Crop Handbook for field hygiene on Guava

The Project for Promotion of Safe and Appropriate Use of Pesticides and Fertilizers in Sri Lanka (SAFE)

Purpose:

Guava is the most common fruit in plain areas such as Anuradhapura, Puttalam, and Matale. However, because of ignorance of field hygiene, many pests and diseases are observed in their Guava orchards. Keeping field hygiene is indispensable to obtain a premium-quality harvest and good yield.

Figure 1: Before(left) and after(right) field hygiene practices

Pest and disease control techniques using hygiene practices:

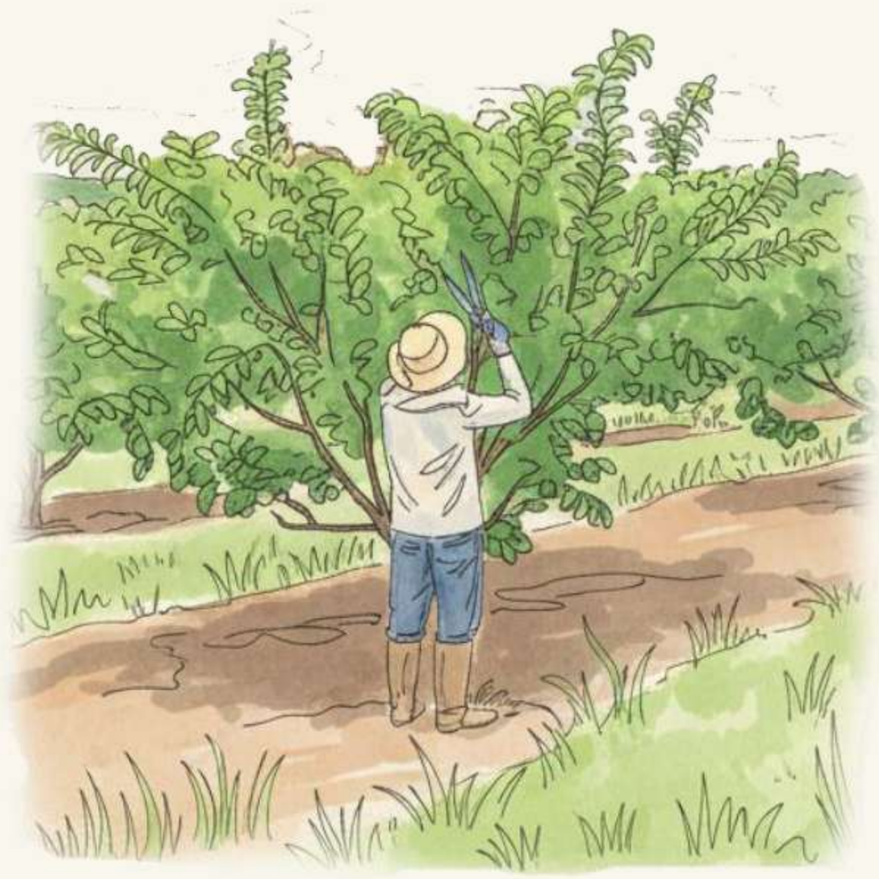
(1) Use of disease-free planting materials

Use healthy, disease-free, certified planting materials. It is better to use plants than seedling. If you prepare your own seedlings, seed treatment should be practiced with proper fungicide such as captan or thiram.

Figure 2: Seed treatment by captan / thiram

(2) Personal hygiene

Wash hands with soap before going to the field and after working in the field. Wear clean clothes to work. Do not use the same cloth when you remove disease-infected plant parts not to transfer disease to another plant.



(3) Soil hygiene (soil sanitation)

Sterilize soil by solarization, and chemical treatment ($CaCO_3$ application).

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Figure 3: Solarization

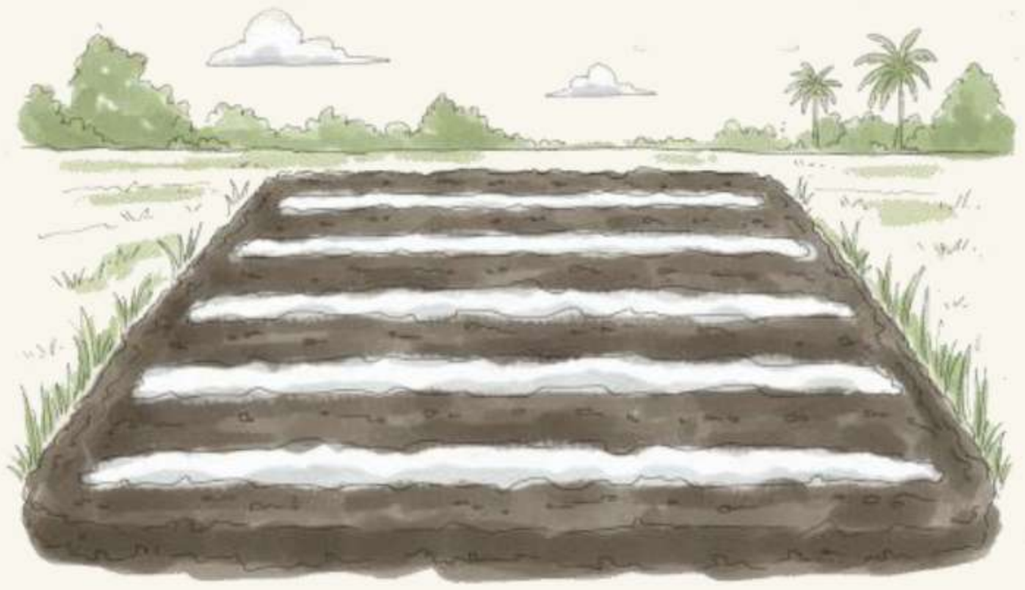

Figure 4: Application of lime

(4) Water hygiene

Use clean water, provide the proper amount of water to the pants, and prepare efficient drainage methods to remove the excess water from the field.

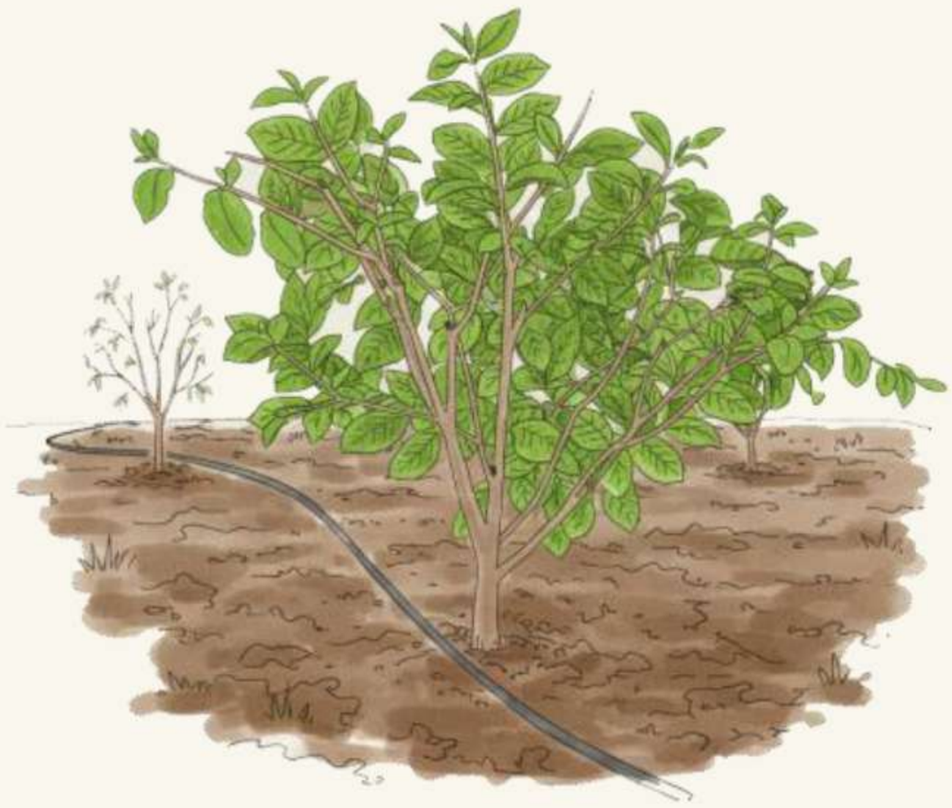

Figure 5: Drip irrigation

(5) Equipment hygiene

Equipment hygiene also plays an important role in preventing pest and disease spreading. Wash and disinfect used tools (boots, clothes, and other working equipment; hoes, knives, buckets used for watering, collecting infected plant parts etc.). It's better to use disinfectants that are freely available like soap water, water with detergents, etc.

Figure 6: Washing out agricultural tools with disinfectants

(6) Field hygiene

Field hygiene is the other fundamental and highly effective farm practice to keep most diseases and pests under control. It involves removal and/or destruction of sources of diseases, pest infestation and weeds from the field. The field should be maintained at maximum cleanliness, and then the incidence of pests and diseases will be low.

These techniques will protect the source of contamination and spread of the diseases. Therefore, it is important to pay attention to the following practices regarding field hygiene:

- **Separation from other cultivated fields and the surrounding environment**

  If the orchard face to another orchard, be careful not to allow entering vectors from that orchard. Insect proof net can prevent those vectors entering orchard. The height of the insect proof net should be designed based on the tree height.

  If insect proof net was already used for other crops previously, there is possibility that the net was contaminated with pathogens. In that case, it is important to disinfect the net with sodium hypochlorite or solar heat treatment before reuse.

Figure 7: Use of insect proof net

- **Removal of infected plant parts from the field**

  Leaving diseased plants and their remains in or around the field preserves the source of infection, resulting in the spread of the disease. Therefore, proper disposal of field debits also lessens the spread of pests and disease outbreaks.

  Establish a deep disposal pit at the corner of the orchard before planting. Further, providing the space to burn the diseased plants is important.

  It is important to dispose of all infected plant parts and crop residues (as well as the unproductive branches and leaves) into the disposal pit and destroy them by burning. If there is a virus infection, remove the plant from the field that was just identified, and burn the plant as well as soil around the infected plant to stop spreading virus diseases

Figure 8: Disposal pit and burning of diseased branches

Figure 9: Remove infected /died plant parts from the field

- **Weeding**

  Weeds in and around the surrounding fields serve as hosts for pathogenic bacteria and sources of insects that transmit viral diseases. Therefore, maintaining the field weed-free, improves the field hygiene and reduces the host plant for pests. It will help to ignorance of the prevalence of vectors of pests by destruction of host. The important thing when you use weeding machine is not to damage the trunk and roots.

Figure 10: Weeding

- **Pruning and training**

  It will increase the ventilation and sunlight penetration into the plant canopy. This will destroy the environment for the growth and spread of diseases and facilitate under control naturally.

Figure 11: Before (left) and after (right) pruning

i. <u>Agricultural tools used in pruning</u>

The tools used in pruning are differ with the stem, and branch sizes that are going to be pruned. Pruning saw is suitable for pruning a large guava plant into a manageable height. Lopper is suitable for cutting medium size branches and secateurs are suitable for smaller branches.

Figure 12: Agricultural tools used in pruning

Further, it should be disinfected after every use in the field in order not to spread of diseases and pests from plant to plant.

ii. <u>Pruning methods</u>

There are several types of pruning methods and open center-head method is best fit for guava.

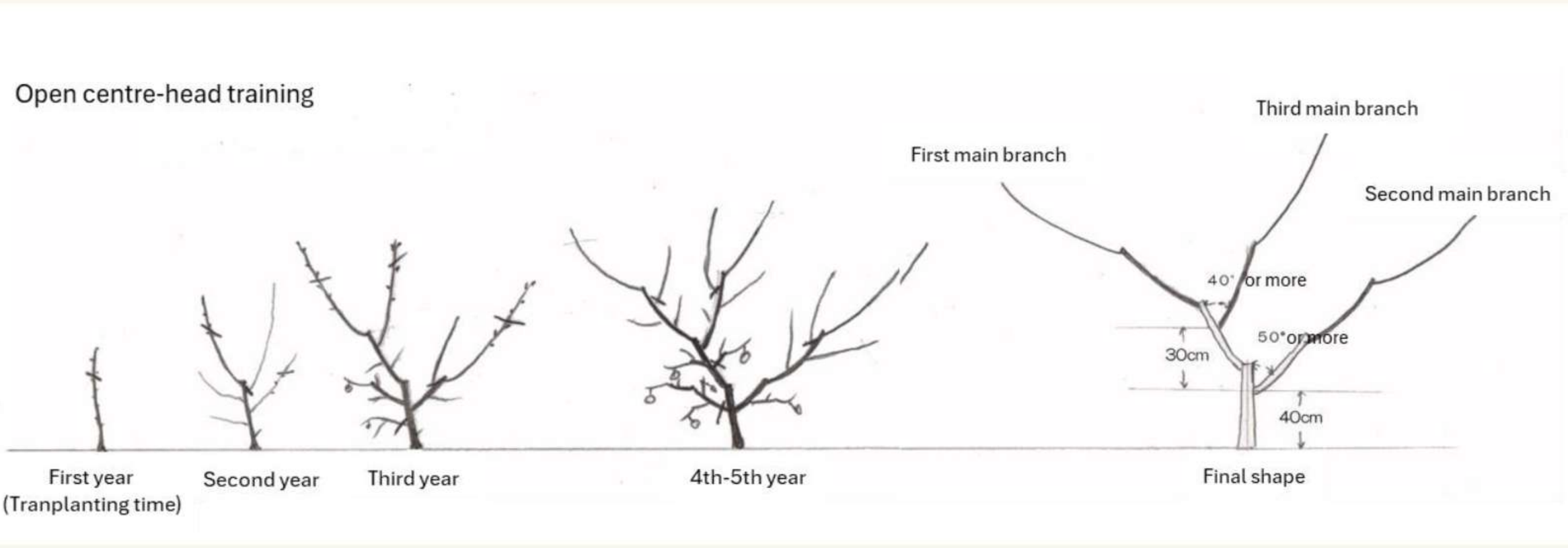

Figure 13: Open center-head pruning system

iii. <u>After care of pruning</u>

The wound that created by pruning makes an extra stress to the plant due to high vaporization of water from the plant, and then it makes an open path to enter pest and diseases. Therefore, it is important to heal that wound/ cut surface by applying a solution with fungicide or available thick liquid on all cut surfaces.

Figure 14: Wound sealer applied to pruned part of the tree

iv. <u>Training</u>

Training the branches of the tree helps to improve sunlight penetration and increase the ventilation of the canopy Using a peg and rope can train the branches easily.

Figure 15: Training of branches

- **Fertilizing**

  Just after pruning, the plant get stress and to recover it, it is important to energizer plants by supplying fertilizer. Before applying fertilizer, initial soil test should be done to avoid misuse of fertilizer. According to the result of soil test, required amount of fertilizers should be supplied to the field without wasting. In case of organic fertilizer, approximately ten kilos of organic fertilizer should be applied to one hectare of the field.

  When applying fertilizer, a small (shallow depth) channel should be made just parallel to the canopy margin. After that, mix well with soil. It is useless that applying fertilizer just adjacent to the root hence absorbable root hairs do not present there. Further, when handling tools such as hoes, it is important to pay attention not to damage roots as guava is highly susceptible to root knot nematodes.

Figure 16: Application of organic fertilizer

After application of fertilizer, apply water to make easy of absorption.

Figure 17: Application of water after topdressing

- **Light pruning**

  About three weeks after the first pruning, a light pruning cycle of newly emerged branches should be done. It helps to make the canopy structure well.

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Figure 18: After light pruning

- **Fruit thinning**

  Sometimes, fruits can be seen in clusters. It is difficult to put two or more bags for each fruit in a cluster. As well, it is not possible to put the two fruits together in one bag. Therefore, it is better to remove additional fruits from the cluster and able to get a high-quality yield.

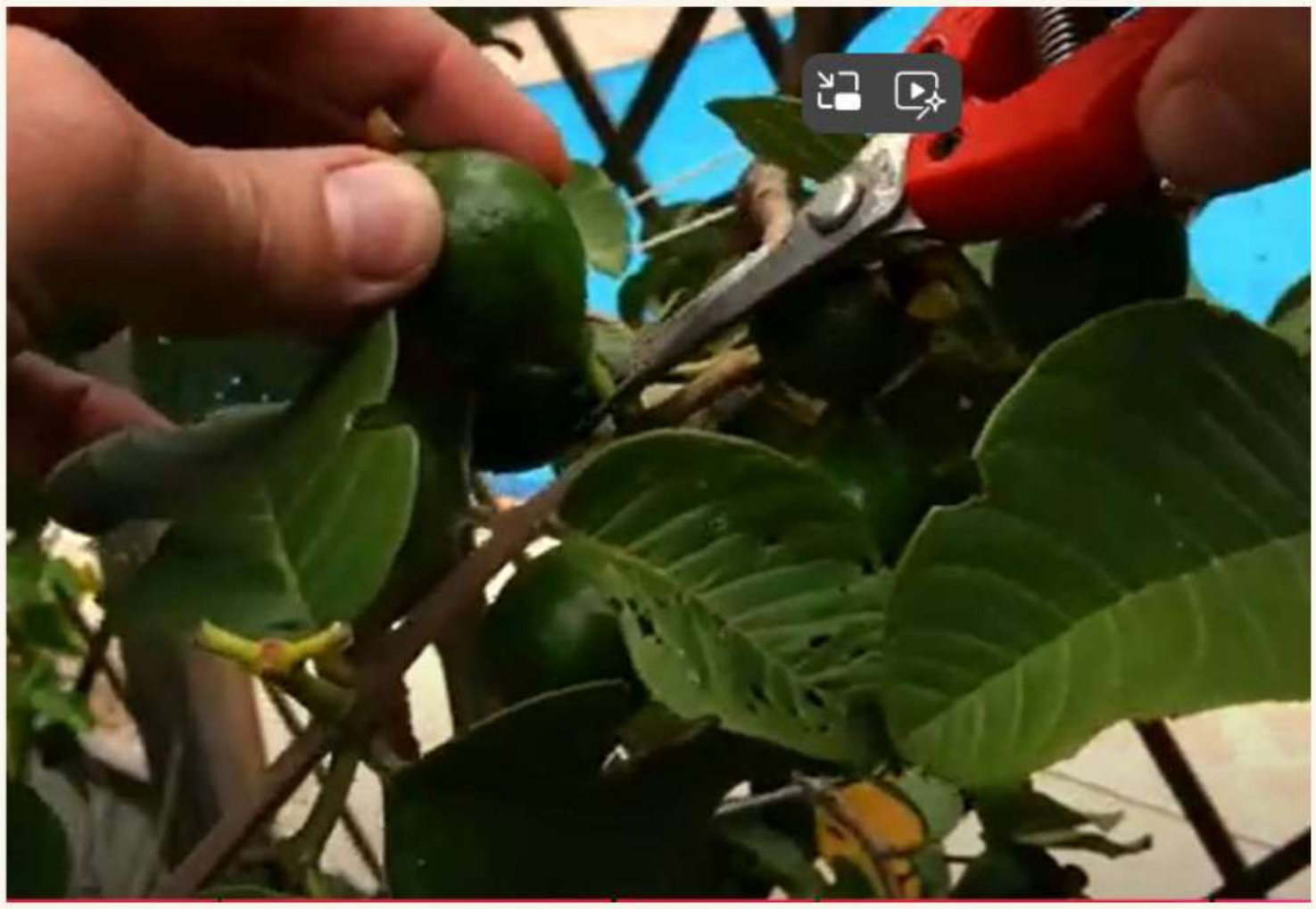

Figure 19: Fruit thinning

- **Bagging**

  Bagging increases the quality and appearance of the fruit. White color bags are suitable, and the time of bagging is important. The bags should be applied at early stage of fruit setting (nearly at the time of 3-4 cm of diameter of fruit).

  A data recording system by farmer themselves should be practiced, it helps to fruit harvest after nearly 3 months after applying the fruit covers. In commercial fruit bags, there are letters at the bottom of the cover and can mark it to identify the date of bagging, so no need to open the bag until the date of harvesting.

Figure 20: Fruit cover application

Figure 21: Letters identifying date of bagging

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