AGROFORESTRY

A PATHWAY TO RESILIENT LANDSCAPES

A Guide to Tree Growing on Farmlands

Food and Agriculture Organization of the United Nations

THE EAST AFRICAN WILD LIFE SOCIETY

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DISCLAIMER

This booklet focuses on the integration of the tree component into agroforestry systems. The information and views expressed in this publication may not necessarily represent the views or position FAO or GEF.

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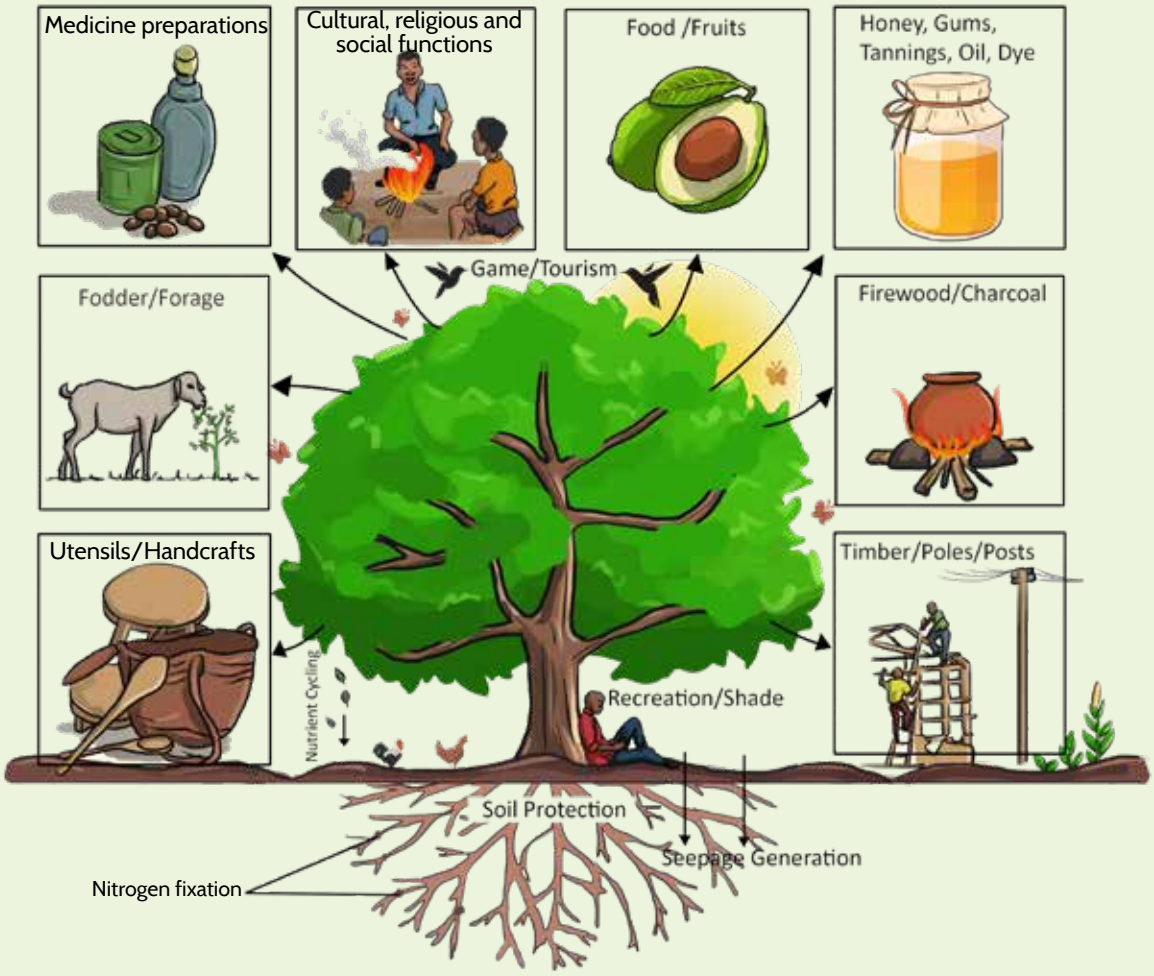
WHAT IS AGROFORESTRY?

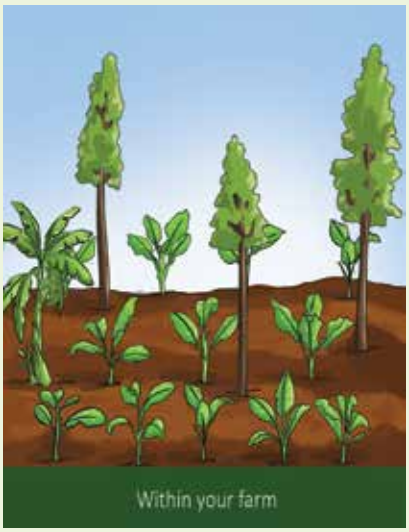
Agroforestry is a way of farming that combines trees with crops and or livestock.

BENEFITS OF AGROFORESTRY



WAYS TO PLANT TREES

Planting trees within a given section of your farm.

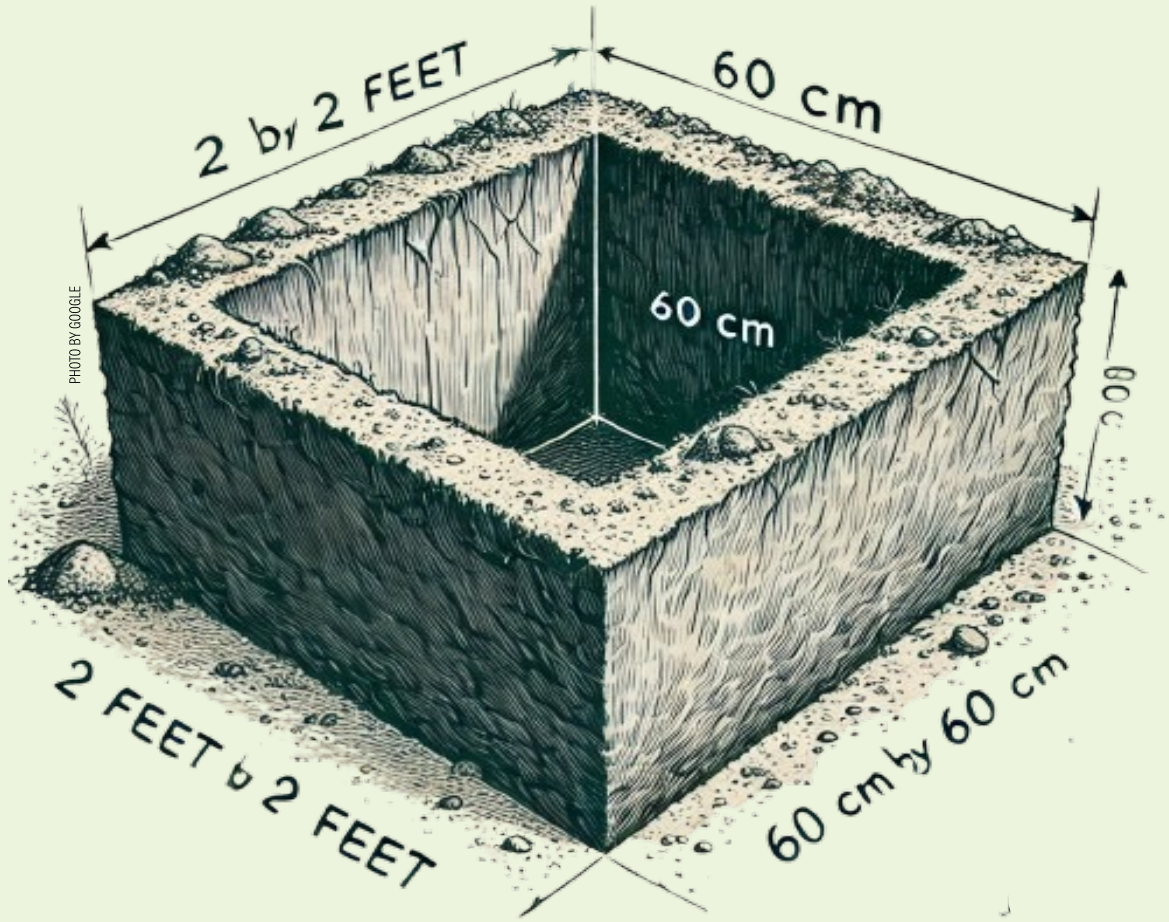


Put enough spacing to ensure they do not compete with crops for nutrients, sunlight and water.

PLANTING REQUIREMENTS

a) Other Agroforestry tree species e.g Grevillea, Neem etc

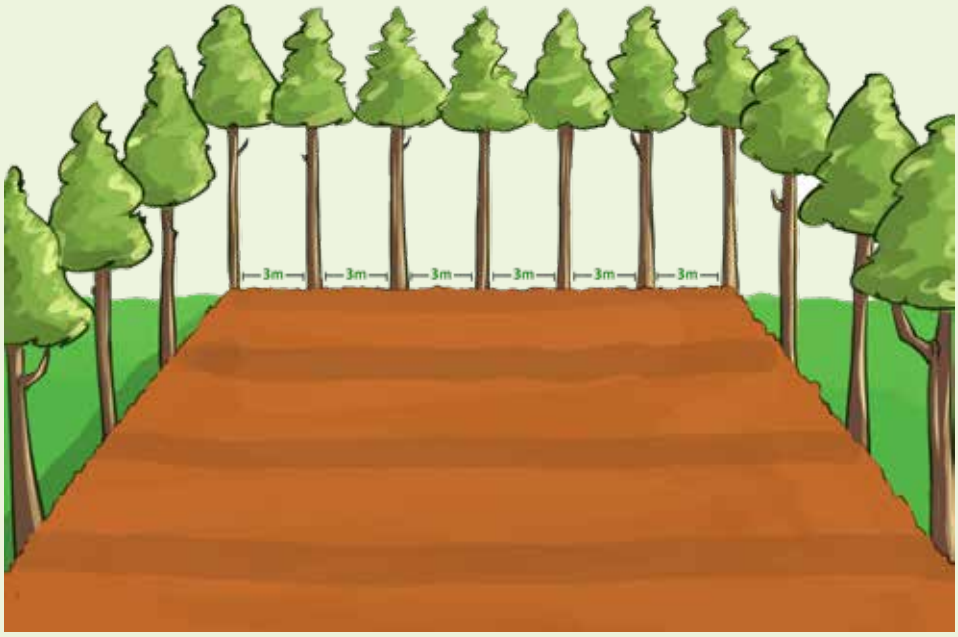
Hole size



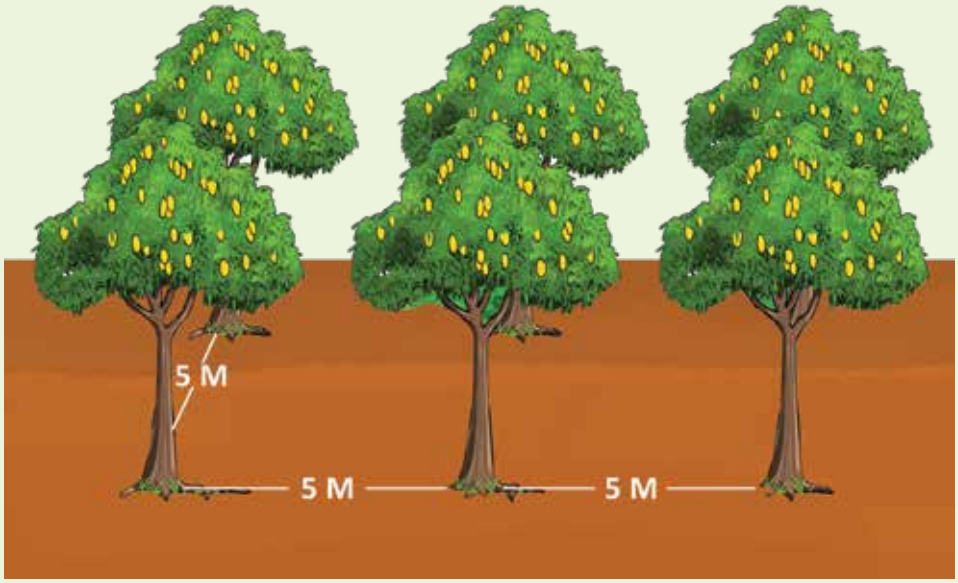
PLANTING REQUIREMENTS

Spacing

Trees within your farm: Give a spacing of 5m within rows, and between rows.



Along the boundaries or fence: give a spacing of 3m within each row.



b) Fruit trees

Hole size: Dig planting holes of 2ft by 2ft.

Spacing: Give a spacing of 5m within rows and between rows (if considering to incorporate crops in your farm for a long time, consider increasing the spacing to 7m by 7m).

PLANTING PROCEDURE

STEP 1

Set aside land/space for planting the trees; the preferred site should provide enough space for the tree's mature size, both above and below ground.

STEP 2

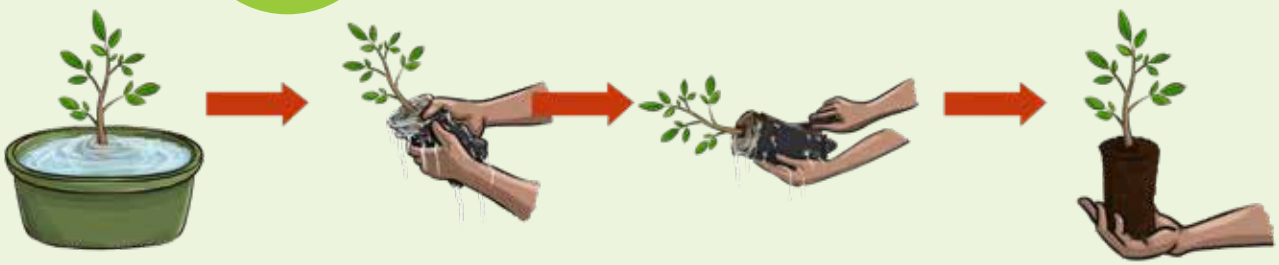
Clear the space and put away the cleared bush.

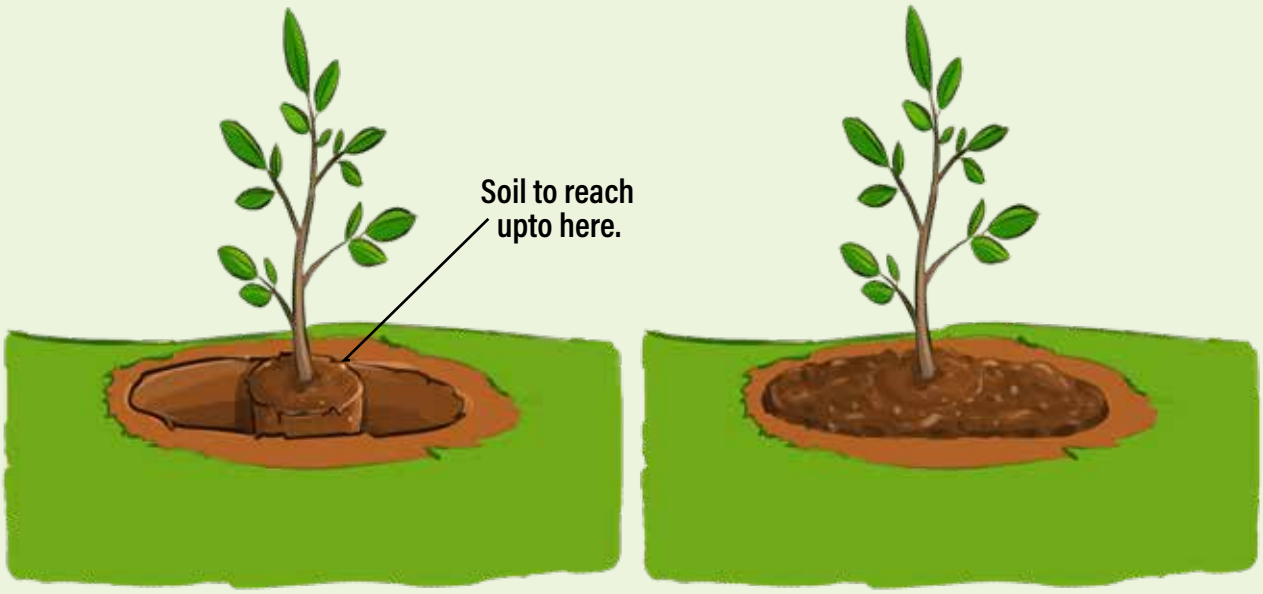
STEP 3

Dig the required hole size. Put aside the top soil and sub soil. Mix the top soil with 1 debe (20kgs) of well decomposed manure (preferably use sheep or cow manure) and return the mixture to the hole.

STEP 4

Moisten the roots of the seedling before planting (can immerse and remove seedling in a bucket/basin of water), then cut the polythene sleeve carefully so that the plant can be planted with the entire ball of soil.





STEP 5

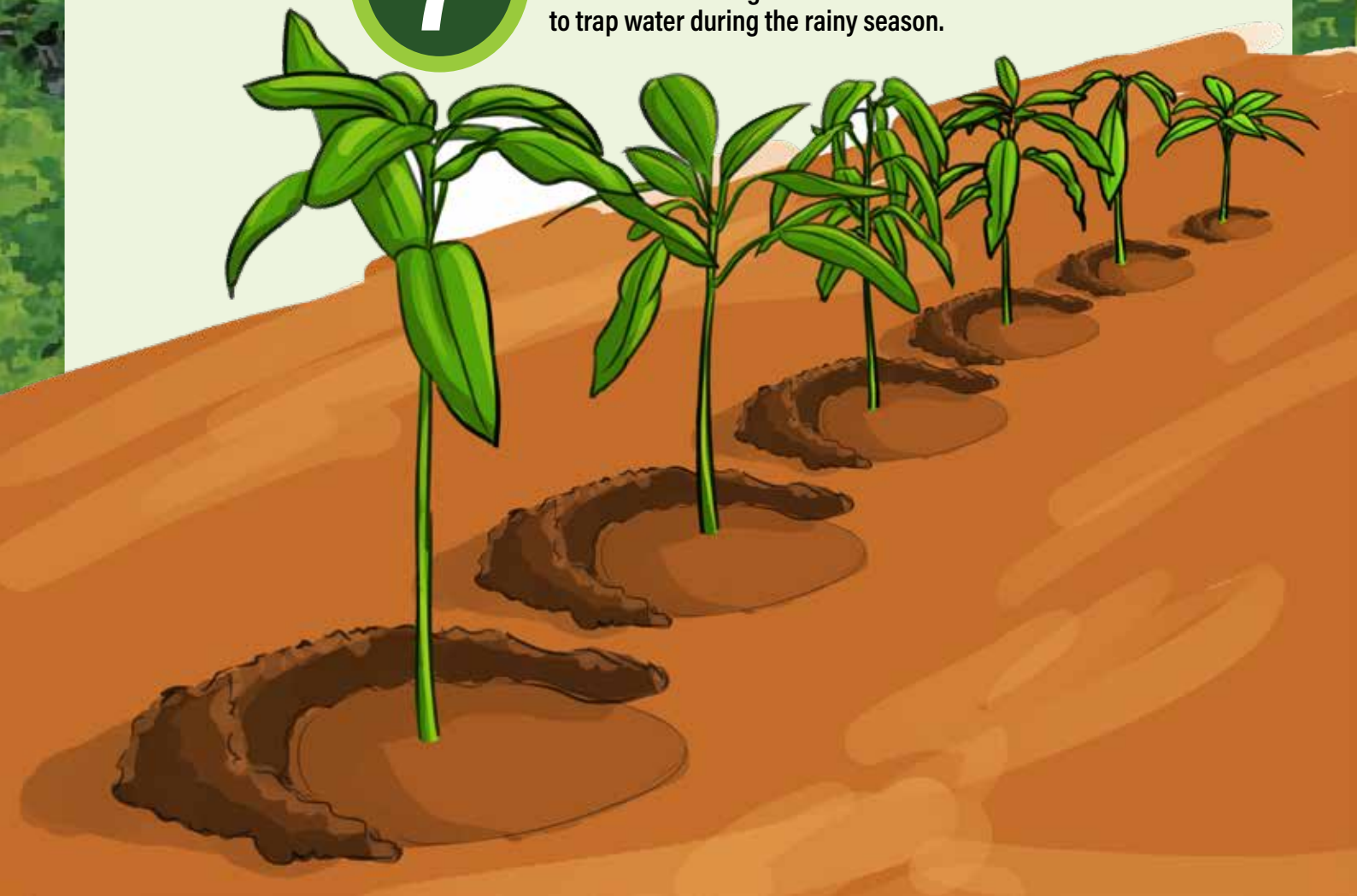
Place each of the seedling at the center of the planting hole.

STEP 6

Cover the seedling with soil up to exactly the same depth it was in the polythene sleeve. Avoid piling soil against the trunk, as this can cause rot.

STEP 7

Based on the direction of flow of water in your farm, put the remaining sub-soil around the seedling to form like a halfmoon to trap water during the rainy season.



WATERING

- Immediately after planting the seedlings, water them thoroughly to help settle the soil around the roots. This initial watering is critical to eliminate air pockets and ensure good root-to-soil contact.
- If planting during the dry season, pour 10 liters of water on each seedling, especially for fruit trees.
- If planting during the rainy season, pour 5 litres of water per seedling.
- Watering should not be done directly above the seedling as it may disturb the soil around the seedlings or damage young roots or leaves. Direct the water to the base of the plant in a gentle and controlled manner.
- Subsequently, water the seedlings 3 -4 times per week during dry periods, providing 10 litres of water per seedling per watering.
- During the rainy season, reduce or stop watering once consistent rainfall provides adequate soil moisture. However, regardless of the season, regularly check the soil moisture by inserting your finger about an inch into the soil. If it feels dry, it's time to water. The soil should feel moist but not soggy.
- Watering should be done in the morning or evening to reduce water loss through evaporation.
- Stop regular watering once the seedling's root system has fully established, which depends on the species, soil conditions and climate.
- Consider gradually reducing the frequency of watering rather than stopping abruptly.
- For fruit trees, periodic watering is required even after establishment, especially during flowering and fruiting stages. Consider watering 50l of water per fruit tree per watering during these periods to prevent fruit abortion (premature dropping of fruits before they fully develop or mature).

MULCHING

STEP 9

Apply a thin layer of mulch around the seedlings (keeping it away from the stem) to help retain soil moisture, regulate soil temperature, and reduce evaporation.

Repeat procedure for all seedlings observing the appropriate spacing from one seedling to another, and from one row to another.

NOTE

- For fruit trees plant at least 3m away from the fence.
- Remove the grafting tape of the grafted fruit seedlings after 1 month of planting.
- Avoid intercropping the fruit trees with maize and vegetables such as spinach, Sukuma wiki. Intercropping with leguminous cereals is encouraged

MANAGEMENT PRACTICES

A ring fence around a Neem seedling

PHOTO BY ANN MUKAINDO

Seedling protection; ring fence the tree seedling to protect them from browsing and grazing by livestock. Always plant seedlings in already fenced areas. Prevent livestock grazing on areas where trees are planted to allow for their regeneration.

PHOTO BY GOOGLE

Water management; Regularly water the seedlings. Observe guidelines highlighted in above. Implement water harvesting techniques to supplement rainfall. In cases of acute water shortage, use bottle irrigation.

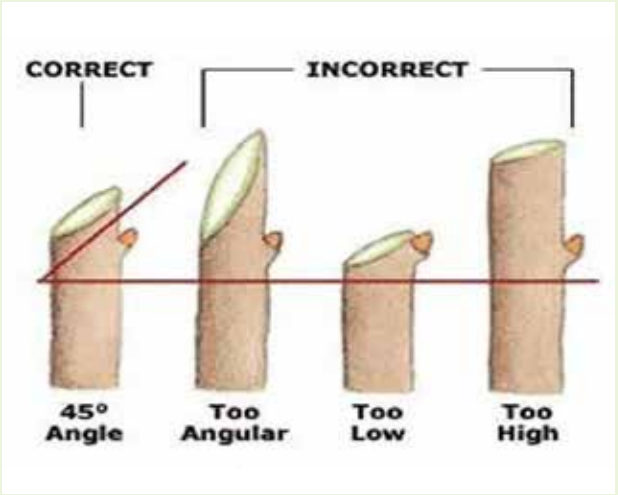
Weeding; Regularly weed your farm or around your seedlings in order to avoid competition for water and nutrients, and reduce spread of pest and diseases.

MANAGEMENT PRACTICES

Pruning: Regularly prune the planted trees as it helps maintain the desired size and shape of the tree, making it easier to manage and more aesthetically pleasing. It also helps stop the spread of disease and pests through removal of dead or pest attacked branches and enhance light penetration. In fodder trees, it increases the biomass and hence feed for the livestock.

To minimize stress, avoid pruning during the dry session. For fruit seedlings remove all suckers growing below the grafted union to avoid nutrient competition. Also remove branches that are less than a foot above the ground.

How to prune your tree



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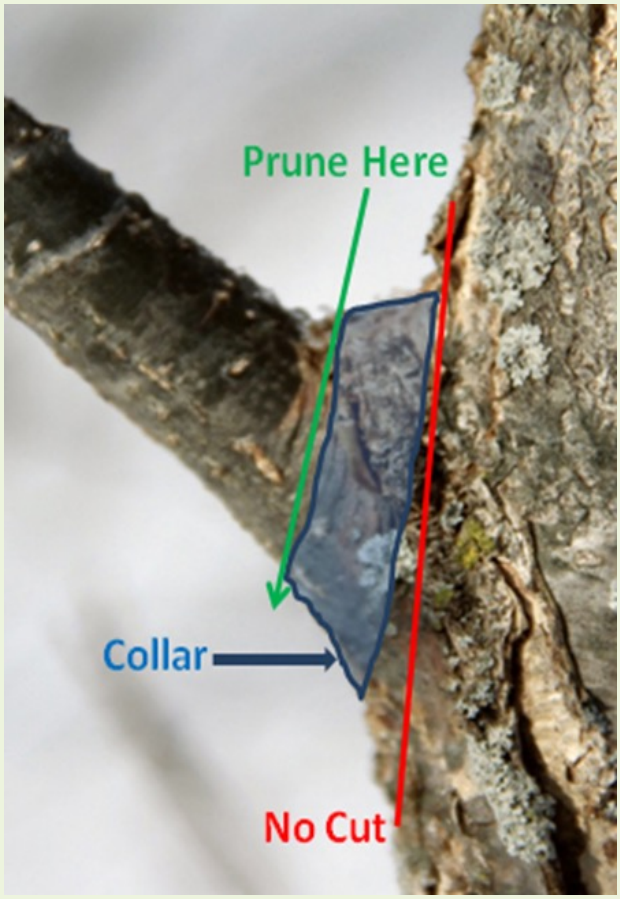


PHOTO BY GOOGLE

Do not prune along the red mark, this leaves a large wood that will take time to heal exposing the tree to diseases

MANAGEMENT PRACTICES

Top dressing: Especially for fruit trees, top dress the seedlings at least after 6 months after planting. Thereafter, regularly top dress the trees with well decomposed manure especially after harvest. To maximize nutrient uptake, apply the manure around the area where the tree's canopy extends. This is where the feeder roots are most active and can absorb nutrients efficiently. After applying the top dressing, thoroughly water the area. This ensures that the nutrients penetrate the soil and reach the root zone, promoting healthy growth and development of the tree.

Pest and disease control: Regularly scout your farm for pests and diseases, employing natural remedies or environmentally friendly control methods. The most common natural and environmentally friendly remedy to control pest include; use of a mixture of pepper, garlic and cooking oil or soap. The ingredients (pepper and garlic) are crushed, and very small amounts of soap or cooking will be added to increase the viscosity during its application to the growing seedlings. The practice is less costly compared to conventional pest control methods. Mixed farming can also help control pest.

Report any observed pests or disease on your farm to the nearest extension office or agrovet for expert advice.

FRUITS HARVESTING

1 DO'S AND DON'TS

Harvest fruits when they are ripe for best taste and quality.

How to know your fruits are ripe

Mangoes: dark green fruits start turning pale green to yellowish.

Oranges: No matter the variety, a ripe orange has sweet, fresh and citrusy smell, bright and evenly colored. Oranges do not continue to ripen after harvest, and therefore should only harvest the ripe ones.

Guava: Turn from green to yellow or from deep green to light green.

2

Gently pluck the fruits from the branches. **DO NOT** hit the fruits with stones or shake the tree to harvest. These actions will cause the fruits to get bruises significantly reducing their quality as well as cause them to spoil. If using any tools, ensure they are clean to avoid contamination.

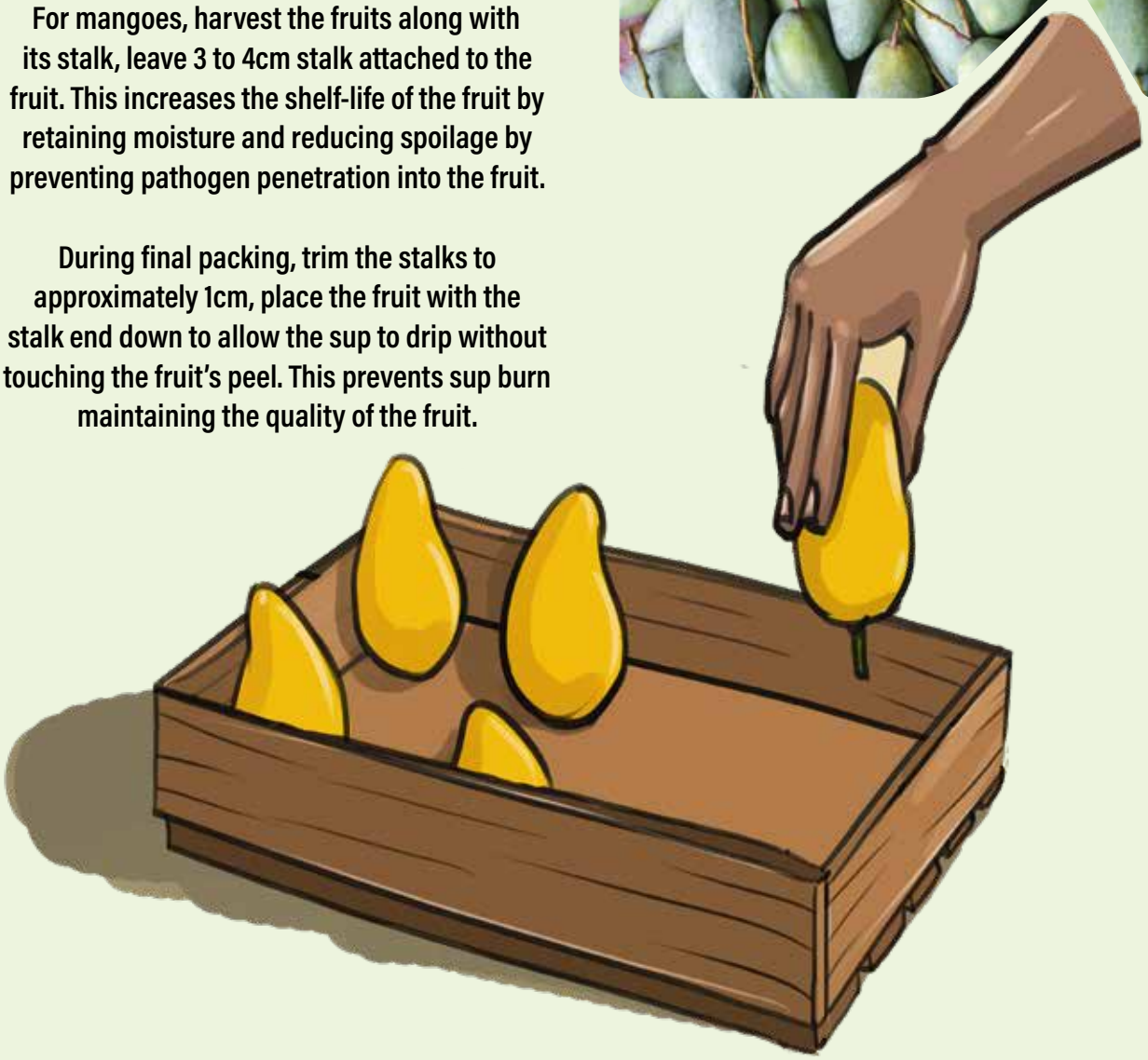
DO'S AND DON'TS

3

PHOTO BY GOOGLE

For mangoes, harvest the fruits along with its stalk, leave 3 to 4cm stalk attached to the fruit. This increases the shelf-life of the fruit by retaining moisture and reducing spoilage by preventing pathogen penetration into the fruit.

During final packing, trim the stalks to approximately 1cm, place the fruit with the stalk end down to allow the sup to drip without touching the fruit's peel. This prevents sup burn maintaining the quality of the fruit.



4

Pack the fruits in clean crates; Avoid packing fruits too tightly in containers, as this can cause bruising or spoilage.

5

Check fruits for pests or damage before harvesting.

6

Avoid direct sunlight exposure and ensure adequate air circulation during fruit transportation.

7

Store the fruits in a cool dry place.

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