

The content of this article 'Propagation methods for citrus trees' was prepared by Ute Albrecht, Mongi Zekri and Jeffrey Williamson for the University of Florida and has been revised and republished by FreshFruitPortal.com.

T Budding

T budding is a relatively simple procedure and is recommended over chip budding, which requires more expertise.

Most Florida citrus trees are propagated by the inverted T bud procedure, but the standard (upright) T bud is also suitable.

T budding can be conducted whenever the rootstock plant has attained suitable size, its bark is slipping, and budwood is available.

Before making any incision to stock or budwood, the blade of the budding knife should be disinfected to avoid transmission of any disease agent.

Using the budding knife, a vertical cut of about 1.0-1.5 inch in length is made completely through the bark in a smooth area of the rootstock stem.

A horizontal cut is made through the bark at the bottom (inverted T) or top (regular T) of the vertical cut (Figure 5).

The cut is made at a slightly upward angle, again cutting completely through the bark. The point of the knife can be used to lift the bark along the vertical cut.

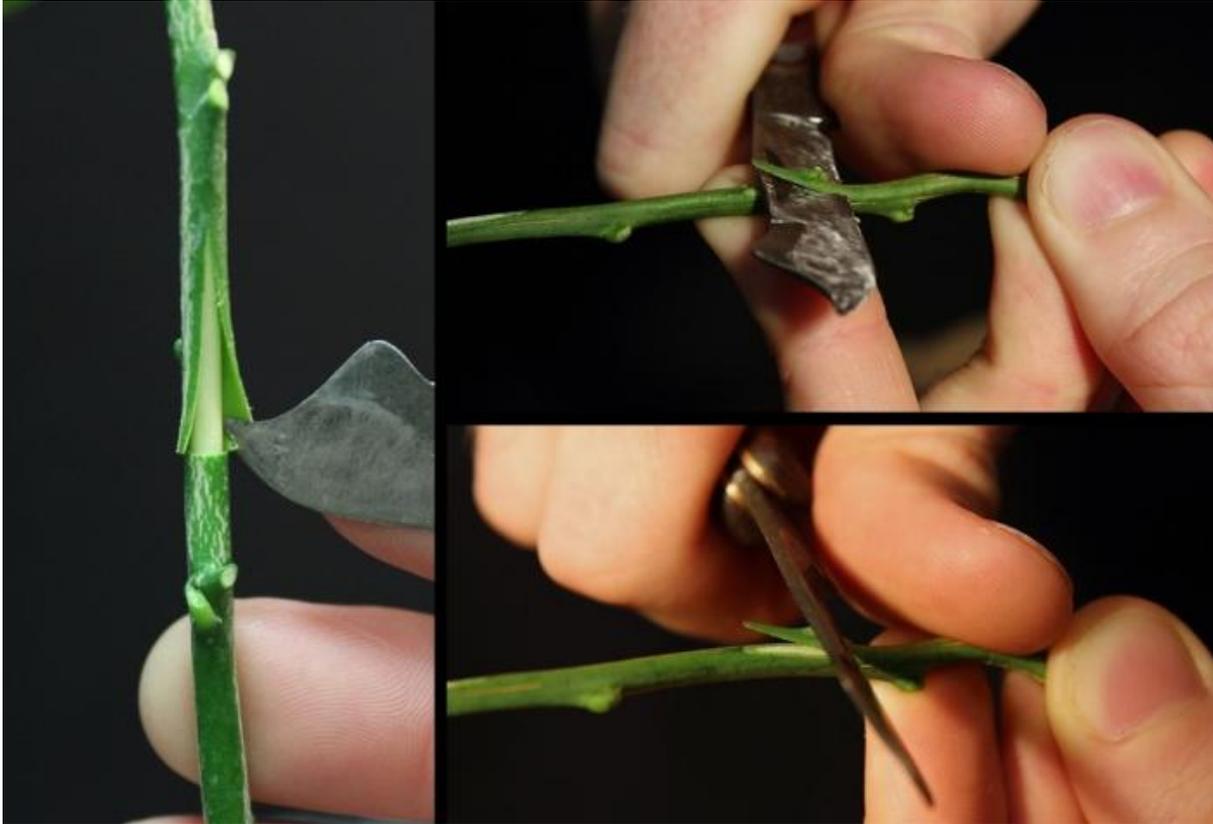
A bud is removed from the budstick while holding the apical end (tip) of the budstick away from you.

With the knife blade almost parallel to the axis of the budwood, a cut is made about 1/2 inch above the bud, and a shield-shaped piece of bark and wood about 3/4 to 1 inch long with a flat, smooth-cut surface is removed.

Only a thin sliver of wood should remain under the bark.

The bud should not be scooped out because too much wood will be removed with the bud.

Avoid touching the cut surface of the bud shield by holding it between the thumb and knife blade, or by carefully using the leaf petiole stub as a handle.



The bud should be immediately inserted into the stock; the cut surface of the bud should not be allowed to dry.

Slide the bud shield (the bud with associated bark and wood) under the bark flaps of the rootstock with the cut surface flat against the wood of the rootstock plant.

The bud shield should be completely enclosed in the T incision (Figure 6).



Buds should be wrapped immediately following their insertion into the rootstock.

Wrap buds with budding tape (polyethylene strips about 1/2 inch wide by 6-10 inches long).

Begin wrapping below the bud with 3-4 turns and finish with several turns above the bud covering all exposed surfaces of the bud with tape.

Alternatively, wrapping can proceed from the top down. The end of the tape is secured beneath the last circular turn.

The wrap should be firm without being excessively tight. Wraps should be removed after 14-21 days and should not be left on more than 30 days.

If a successful union has formed between the bud and the rootstock, the bud will be green and show no signs of shriveling or drying.

Callus formation should also be evident around the edge of the bud.

Chip budding

Chip budding requires slightly more skill than T budding and is usually done whenever the bark of the rootstock plant is not slipping or has become too thick to T bud.

The chip bud is cut while holding the budstick with the apical end toward the budder. A thin slice of wood with a scion bud is removed by making a smooth upward cut about 1 inch long and just into the wood.

A second cut is made at the top of the first cut, forming a notch.

A chip is removed from the rootstock in a similar manner (Figure 7) and the scion bud is placed on the cut to match the cambium.

Cambial tissue is a thin layer between the bark and the wood of a tree.

This is an area of active cellular growth of a tree. Because only two thin lines of cambial tissue are available for healing on both the scion bud and rootstock, it is important that matching on both sides occurs whenever possible.

The scion should be wrapped as described for T budding so that all cut edges are completely covered.



Aftercare

After the wrapping has been removed and the union between the bud and stock has occurred, the bud must be "forced" into growth.

Naturally occurring plant hormones produced in the upper portion of the rootstock seedling may prevent the scion bud from growing unless the bud is forced.

Buds are forced by cutting about 2/3 of the way through the stock, on the same side as the bud and about 1 to 1 1/2 inches above it.

Then, the seedling top is pushed over to lie on the ground; this procedure is known as lopping.

Alternatively, the seedling top is bent over to form a loop in a process called bending (Figure 8).

In both cases, the rootstock top will continue to supply the roots and developing scion with food and other growth substances during the early stages of scion development (Figure 9).

After the scion bud has grown several inches, the rootstock may be removed by making a cut about 1/2 inch above the scion.

If lopping or bending are not practical, the rootstock top can simply be removed with a sloping cut completely through the rootstock at about 1 inch above the scion bud.

Rootstock sprouts, which form along the main stem (especially in close proximity to the scion bud), should be removed as soon as they develop because they will slow the growth of the developing scion.

As the scion grows, it will need to be staked and tied at regular intervals to prevent breaking of the scion.

When the nursery tree reaches a height of about 18 to 20 inches, it is ready to be planted in the field (Figure 10).

The top should be pinched out to stimulate lateral shoot development.



Grafting

Grafting procedures other than budding involve the use of a scion with two or more buds.

There are numerous types of grafts, including whip, cleft, bridge, in-arch, stump, side, inlay bark, approach, and others.

Grafting is most commonly used to repair existing trees or to top-work existing trees to change varieties.

Top-working

Top-working is the process of changing the top of an established tree from one cultivar to another, or to multiple cultivars, by budding or grafting.

Several procedures may be used when top-working citrus trees. They include bark grafting, cleft grafting, and T budding.

To top-work a citrus tree by T budding, prune the tree back to leave only a few branches of 2-5 inch diameter or smaller.

Insert 1-3 buds on the upper side of the remaining scaffold limbs using the T bud method. Remove unwanted buds and sprouts to insure that only the desired scion buds grow.

If limbs are so large that budding would be difficult, prune back to major scaffold limbs, removing the entire top (caution: severely pruned trees should be whitewashed to prevent sunscald).

After limbs sprout back and mature a bit (6 months or so), the sprouts can be budded as initially described, using 4-6 of the stronger sprouts on each limb (Figure 11).

