

Topworking Citrus Trees

Citrus growers sometimes wish to change established groves to other varieties. It is often cheaper to graft existing trees to another variety than to pull out the stumps and plant new trees. Topworked trees will also come back into production sooner than nursery trees. Trees to be topworked must be thrifty and free of fungus or virus diseases that would affect the new top. If you are in doubt whether your trees are suitable for topworking, call in your Farm Advisor or another competent person.

Topworking of citrus trees can be done by budding or grafting. Either method may be used on any size of trees, but in most areas younger trees are budded while large trees are grafted. In some areas, particularly Central California, budding is preferred for trees of all ages.

Topworking by budding

Budding can be done in two ways: either directly into the trunk or scaffold limbs, or into new shoots of heavily cut-back trees. The last method gives a good percentage of bud take, but some time is lost in growing the shoots; also, more follow-up work is required. Most budding is done directly in the scaffold limbs.

Select the branches in which you will place buds and remove all growth which is in the way. Usually some unbudded branches are left as "nurse" limbs.

You may bud in the fall, or, more generally, the following spring when the bark slips well. Start spring buds 3 to 4 weeks after budding by cutting back the branches or by girdling (removing a strip of bark $\frac{1}{4}$ inch or more wide completely around the branch) 2 to 3 inches above the bud. Buds placed in the fall are held dormant by not cutting back or girdling

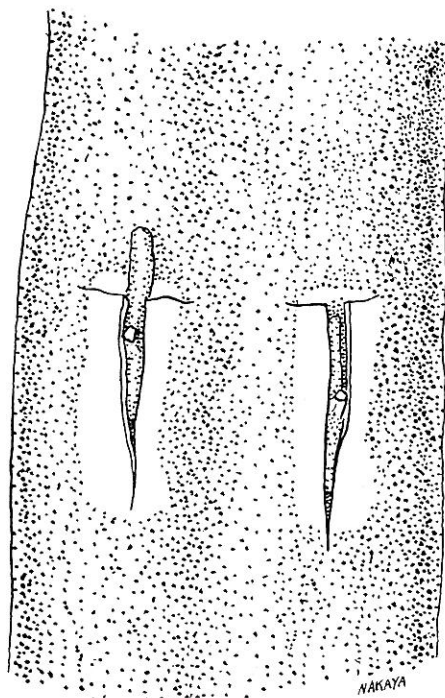
the branches until the next spring. Be careful to avoid splitting when cutting off large branches: remove most of the weight of the branch with a first cut farther out on the limb, and then make a second cut closer to the bud.

Budwood for topworking should be larger than that described in the section on budding nursery trees. On large limbs, two buds are often placed at the same height so that they can be tied with one wrapping operation. Make a T-cut in the limb where the bud is to be placed, and lift the bark to insert the bud. If the bark is too thick to manipulate well, scrape it with a knife to thin it to about $\frac{1}{8}$ inch.

Select budsticks about $\frac{1}{4}$ inch in diameter. Cut the bud from the budstick and insert it in the bark incision as described (pages 14-15). Be careful not to place buds in an inverted position. For topworking make the shield (bark and a thin layer of wood attached to the bud) about $1\frac{1}{2}$ to 2 inches long. With a shorter shield there is the danger of bark growing over it and smothering the buds. After buds are inserted, tie them in by wrapping over them with waxed budding cloth or plastic tape.

After 3 or 4 weeks remove wraps and examine buds to see if they have remained alive. If callus tissue has grown over the bud cut the tissue away carefully—otherwise the bud may become buried and will fail to start. If the buds look all right, shorten or girdle the branches; this should start the buds growing.

After the new shoots have made good growth, cut the branches off flush with the bud and seal the cut surface with a pruning compound. Make this last cut at an angle; this gives better healing on vertical branches, and prevents water standing on the wound surface. All nurse branches should be removed so that all the growth goes into the new top.



Topworking by budding. Left: bud partially inserted. Right: bud inserted and ready for wrapping.

Topworking by grafting

Grafting of old citrus trees is done with the bark graft. Dehorn trees and set the scions in the main scaffold limbs, or cut off these trees below the branches and set the scions in the main trunk. When grafting into the scaffold branches leave some branches on as nurse limbs, both for shade and to maintain the root system until new scions develop foliage.

Graft when the rootstock bark separates readily from the wood. About a day after cutting a tree back the bark tightens; thus, if the grafting is not done immediately after cutting wait about a month until the bark loosens again, at which time re-cut and graft the limb stubs or stump.

Here are the directions for a bark grafting method which has proved satisfactory: cut off the branches and make verti-

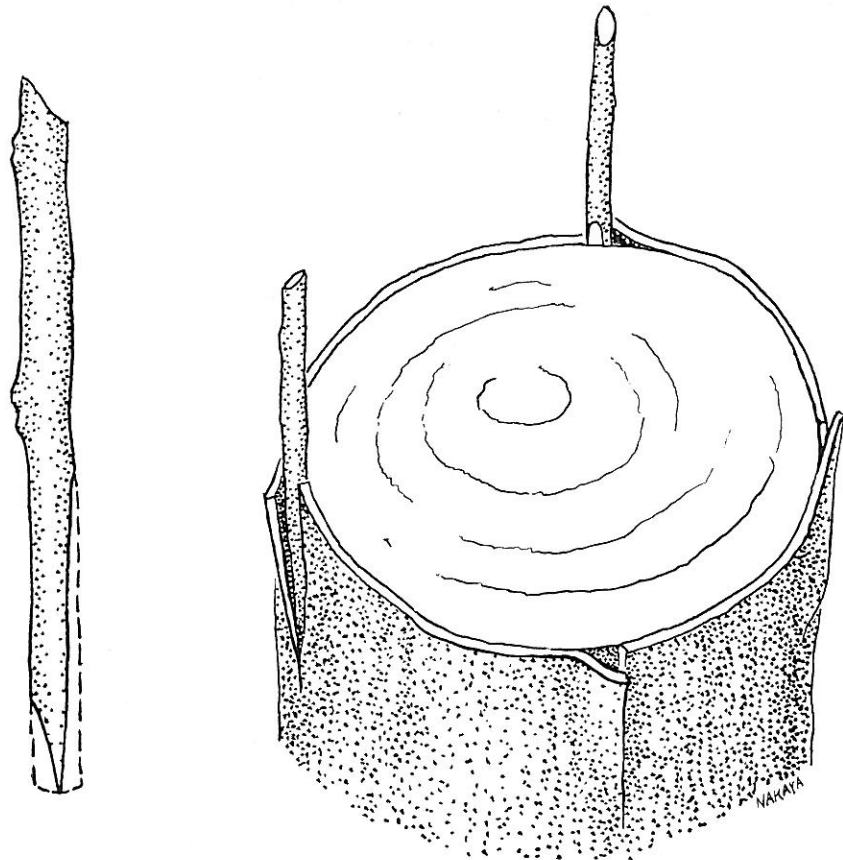
cal slits ($2\frac{1}{2}$ to $3\frac{1}{2}$ inches long) in the bark of the stub where the scions are to be placed. These cuts extend through the bark to the wood and are from 3 to 5 inches apart around the stub. Select scionwood from firm, current season's growth, or from wood as old as two or three years. the diameter may vary from $\frac{3}{16}$ to $\frac{3}{8}$ inches.

Cut a scion (see page 25) with a long sloping basal cut $2\frac{1}{2}$ to 3 inches long. Sometimes a second sloping cut $\frac{1}{2}$ inch long is made on the opposite side. Leave at least two good buds above the longer cut. Lift bark on one side of the cut on the stump high enough to insert the scion, and push down scion with the long cut facing in toward the wood—one side of the scion should fit snugly against the unlifted portion of the bark on the stump. A little cut surface on the face of the scion should still be visible above the rim of the stump after the scions are inserted.

Don't make scions longer than necessary, as long scions can dry out before unions can form. The scions may be nailed in place with thin flat-headed nails, or tied with several loops of cord, friction tape, or vinyl tape around the stump. On some very large stumps baling wire has been used successfully. Take care to have a good fit and enough pressure to hold the scions securely at the point where the top edge of the stump and the cut surface of the scions join; most of the strength of the new union will be in this area. After the scions are fastened, seal all cut surfaces with a pruning or grafting compound to prevent drying.

Protection after grafting

After grafting, protect the scions and trunk from burn resulting from direct sunshine on exposed surfaces. Whitewash trunks and branches on the south side and shade the scions with ventilated paper bags or other material to keep direct sunlight from striking them. Scions may also be protected from the sun by covering



Topworking by bark grafting. Left: scion, showing two cuts. Right: stock, showing vertical slits in bark and two scions inserted.

with white latex paint. As the scions start to grow, tear the bags to let the shoots come through into the sunlight.

Keep an eye on the material you used at grafting time to tie the scions; loosen or remove the ties before they cut into the bark.

In areas where strong winds may break the scions out as they grow, nail 1×2-inch boards to the stump for support. These boards should extend 3 to 4 feet above the graft. Tie the shoots loosely to them.

Many propagators prefer to protect against breakage by merely cutting back or pinching the longer shoots to keep them short and bushy.

Rub off all shoot growth on the stump immediately around the new buds and grafts so they won't compete with the new top. If nurse limbs have been left on the stump, cut them back or remove them before they interfere with the new growth from the scions. Eventually, all shoots below the scions will require removal.