growth of shoots, especially if the soil is wet.

6) Hailstorms

Hailstorms may wipe out complete fields of fully flushed tea, disrupting plucking rounds. Thus it is advised to avoid hailstorm prone areas when deciding to grow tea.

7) Nitrogen fertilizer

Increase rates of shoot extension and development and reduces the length of shoot replacement cycles. It also increases (up to 14%) the basal shoot population density and particularly, the number (300%) of harvested shoot (clone 6/8), but reduces the number of dormant (banjhi) shoots. The length of shoot at harvest is increased with nitrogen fertilizer.

8) Leaf standard

Any philosophy on plucking must take into account the effect of leaf standards on both the tea bush and the value of made tea.

Because of the genetic variation between bushes in a seedling population and biological variation within a bush in a clonal population, there will be a big variation in size of a population of shoot of the same age, and a big variation in the age of a population of shoots all of the same size.

Thus a compromise is necessary, and overtime it has evolved that a leaf standard of a mixture of two and three leaves and a bud is acceptable, because this standard combined with good procedures in the factory, will generally be the most profitable.

BUSH HUSBANDRY

Objectives

At the end of this chapter participants will be able to:

- Understand why the bush has to be managed to produce shoots
- Understand the function and importance of maintenance foliage
- Know how to construct and maintain a desirable plucking table
- Know the disadvantages of too short or too long table height

Origin of shoots

The tea plant produces shoots that are plucked for processing in a factory. The majority of shoots arise from plucked origin due to transfer of dominance by plucking. Some other shoots appear from unplucked origins i.e. the growth of a shoot from low in the frame or from a banjhi shoot breaking dominance.

Function of the leaves

Tea bush obtains its food from the atmosphere. When gaseous carbon dioxide diffuses through stomata on the leaf surface and water absorbed by roots passes up the stem into the leaves a process called *Photosynthesis* occurs in the presence of chlorophyll and light. Carbon dioxide and water react to synthesize sugar in this process. If there is insufficient light photosynthesis will be reduced or even stopped. An efficient plant manufactures more sugar than is needed for current growth. The excess sugar is converted into starch and stored mainly in the roots. The stored starch is available for use in an emergency such as when new shoots are produced after pruning, or when the rate of photosynthesis drops at night.

Maintenance foliage

The production of new shoot after pruning, skiffing or plucking is dependent upon the plant's starch reserves. If the existing foliage on a skiffed or plucked plant is highly efficient, the starch, which is used, will be replenished quickly. But if it is inefficient the

amount of stored starch decrease every time the bush is plucked to the point when shoot production could cease whenever the plant is subjected to sub optimal growing conditions. It is therefore essential that the tea bush be allowed to retain at all times an adequate amount of efficient foliage. On a plucked tea bush this foliage is called **the maintenance foliage or layer**. It is the layer of mature leaves below the plucking surface.

If the maintenance layer is too shallow or too sparse then the rate of sugar production may be too slow to permit the accumulation of starch reserves and hence there will be a lot of die backs, which decrease the number of plucking shoots and formation of more banjhi and crows feet.

After pruning, a deep and dense layer of green leaves must be allowed to form before plucking starts. Once an adequate maintenance layer has been formed and plucking has started the maintenance foliage gradually becomes senescent and dies. It is necessary to keep adding new efficient leaves on the bush whenever a shoot is plucked above the plucking table or in steps by missing out one or more plucking rounds and restart plucking at higher level.

The plucking surface rises by an average of 5 cm per annum; the maintenance foliage is being continually replenished. Weight of plucked shoots is more when the maintenance foliage is adequate and rate of growth is faster.

In view of the importance of maintenance foliage, it is advisable to ensure that there is adequate maintenance leaf on the bush at all times. Maintenance foliage 7 to 9 inches (18 to 22 cm) thick has been found to give good yields and helps in development of healthier frames. As such, all managers must ensure that NO "maintenance leaf" is plucked and pluckers are trained about the importance of the maintenance foliage to the yields and their earnings from the resultant crop.

Tipping

The first three harvests after pruning are called tipping. Plucking of a periodic shoots which develop after pruning. The objectives are to leave maintenance foliage and to create a level surface from which the new shoots arise after the removal of apical dominance by plucking.

It is important to establish a leveled plucking surface because when the surface is level, it is much easier for pluckers to exercise their skills and for supervisors to check that plucking is being collectively executed. Mutual shading of leaves is also minimized. Tipping height of 10 to 15 cm above pruning point is recommended as a good practice.

Tipping-in Aids

A variety of aids are used to assist in tipping-in at the correct height, e.g **simple stick cut to the appropriate length** and hang on the neck of the plucker or **an adjustable cross or T wooden structure**.

Three tipping rounds using the same measures is sufficient to establish the necessary plucking surface level. Tipping-in on a two weeks round produce a good plucking surface.

Plucking Surface or Table

It is important to maintain a level plucking surface (table) that follows land topography and runs parallel to the surface of the ground.

The annual table rise of above 5 cm means that crop is being lost (each additional 1cm rise causes a loss of 70-150 kg made tea per hectare).

A system of less than 5 cm rise may be practiced provided the bushes are able to:

- replenish the maintenance foliage.
- impart apical dominance after plucking so that buds can produce big harvestable shoots.

Importance of level plucking table

a) Helps the plucker to identify the origin of the shoots and to categorize them into:

- Mature
- Immature



Plate 1: A leveled plucking surface

- Banjhi
- b) Helps a plucker to determine a level at which to break back
- c) Increase the plucker productivity
- d) Make it easier for the supervisors to check on plucking standards and bush management
- e) Increases efficiency in pest control
- f) Better absorption of foliar nutrients when surface is level and no missing of

bushes

g) Ensures an even distribution of solar radiation incident on the surface

Table height

Optimum table height for easy plucking should be 60-100 cm. Above this height plucking becomes cumbersome and hence reduces plucker productivity.

Disadvantages of a table less than 60 cm

- Fatigue sets in.
- Leaf wastage as it falls out of the basket.
- The plucker is in uncomfortable, bent over position.
- Can result into the sides of the bush being plucked lower than the centre

Disadvantage of a table higher than 100 cm are

- Hands are above the elbow, plucking change from a system of selective to the one where shoots are grabbed
- Holding hands above the elbows for any length of time is tiring

Plucking table should rise gradually over the pruning cycle and this rise should not be more than the permissible 5-7.5 cm per year.

What will happen if the table rise is restricted?

If the table rise is restricted sooner or later only buds in the axils of the scale leaves will be available for the transfer of dominance and shoots arising from these buds will be thin and light. This affects bush health adversely and there is a delay in shoot development.

Breaking Back

This is part of bush sanitation operation which should be a continuous process. It should be carried out concurrently with plucking as it is part of it. It helps the plucker to manage bush husbandry and leaf standards. For example shoot grades higher than 3 leaves and a rolled leaf, are plucked to the 3 and a bud standard leaf while the piece of stem (butt) protruding above the plucking surface is then broken back at the plucking surface and discarded. Hard banjhi leaf at the plucking surface are broken back at the same time.

This operation maintains a leveled plucking surface. Breaking back is usually caused by delays in plucking. However, continuous level plucking causes clusters (crows feet). DO NOT break back to brown wood. It may initiate die back.

Skiffing:

A very light prune intended to level the plucking surface if it has become uneven, or sometime to extend the length of the pruning cycle in a mature crop. In skiffing you don't take out all the maintenance foliage.

Usually it is a sign that management has failed to control the harvesting process. IDEALLY one should never get into this situation. NO KNIFING AFTER PRUNING!

“Sometimes it is done when the management want to change from hand plucking to machinery with the aim of leveling the plucking surface.”

PLUCKING AIDS

Objectives

At the end of this chapter participants will be able to know different kinds of plucking aids and their use.

Overview of plucking Aids

Plucking aids are very important in the Tea industry as they facilitate both smooth handling of plucked tea as well as proper maintenance of the tea bushes in the field. There is evidence to show that plucker productivity is related to the aids used by the plucker.

Training the plucker to use the individual skills and plucking aids will increase productivity, which will benefit both to pluckers and the management.

Aids used in plucking

Basket

Characteristics of a good plucking basket:

- Minimum size 50 cm wide and 55 cm high.
- Designed to carry 10-15 kgs of leaf.
- Made up of light materials.
- Durable.
- Easier to fill and empty.
- Should not be abrasive.
- Should allow air to circulate.
- Be cost effective.

Tips when using it

- Leaves not to be crushed inside the basket.
- Overloading will cause leaf crushing and spillage.

Coats with hats

- Are used on rainy days to protect clothes to be wet which creates uncomfortable environment to the plucker.

Aprons

- Should be made from appropriate material.
- Protect the plucker from being injured with sharp sticks & stems in the field.
- Protect breakage/torn of clothes.

When to use them

- Aprons to be used through out the year.

Scales

- To be set to zero before weighing.
- Regular check up by management using test weights.
- Technical department is responsible for doing adjustment and repairs.

Weighing nets

- Should be large enough 1.5-2 m × 1.5-2 m to avoid spillage during weighment.
- After inspection, the corner ties of the net should be gathered together for weighing.
- There should be a minimum of 10 nets per shed.

Ground sheets

- For spreading and sorting of leaves.
- Green leaf should not be on direct contact with the soil.



Plate 2: Sheets reduce grit on green leaves

Plucking wand

- Are given to pluckers to maintain the level of plucking and to control its rise.
- It has 2-3 m long.
- Straight and light.
- Mostly used bamboo sticks.
- Usually 1-2 cm thick.
- Should be put across the lines to avoid bad plucking in the line sides/edges.

- To maintain levels a plucking wand should cover at least three bushes at ago, the one plucked just before, the one being plucked and the one to be plucked next.

Green leaf sacks

- To avoid overfilling of leaf ample sacks must be available for bagging.
- Leaf sacks must be with handles.
- Must be clean and free from grit.
- Must be careful washed before being used for leaf.
- Must be only used to carry leaves and not other material.
- Present recommended filling capacity is 12 kg.

PLUCKER PRODUCTIVITY/OUTPUT

Objectives

At the end of this chapter participants will be able to

- Understand factors, which affect pluckers output/productivity.
- Know and identify skills needed for plucking.
- Identify a good plucker.
- Understand key points for supervision.

Factors affecting plucker output/productivity

The plucker has the responsibility of plucking the raw material that make the finished product (Made Tea).

Pluckers' output is affected by the following factors:

1) Distance to weighing point

Pluckers must avoid walking excessive distances to dispose of plucked leaf, as this greatly affects worker output.

How to reduce this problem:

Use of movable weighing stations in the field with prior planning by management. Presence of Plucking paths in the plantation, which are used to facilitate disposal of the plucked tea. The distance between these paths are not fixed, commonly varying between 20-50 m depending on growth state of tea bushes.

2) Method of plucking:

To maximize output, it is essential that a worker use both hands for plucking. Disposing plucked tea by using one hand reduce output, workers must be persuaded to dispose off the plucked tea with both hands simultaneously. At this point care should be taken not to miss the basket and spill any tea that has been plucked. Do

not accumulate large clusters of plucked leaf in hand as this would slow down plucking, damage shoots and hence cause loss.

3) Available shoots per square meter:

The quantity of available shoots per square meter has a direct bearing on the output of the plucker. The more they are, the higher worker output is likely to be. Best outputs are obtained where the shoots available are in excess of 120 per square meter.



Assessment of the number of shoots per square meter:

A quadrant is a very useful tool for measuring number of shoots per square meter. The advantage of a quadrant is that it is light and easy to carry. The quadrant is made up of 6 gauge reinforcing rod with sides measuring 31.6 cm. Measurement should be taken at least five points diagonally across the field to be plucked. On arrival of

Plate 3: Pluckable shoots

the position where the counting is to be done the quadrant is thrown in the direction of travel and on landing, the pluckable shoots within the quadrant are counted. This operation is repeated four more times along the diagonal. If the average result of a count of five is 30 pluckable shoots per quadrant, the number of shoots available for plucking per square meter is $30 \times 10=300$.

4) Percentage Break Back:

The amount of break back that a plucker is required to do also affect output. If the amount of break back is below 10% of the number of shoots that are available for plucking, the output of a plucker will be minimally affected.

5) Working Height:

There is a significant increase in the time taken per shoot plucked, as the working height increases. For most pluckers the optimum level ranges from 0.7 meters to 1.1 meters.

6) Receiving Plucked Tea:

Workers output can be substantially increased if delays are avoided or minimized, which implies careful planning for management, who should ensure that the point used for collection, checking, and weighing, is close to actual plucking area. Hereby movable plucking stations can be useful if they are located nearby.

7) Use of Plucking Path:

Plucking path in the field make it easier to dispose of plucked tea. The distance between the paths vary with the age of the field and depend on four factors:

- The number of pluckers per hectare
- Average meters of row per plucker
- Kilograms of green leaf per hectare
- Kilogram of green leaves in a basket

As the field matures it is possible to change the distance between plucking paths. It is always appreciated that plucking by hand is a skilled activity that require concentration, dexterity, and stamina.

8) Pluckers skills:

The skill of the plucker has an important bearing on the quality and quantity of Tea harvested. We know from the records that there is enormous variation in the output and quality of work of different pluckers.

They are not just manipulative skills of moving the hands rapidly to get fast plucking, but also mental skills. The plucker is constantly making decision about what is suitable material to pluck and selecting shoots and deciding at what level to pluck them.

With a skill like plucking that is carried out rapidly and with both hands, it is helpful to slow down what is happening in order to identify in detail what is really going on. This has been done with skilled workers using the 2 main methods employed by pluckers -The Palm Up method and The Palm Down method.



Figure 4: Palm up method of plucking

Plucking by hand is a skilled activity that requires perceptual, sensory and motor skills coupled with stamina.

i) Perceptual skills:

- Identify which shoots to pluck
- Feeling/Look for the right point to place the fingers on the shoot or shoots
- Performing these activity very fast

ii) Sensory skills

- Applying the correct finger/thumb pressure to pluck soft shoot and leave hard
- Feeling when the number of shoots in the palm reaches the level where crushing may occur

iii) Motor skills

- Fast plucking action
- Moving plucked shoots back into the palm of the hand
- Coordination of both hands to get an even rhythmical alteration movement

Other factors

Quantity of output produced by a good plucker varies due to the following factors apart from skills:

- Type of tea and stage in the pruning cycle
- Plucking rounds and shoot density on the bush
- Time of day
- Weather condition

Characteristics of a good plucker

- Work systematically down the row walking between rows
- Breaks back and ensure that the table is level as they go
- Work with hands close together and as near to the body as possible
- Make even alternate plucking movements with each hands
- Tends to make rapid hands movements
- Constantly watch hands movement and concentrates
- Pull receptacles along by handle –don't lift to move
- Avoid leaf spillage
- Avoid unnecessary talks during plucking
- Body movement kept to the minimum economy of movement

Supervision

As it is the most important and expensive activity, it is important to pay strict attention to detail in all aspects of plucking. Priority supervision must be given to it all the time. Supervisors must direct all their energies to the control and supervision of pluckers, and must not be allowed to pluck or break back bushes themselves.

Constant checking both of leaf in the pluckers' basket and of the condition of the bush after plucking is the most effective way of assessing plucking standard.

Leaf in the basket must be checked for:	Field Quality analysis
Hardness	Minimum of 1000 shoots per kilogram
Length	No more than 2% maintenance foliage in the sample
Torn fragments	All banjhi above table level plucked
Crushed leaf	New fourth generation intact
Immature leaf	Table left intact
Foreign materials	No spillage after plucking

Headmen

In most of the modern estates with adequate human resources there should be 1 headman per 30 pluckers

Responsibility of headman

- To inspect how the pluckers are plucking
- To inspect if they pluck to the plucking table, no plucking in hollow or down the sides
- To inspect if some acceptable leaves are left behind
- To inspect leaves which are in the basket if they are acceptable
- To inspect if they remove banjhi which is on the plucking table
- To inspect breaking back
- To inspect if immature leaves are left on the bush

Clerk

In most of the modern estates with adequate human resources there should be 1 clerk per weighing shed

Responsibility of the clerk

- Weighing and recording green leaves
- To inspect tea

In order to increase efficiency in plucking the management should:

- Provide food for pluckers between 12:00 to 1:00.
- Should initiate day care center for pluckers' children
- Should construct houses or camps for pluckers if fields are far from villages

Plucking standards tend to deteriorate during the afternoon, and whenever possible office work should be arranged so that a member of management staff is free to supervise during this vital period.

PLUCKING SYSTEMS/SCHEDULES

Objectives

At the end of this chapter participants will be able to:

- Understand different kinds of plucking system.
- Choose a plucking system which is conducive to their organization.

Plucking System

Must take into account 5 fundamental variables which are yield, plucking rounds, area to be plucked, hours of plucking and number of pluckers.

The four variables can be fixed or varied by management except for yield, which is always variable.

Gang Plucking

Is a traditional way in which a group of people, the number depending on labour availability and the size of the crop, move across the field together.

Management decides on a daily basis how many pluckers are required to pluck the crop, usually assuming that a plucker can pluck 1/10 of a hectare per day. But the number of pluckers obviously has to vary according to the yield (which varies from field to field and day to day) and peak and trough pattern.

If the plucking round is fixed, so the area plucked each day is automatically fixed. Generally on a gang system, the hours of work per day is fixed at 8 hours and it is this that puts pressure on management because if too few pluckers are taken on, the scheduled area will not be completed in the 8 hours so the control over the plucking round is lost. If too many pluckers are employed, plucking will have finished before the 8 hours fixed. Which means other work has to be found and as this is difficult in the afternoon, pluckers move into the area scheduled for the next day, which again results in the lost of control over round length.



Plate 4: Gang Plucking

Gang plucking has the following disadvantages:

- Accurately estimating the crop on a daily basis is difficult, but essential so the number of pluckers required can be calculated.
- Pluckers underestimate will result in the fixed area not being completed, thus

control of shoot age is lost.

- Pluckers overestimate will result into low productivity and so poor earning for the plucker.
- Management is therefore compelled to keep a number of pluckers on standby for the peaks, and in the troughs these workers have to be occupied.
- The system offers no self motivation to the pluckers which make quality control difficult.
- Absenteeism is not easily controlled.

Programmed Scheme Plucking (Boma Plucking or PSP)

Each plucker has a fixed number of plots to pluck and if that plucker is absent without authorization the plot will be relocated to other plucker hence rendering the previous plucker jobless.

PSP system fixes:

- The number of pluckers.
- The length of the round.
- The Demarcation of the Area.

To cater for known variation of yield, a flexible working time was adopted and the task was that the plucker had to complete his plots.

PSP has the following advantages:

- 1) A regular plucking force on a predetermined programme facilitates management and labour training.
- 2) Flexible time reduces stress to the pluckers.
- 3) Because pluckers can be identified with their plots, they become an integral part of the production process which gives them an identity and a feeling of belonging.

- 4) Pluckers have a vested interest to see that their plots achieve the maximum yield potential which coincides with management objectives. Because of this pluckers will take an interest in pest and disease control and indeed any disorder that is likely to cause a drop in yield.
- 5) Unauthorised absenteeism is reduced to manageable levels, thus, assuming the plot sizes are correct, the objectives of plucking at right size and age of shoots is achieved at all times by a motivated labour force that has a vested interest in maximum yield.

Shortcomings of PSP

The success of this system depends on plot size.

When it is too big, it is impossible to complete in one day, even in non peak period.

When it is too small, productivity is low with the consequent drop in earnings.

Main Benefits Derived from Programmed Scheme Plucking are:

- Improve plucker productivity.
- Reduction in the number of pluckers required.
- Improved yields.
- Improve bush maintenance and field appearance.
- More consistent factory daily intakes.
- Reduction in absenteeism.
- Reduction on field supervisory staffs.
- A settled better paid and happier workforce.
- A more professional workforce.
- Management can manage plucking hence happier management.
- Increased profit.

MECHANICAL HARVESTING

Objectives

At the end of this chapter participants will be able to:

- Understand semi mechanical and mechanical harvesting.
- Aids used in semi mechanical harvesting.
- Advantage and disadvantage of mechanical harvesting.

Mechanical Harvesting

Mechanical harvesting has been practiced wherever labour is short and costly. It makes no difference how the bush is going to be plucked because there will be enough maintenance foliage, a leveled plucking table with a controlled rise to replenish maintenance foliage.

Types of mechanically harvesting:

- A hand operated aid, e.g, shears and blades
- A hand held motorised cutter bar by using wheeled track or self-propelled machinery.
- Tea harvesters.

Main difference between mechanical harvesting and hand plucking

Mechanical harvesting is not selective and any shoot of whatever size, if it is at the height of the cutting mechanism of the machine will be cut off.

What happens to the shoot after mechanical harvesting is just like the way it happens when the shoot is hand plucked. Hence exactly like hand plucking the aim should be to pluck the shoots when they reach the appropriate shoot age.

Advantages of Mechanical Harvesting

- Increase in productivity
- Increase in shoot numbers
- Reduction in shoot size

Disadvantages of Mechanical Harvesting

Cost

Shears are initially costly, and the cost can only be recovered through reduction of 'plucking costs', using piece rate or through a reduction in overheads in the number of pluckers.

Quality

SMH may increase the proportion of coarse leaves compared to hand plucking during the induction phase when the bush is being attuned to the shears.

Yield

SMH appear to cause some loss of yield compared with hand plucking.

Bush health

Continued use of shears with a low step for harvesting tea have been reported to have a deleterious effect on the health of the bush, reducing the leaf area index of the bush.

Use of blades in harvesting

Blade plucking seems to increase yield of an acceptable leaf, particularly for small leaved clones.

Blades are similar to shears in increasing the coarse fraction, they damage the plucking surface (they reduce productivity even before sorting out the coarse fraction).

Tea Harvesters

In Tanzania there are 2 tea harvesters which are in trial bases at Ngwazi estate of a tea company known as Brooke Bond Tanzania. The bigger one harvests 3 rows at a time and has a capacity of harvesting 8 ha per day. The smaller one harvests 2 rows at a time and has the capacity of harvesting 7 ha per day.

LEAF HANDLING

Objectives

At the end of this chapter participants will be able to:

- Understand the effect of leaf handling on made tea value
- Know post harvest handling of green leaf

Post harvest handling of green leaves

Green leaf is the raw material from which the tea beverage is produced within 24 hours after plucking. The leaf should be handled with care in order to produce high quality black tea of commerce.

The following points should be considered:

- The plucked leaf must be kept fresh.
- The plucking baskets must not be over filled or the leaf compressed by hand.
- The leaf must be kept in the shade.
- Coordination between field and factory staff on leaf status must be maintained.

Easy access in and out of the field is very important, and parallel access paths will significantly increase plucker productivity.

The average distance a plucker has to walk to the weighing points should be kept to minimum, this is achieved by having many weighing points.

Handling the crop



Plate 5: Piling green leaves increase fermentation rate



Plate 6: Turning of green leaves

- The leaf should not be crushed.
- It must get to the factory as quickly as possible.
- Collecting point should be undercover in order to keep the leaf cool, shelter it from sunlight and prevent it from becoming excessively wet if it rains.
- It must not be too deep a pile.
- Crushing the leaf in transit causes undue withering and fermentation which cannot be controlled.
- Leaf should be fluffed up and spread as thinly as possible on the leafshed floor until the lorry is expected.
- If it is to remain for more than an hour in the shed it must be turned at intervals to keep it cool, low temperatures help to keep the leaf fresh.

Organisation of weighing points

The leaf shed

- Permanent leaf shed must have floors of sound undamaged concrete with smooth finish;
- Temporary shed must be floored with consolidated earth;
- A ground sheet made from fertilizer bags which is sound and free from holes must be provided at every temporary leaf shed;
- One leaf shed must have approximately 5 weighing nets and one balance;
- The number of pluckers per weighing point should be limited to 50.

Preparation for weighment

- Sweep up the leaf shed and its surroundings;
- Remove remains of old leaf from leaf sacks and stack them neatly;
- Check for the accuracy of the weighing scale.

Inspection, Weighment, and Recording

- For weighment pluckers must line up in an orderly fashion
- Leaf to be tipped on to weighing nets and examined by the weighing clerk. He will be responsible for seeing that no sub standards leaf goes forward for weighment. This is an additional check on the quality of leaf, and does not lessen the responsibility of supervisors in the field for maintaining the standards of leaf plucked. If the leaf is of low standard, the responsible plucker should sort it out immediately.
- The weighed leaf must be recorded on the standard weighing sheet in ink
- No alteration to be allowed
- Errors must be cancelled with a clean line and the correct figure written above
- Excess weights must be recorded in the excess weight column and will not be credited to the plucker if its occurrence is caused by overloading
- Leaf must be recorded to the nearest kilogram.

Leaf weighment

At high cropping season:

- Pluckers are free to weigh up individually whenever they have a full basket.

At low cropping season:

- Pluckers should weigh as a gang. To minimize the walking time the weighment point should be sited as near to the pluckers as possible. Enough plucking paths should also be provided.

Green leaf Transport

Drivers:

- To sign for work regulations entailing disciplinary action to be taken if they are ignored

Responsibility of Drivers

- To make sure that the leaf is delivered to the factory in good condition and to supervise loading and offloading of green leaf.

Lorries for carrying green leaf

- Must be equipped with the full complement of trays;



Plate 7: A lorry with full complement of trays

- Leaf should be loosely packed in ferrying containers.

Green leaf sacks

- The driver is responsible for the loading and offloading of the leaf, in an orderly manner to avoid over heating and careless leaf handling;
- Avoid pressing of leaf when filling it in sacks;

- Avoid crushing the leaf while loading onto the lorry;
- Avoid stacking full sacks on top of the other;
- Avoid the sacks to come into contact with sand or grit;
- No one is allowed to sit on top of the leaf or to place articles on top of the leaf;
- It is advisable to load of green leaf in the sacks while the lorry is waiting in order to reduce crushing and undue fermentation which lower the quality of the leaf.

Contamination

Lorries, which have carried materials liable to contaminate leaf must thoroughly be cleaned before taking leaf to the factory.

REFERENCES

TEA GROWERS HANDBOOK

Tea research foundation of Kenya
4th Edition

TEA CULTIVATION TO CONSUMPTION

Edited by K.C.Willson and M.N.Clifford
First Edition 1992

TEA PLANTERS HANDBOOK

TEA RESEARCH FOUNDATION OF CENTRAL AFRICA

Edited by W.J. Grice
April 1990

1. SHOOT GROWTH plus PLUCKING equals PROFIT and

2. DEFINITION OF TERMS USED IN HARVESTING

TRIT OCCASIONAL PAPER NO 1

By M.K.V Carr
April 2000

A COMPARISON OF TEA HARVESTING TECHNIQUES IN THE SOUTHERN HIGHLAND OF TANZANIA

B.SC.THESIS
By J. Squirrell
June 1995
Silsoe College

TEA PLUCKING AND QUALITY CONTROL

DATE

VENUE

DURATION

COURSE TITLE

TARGET GROUP

Managers, Team leaders and Supervisors in charge of plucking team/gang

NUMBER OF PARTICIPANTS

20 trainees per session

COURSE DELIVERY

The course will cover both theory and practical. 2 days will be spent for indoor workshop and 1 day for field practicals. Where applicable, trainers will practically demonstrate all theoretically covered topics.

TRAINING METHODS

Participatory Approaches will be used in order to increase participation. Methods to be used are discussion in Plenary, Groups, Cards, Buzz groups, Drawings, Trainees to practice demonstrations etc

TRAINING MATERIALS

Item	Quantity
Flipchart, Flipchart stand, Marker pens, Notebooks	2 rolls, 1, 3 boxes, 1 per each
My clear bag, Over head projector, PowerPoint Projector	1 per each trainee, 1, 1
Ruler, Rubber Pencil, Pen, Transparencies, Apron	1 per each trainee, 1 box, 10
Reams of paper, Masking Tapes, Plucking baskets	3, 3, 10
Staple machine, Staple pins, Handouts, Coats with capes	1, 1 box, 1 per each trainee, 10
Wand, Ground sheets, Weighing nets, Scale (25 kgs)	10, 3, 5, 1
Recording sheet, Clipboard, Field to pluck	1, 1, 1

COURSE PROGRAMME

DAY 1

WHEN	WHAT	WHY
8:00-9:00	RECAP-What have you learned from last day's workshop?What was hard for you to understand	Will help the trainer to concentrate on parts, which were not well understood.
9:00-10:00	PLUCKERS PRODUCTIVITY	Trainees to know ways of increasing Plucker productivity.
10:00-10:30	TEA BREAK	
10:30-11:30	PLUCKING SYSTEMS	Trainees to know, which system is conducive in their environment.
11:30-12:30	SEMI MECHANICAL HARVESTING	Trainees to know the use of shears, blades on harvesting.
12:30-1:30	LUNCH	
1:30-2:30	LEAF HANDLING	Trainees to know proper leaf handling procedure to reduce loss in quality,quantity.
2:30-4:00	PRACTICALS	To equip trainees with practical skills.

DAY 2

WHEN	WHAT	WHY
8:00-9:00	RECAP-What have you learned from last day's workshop?What was hard for you to understand	Will help the trainer to concentrate on parts, which were not well understood.
9:00-10:00	PLUCKERS PRODUCTIVITY	Trainees to know ways of increasing Plucker productivity.
10:00-10:30	TEA BREAK	
10:30-11:30	PLUCKING SYSTEMS	Trainees to know, which system is conducive in their environment.
11:30-12:30	SEMI MECHANICAL HARVESTING	Trainees to know the use of shears, blades on harvesting.
12:30-1:30	LUNCH	
1:30-2:30	LEAF HANDLING	Trainees to know proper leaf handling procedure to reduce loss in quality,quantity.
2:30-4:00	PRACTICALS	To equip trainees with practical skills.

DAY 3

WHEN	WHAT	WHY
8:00-12:30	PRACTICALS	
12:30-1:30	LUNCH	
1:30-2:30	EXERCISE	Confidence builder for trainees
2:30-3:30	ACTION PLAN	Trainees to write their action plan on how to increase quality and quantity of Tea production.
3:30-4:15	COURSE EVALUATION	Trainees to evaluate the course to help trainers to improve their roles

SESSION PLANS

SESSION PLAN 1

WHEN	WHAT	HOW	AIDS	WHO
45 MIN	INTRODUCTION	SELF	FLIPCHARTS, MARKER PENS	ALL
	WORKSHOP PROCEDURES, PROGRAM, METHODOLOGY	PLENARY		ALL
45 MIN	EXPECTATIONS, FEARS & WORRIES	TRAINEES TO WRITE THEIR EXPECTATION, & FEARS	CARDS, MARKER PENS	TRAINEES
30 MIN	COURSE OBJECTIVES	PLENARY	OHP, POWER POINT, FLIPCHART	TRAINER
30 MIN	TEA BREAK			ALL
60 MIN	DEFINITION OF TERMS	BUZZ GROUPS		ALL
90 MIN	BUSH HUSBANDRY	PLENARY GROUP WORK	FLIPCHARTS, MARKER PENS	ALL
60 MIN	LUNCH BREAK			
60 MIN	CONCEPT OF PLUCKING	PLENARY Q & A	POWERPOINT	ALL
60 MIN	PLUCKERS PRODUCTIVITY	PLENARY GROUP WORK	FLIPCHARTS, MARKER PEN	ALL

SESSION PLAN 2

WHEN	WHAT	HOW	AIDS	WHO
60 MIN	RECAP	ROTATION		ALL
60 MIN	PLUCKING, AIDS	PLENARY, Q & A	AIDS, FLIPCHARTS	ALL
30 MIN	TEA BREAK			
60 MIN	PLUCKING SYSTEMS	PLENARY, Q & A	POWERPOINT	ALL
60 MIN	LEAF HANDLING	PLENARY, Q & A	POWERPOINT	ALL
60 MIN	LUNCH BREAK			
150 MIN	PRACTICALS		AS MENTIONED	ALL

SESSION PLAN 3

WHEN	WHAT	HOW	AIDS	WHO
240 MIN	PRACTICALS	BY DOING	AS MENTIONED	ALL
60 MIN	LUNCH			
90 MIN	EXERCISE	GROUP	FLIPCHARTS, PENS	TRAINEES
45 MIN	ACTION PLAN	CONSTRUCTION OF ACTION PLANS	ACTION PLAN SHEET, PEN	TRAINEES
45 MIN	COURSE EVALUATION	EACH PARTICIPANT WILL FILL IN EVALUATION SHEET	COURSE EVALUATION SHEET	TRAINEES

PRACTICALS

Trainees to know and practice:

- Tea Plucking
- Plucked origin of shoots
- Un plucked origin of shoots
- Hard and Soft Banjhi
- Hard and Soft leaves
- Apical dominance
- Fine plucking
- Coarse plucking
- Light plucking
- Hard plucking
- Hard leaves, Mother leaves, Maintenance leaves
- Selective plucking
- Non selective plucking
- Breaking Back
- Table height
- The use of a cross in Tipping, its advantages and Disadvantages
- Tipping
- Construction of a plucking table
- The use of a wand for table leveling
- Standing between rows
- Plucking methods-Palm up and palm down
- The use of shears and blades in harvesting
- Inspection (Field, Shed, Factory)
- Weighing and Recording (By using a balance and a sheet)

ACTION PLANS

Name: _____ Organisation _____

Title _____

ACTION	EXPECTED RESULT	INDICATORS	COLLABORATORS	BY WHEN

Trainees should fill in 2 copies of his / her Action plan. One copy will be returned to the trainer while the other will help him / her in implementation.

WORKSHOP ASSUMPTION

- That the workshop facilitators are participants in the learning process
- That the objectives have direct impact on participants work
- That the workshop topics provide an initial focus for discussions with and among participants
- That the workshop will provide opportunity for mutual sharing of experiences and expertise with particular emphasize on gender issues

LEARNING LOGS

We will be using a number of different methods to help you gain as much as possible from this workshop. As one of these methods we will use 20-30 minutes of workshop time each morning to look into our 'rear –view mirrors' i. e, to reflect on the most significant events of the previous day (s).

To increase the value of these daily reflection periods, we ask that each participant to take some time each evening to write down his /her reaction in a learning 'log'.

- What were the most important things you have learned today?
- What point/Topic was hard for you to understood?

What you write in the leaning log is for your own benefit.

We will begin every morning of this workshop with 20-30 minutes discussion of your responses to these and similar questions.

EXERCISE:

Name..... **Date**.....

1) Tick the right statement. The maintenance foliage is:

- a) The layer of hard leaves below plucking table
- b) The layer of soft leaves above plucking table
- c) The layer of soft leaves below plucking table

2) Which among the statements below is a real component of tea yield:

- a) Mean fresh mass per shoot
- b) Number of shoots harvested per bush
- c) Number of shoot replacement cycles in a year
- d) Weight in kilograms of green leaf

3) Differentiate the following terms as used in Tea plucking

➤ Selective and non selective plucking

.....
.....

➤ Plucked and un-plucked shoot origin

.....
.....

➤ Plucking round and programmed plucking

.....
.....

➤ Breaking back and skiffing

.....
.....

➤ Palm up and palm down methods of plucking

.....
.....

4) Which of the following is **not** a direct role of a plucking supervisor

- i) Examination of leaf in the basket while plucking is progressing
- ii) Ensuring that pluckers do not break back bushes unnecessarily
- iii) Supervising loading and offloading green leaf
- iv) Checking leaf in pluckers' baskets and condition of the tea bushes after plucking

5) Write T for the true and F for a false statement at the end of each sentence.

- a) Apical dominance is a vigorous growth of an apical bud in a leaf axil. ____
- b) Uncomfortably bending over position of a plucker during plucking is a disadvantage to plucking. It occurs when the table gets higher than 1 m. ____
- c) Tipping normally means to leave maintenance foliage and thus establish a plucking surface. ____
- d) An annual rise of a plucking table of more than 5 cm reflects a loss of some tea crop during the year. ____
- e) Irregular plucking surface makes easy identification of mature, immature and banjhi leaves and hence increases plucker productivity. ____
- f) Bruised/Crushed leaf is desirable as it reduces fermentation time during processing. ____
- g) Training the plucker to use his/her skills will increase productivity which is of course beneficial to a plucker and not management. ____
- h) Plucked green leaf remaining in the field for more than an hour must be turned regularly to keep it cool. ____
- i) Temperature, water and nitrogen have a profound influence on shoot replacement cycles. ____

6) Mention two advantages of having a level plucking surface?

(i).....

(ii).....

7) Which two measures should farmers/ estate owners/ factory owners always take in order to reduce loss in quality of harvested leaf?

(i).....

(ii).....

8) Which two steps can be taken to reduce loss of leaf quality during a plucking session.

(i).....

(ii).....

9) Comment on the advantages and disadvantages of hard plucking and gang plucking.

➤ Hard plucking is good/not good because.....

.....

➤ Gang plucking is good/not good because.....

.....

10) Give two factors that may affect a Pluckers' Productivity

(i).....(ii).....

11) What is the advantage of a plucking path in a tea field?.....

.....

12) What would happen if plucked leaf remained heaped in the field for more than _____ an hour?.....

13) What three points should be improved by management, supervisors, pluckers in order to increase the quantity and quality of plucked leaf?

(i).....

(ii).....

(iii).....

14) What should be done at the leaf shed before weighing the green leaf?

.....

.....
15) Mention two ways to estimate plucking round?

(i).....(ii).....

16) Mention two tea plucking aids you learnt during the course. Mentioned other two other aids of your choice. Please specify their use in plucking.

No.	NAME OF AID	FUNCTION IN PLUCKING
1		
2		
3		
4		

17) Mention three advantages and three disadvantages of semi mechanical harvesting?

No.	ADVANTAGES	DISADVANTAGES
1		
2		
3		

18) In many cases skiffing is considered as a management failure, why?

.....
.....
.....

COURSE EVALUATION

Your frank assessment is needed in order to improve future Trainings.

Please circle:

1=Very good

2=Good

3=Average

4=Bad

5=Very Bad

1) Please give your comments on the following:

	<i>Ranking</i>					<i>Reason</i>
Method of training						
Lectures	1	2	3	4	5	.....
Plenary	1	2	3	4	5	.....
Group Exercise	1	2	3	4	5	.....
Field Work	1	2	3	4	5	.....
General standards of Training	1	2	3	4	5	.....
Course Content						
Definition of Terms used	1	2	3	4	5	.....
Bush husbandry	1	2	3	4	5	.....
The philosophy of plucking	1	2	3	4	5	.....
Pluckers productivity/Output	1	2	3	4	5	.....
Plucking Aids	1	2	3	4	5	.....
Plucking Systems	1	2	3	4	5	.....
Leaf handling	1	2	3	4	5	.....

2) General assessment of the training course and the course material

➤ What were the most useful part, and why?

.....
.....
.....

➤ What were the least useful parts, and why?

.....
.....
.....

3) What did you like most in this training? (Rank)

.....
.....
.....

4) What topics were not understood?

.....
.....
.....

5) What suggestion will you make to improve the training course?

.....
.....