UNIT 7 ORGANIC TEA

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7.0 OBJECTIVES

After studying the unit, you should be able to:
• explain the basic principles of organic farming;
• distinguish between organic and conventional farming;
• describe organic inputs and their specifications;
• discuss the manuring, pest, disease and weed management;
• describe the guidelines for manufacturing organic tea; and
• explain procedures for certifying organic tea and the certifying agencies.

7.1 INTRODUCTION

The objective of organic tea cultivation is to have an eco-friendly plantation aimed at the conservation of ecology and natural habitat without polluting soil, air and water and yet maintaining sustainable tea production. Here, tea is produced in the absence of synthesized chemicals like pesticides, fungicides,
herbicides, growth regulators and concentrated fertilizers. Naturally occurring mined products and bulky concentrated organic manures are used for nutrition and maintenance of soil fertility. Pests and diseases are controlled by the use of resistant cultivars, regulation of micro-climate and biological control agents etc. In this chapter, we shall discuss the package of practices followed in organic tea fields, factories and the agencies certifying organic tea.

Activity 01
Before reading this unit please visit a nearby organic garden and list out the practices followed.

7.2 RELEVANCE OF ORGANIC TEA CULTIVATION

In high value plantation commodities like tea and coffee, there is good scope for switching over to organic farming. Many of the plantation commodities are exported and therefore, it is possible to realize higher returns from unit quantity exported when produced by organic means. Secondly, as these crops are generally grown in ecologically fragile hilly tracts, adopting organic farming methods would entail the protection of the environment and also in the prevention of contamination of streams and rivers that originate from these hills.

For the production of organic tea a high level of technology is not required, but a commitment to improve the cultivation and the physical ability to implement the system is necessary. In organic tea estates, agronomic practices like soil conservation, composting, manual weeding, recycling of organic wastes, shade regulation etc., form the essential requirements which require more labour. As the need for animal manure is high appropriate measures like maintenance of pastures and sufficient livestock are essential which again demand large workforce. Thus labour is an important investment in organic tea estates. It is also mandatory to provide appropriate housing, education, health facilities, etc., to these workers.

During the transition from chemical based agriculture to organic farming, decline in productivity has been noticed. However, it has been reported that establishment of organic tea right from planting gave more desirable results in terms of productivity and net return.

7.3 ESTABLISHMENT AND MAINTENANCE OF ORGANIC TEA PLANTATIONS

Certain essential components which serve as pre-requisite are to be taken care of when new plantations are established for producing organic tea. Personnel in the field of plantation management should have the know how of aspects mentioned below.

- Selection of site

The area for new plantation needs to be sufficiently isolated to ensure that there is no possibility of any pollutants or contaminants flowing or drifting into it from any known or unknown sources. There should be a buffer zone of sufficient width on all sides of the garden depending on the topography of the area to ensure safety. The minimum width of the buffer zone should be 100
Organic Tea

meters. A history of the field for organic tea production of about ten years, giving details of external inputs during pre-conversion period, should be maintained to facilitate inspection by the certifying agency.

Tea requires strongly acidic soil with pH around 5.0 and depth of 1.5-2.0 meter with good drainage. Organic matter status should be medium to high depending on the elevation and rainfall of the area. Tea is a calcifuge crop and will not tolerate high calcium content in the soil unlike legumes which have an affinity for calcium. In order to avoid incidence of root diseases, root bases of felled should be removed to the maximum extent possible. Stones should also be removed. The trashes should not be burnt inside the field as ash being alkaline (pH 9.5 -10), it increases the pH of soil.

The tea cultivars, bi-clonal seed stocks and grafts released by authentic agencies like UPASI TRF can be used for planting. The selection of cultivars should also be based on the elevation, topography, weather pattern and pest and disease incidence in the area. Rooted cutting and seeds for raising the nursery should preferably be collected from organic estates or block only. If these are not available, seeds from conventional estates or blocks not treated with any chemical can be used. The organic tea nursery should be clearly separated from conventional nursery if both of them are located in the same estate.

- **Water**

A perennial source of water free from pollutants is required in the estate for large scale compost preparation, which is essential for organic tea cultivation.

- **Livestock**

Livestock is an integral feature of organic farming for obtaining manure. The requirement of the number and variety of livestock like cattle, goat, sheep, pigs and poultry should be judiciously worked out depending on the availability of resources in the estate.

- **Labour**

Additional labour is required for organic tea cultivation compared to conventional tea cultivation. The extra labour is required for trenching, compost preparation, weed control, application of bulky concentrated organic manures, shade regulation, etc.

- **Soil conservation**

The land is cleared of the roots of the fallen trees and the drains are dug out at suitable intervals depending upon the slope to conserve the soil. Contour planting either in a single hedge or double hedge across the general slope should be followed. For high yield, complete ground cover is important. In recent years, the trend allover is to go for closer spacing in order to achieve high yield. In South India, a contour planting of single hedge (120 cm × 75 cm) with a plant population of 10800/h and a double hedge planting (135 cm × 75 cm × 75 cm) accommodating 13300 plants/ha are recommended. This method has many advantages such as early and high yield, better soil conservation and less weed growth in the hedge that also facilitates efficient cultural operations.

- **Planting**

Planting season normally coincides with June - July and September - October for South West monsoon and North East monsoon areas. Pits of 30 × 30 × 45
cm size are dug and plants of 12-15 months age are planted after removing the polythene sleeves. Immediately after planting, plants are staked to prevent wind damage. At the time of planting, application of compost or vermicompost @ 0.5 to 1.0 kg per pit is advocated. Staggered two-row hedge system of planting is recommended because a greater number of plants can be accommodated in a unit area. Planting two-row hedges results in a faster ground cover and make it more convenient to carry out cultural operations. The relationship between yield and population is parabolic at high population density and asymptotic at low population. Studies on the distribution of shoots in relation to spacing indicated that planting of adjacent bushes in a row closer than 60 cm is unlikely to increase the yield after the neighboring bushes meet.

A spacing of $135 \times 75 \times 75$ cm is recommended to plant semi orthotropic cultivars such as UPASI-2, UPASI-3, UPASI-9 grafted plants and bi-clonal seed stocks. Acutely orthotropic (erect) clones such as UPASI-1 and UPASI-27 need closer spacing ($120 \times 60 \times 60$ cm) to accommodate about 15,000 plants per hectare.

Grevillea (Silver oak) should be planted along tea rows initially at 6 x 6 meter (m) spacing to accommodate about 275 plants per/ha. Apply 100 gm rock phosphate and 400 gm dolomite per pit at the time of planting for successful establishment. Initially shade trees are planted at 6 x 6 m and later thinned to 12 x 6 m after 8-10 years of planting and finally into 12 x 12 m by 12-15 years after planting. They are pollarded at 8-9 m allowing 3-4 tiers of branches below the point of pollarding. They should be subjected to annual lopping before the onset of monsoon. The erect branches are lopped, retaining the laterals.

- **After care of young plantations**

Bringing up of young teas is an important aspect and is achieved through a series of operations. The leader stem of the young plants is cut 4-6 months after planting leaving 8-10 leaves below the cut. Later, these plants are tipped at 35 cm height and second tipping will be at 50 cm. After this, the bushes can be brought under regular plucking. The young plants can be manured after planting by dibbling the organic manure in the dip circle. They should be mulched and protected against drought, pests and diseases. Young plants are subjected to formative pruning in the 5th or 6th year after planting.

### 7.4 CONVERSION OF PLANTATIONS

For an existing plantation, the minimum conversion period should be three years from the last usage of synthetic agrochemicals. One can start marketing the tea as “in conversion organic tea” only after the completion of one year from the start of conversion. The tea can be marketed as “organic tea” only after the completion of conversion period of three years. But for a newly planted or replanted area raised through organic cultivation practices, the first year itself can be considered as organic produce provided chemicals have not been used in the previous cropping. In the case of cultivation on virgin land and for farms where records are available that no chemicals were used previously, the conversion period can be relaxed. It is desirable that organic method or production is followed in the entire farm, but in large plantations, the transition can be in phases for which a conversion plan must be prepared.
Check Your Progress 1

Note: a) Use the space below for writing your answers.
    b) Compare your answers with those given at the end of this unit.

1) What is organic farming?

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2) What are the advantages of organic farming?

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3) Briefly mention the inputs for organic agriculture?

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7.5 MAINTENANCE OF NEW AND ESTABLISHED PLANTATIONS

Organic tea plantations demand proper and adequate maintenance by way of application of manures and protection from maladies including weeds, using biological measures, details of which are given below.

7.5.1 Nutrient management

Regulations on organic production stipulate that the fertility and biological activity of the soil must be maintained or increased by using natural and as much as possible local resources and organic by-products. A deficiency in nutrient supply can be overcome by application of bone meal, wood ash and other permitted products. Considering the nutrient requirements and the satisfactory levels of organic matter status in organic fields, it is desirable to apply 10 tonnes (t.) of compost, 2.5 t. of neem cake and 2.5 t. of castor cake per hectare every year for the new clearings and first year fields. For mature fields, 5 t. of neem cake and 5 t. of castor cake/ha/year may be applied. Organic manures should preferably be applied in the staggered trenches. The dimension of trench should be $2 \times 0.3 \times 0.45$ m with 2 m between two adjacent trenches. Trenches may be taken across the slope once in every two or three rows depending on the gradient.

In tea fields, the organic matter is also added through shade tree litters and loppings, tea leaf litter, tea pruning and weeds. In South India, the common shade tree is silver oak (*Grevillea roubsta*). *Calliandra calothyrsus*, *Gliricidia sepium* and *Albizia sp.* may be planted as temporary shade trees in young tea
Production and Management of Tea

fields. The annual average addition of organic matter through leaf fall from shade trees is estimated to be between 2.5 to 5.0 tonnes of dry matter per ha. In the year of pruning, burial of prunings in staggered trenches in alternate rows will be useful in areas where annual rainfall is below 1500 mm. The amount of dry matter returned to the soil by retention of pruning in mature fields is nearly 14 tonnes in a pruning cycle.

Nitrogen can also be supplied by regular loppings of low and medium shade trees and leguminous trees (Gliricidia sepium and Gliricidia maculata), which can be grown along roadsides and other vacant patches. Bone meal, fishmeal, and other manures of organic origin can also be used if available from unpolluted environment.

**Phosphorus (P):** In the new clearings phosphorus should be applied @ 90 kg/ha/year (23 g of rock phosphate or 35 g of munsorie phosphate per plant). It should be applied by placement at 10 to 22.5 cm depth in holes made by crowbar on both sides of tea bushes on the upper side of the slope. In established plantations, the soil available P should be maintained at or above 22 ppm. Phosphorus may be applied @ 60 to 80 kg/ha in the first and third years as placement based on soil test values.

**Potassium:** Requirement of potassium in organic tea is usually met by the addition of wood ash @ 500 kg/ha preferably in dry period by broadcasting 15 cm away from the collar of bushes. Wood ash may be applied only in mature tea fields except in the pruned year, preferably in dry periods. If potash deficiency is continued to be seen and the exchangeable potassium level in the soil is low, patentkalli, a naturally mined potash fertilizer need to be applied @ 200 kg per hectare.

**Foliar application:**

- Two application of Zinc sulphate @ 2 kg/ha can be given every year after getting necessary approval from the certifying agency.
- In biodynamic fields, cow urine one litre in 10 liters of water, can also be applied once a month between January and March.
- Weed extract can be prepared in a barrel of 200 litres of capacity. One third of the barrel may be filled with plant materials such as *Erythrina*, *Crotonalia* and other weeds and the balance with water. After allowing it to mature for 3 to 4 months it can be used. The suggested dilution rate is 20 litres of weed extract in 200 litres of water per hectare.
- Cow dung solution can be prepared by filling one third of the drum with fresh cow dung and topping the rest of the volume with water. After 10 days, the solution is stirred everyday. The total volume needs to be maintained by adding water if required. After three months it will be ready for use. It can be sprayed @ 20 litres in 200 litres of water per hectare. All the above liquid manures should be properly filtered and then used for spraying.
- Biodynamic (BD) formulations are also used. BD 500 (75 g in 40 liter of water per hectare) is applied to the soil, B.D. 501 (2.5 g in 40 litres of water) is applied twice in a year over the canopy of bushes early in the morning. Cow Pat Pit (CPP) manure is applied once every month during April, May and September to November @ 5 kg/ha in 100 litres of water per hectare.
Soil reaction: Liming is not recommended for new clearings. However, in mature tea fields the soil pH should be maintained at about 5.0. For this, application of agricultural lime or dolomite will be required.

Shade management: Adequate attention to the maintenance of optimum shade should be given in organic tea cultivation and shade should be regulated properly by annual lopping.

7.5.2 Bio-fertilizers

Use of bio-fertilizers fortified with suitable bio-inoculants is approved in organic tea fields. Bio-fertilizers have no side effects instead all positive impacts help tea growth and better quality. Acid tolerant bioformulations may be used @ 25 kg per ha. The material may be mixed with soil at 1:5 ratio (1 part of *Azospirillum* formulation with five parts of soil) and applied by shallow placement method in root zone of the bushes. Phosphate solubilising biofertilizers *viz.*, *Pseudomonas* and *Bacillus sp.* can also be used @ 25 kg/ha.

7.5.3 Irrigation

A perennial source of water free from pollutants is essential for irrigation in organic tea. Surface irrigation is generally not recommended in young tea as it promotes shallow root system making the plants vulnerable to drought whenever irrigation is withdrawn in subsequent years. Sub-soil irrigation could be followed in the first year. Here tubes of 3 cm diameter and 30 cm length are used. These tubes can be of earthen ware pipes or bamboo reeds or PVC pipes. The tubes are placed in the pits at the time of planting at 45° angle and the soil is consolidated. As and when there is short fall in moisture, about 1 litre of water is poured through the pipes which are directly in contact with the root system of plants.

Alternatively, drip irrigation is also recommended during drought months. In this system, water is applied @ 4 mm on alternate days for clayey loam soils and 4 mm every day for sandy loam soils. However, sprinkler irrigation is discouraged in new clearings.

**Check Your Progress 2**

**Note:**

a) Use the space below for writing your answers.

b) Compare your answers with those given at the end of this unit.

1) What should be the width of buffer zone for organic tea?

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2) What is the conversion period for organic tea?

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7.5.4 Crop protection

International regulations stipulate that pests and diseases should be primarily tackled by planting of tolerant or resistant cultivars, manipulation of microclimate through shade regulation and pruning etc., and by the use of eco-friendly approaches like biological control.

Soil pests: Tea plants in the new clearings are subjected to the attack of cockchafer grubs. Application of neem cake @ 250 g/pit can be very effective in controlling this pest.

Stem borers: Phassus borer and red coffee borer are important pests in the new clearings. These can be effectively controlled by application of neem products and through regulation of shade. Shot-hole borer is a major pest of tea in young and mature tea in the low and mid elevation tea estates. The incidence could be minimized by adopting the following practices.

- Avoid pruning during dry weather.
- Remove all the badly affected branches while pruning.
- Spray the fungal pathogen *Beauvaria bassiana* @ 1.5 kg/ha during May and October when the humidity levels are high.
- Place cut stems of *Montonova bipinnatifolia* in shot hole borer infested 3-4 year fields. About 400 cut stems are required for a hectare.

Leaf feeders: Leaf folding caterpillars such as leaf rollers, flushworms and tea tortrix can be manually removed while harvesting. Manual removal of caterpillars and pupae will go a long way in reducing the incidence of the looper caterpillars. In case of severe infestation, neem formulations of 0.15 per cent @ 1000 ml/ha or 5 per cent @ 100 ml/ha or 1 per cent @ 200 ml/ha in 200 litres of water may be applied using hand operated knapsack sprayers. Light traps can be very effective in attracting the moths of these caterpillars.

Neem formulations, sulphur, lime sulphur and paraffin oil can be used for the control of mites. Entomopathogenic fungi are also effective against tea mites. Thrips can be controlled by the application of entomopathogens. Yellow pan water/sticky traps can also be used for the control of thrips.

Disease management: Blister blight can be reduced by the use of resistant clones, by modifying micro-climate through thinning shade trees, by weed control, etc. Need based application of copper-oxy-chloride @ 6 kg/ha/year may be done. However, approval from the certifying agency is needed before applying this fungicide.

In addition to these, adjusting the pruning time based on weather conditions will also be helpful in controlling blister blight. In areas, where the incidence of blister blight is severe throughout the monsoon period i.e., between June and November, it would be advisable to prune a sizeable area during August/September. In areas where the incidence is pronounced only after September, it would be beneficial to prune a large area during April. Certain tea cultivars
are tolerant to this major disease and some of them (UPASI-2, UPASI-8, UPASI-9, UPASI-17 and UPASI-26) could be used in the planting programme.

**Root diseases:** Four types of root diseases viz., root splitting, black, red and brown root diseases may occur in patches. The following measures are suggested to prevent the spread of root diseases to adjacent areas and for the recovery of the infected areas.

a) For the control of black root disease, avoid burial of pruning in the infested field. Incorporate preparations of *Trichoderma viridea* or *Gliocladium virens* @ 200 g/pit at the time of planting.

b) For the control of red, brown and root splitting diseases, the following measures may be followed:

- Isolation of infected area.
- Include one circle of healthy bushes – in case of *Fomes* infection.
- Include two circles of healthy bushes – in case of *Poria* infection.
- Take trenches of 1.3 m deep and 45 cm width.
- Put soil inside the infected patch.
- Uproot and burn the bushes *in situ*.
- Rehabilitate soil with Guatemala grass.
- Use of following bio-control agents at the rate of 200 g per plant for:

  - *Trichoderma harzianum* - Red root and Root splitting disease
  - *T. viride* - Black root disease
  - *T. viride, T. resei* and *T. koningii* - Brown root disease

**Weed control:** Weeds are a serious problem in new tea clearings. Use of any kind of herbicides is prohibited. Weeds can be managed by the following ways:

1) Weeds should be controlled manually by hand pulling during dry periods and slashing during monsoon; uprooted and slashed weeds may be retained in the field.

2) Cultivation of green manure crops/cover crops/grain legume crops and mulching with weed slashings and shade tree litter etc., would also help in smothering the growth of weeds. Closer planting (at a distance of 130 × 75 × 75 cm), correct pruning and tipping practices and infilling will also reduce the incidence of weeds. Once the tea bushes cover the field the
weed growth would naturally get suppressed and manual slash weeding should be sufficient. In grass infested areas thatching may be done.

Check Your Progress 3

Note: a) Use the space below for writing your answers.

b) Compare your answers with those given at the end of this unit.

1) Give an account on pest, disease and weed control in organic tea.

2) How frequently should the soil and tea samples from organic tea gardens be analysed?

7.6 POST HARVEST AND MANUFACTURING PRACTICES

Organic tea is a specialty tea, targeted especially for select consumers who are quality conscious. Hence, it is essential to adopt good agricultural (GAP) and manufacturing practices (GMP) to maintain quality standards at all levels. Despite good cultivation practices, the quality of final produce will get affected if proper care is not bestowed during processing stage.

Generally, leaf after plucking will be taken to a collection point, weighed and then moved to the factory for processing. The leaf should be handled properly while transporting to the factory. Plucked leaves are generally packed either in coir bags or plastic containers. Proper care must be taken to ensure that the plucked leaves do not become contaminated by foreign matter. Possible contamination sources include: pesticides, petroleum products and paints. While transporting in lorries or tractor-drawn trailers, the bags should not be placed one above the other. To enable more bags to be put on a truck, a removable intermediate floor is advisable.

Manufacturing practices: For manufacturing, only mechanical and physical processes are allowed with natural fermentation. It can be manufactured as Orthodox, CTC, Oolong or Green tea.

Manufacturing facility: Manufacturing of organic tea should be carried out in a factory to eliminate all chances and possibilities of organic tea coming into contact with conventional tea. The manufacture of “Organic tea in conversion” and “Organic tea” should be done on separate days; care should be taken to
properly clean and wash the factory with water under pressure before the manufacture of “Organic tea” and after manufacture of “Organic tea in conversion”.

**Storage and packing:** There should be a separate store for organic tea where no fumigants, insecticides or fungicides are used. Vacuum, steam or high pressure water cleaning is permitted. Organic tea should be packed in plywood chests or biodegradable packing materials on the day of production and the organic quality grade should be clearly indicated on each chest or container along with the invoice number of dispatch.

**Transportation and shipment:** The chests of organic tea should be transported separately and there should not be any chance of it coming into contact with the non organic tea. Before shipment to the destination, it should be stored in a separate place, away from the non organic tea.

### 7.7 INSPECTION AND CERTIFICATION

Tea qualifies as ‘organic’ when it is grown by using ecofriendly techniques and processed in accordance with the principles of organic farming. Further, a sound system of certification and labeling of the produce by a competent agency is essential. The tea estate where production is organized as per accepted standards has to be supervised and inspected at frequent intervals and at different stages of production before certification in order to ensure quality and authenticity. The certification agency has to adopt very reliable methods such as soil tests, leaf analysis, water tests, quality tests besides taking note of the natural qualitative indicators so as to ensure credibility of the system and to prevent fraudulent labeling of the produce.

While certification gives reliability to a product as organic, the certification itself would need a guarantee. This is provided through a system of accreditation. The International Federation of Organic Agriculture Movement (IFOAM) has been in the forefront of promoting, monitoring and certifying organically farmed produce. All the organizations who have gardens growing organic tea in India, have recently formed an association called “Indian Bio-Organic Tea Association” to further their interests and also to disseminate information about the benefits of organic tea, both in terms of a healthier alternative and a balanced environment.

#### 7.7.1 Inspection agencies

The accredited certifying agencies in India accredited under the NPOP* are:

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<thead>
<tr>
<th>Agency Name</th>
<th>Address</th>
<th>Phone No.</th>
<th>Fax No.</th>
<th>Email</th>
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<tbody>
<tr>
<td>Ecocert SA (India Branch Office)</td>
<td>Sector-3, S-6/3 &amp; 4, Gut No. 102, Hindustan Awas Ltd., Walmi-Waluj Road, Nakshatra Wadi, Aurangabad – 431 002, Maharashtra</td>
<td>0240-2377120, 2376949</td>
<td>0240-2376866</td>
<td><a href="mailto:ecocert@sancharnet.in">ecocert@sancharnet.in</a></td>
</tr>
<tr>
<td>BVQI(India) Pvt.Ltd.</td>
<td>Marwah Centre, 6th Floor, Opp. Ansa Industrial Estate, Krishnalal Marwah Marg; Off Saki-Vihar Road, Andheri (East), Mumbai – 400 072, Maharashtra</td>
<td>022-56956300, 56956311</td>
<td>022-56956302 / 10</td>
<td><a href="mailto:scsinfo@in.bureauveritas">scsinfo@in.bureauveritas</a></td>
</tr>
</tbody>
</table>
7.7.2 Analysis of soil, leaf and tea

Soils analysis: Soil of zero to 30 cm depth should necessarily analysed each year regularly for macro and micronutrients and heavy metal status. This will reveal fertilizer usage and contamination from sources other than intentional application such as wind drift from neighbouring plantations or water flowing in from other plantations and agricultural fields.

Leaf analysis: Tissue analysis of mother leaf should also be carried out annually for pesticide and fungicide residues and for the levels of macro and micronutrients and heavy metals. This will reveal mineral nutrient status and pesticide and fungicide residues, if any.

Marketable tea analysis: The marketable organic tea should be analyzed twice in a year, pre-and post-monsoon, for pesticide residues, flavour and quality.
7.7.3 Book-keeping

Book-keeping should be properly maintained to make an audit trail of inputs and marketable tea supplied to consumers. The invoice number should be mentioned on tea chests, in the factory book and in the documents. With the invoice number, the origin of the tea can be traced back. Information can be collected as to when it was manufactured, the quantity manufactured and the site and quantity of leaves plucked in the field with the factory diary and field book.

7.7.4 Inspection by independent agency

Surprise inspections by the representatives of an independent agency at least once in a year, are required. They will make field visits to check the organic cultivation techniques, take samples of leaf and marketable tea at random and also check the book keeping system.

7.8 LET US SUM UP

The objective of organic tea cultivation is to have an ecologically sustainable plantation aimed at the conservation of ecology and natural habitat without polluting soil, air and water and yet maintaining sustainable tea production. Tea is produced in the absence of synthesized chemicals like concentrated fertilizers, pesticides, fungicides, herbicides and growth regulators.

For the production of organic tea, a high level of technology is not required but a commitment to improve the cultivation and the physical ability to implement the system are necessary. In organic tea estates, labour is an important investment. It is mandatory to provide appropriate housing, education and health facilities to these workers.

The organic tea area needs to be sufficiently isolated to ensure that there is no possibility of any pollutants or contaminants flowing or drifting into it from any known or unknown sources. There should be a buffer zone of sufficient width on all sides of the garden depending on the topography of the area, to ensure safety. The minimum width of the buffer zone should be 100 metre.

For an existing plantation, the minimum conversion period should be three years from the last usage of synthetic agrochemicals. One can start marketing the tea as “In conversion organic tea” only after the completion of one year from the start of conversion.

International regulations stipulate that pests and diseases should be primarily tackled by the planting of tolerant or resistant cultivars, manipulation of microclimate through shade regulation and pruning etc., as well as through use of eco friendly approaches like biological control.

For manufacturing, only mechanical and physical processes are allowed with natural fermentation. It can be manufactured as orthodox, CTC, Oolong or green tea.

The inspection and certification agencies in India are Ecocert, BVQI, IMO, INDOCERT, Lacon, SGS and SKAL, Tea Board, Coffee Board, Spices Board, Coconut Development Board, Directorate of Cashew and Cocoa Board, Agricultural and Processed Food Products Export Development Authority (APEDA).
7.9 GLOSSARY

Accreditation: The evaluation and formal recognition of a certification programme by an authoritative body.

Buffer Zone: A clearly defined and identifiable boundary area bordering an organic production site that is established to limit application of, or contact with, prohibited substances from an adjacent area.

Certification: A procedure by which a third party gives written assurance that a product, process or service is in conformity with certain standards.

Conversion: The process of changing an agricultural farm from conventional to organic farm. This is also called transition.

Cow Pat Pit: Cow Pat Pit is known as CPP and is a specialized type of compost. It refers to cow manure mixed with crushed egg shell and basalt dust, then put into a 30 cm deep pit lined with bricks. The dung is fermented, together with preparations BD502-507 for a period of 3 to 4 months.

Inputs Restricted: Those items that are allowed in organic farming in a restricted manner, after a careful assessment of contamination risk, natural imbalance and other factors arising out of their use. Farmers should consult the certifying agency.

Organic Farming: A set of agricultural practices in which no artificial fertilizers, hormones, pesticides are used. Organic farming is increasingly popular in developed countries as consumers become more concerned over the potential health hazards of chemical residues in food.

Plant Protection Product: Shall mean any substance intended for preventing, destroying, attracting, repelling or controlling any pest or disease including unwanted species of plants or animals during the production, storage, transport, distribution and processing of food, agricultural commodities or animal feeds.

Standards: Documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines or definitions, to ensure that materials, products, processes and services are fit for their purpose. Standards include environmental standards; organic standards; labour standards; social standards; and normative standards.

CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress 1

1) Organic farming may be defined as a set of agricultural practices in which no chemical fertilizers, hormones and pesticides are used.
2) Conservation of ecology and natural habitat without polluting soil, air and water and yet maintaining sustainable tea production. It is possible to realize higher returns from unit quantity exported, when produced by organic means. As these crops are generally grown in ecologically fragile hilly tracts, adopting organic farming methods would entail the protection of the environment and also in the prevention of contamination of rivers that originate from these hills.

3) Naturally occurring mined products and bulky, concentrated organic manures are used for nutrition and maintenance of soil fertility. Pests and diseases are controlled by the use of resistant cultivars, regulation of micro-climate or by the introduction of biological control agents and use of natural products, prepared or extracted without the use of inorganic solvents.

Check Your Progress 2

1) Minimum 100 metre.

2) For existing plantations the minimum conversion period should be three years from the last usage of synthetic agrochemicals. For a newly planted or replanted area raised through organic cultivation practices, the first year itself can be considered as organic produce.

Check Your Progress 3

1) Pests and diseases are controlled by the use of resistant cultivars, regulation of micro-climate or by the introduction of biological control agents and use of natural products, prepared or extracted without the use of inorganic solvents. Weeds can be controlled manually.

2) Soil and leaf samples should be analysed annually. Marketable tea should be analysed twice in a year i.e., pre and post monsoon for pesticide residues, flavor and quality.

SUGGESTED READINGS


(Feedback Questionnaire)

Dear Student,

You may have found certain portions of the text very interesting and some portions difficult to understand while studying the units of this block. We wish to know your difficulties and suggestions in order to improve the course. Therefore, kindly fill in this questionnaire pertaining to this block and send us this sheet. If you find the space provided in sufficient, please use a separate sheet.

**Questionnaire**

**Enrolment No.** □ □ □ □ □ □ □ □ □ □

1) How many hours did you need for studying the units of this block.

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>Number of Hours</td>
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</table>

2) Please give your reactions to the following items based on your reading of the block.

<table>
<thead>
<tr>
<th>Items</th>
<th>Excellent</th>
<th>Very</th>
<th>Good</th>
<th>Poor</th>
<th>Give specific examples, if poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Quality</td>
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<tr>
<td>Language and Style</td>
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<tr>
<td>Illustrations Used (diagrams, tables, etc.)</td>
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<tr>
<td>Conceptual Clarity</td>
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<td>Check Your Progress</td>
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<td>Feedback to Check Your Progress</td>
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3) Any other comments:

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