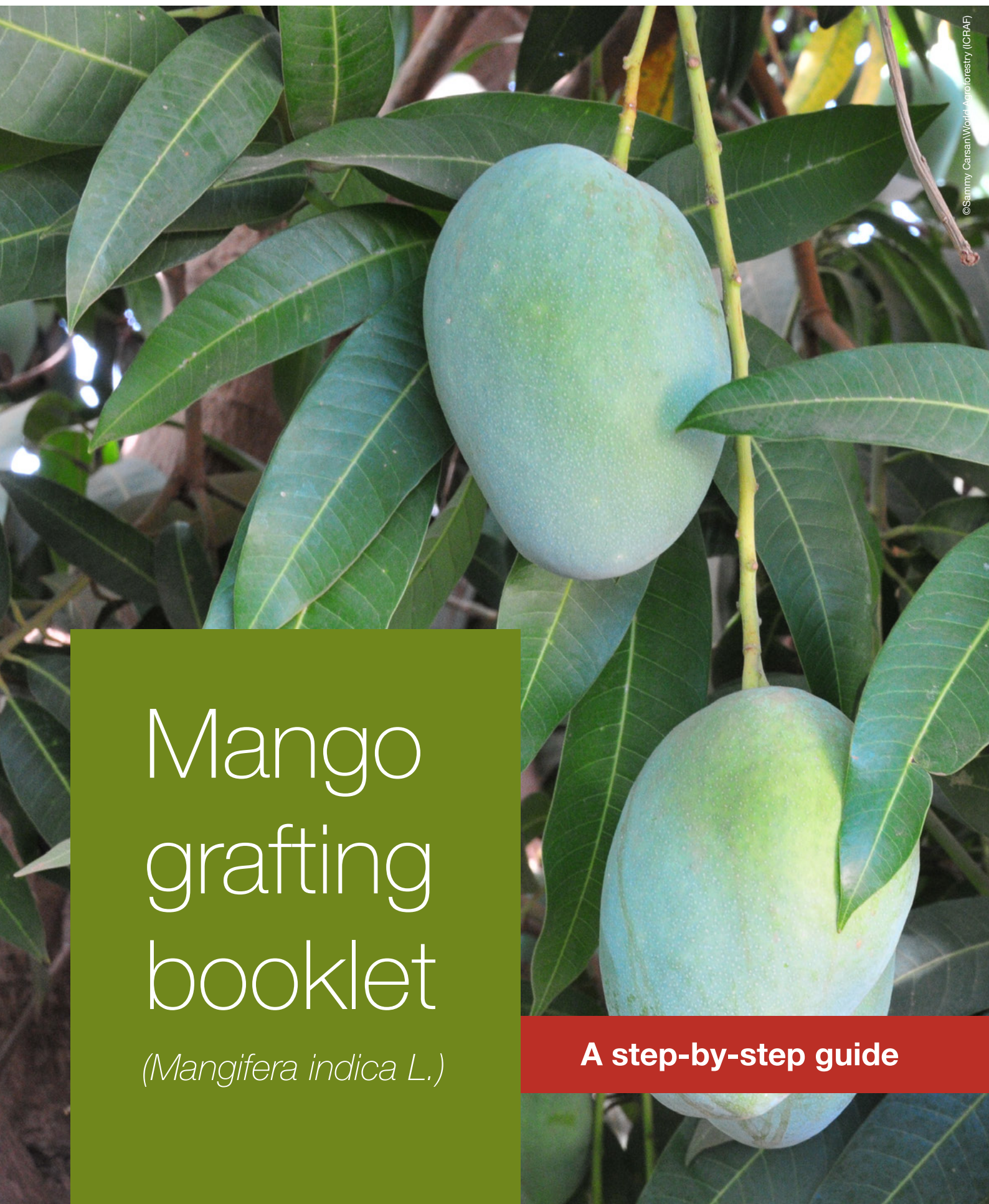




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Mango grafting booklet

(Mangifera indica L.)

A step-by-step guide



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Introduction

Grafting is a rapid vegetative propagation technique used to multiply plants identical to the desired parent tree. Propagation is the process of raising new plants from a variety of sources: seeds, cuttings, bulbs and other plant parts.

Grafted mango trees take a shorter time to start flowering and produce fruits. More trees can be accommodated per unit of land as trees grafted on a dwarfing rootstock grow less vigorously. Given the many mango varieties available, farmers have good opportunities to graft desired varieties with great market and domestic consumption potential.

Plant grafting principles

- Involves joining or uniting two separate woody parts of a living plant tissue from different trees or plants to form one plant.
- Parts used in grafting: A scion, refers to the bud or piece of stem that is to be attached to the rootstock. Rootstock refers to the seedling or tree upon which a scion is to be attached. Materials selected as scions should be taken from terminal buds (end of a branch) of a tree or plant, at the 'tight bud stage' or before a new flush with buds which are swollen but have not opened.

There are several grafting methods which differ depending on how the scion is attached to the rootstock. These grafting methods are top/wedge whip/tongue and side/Veneer. Usually, mango seedlings are grafted using top/wedge grafting method.



Step-by-step guide to grafting

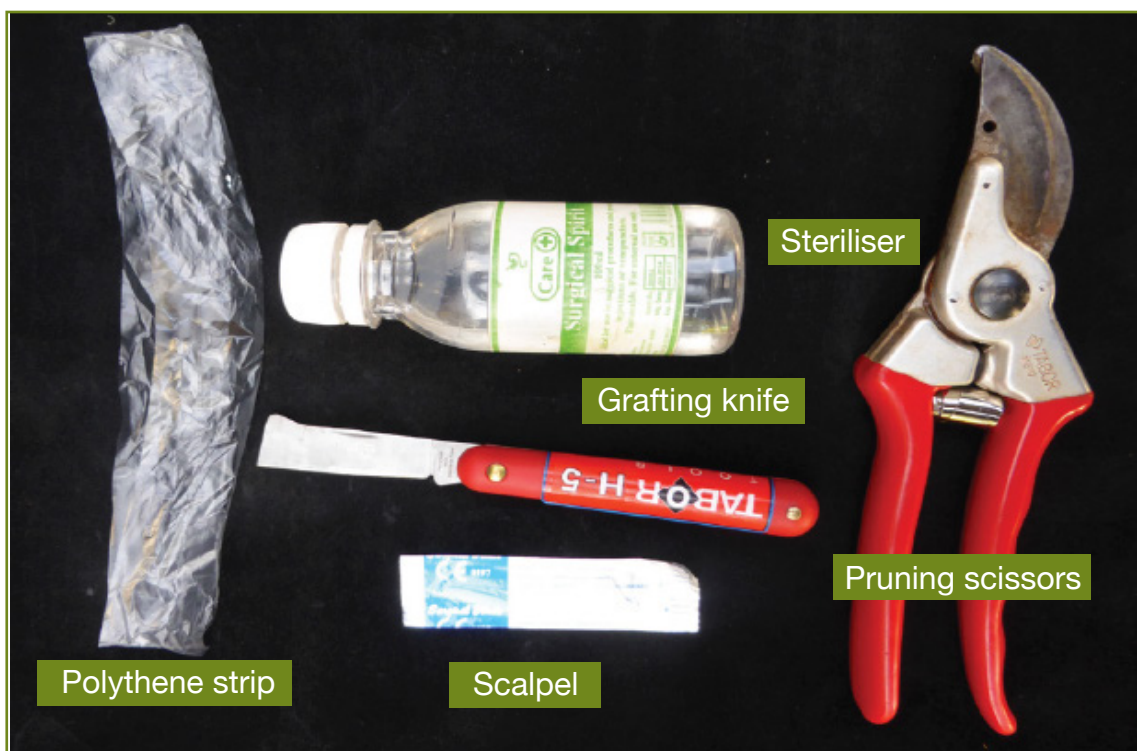
STEP

1

Prepare your propagation tools and materials

Required tools and materials:

- Pruning scissors, scalpel or grafting knife.
- Grafting tape or soft clear polythene bag cut in strips. The ideal material for covering should be a clear polythene strip that is water-proof and flexible.
- Sterilizer such as spirit, but other alternatives could be used including rubbing isopropyl (alcohol - although it evaporates quite easily) or household bleach prepared by mixing one part with nine parts of water by volume (this bleach can be highly corrosive on certain metals).
- Plastic bag to collect scion, a wet newspaper or cooler box (optional).



All grafting tools should be thoroughly sterilized before each grafting activity to avoid infecting plants with diseases

Select the rootstock

A good rootstock is very important for future production of high quality mango fruits. The rootstock provides the rooting system and part of the stem of the future mango tree.

Select the rootstock based on these criteria:

- Suitable varieties; best are 'Peach' and 'Sabre' varieties, but if not available select a seedling from a local mango tree that grows well in your area.
- Healthy, strong and free of pests.
- About 6 months old (which should be at least 25 cm tall) with a stem as thick as a pencil.



Cut the scions

It is very important to get quality scions for grafting, as this will develop into the productive crown of your future mango tree.

To get quality scions follow these steps:

- Identify a highly productive, healthy mother tree of the desired variety and quality.
- Select scions from the end of the branches which are as thick as a pencil and have an active, healthy terminal bud.
- Cut the scion at 10 cm length by use of a pruning scissors, secateurs or a very sharp knife.
- Remove the leaves from the scion using a clean sharp knife or secateurs.
- Wrap the freshly cut scions in a wet newspaper and put the package in a plastic bag.
- Transport your scions to the grafting location as soon as possible. Store the package in a cool place during transportation and use a cooling box if you will be travelling for long.




When to collect scions

It is advisable to collect scions during warm and humid weather, just before the production of new leaves (also called flushing).

What to avoid when harvesting scions

- Harvesting from diseased branches
- Low lying or crowded branches
- Bigger or smaller sized scions that don't match the rootstock
- Scions not at 'tight bud stage'
- Woody or matured stems
- Avoid collecting scions between the flowering and harvesting seasons



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- Scions should be stored in a zip-lock plastic bag in a cool dark place for not more than 7 days. The sooner you perform the grafting with the cut scions, the better and the higher the success rate. It is recommended that you collect the materials (steps 1 and 2 above) and carry out the grafting activity on the same day whenever possible.
 - To ensure successful grafting, it is recommended that a farmer selects healthy and vigorous rootstocks and scions which come from desired mango varieties.

Preparing rootstock for top or wedge grafting

- Ensure that you pair scions to rootstock of the same thickness.
- Cut the mango rootstock seedling horizontally at a height of about 6–8 cm above soil level by using pruning scissors or a sharp knife.



- Split the cut upper end of the rootstock through to a depth of about 3 cm using a very sharp knife.



Preparing the scion for top or wedge grafting

- Cut the scion to a final length of about 10 cm using a pair of pruning scissors or a sharp knife.
- Use the scalpel or razor blade to sharpen the cut lower end of the scion to a V-shape by removing the wood on both sides of the scion.
- Try to make the V-shape as deep as possible (about 2–3 cm) as this will increase the survival rate of your grafted scion.



Join rootstock and scion

- Slide the sharpened end of the scion into the slot you have cut on the rootstock.
- Insert the scion as deep as possible into the cut of the rootstock and align the two parts.



Make sure the cambium parts (these are the white greenish layers just under the bark) of the scion and the rootstock are in close contact and quite firm. It is important that both the scion and rootstock have exactly the same thickness at the contact location. If this is not the case, it is advisable that you remove the scion and repeat the sharpening at a thinner end or cut the rootstock at a thicker part of its stem. Then repeat the joining and check if the two match.

STEP 7

Enclose (bandage) the union

Fix both the scion and rootstock in place by covering the point of union until it is healed. To do this;

- Hold the union carefully with one hand.
- With the other hand, wrap the grafting tape or the polythene strip tightly around the union and knot or inter-loop the two ends of the tape/strip.
- Make sure that the wrapping is tight enough and that the scion does not move out of the union while wrapping.



Cover the scion

This is done in order to increase the temperature and humidity around the graft, hence improving the chances of a successful graft union.

- Wrap another grafting tape or polythene strip around the scion, but a bit more loosely than the one bandaging the union.
- Knot or inter-loop the two ends of the tape/strip.
- Don't cover the upper part of the scion which is the terminal bud so that it can grow and produce new leaves.

What to avoid

- Using unclean grafting materials can lead to wound contamination/infection.
- Direct exposure of the union to sunlight may lead to high water loss. Grafted mango should be stored under a shade.



Let the wounds heal and remove the bandage

Fix both the scion and rootstock in place by covering the point of union until it is healed. To do this;

- Hold the union carefully with one hand.
- With the other hand, wrap the grafting tape or the polythene strip tightly around the union and knot or inter-loop the two ends of the tape/strip.
- Make sure that the wrapping is tight enough and that the scion does not move out of the union while wrapping.



Post grafting care: hardening, transplanting and removal of terminal bud

- Harden your grafted seedling to avoid shock by placing them in a shade house or a shaded area for 6-8 weeks before transplanting.
- Transplant the grafted seedling into a well prepared planting hole (refer to planting booklet).

About 6 months after transplanting, you can remove the terminal bud of the stem to initiate branching at the desired height of your mango tree.



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Over watering of recently grafted plants is a common mistake encountered as there is minimal loss of water through leaves. Please do not overwater the grafted plant.



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