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# **Module 8**

## Tree maintenance

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In smallholder farms, pruning and top working are the most important maintenance procedures for established trees. Plant protection and fertilization are also important, but small-scale farmers do not give them as high a priority.

### Pruning

Pruning is done to—

- encourage good development and shape of the tree
- maintain healthy fruit trees, free of pests and diseases
- encourage production
- stimulate frequent production and avoid alternating yields
- expose all fruits to sunlight for ripening and allow good aeration

All pruning wounds the tree and exposes the plant to stress. Through the open pruning cuts, pests and diseases can enter the tree.

### Principles of pruning

Pruning is preferably done in a resting period of the tree, when it is not flowering or fruiting. As the tree reduces its production of leaves, sprouts and fruits during such periods, an open cut bleeds less and the tree loses less energy and nutrients. These periods are during the cold season or the dry season. Avoid—

- cuts with large diameters
- unclean, unstraight cuts
- cracks in the remaining branches
- unnecessary wounds
- cuts that allow waterlogging in the wounds

### Types of pruning

#### Formative pruning

Done at a very early stage after planting—within the first 3 years, formative pruning creates a desirable shape with some main branches. It gives you a good tree canopy. Formative pruning—

- starts in the nursery with the young tree
- forces the tree to form the desired shape
- creates a strong framework for fruit production

#### Maintenance pruning

Done to maintain the resulting canopy by annual or biannual pruning, maintenance pruning—

- ensures the initially established tree shape is maintained
- removes weak, diseased or undesired parts of the canopy

## Tools

- pruning secateur
- pruning saw

Do not use a panga, because it creates wounds that are quickly infected by disease and insect pests.



*Pruning secateur*



*Pruning saw*

## For wound sealing

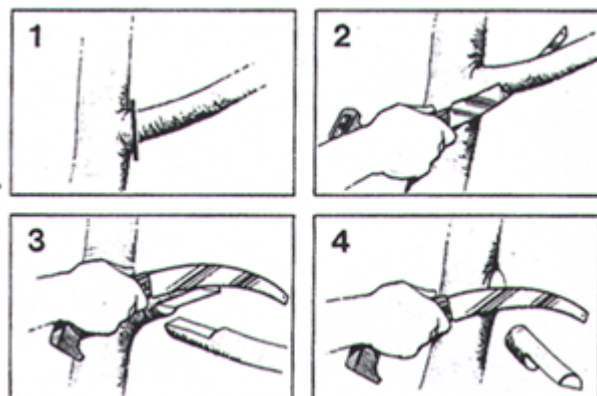
You will need—

- oil paint or
- tree wax, made of 1 part beeswax and 9 parts paraffin from a household candle, melted in a tin
- a brush with which to paint the cut that closes the wound.

## How to prune a branch

### Pruning strong branches

- Cut strong branches using a pruning saw to achieve a straight cut. Strong branches tend to break if you cut them straight downwards.
- Cut strong branches in 3 steps:
  - 1 – Cut 1/3 of the diameter from the underside of the branch first, approximately 5 cm from the stem.
  - 2 – Cut from the upper side of the branch, approximately 8 to 10 cm from the stem, until the branch is removed.
  - 3 – Make the last cut close to the stem, creating a smooth, straight and slightly slanting cut that can heal quickly.
- Cuts with a diameter larger than 5 cm should be sealed with oil paint or tree wax.



*Pruning a strong branch with a pruning saw*

### Pruning small branches

Cut small branches with a pruning secateur. Most pruning secateurs will cut branches with a diameter up to thumb size. As the branches are usually thin, they tend to dry out.

It is important to cut with a slanting cut.

### Steps in pruning a fruit tree

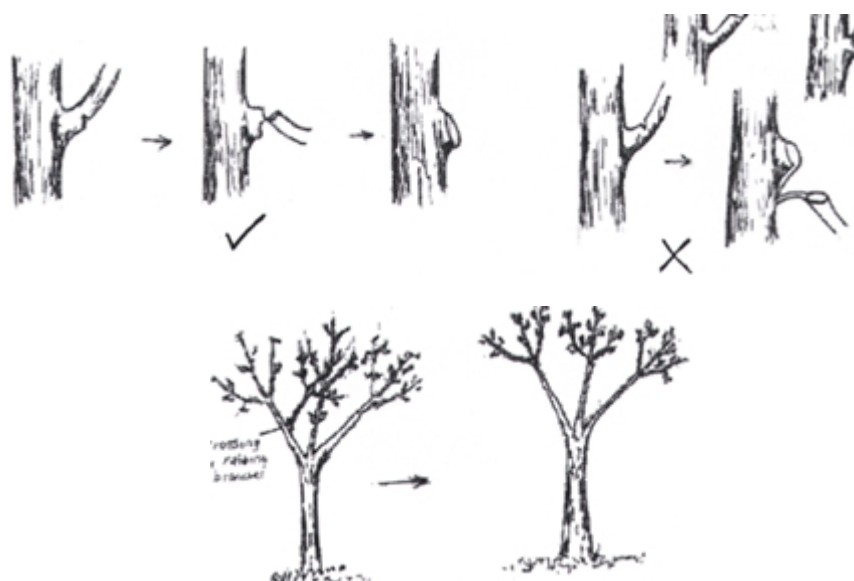
**Step 1:** Remove rootstock suckers from the bottom of the stem. Prune all dead and diseased branches. Cut all branches that hang down close to ground level. The fruits they bear will be of low quality and easily affected by pests and disease, as they come in contact with the ground.

**Step 2:** Prune all crossing, overlapping or rubbing branches that interfere with other branches. When you must choose which branches to cut out, select the weaker ones.

**Step 3:** Remove all water suckers. These are shoots that grow from the rootstock (usually at the base of the plant). As they are usually soft, you can use the secateur, but you have to make sure you cut them close to the bark of the originating branch, to prevent them from sprouting again soon.

**Step 4:** Take your time to identify the main branches and the secondary lateral branches forming the tree shape. As each tree is different, walk around the tree once or twice. If you are doubtful about a branch's importance, shake it and identify which parts of the tree belong to that branch.

- Identify the branches that should definitely remain.
- Decide whether you really need to cut off a branch or whether it is still tender and can be forced into a desired direction with a string or a wooden spreader. The tree should remain with well-developed, promising branches in all directions.
- Cut branches that obviously distort the tree's shape or tend to develop in an undesirable direction. For most fruit trees in the tropics and subtropics, this means opening the crown of the tree by removing only branches that get too dense in the centre of the fruit tree. This opens up all the formerly shaded and suppressed parts of the canopy.



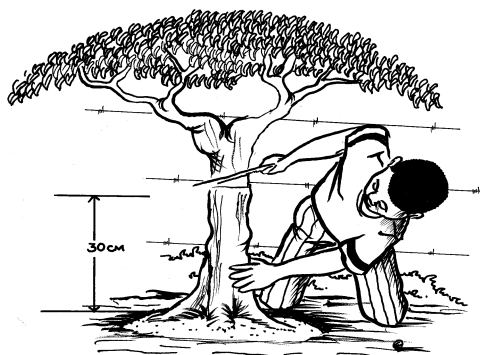
*Steps in pruning a fruit tree*

## Top working

- Top working is a method of grafting. It is used to change the tree cultivar, which might be important for upgrading unimproved local trees or old cultivars that are no longer marketable.
- It is a method that can react to market trends more quickly than establishing new fruit trees on your farm and uprooting the old ones.
- An advantage of top working is that throughout the process the root system is not affected.
- It will take 3 to 4 years from the top working to the first harvest of the new cultivars, as you have:
  - a) To cut the whole stem of the old tree and graft directly under the bark of the remaining stump.
  - b) To graft a on a side shoot of the main stem of the old tree.

Top working bears the risk that the grafting does not take. This might happen due to improper grafting or diseases, which affect the cut of the former stem.

### Top working by grafting under the bark of the stump



Cut the tree at knee height to leave a stump.



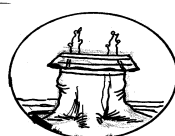
Make a wedge cut on the tree stump.



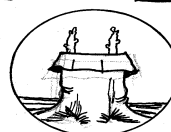
Prepare scions by cutting a clean straight wedge.



Insert the scions in the wedge in the stump.

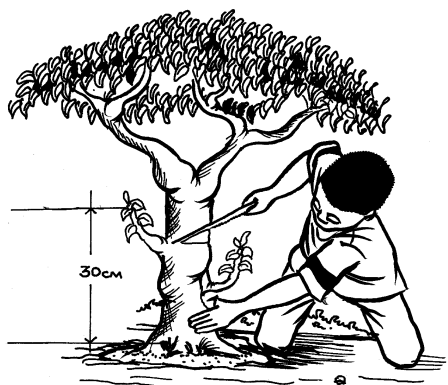


Tie the scions in place using grafting tape.



Protect the stump with a polythene sheet.

### Top working by grafting a side shoot of the old tree



Cut the tree at knee height.



Use shealing paint to seal the wound.



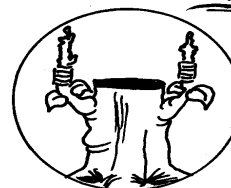
After side shoots have developed, prune them back and make wedge cuts.



Tie the graft union with grafting tape.



Insert prepared scions into the wedges.



**Trainer's note:**

Have the participants summarize the importance of pruning, principles of pruning and types of pruning.