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Plant grafting for home gardeners

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Grafting Terms

Cambium—a single layer of dividing cells between the bark and the wood. The cambiums of the stock and scion must be in contact for a union to form.

Clone—a group of individual plants asexually propagated from a single plant and, therefore, genetically identical.

Grafting wax—used to protect a graft. Typically made using 5 pounds (2.3 kilograms) resin, 1 pound (.5 kg) of beeswax, ½ pound (.2 kg) powdered charcoal and ½ cup (.2 liter) raw linseed oil. This mixture requires a heat source to keep it liquid while using. Suitable substitutes are available commercially.

Scion—a twig or shoot that serves as the aerial portion of the graft.

Stock—the portion of the plant that serves as the rooted portion of the graft.

Grafting Principles

The cambium layers of both the stock and the scion must come in contact. After the graft has been made, it must be protected from dessication, disease, and independent movement of the stock and scion. Provision must be made for unrestricted growth; therefore materials used for grafting must be stretchable. Scion wood must always be right side up for the graft to take.

A *bridge graft or inarching* is used to bridge over girdled areas of a tree that generally are caused by gnawing rodents. Repair work should be done as soon as the bark slips (peels easily) in the spring. Obtain scion wood from the tree, bevel the ends and slip these into T cuts made above and below the girdled area, allowing a substantial arch. Nail in place and protect with grafting wax. Nearby seedlings or root suckers may be used by grafting them to the tree above the girdle (see Figure 1).

A *bud graft* is used to asexually propagate stone fruit (peaches, plums, etc.) although it also may be used to propagate many other plants. This method has the advantage of using very little scion material (one bud) and survival is usually higher than with other grafting methods. A disadvantage with this method is that it must be done during a relatively brief period in the spring of the year when the bark slips (peels easily).

To make this graft, remove a chip of wood containing a leaf with its axillary bud. Make a T cut in

Quick Facts

Grafting is a means of joining tissue from two plants by holding cut surfaces in position until a union of living cells is formed.

Grafting is regularly used to asexually propagate fruit trees and to repair trunk injuries.

Grafting also is used to create novelty items such as tomato plants that produce potatoes, moon cactus and fruit trees bearing more than one variety per tree.

Grafting is used scientifically to accelerate fruit breeding programs, as a test for compatability and to determine, by transmission, if a virus is the cause of a symptom.

The four common graft methods are bridge, bud, cleft and whip.

A graft must be protected until union takes place.

Grafting is a means of joining tissue from two plants by holding cut surfaces in position until a union of living cells is formed. This technique is used regularly to asexually propagate fruit trees and other woody plants that do not readily root from cuttings. While nearly all of the plants that are commonly grafted can be produced from seed, the variability in the plants produced is so great that it is more practical to clone these plants by grafting. Apples are a good example of this.

Grafting is the means used to incorporate dwarfing in fruit trees. It is involved in the production of novelty plants such as moon cactus that may be recognized by a pink cactus ball impaled upon a sharpened stem of an upright cactus variety. The potato plant that bears tomatoes does so because it has had its top removed and the top of a tomato plant has been grafted in its place.

Grafting may be used to save a girdled tree, change the variety being produced by a fruit tree, or to introduce a new source of pollen into an orchard. Grafting also may be used to incorporate both maleness and femaleness into the same dioecious plant, such as holly, so that fruit may be borne. Scientifically, grafting may be used to accelerate a breeding program, to test for compatability and determine by transmission if symptoms are virus caused.

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To simplify technical terminology, trade names of products and equipment occasionally will be used. No endorsement of products named is intended nor is criticism implied of products not mentioned.

the stock and clip off the leaf blade leaving just the petiole (leaf stalk) stub to serve as a convenient handle for manipulating the chip. Next, remove the wood adhering to the bark of the chip while avoiding touching the cut areas with fingers—use a knife point. Now, insert the bark with its bud and petiole into the T cut. Wrap with rubber budding tape or a suitable substitute. It is not necessary to use grafting wax, neither is it necessary to remove the wood chip; however, by so doing, bulk is reduced and there is a greater area of contact between the two cambiums (see Figure 2).

A *cleft graft* is used for top working larger trees to change to another variety or introduce a new pollen source. To top work a tree over to another variety, cut back half of the main limbs to where they have a diameter of 2 to 3 inches (5 to 8 centimeters). A cleft graft is performed in these stubs at this time and the following year the remaining limbs are cut back and cleft grafted.

To make the graft, split the stub with a special grafting tool used for this purpose or a hammer and hatchet. Hold the split open with a screwdriver and position bevelled scions in the split so that their cambiums align with the stock cambium. Withdraw the

screwdriver and seal with grafting wax. This graft may be made during the late winter or early spring while the wood is dormant (see Figure 3).

A *whip graft* uses scions and stocks of approximately the same diameter. This graft is used primarily on year-old seedlings that are being converted to named varieties by removing their tops and replacing them with scion wood. This graft can be done during the winter in the root cellar where the fall dug stock is stored. This is an advantage because yard chores are not as numerous in the winter. To make this graft, remove the top from the stock with a diagonal cut and split the cut surface vertically. In the same way, select a piece of scion with two or three buds and make a matching diagonal cut. Slip them together as shown in Figure 4, wrap with rubber grafting tape and coat with grafting wax.

For greater detail consult a text on fruit production such as the following.

Childers, N.F. 1978. *Modern Fruit Science*. 8th Ed. Horticulture Publications, Nichols Ave., New Brunswick, New Jersey 08903.

Hartman, H.T. and D.E. Kester. 1975. *Plant Propagation: Principles and Practices*. 3rd Ed. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.

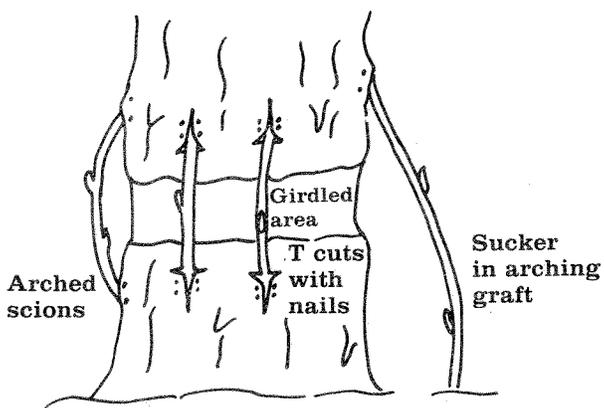


Figure 1: Bridge graft.

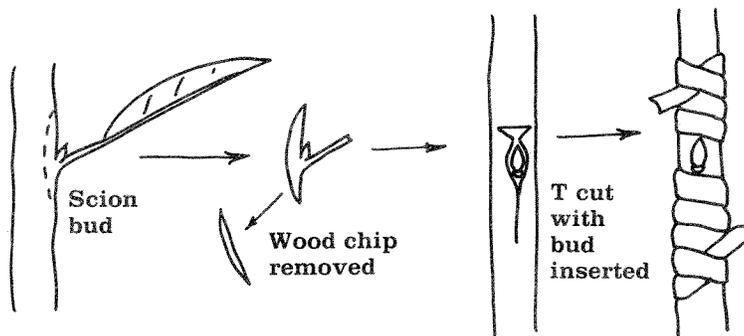


Figure 2: Bud graft.

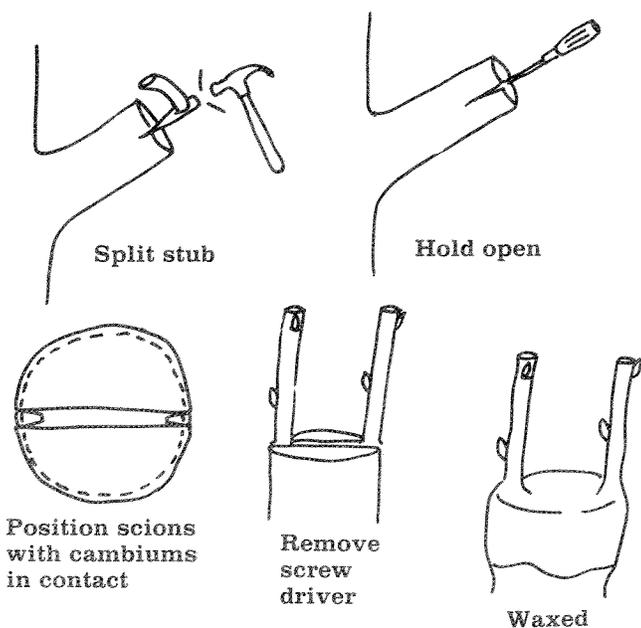


Figure 3: Cleft graft.

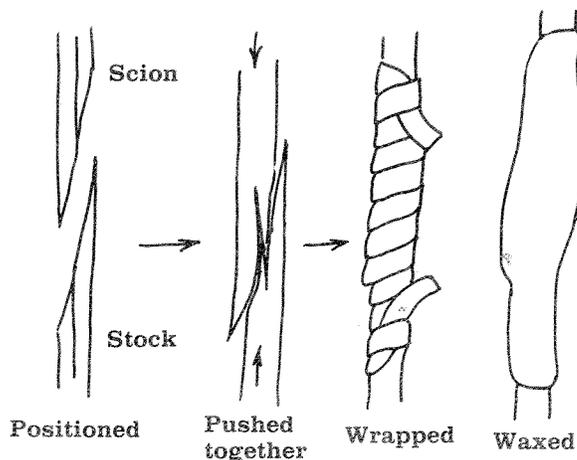


Figure 4: Whip graft.