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# Grafting mangoes

## Summary

With all grafting, observe the following points:

- maintain good hygiene throughout
- use healthy, vigorous rootstocks
- use healthy scion or bud wood with active buds
- keep unused bud wood wrapped in plastic and stored in an esky or refrigerator
- use fresh scion wood if possible
- always cover the fresh graft with a plastic bag to create a warm, humid environment
- if grafting in full sunlight, cover the plastic bag with a brown paper bag to prevent excessive heat build-up
- do not over-water stocks after grafting
- keep the grafting knife clean and sharp, and do single cuts only when grafting
- always match the cambium layers on one side during the tying process - don't worry if both sides do not match
- use young grafting wood if possible.

## Introduction

The Kensington, R2E2 and Common and Honey Gold™ mango varieties produce polyembryonic seeds that will produce seedlings true to type. Consequently, it is not essential to graft these varieties, however, a number of other advantages do make grafting them worthwhile.

Other varieties, such as Calypso™, Palmer, Keitt and Kent, produce monoembryonic seed and plants produced from these seeds will not come true to type so they must be grafted.

The primary aim of grafting is to produce plants the same as their parent. Other factors may include reducing disease incidence, introducing vigour or dwarfing effects, and inducing earlier maturity. Calypso™ and Honey Gold™ are protected under plant variety rights so cannot be commercially propagated without the permission of the owner of these rights.

With a little practice grafting mangoes is relatively easy and following some basic requirements will increase your success rate.

## Propagation tools

You should obtain a special grafting knife which is different from an ordinary knife as it is sharpened on one side only. It must be kept very sharp and clean at all times.

Use special 1.25 cm wide PVC grafting tape available from most nursery shops. Clean-cutting secateurs are useful for cutting bud wood, and small plastic bags and brown paper bags placed over the graft greatly improve the success rate. A fine sharpening stone is necessary to maintain a very sharp knife.

## Rootstocks

Both Kensington and Common mango seedlings are suitable as rootstocks, as they produce uniform, vigorous seedlings that are compatible with other varieties.

The main requirement is to have vigour in the rootstock at the time of grafting. You can achieve this by using a well-drained potting mix and attending to nutrition and pest and disease control. Do not graft rootstocks that are not vigorous.

The size and age of the rootstock can vary considerably if it is vigorous. However, the most common stocks selected would be about 12 months old, 40-50 cm tall and up to 1 cm wide at a point about 20-30 cm above ground level. Field planted stocks can also be grafted after 6-12 months of growth.

## Scion or bud wood

Tip wood is considered the best material to use for grafting. The most suitable tips have prominent eyes or buds. The growth may vary from just matured wood (wood that has changed colour from the pink leaf, immature stage) up to fully matured growth.

Ensure all scion wood is free from pests and diseases.

Prepare the scion wood by cutting the young shoot (about 10 cm long), off the parent tree and trimming the upper and terminal leaves back, leaving about 1 cm of petiole on the scion. These short petioles protect the juvenile buds at the base of each petiole and indicate the success of the graft a few days after grafting. Cut the entire leaves and petioles towards the base of the scion back flush with the bark.

## Time of grafting

Only attempt grafting when the rootstocks are vigorous and the buds on the scion wood are swollen. Best results are obtained during warm, humid weather - usually from January until the end of April. You can be successful at other times of the year by artificially increasing the temperature and humidity. Day temperatures of 25-30 °C and nights of 18-21 °C are ideal. It is usually difficult to obtain quantities of suitable bud wood between flowering and fruit harvest.

## Grafting technique

The most suitable height for grafting is about 20-30 cm above ground level. At this point, the rootstock should be straight, at least pencil thickness and have green bark. If the bark is old, brown or corky, avoid the area. Retain the leaves on the stock below the point of grafting.

A wide range of graft types can be used on mangoes, but the two most common are the whip and the cleft or wedge graft. The whip graft is used widely by nursery operators and other highly experienced operators, while the wedge graft is used by most other grafters. Both grafts are quite easy to do. After a little experience, and if you perform certain basic steps, you will achieve a high percentage of successful 'takes'.

## Wedge or cleft graft

Prepare the scion wood by making two sloping cuts at its base to form a wedge 2.5-3 cm long, depending on the width of the stock. Cut the top off the rootstock 20-30 cm above soil level and make a clean-edged cut down the centre of the stem for about 3 cm.

Insert the scion wood wedge into the rootstock cut to match the cambiums on the thick side of the scion. Then tie the union firmly with grafting tape to seal the union, prevent moisture loss and stop scion movement.

## Whip graft

A whip graft involves making a single-angled cut through both the rootstock and the scion wood. This cut would be similar to the first cut used on the cleft graft, though it need not be as long.

As with all grafts, ensure that the area where the graft is to be made is straight and preferably relatively young with green bark. Make only one angled cut on both the rootstock and the scion, preferably about the same length.

When tying the graft, start taping at the bottom and finish above the top of the graft. The cambium should be matched on at least one side of both the scion and rootstock during this process.

## Covering the graft

You will greatly enhance your success rate by covering the newly completed graft with a small plastic bag and tying it at the bottom to enable a build-up of heat and humidity. You do not require further covering in a shaded greenhouse but, if the grafted plants are in the sun, place a small, brown paper bag over the plastic bag to prevent excessive heat build-up.

## Removal of bags and grafting tape

Remove the plastic bag and paper bag from the graft once it has grown 1-2 cm. This may take 2 to 4 weeks. The new shoot growth is very brittle so handle the plant carefully.

Remove the tying tape after the first flush growth has matured. If left on too long (several months), the tape may restrict growth by becoming too tight in the graft area. The time taken to tape removal will be 2-4 months. The trees can be planted in the field at this stage.

## Hygiene

You will need to maintain a high level of hygiene at all times. Periodically dip grafting knives into methylated spirits to sterilise them. You should also spray the stocks and dip the scion wood in a 0.2 per cent mancozeb fungicide.

## Post-grafting care

Over-watering recently grafted plants is perhaps one of the most common faults encountered. Remember that little leaf surface remains on the stocks following grafting and water loss through transpiration is minimal.

Suckering is sometimes prolific after grafting, if suckers grow from the rootstock remove them.

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