Cutting the guesswork in grafting

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Introduction

In these articles Paolo Dobner and I wish to share our recent experiences grafting with a range of deciduous species. In this article, there are two aspects of grafting that we encourage all who read it to try: using black tape for tying, and the grafting of dormant trees anywhere from leaf drop to very early spring.

Choice of knives

Possibly the most important place to start when grafting is the choice of knife. Having previously worked as a grafting contractor, my first consideration is that the knife be comfortable to use. Secondly, it must be sharp. To save time and know the knife is dependably sharp, I have switched from the traditional grafting knife to what we call in New Zealand, a "craft knife" This is basically a knife with a disposable blade, either the snap off type, or the replaceable type. These blades are generally very thin, less than 1 millimeter, and there is less risk of splitting the wood when making cuts.

Rootstock preparation

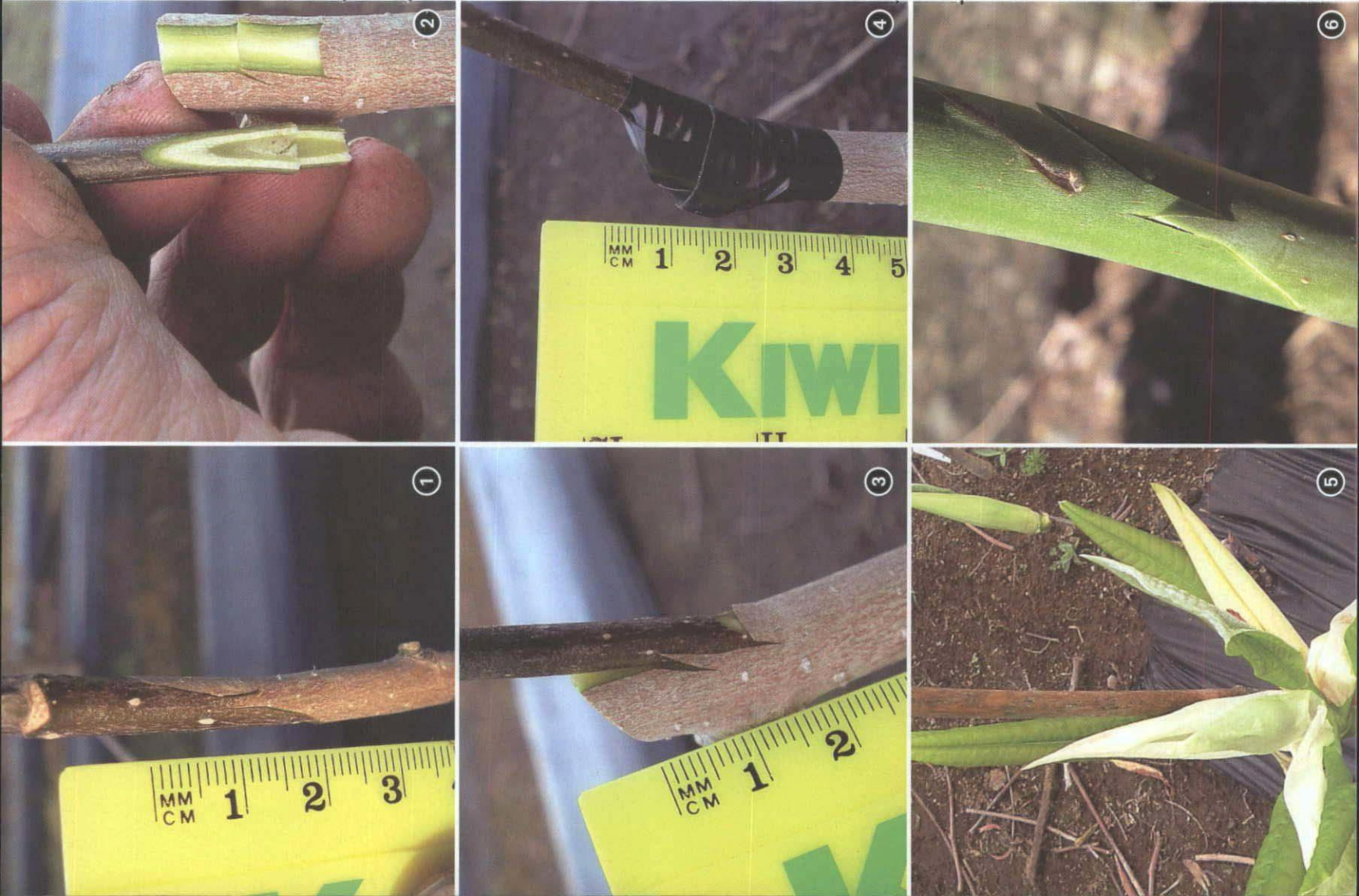
To take much of the guesswork out of grafting, the easiest thing to do is start with totally dormant rootstocks and scions. This can be with plants in containers, or plants established in the ground. The important thing is that there be no sap flow, which in the case of potted plants means keeping the root system cool and a little dry to minimize the possibility of sap flow. One advantage of grafting in total dormancy means there is no slipping of the bark, which can cause bruising and infection.

After performing the grafting operation, maintain this state of relative dormancy for the best results. In effect, the techniques described explain how to "spot weld" plants.

Which grafting technique?

Again, you must be comfortable with the technique you choose to use. The objective is make a cut on the scion and a cut on the rootstock that totally match, then tie them together until the cuts heal and the plant becomes whole. My preference is for the "whip and tongue" method, where two cuts are made on both the stock and the scion, which when placed together match as perfectly as possible.

Firstly choose a rootstock and scion of the same diameter. Make the first cut right through the stem at about 30 to 40 degrees. Make the next cut by holding the scion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or stock and placing the blade about 1/3 the way down from the pointed end of the cut. The blade then slices a 'tongue" into the cut surface. This should be a further 1/3 length of the total cut. When you repeat this on the other surface to be joined, the two opposing surfaces can be slipped together with each tongue slipping behind the other. This is a strong union, and you can let it go when preparing the tying material (see Figure 1).

If the two stems to be joined are not equal in diameter, a smaller scion can be grafted to the top edge of a larger rootstock that has been cut on an angle. Make a modified whip and tongue cut on the scion and make a similar cut on the rootstock (see Figures 2 and 3). Figure 4 shows the graft tied slightly up onto the scion to keep water out of the graft.

This is a graft of *M. tripetala* three months from grafting (July 15) showing a flower bud developing normally.

With some species such as *M. macrophylla* and *M. doltsopa*, there is naturally a large volume of pith in the stems. Figure 5 shows *M. macrophylla* var. *dealbata* (left), ready to go onto *M. macrophylla* rootstock (right). Figure 6 shows the completed graft. This can make grafting more difficult, but there tends to be less pith and more xylem toward the base of a season's growth. Take care not to get loose bits of pith into the graft union, as it will interfere with callusing.

With species such as *M. obovata*, using terminal scions and consecutive scions down the stem all resulted in similar lengths of growth even though the buds down the stem were very insignificant at grafting time. Grafting well before spring allows a good union to develop and force as much growth as possible into these sorts of scions.

Tying and aftercare

The simplest tying material is black adhesive electrical tape. It can be cut easily, and it sticks to itself without needing to be tied off.

Figure 7

Figure 8

The color preference of black allows for solar heating, which can achieve up to 5 degrees Celsius difference to the rest of the plant when the sun is shining, but is still significant even on cloudy days. This appears minor, but by changing the temperature in the graft area, you speed up the healing process. Figure 7 shows the temperature on a graft without tape and Figure 8 shows the increase in temperature on a graft with black tape.) When tying, start the tape on the rootstock as this is more stable and allows the tying tension to be started. Keep the tape tight as you tie, but make sure no part of the graft moves as it is tied.

The ties must be left on as long as possible. I have left some tape on grafts for up to a year or more. Figure 9 shows a tree reworked with *M.* 'Aurora' with ties left on for a full year. As long as there are no more than two layers of tape, it seems to stretch in the warm weather and the plant will force it to stretch. This enables cleft grafts with thin scions matching on one side only much more time to heal. As a matter of course, when using black tape on cherry grafts in the commercial nursery situation, we like to remove ties after four months.

If grafting on containerized plants, make sure the temperature of the container remains low to stop root activity forcing sap to rise. This can be done by either shading them somehow or plunging them into sand or compost to buffer any temperature change while the graft union is left in the sun.

Successful applications

One of the earliest experiences with black tape tying was grafting a cherry branch to a rootstock in early winter. This subsequently healed by spring and the flowers opened to full size at the normal time. Spurred on by this I grafted a flower bud of *Magnolia* 'Woodsman' (one of the latest to flower here) onto a seedling in mid winter and the flower opened about the right time, but it was a little smaller than usual.

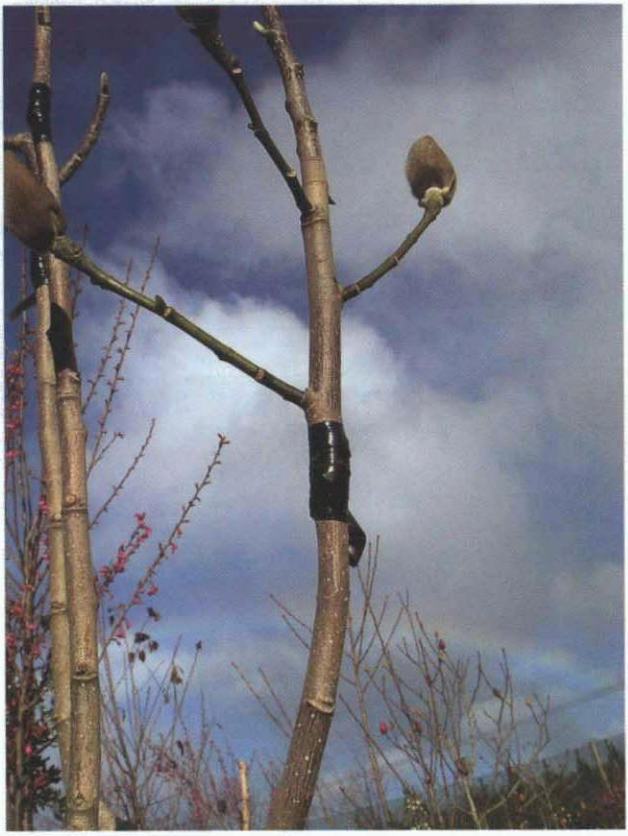

Figure 9. Tree reworked with *M.* × 'Aurora' with ties left on for a full year.

More recently, I have grafted a set of *M. ashei* scions with flower buds onto seedlings of *M. macrophylla* to set up a seed orchard and to allow some hybridizing with this wonderful little tree.

Since our local climate in New Zealand is approximately the same as USDA zone 9a-b, we do experience some frost. This appears to have no effect on the grafts that are done in the early part of winter. I encourage those of you even in the harshest of climates to try grafting outdoors using black tape to tie the grafts. In theory there should be no detrimental effect from frost providing the grafting operation is done in fine dry weather, the ties are tied as tightly as reasonably possible, and there is no sap flow to flood the grafting union.

This is a good way of reworking established trees, or adding other varieties to a collection by having multiple varieties on one framework.

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All photographs by the author.