

# Budding And Grafting Fruits And Nuts

BUDDING or GRAFTING is done to change an undesirable variety to a more desirable one or to increase the planting stock of a desirable variety.

Some important points in successful budding or grafting are (1) selection of scions or buds from vigorous growth, (2) proper care of scion wood from the time it is collected until it is used, (3) sharp tools to make smooth cuts, (4) good contact between cambium on the stock and scion or bud and (5) proper care of scions after budding or grafting.

Several methods of budding and grafting are described in this circular, with a listing of the most suitable methods to be used on different plants.

## WHIP GRAFTING

Use the whip graft to propagate desirable varieties of woody plants on seedling root stocks that are hardier or more resistant to root insects, diseases and nematodes.

Grafting should usually be done in January or February. Cut scion wood after the tree becomes dormant. Use vigorous, healthy scions from the previous season's growth. Select those a foot long or more and about as thick as a lead pencil. Wrap the scions in slightly moist sawdust or peat moss and seal them in a plastic bag. Store in the refrigerator or other cool place until ready to use.

You can leave the root stock of fruit trees in the ground or take it up and graft it, and then replant. Pecan stocks must be left in the ground. Or, you can cut the main root into sections 4 to 6 inches long and graft a scion to each section. Cut the scion wood into sections with at least three buds. Discard the terminal section. You will get a better union if the scion and stock are about the same size.

Make a smooth sloping cut 1 1/4 inches long or three times the diameter of stock or scion on the upper end of the stock. Then make a similar cut on the lower end of the scion. Be ginning one-third the distance from the end of the sloping cut, make a second cut slightly across the grain and about three-fourths through the stock or scion. Slip the two parts together so the cambium layer of each touches on one side. Wrap the union firmly with rubber bands or cotton string that has been soaked in melted grafting wax.

If stocks were taken out of the ground before grafting, tie them in bundles of 25 to 50, label and place

them in damp sawdust or sand until ready to set out in spring.

## CLEFT GRAFTING

The cleft graft is used for topworking fruit trees to change the variety. Cleft graft in the spring just before growth starts.

Collect and store scion wood as described under whip graft. Topwork large trees over a period of about 2 years since injury may result if the whole top is removed at one time. Graft top limbs the first year to avoid breaking the grafts when the rest of the tree is worked.

**Mature Trees.** Select a number of branches about 1 to 2 inches in diameter in the top part of the tree. Cut off the branches 3 to 4 inches from the main limb, making a smooth, square cut. Leave the remaining branches to nourish the tree and shade the grafts and for working later.

**Young Trees.** Cut off the lateral branches 3 to 4 inches from the main trunk, or you can cut off the main trunk for grafting.

Make a cleft or split in the stock (the stub of branch to be grafted) with a chisel, large knife or special grafting tool. Be careful not to split the branch too deeply.

Cut the scion wood into sections with three buds each. Make one cut just above the top bud and the other about an inch below the bottom bud. Next, begin at the base of the lower bud and make a sloping cut about 1 1/2 inches long on each side of the scion, forming a wedge shape. Leave the bud side of the scion slightly thicker than the other side and leave a blunt point on the scion (see Figure 2)

Open the cleft with a screwdriver or similar tool. Insert one scion into the cleft on each side of the stock



Figure 1. Whip grafting. A. Scion and stock prepared. B. Fitted together. C. Wrapped with waxed twine. Use in February on apples, pears and chestnuts.

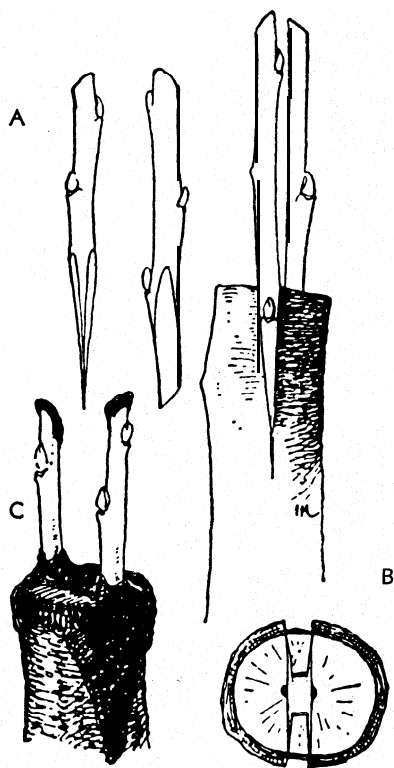


Figure 2. Cleft grafting. A. Scions prepared. B. Set in place. C. Waxed. Use in February on apples, pears, persimmons and nut trees,

with the thick side of the scion toward the outside of the stock. Push the scion downward until the lower bud is about even with the cut surface of the stock. The cambium or inner bark of the scion and stock must be in contact. Lean the scions slightly to the outside to improve the chance of contact.

Cover all cut surfaces with grafting wax. Be especially careful to close the cleft below the point of the scion. Cover the graft with a paper bag for about 3 weeks to shade and protect it from drying.

### BARK GRAFTING

The bark graft method is usually used for topworking pecans, persimmons and other fruit trees. Do the work in the spring after the sap rises so the bark can be separated from the wood easily. Collect and store scion wood while it is dormant, as described for whip graft.

Cut the stock off, as for the cleft graft. In topworking large trees, you may save time by going through the orchard and sawing off limbs to be grafted before the actual grafting is done. On large limbs, make one cut from the underside and another from the top to prevent splitting. Then saw

off the stub smoothly just before making the graft (see Figure 3).

Cut a scion with three buds. Beginning about 1 1/2 inches from the lower end, make a sloping cut through the scion. On the opposite side make a sloping cut about 3/4 inch long to form a slight wedge.

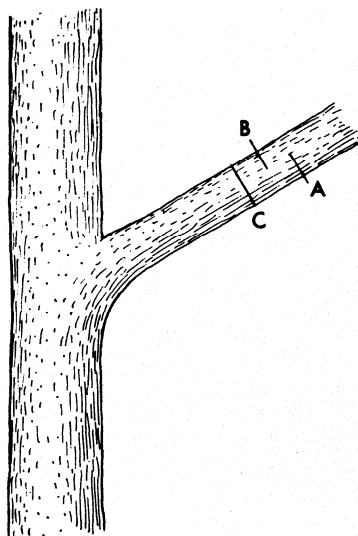


Figure 3. Sawing limbs. A. Make first cut from bottom side of limb. B. Make second cut from top. C. Then saw limb off smoothly.

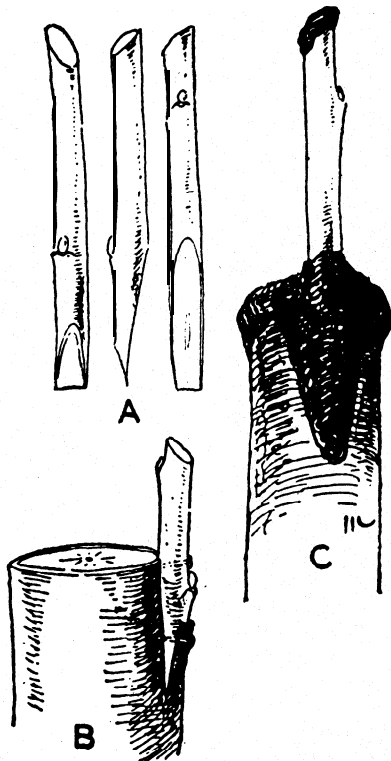


Figure 4. Bark grafting. A. Scions made by slanting cuts without a shoulder. B. Stock prepared by taking out a piece of bark to admit the scion. C. The complete graft with all the cuts waxed. Use when bark slips on nut trees and persimmons.

Place the scion against the stock. Then with a sharp knife cut through the bark of the stock along each side of the scion. Loosen this strip of bark, with the point of the knife and peel back about as deeply as the long cut on the scion.

Slip the scion under this strip of bark and gently push downward to the bottom of the loosened bark. Cut the strip of bark, leaving a "tongue" about 3/4 inch long.

The scion may be held firmly in place by wrapping with soft string or with two slender wire brads about 1/2 inch long. Drive one brad through the tongue of the bark and scion, the other a little above the end of the tongue. Place two scions on each stock on limbs 2 inches or more in diameter.

Cover all cut surfaces with melted grafting wax. Place a piper sack over the graft for about 3 weeks to shade the scion and prevent drying.

### CARING FOR GRAFTS

Remove all suckers from below the graft at the end of the first season. After the stub has healed over - usually after the third season - one scion may be removed. If the scion makes long slender growth, head it back to cause lateral branching. Support the scion by nailing a stout strip to the stock and tying the scion to it.

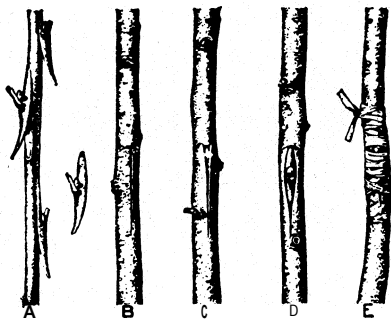
### SHIELD BUDDING

Use the shield bud method for propagating nursery stock of various fruits and ornamentals. Budding is usually done during the growing season - June to August.

Cut bud sticks from vigorous shoots of the current season's growth. Be sure there are well developed buds in the middle section of the bud stick. Often a cluster of three buds appears in the leaf axil. The two outside ones are flower buds and the middle one is a leaf bud. Select only those with a single leaf bud. Trim off the leaves, leaving about 1/4 inch of the stem to be used as a handle. Wrap the bud sticks in damp burlap to prevent drying.

Select seedlings about the size of a lead pencil or slightly larger. Make a T-shape cut on the seedling just above the ground. Lift the 'comers of the T with a knife and carefully loosen the bark.

Cut the bud from the bud stick to include a small portion of bark above and below the bud and a thin shav-



**Figure 5. Shield budding.** A. Bud stick. B. T-shape cut through the bark of the stock. C. Bark raised to admit the bud. D. Bud in place. E. Bud wrapped with raffia. Use in midsummer on stone fruits and citrus.

ing of wood underneath it. On peach and plum buds, remove any wood to prevent spread of phony disease. Grasp the bud by the stem or handle, insert it into the T-shape opening and push it downward into place. Cut off the top of the bud shield even with the crosscut of the T so it will fit closely to the stock.

Wrap the bud tightly with narrow strips of damp raffia 15 to 20 inches long or with rubber bands 3/16 inch wide. Do not cover the bud itself. Begin wrapping below the bud, crossing the first lap to hold it in place. Wrap up to and above the bud, slipping the free end under the last lap to hold it in place. Cut raffia after 3 weeks to prevent constriction of growth. It is not necessary to cut rubber bands.

When budding is done in June, break about half of the seedling over to shade the bud. This forces the bud into growth. As soon as the bud begins to grow out, cut the seedling top just above the bud.

When budding is done in August, the bud will remain dormant until the following spring. After the bud begins to swell, remove the top of the seedling. Remove all shoots arising below the bud during the growing season to force growth into the shoot developing from the bud.

### RING BUDDING

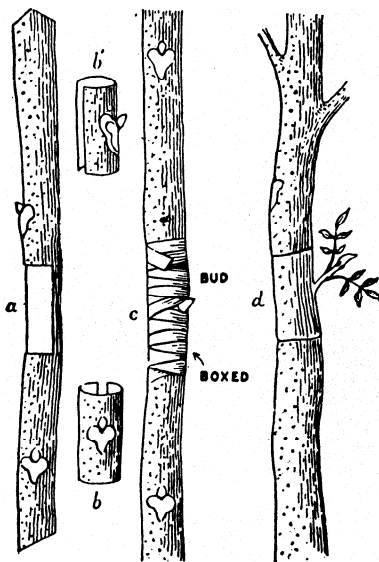
Use the ring bud method to propagate pecans in the nursery and also to topwork older trees. You can do this in the spring just after the sap begins to rise but before the buds begin to grow. Or, do it in the summer after buds form on new growth - late July or August.

In older pecan trees, it is a usual practice to saw off several limbs of

the tree during the winter. New sprouts will grow out from the stubs, and buds can be placed on them later in the summer.

A slight modification of the ring bud method will probably give best results.

Using a two-bladed budding knife, make two parallel cuts around the stock, leaving about 1/4 inch of bark uncut. Next, make a similar cut completely around a section of a bud stick which has a bud. Carefully peel this section of bark from the bud stick. Be careful not to split the bark directly under the bud. Place the bark against the stock so its top and bottom edges just fit the two cuts on the stock. Then make two vertical cuts in the bark of the stock along the edges of the bud



**Figure 6. Ring budding.** a. Bud stick after removal of the bud. b, b(1) Front and side views of the bud. c. Bud in place on the stock after being wrapped with a 1/2-inch strip of waxed cloth. d. Bud starting into growth after the cloth has been removed. Use in early spring or July on nut trees and persimmons.

bark. Remove the section of bark from the stock. Put the bud section into the exposed area of the stock. It is important for the bud section to fit exactly into the area on the stock from which the bark was removed.

Keep the bud in place by wrapping it with raffia, grafting tape or rubber bands. Seal the cut area with grafting wax. Remove the wrapping materials as soon as the cuts are entirely healed. The following spring remove the top of the stock just above the new bud.

### GRAFTING WAX

Grafting wax can be bought at farm supply stores. Or, a good wax can be made by melting together 4 pounds of resin, 2 pounds of beeswax and 1 pound of tallow. Then pour it into cold water -and pull it like pulling taffy candy until the wax is a light straw color. Form it into convenient sized balls and store it in a cool place for future use. You can use this wax to make grafting cloth or twine.

Another good wax can be made by melting together 5 pounds of resin and 1 pound of beeswax. As soon as these materials are melted, stir in 1/4 pint of linseed oil and remove from the heat. Then stir in 1/2 pound of lampblack or powdered charcoal a little at a time. This wax must be heated and applied with a small paint brush.

Be careful when heating wax over an open flame; it is highly flammable.

### DEFINITION OF TERMS

**STOCK** - A root, trunk or limb on which the scion or bud is to be grafted.

**SCION** - A section of scion wood that has two or three leaf buds to be grafted onto a stock.

**SCION WOOD** - Mature dormant shoots of the previous season's growth.

**CAMBIUM** - The growing tissue of the tree located between the wood and the bark.

**GRAFTING** - The process of inserting the scion into the stock.

**BUDDING** - The process of inserting a single bud into the stock.

**BUD STICK** - Current season's or previous season's growth from which single buds are taken for budding.

**TOPWORKING** - The process of changing the top of a fairly large tree to a desired variety by budding or grafting.

## KEY TO BUDDING AND GRAFTING FRUITS AND NUTS

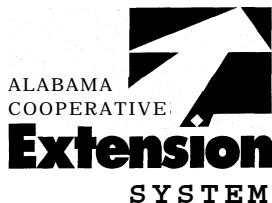
Plants	Graft or Bud Methods	Times	Major Uses in Propagation
Apple	Shield bud Whip graft Cleft graft	Late July or August Late winter When new growth starts	Nursery stock Nursery stock Topworking
Pear	Shield bud Cleft graft	Late July or August When new growth starts	Nursery stock Topworking
Peach	Shield bud	June or dormant bud August	Nursery stock
Cherry	Shield bud	Late July or August	Nursery stock
Plum	Shield bud	Late July or August	Nursery stock
Pecan	Whip graft Ring bud  Bark graft	Spring when growth starts Spring when growth starts July or August After growth starts	Nursery stock Nursery stock Topworking Topworking

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