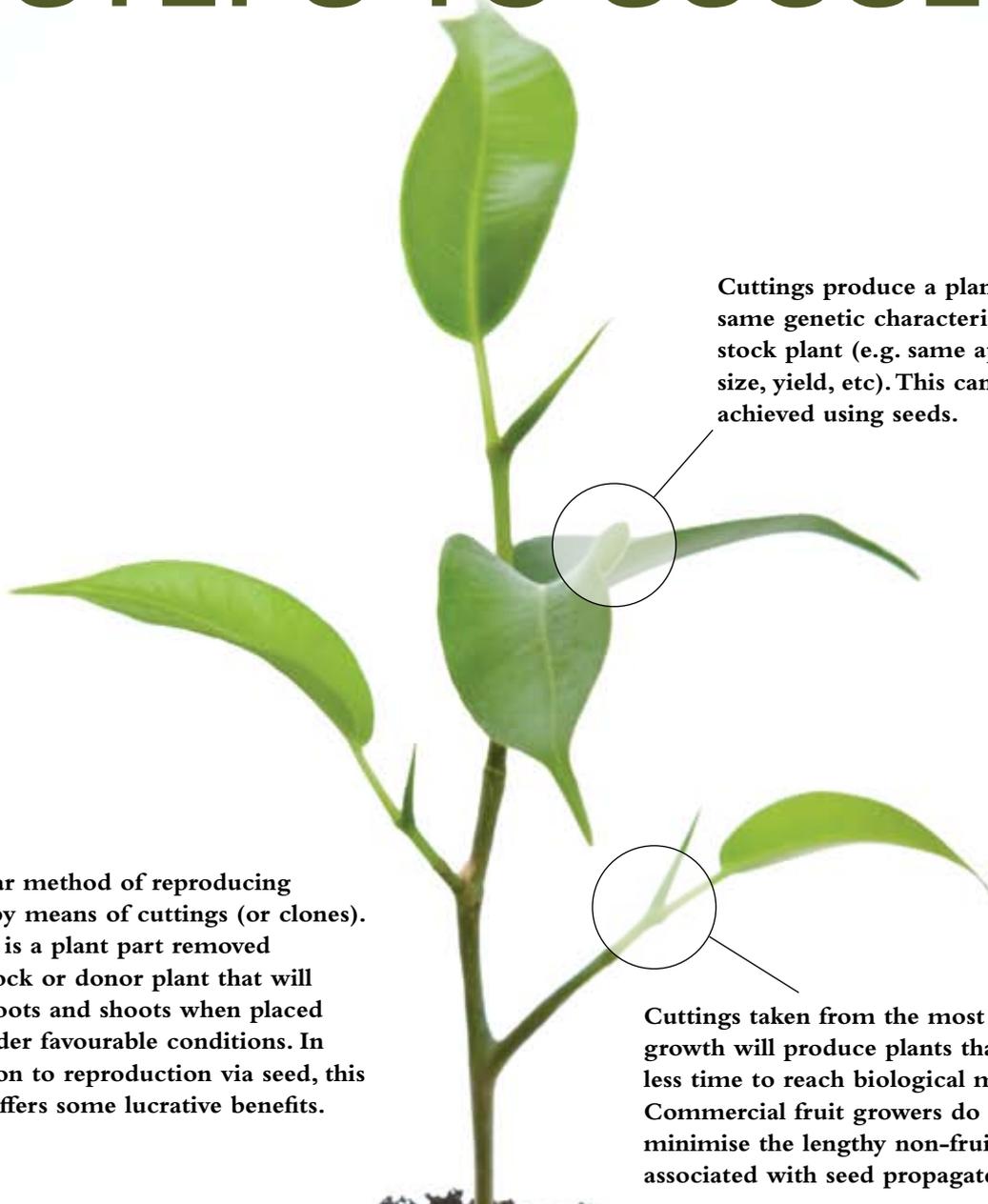


HOW TO PRODUCE CUTTINGS

10 STEPS TO SUCCESS



Cuttings produce a plant having the same genetic characteristics as the stock plant (e.g. same appearance, size, yield, etc). This cannot be achieved using seeds.

A popular method of reproducing plants is by means of cuttings (or clones). A cutting is a plant part removed from a stock or donor plant that will develop roots and shoots when placed in soil under favourable conditions. In comparison to reproduction via seed, this method offers some lucrative benefits.

Cuttings taken from the most recent growth will produce plants that take less time to reach biological maturity. Commercial fruit growers do this to minimise the lengthy non-fruiting phase associated with seed propagated plants.

Figure 4.1 - Initial root formation

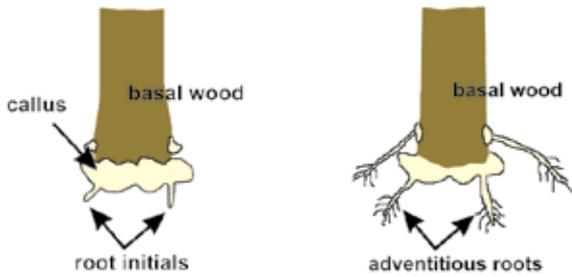


Figure 4.1a:
Callus tissue forms prior to the formation of root initials (typically within 5 days.)

Figure 4.1b:
Adventitious roots break out of the callus tissue (typically 7-10 days).

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STEP 4 Select a plant that has been well maintained, has favourable characteristics and is free of disease. The cuttings material must be of semi-hard wood. Avoid plants that are well into the flowering stage.

STEP 5 Using secateurs (or a scalpel) remove a lateral (side branch) that has at least two sets of leaves on it and has a stem diameter of at least five millimetres (see Figure 4.2). Then immediately place the cut end into tepid water.

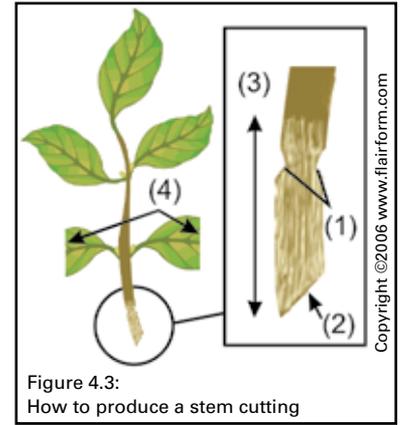


Figure 4.3:
How to produce a stem cutting

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Stem cuttings: The most appropriate cutting material will vary between species; however, most species can be propagated using stem cuttings. Stem cuttings possess stems, leaves and sprouts (see Figure 4.2). Roots grow from the basal wood (Figure 4.1a and 4.1b) and shoots grow from the sprouts.

The physical age of the material selected is important to a cutting's survival. Material can be classified as softwood, semi-hardwood or hardwood. Semi-hardwood generally provides the best cutting material because it's relatively unsusceptible to rotting, fungal attack or dehydration and it has a relatively high rooting potential. This material is best identified by wood turning hard and changing colour from green to brown with the formation of bark; it is not as supple as softwood, but still flexible; and its leaves are darker in colour.

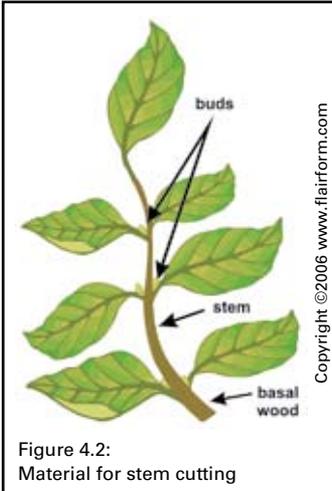


Figure 4.2:
Material for stem cutting

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Procedure

STEP 1 Thoroughly wash and sterilize all hardware and areas that are likely to contact cuttings and cause disease contamination.

STEP 2 Pre-soak medium by immersing in a highly pH buffered seedling nutrient. This helps ensure that excess alkalinity is removed and ensures optimum root-zone pH. Gently squeeze to drain excess nutrient.

STEP 3 To increase the success rate of cuttings (see figure 4.6) and seedlings, use a heat mat* and propagation lid to maintain root and air temperature at 20 to 25°C and relative humidity at 80 per cent. As a light source use cool white fluorescent lighting timed to run for 18 hours per day. Ensure this environment is established prior to planting cuttings.

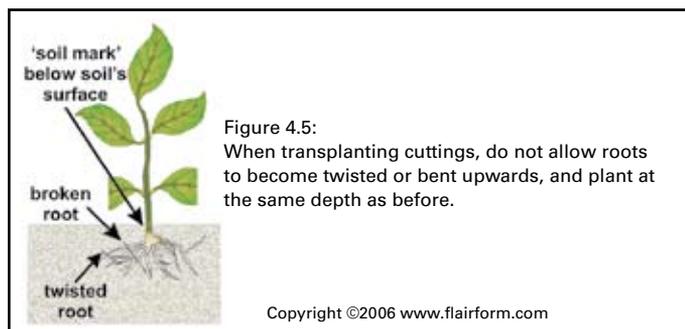
*Heat mat: A heat mat applies heat directly to the medium and basal end of the cutting to promote rapid root development.

With minimal foliage and no roots, cuttings largely depend upon existing (internal) energy reserves for the creation of roots. Consequently, the longer it takes to form roots, the less chance there is of survival. Heating the air alone is counter productive as this promotes unnecessary foliage growth, which wastes valuable energy supplies that are required for the production of roots.

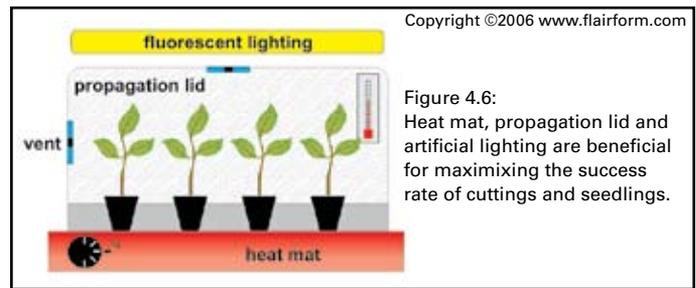


STEP 6 Using a scalpel, trim cuttings as per figure 4.3: (1) Remove bottom set of leaves and nodes, (2) Cut through stem* at a 45° angle approximately five to 10 millimetres below where the leaves and nodes were, (3) Scuff (but do not fully remove) the bark between the nodes and the base of cutting, (4) if bottom set of leaves are too large these should be cut in half**.

** Better results may be achieved by trimming this set of leaves 24 hours prior to removing the cutting from the plant.



STEP 7 Immediately immerse entire basal end into cutting gel. (See region three in Figure 4.3). Punch a hole in the medium of diameter slightly greater than that of the basal end and deep enough so cutting will not fall over. Push right to the base of the pre-made hole then press medium against the stem. Do not re-water!



STEP 8 Mist cuttings daily using water, and water the medium as required using a seedling nutrient (EC 0.8mS). Ensure to maintain root and air temperature at 20 to 25°C and relative humidity at 80 per cent. Diligently remove any dead leaves or dead cuttings as these are an ideal host for fungi. Also, keep removing floral buds.

STEP 9 Depending on the plant variety, roots usually develop within seven to 10 days. Once this occurs, gradually expose cuttings to their proposed environment. Note that a sudden change in humidity, nutrient strength, light intensity or temperature might kill them. Therefore, gradually increase nutrient strength to EC 1.5mS. Also, remove the propagation lid for 30 minute periods initially, increasing the frequency over the course of a few days (or as required) until the cuttings are ready to be planted into their proposed environment.

STEP 10 When transplanting, to avoid disturbing roots, simply plant the entire root block and medium used in the propagation system. If it is necessary to remove the cutting from the propagation medium, ensure to be extremely gentle with the roots during the transplanting process (Figure 4.5):

1. Allow the roots to settle naturally into the new medium. Do not allow the roots to become twisted or bent upwards.
2. Plant cutting to the same depth as it was before. **MY**



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