



J&L Garden Center

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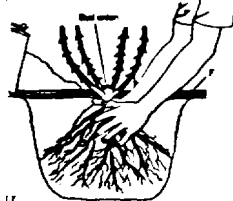
Budding And Grafting



Anyone who has ever purchased a rose bush or a fruit tree from a nursery has benefited from the art of Budding or Grafting. Relatively few home gardeners, however, have tried to propagate plants by either of these methods. Budding and grafting are not really difficult but they do require some practise to master this art; as well as a steady hand, and a few special tools. There are many different styles of grafting; each style has its advantages. As you learn more about grafting you should choose the type of grafting best suited to your plant's needs. In addition to the types of grafting listed in this handout there are many other types of grafting including: Bridge Grafting, Inarching, Double Grafting, Approach Grafting, and Saw Kerf Grafting.

Reasons for Budding & Grafting

Commercially, ninety percent of all trees and shrubs grown are propagated by either budding or grafting, for several reasons.



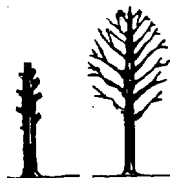
1. Budding and grafting requires much less plant tissue to start a new plant than by other methods. Many new varieties of plants are usually in short supply, so, the less tissue needed, the more plants propagated.

2. Budding and grafting usually produces new plants more quickly than by other methods. Sometimes propagating a plant, by trying to stimulate new roots, can take "forever".

3. The most important reason that trees and shrubs are either budded or grafted is they produce identical new plants from the original plant. Many plants, started from seed, would be a variation of the original plant, and the variation the plant inherited might not be known for several years. Plant propagators and hybridizers are always looking for these new and different plant variations. They watch plants carefully to see what new traits might occur.

4. Budding and grafting provides a way to add a new variety, or branch, to an existing plant. Sometimes a fruit tree needs a different variety to pollinate its blossoms; a different variety can be added to the existing tree without the need of planting an additional tree.

5. Budding and grafting can provide a way to save a plant that was physically damaged, or that was overcome by insects or diseases.



Definitions

Bud. This is a single growth point that is placed into the root stock in the budding process.



Budding. This art is similar to grafting but involves the use of a single bud of one plant attached to the root system of another plant.

Cambium. This is the layer of cells that lies between the plant's bark and the woody core of the stem. It is the only "living" part of the trunk and stem. The only way budding or grafting will be successful is when the cambium layer of the scion and the root stock are aligned properly so they can unite.

Grafting. This is the art, not a science, of joining parts of two (or more) plants and causing them to grow together into a single plant.

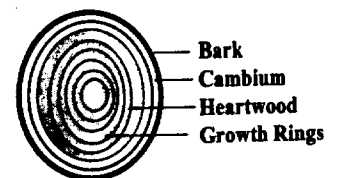
Root Stock, Stock, Understock. These are the names given to the plant onto which you bud or graft. It supplies the root system, and sometimes the trunk, for the ultimate finished plant.

Scion. This is the piece of stem that you graft onto the root stock.

Topworking. This is the process of grafting new cultivars to an existing tree to either change the varieties already growing on the tree, or to add new varieties to the tree.

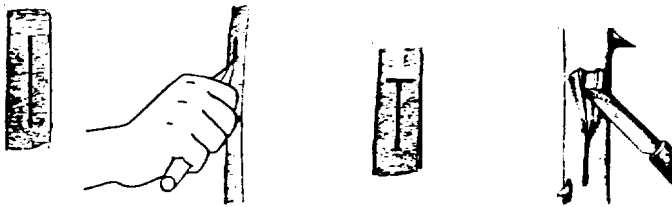
Budding

Budding is the process of inserting a single growth point onto a new plant, and having it grow. Budding accomplishes the same results as grafting but it is considerably easier to do and,



for the beginner, is more likely to be successful. Budding is done in the late-summer and early-fall, when plants are actively growing. Simply insert a growth bud from one plant under the bark of another plant, of a related kind. If you do the budding carefully and if the plants are compatible, the bud will unite with the stock. Throughout the fall and winter the bud will remain plump, but dormant. In the spring, it will begin to grow when the surge of growth comes to all buds on the plant. At that time, in the late-spring, cut off the stock to a joint just above the growing bud that you inserted last fall.

Steps Of Budding

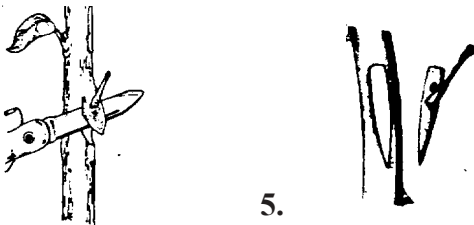


1. 2. 3.

1. Make a vertical cut one inch long in the stock branch, slicing through the bark and cambium; down to the heartwood.

2. Make a horizontal cut through the bark, across the top of the vertical cut. Make the cut about one-third of the circumference of the stock.

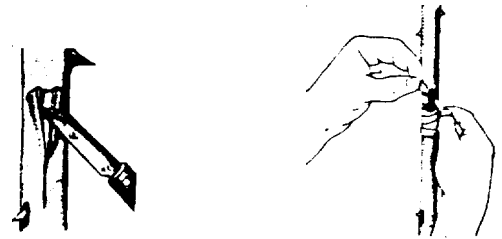
3. Gently pry up the corners where the cuts intersect. If the bark won't budge or if the bark chips away, it is probably too early, or too late, in the season to do budding. The bark should peel easily.



4. 5.

4. Slice under a strong bud on the budstick. Start about an half inch below the bud and finish one inch above it. You must cut down into the heartwood a bit; not just barely under the layer of bark.

5. Remove a shield-shaped piece of bark with the bud. Cut about three-quarter inch above the bud, slicing downward. Leave some of the wood attached to the back of the bud shield.



6. 7.

6. Push the bud shield down into the loosened bark flaps on the stock, being careful not to damage the bud. The top of the shield should match the top of the "T-cut" on the branch.

7. Bind the cut with plastic tape, leaving the bud exposed. Don't use fabric tape, it won't stretch. Next spring, when the bud begins to grow, cut off the stock just above the bud. Be sure to cut the stock on a slant towards the bud, but at least an half inch away.

Grafting

Grafting is the actual process of pressing the cambium layer of the scion against the cambium layer of the stock, so the two layers will grow together. The alignment of the two cambium layers is critical to the success of grafting. Keeping the cuts clean and fresh is another important element of grafting. It is vital that the union is completely sealed, with grafting wax, to prevent the tissue from drying out. After completing the grafting process it is extremely important that the union be held immobile so the two cambium layers have a chance to unite and grow together.



Although many different grafting methods have been devised, all involve uniting a short length of scion with the stock. The stock plant may be either a seedling, to be grafted near the ground level, or it may be a larger branch to be grafted at the top of a trunk or on a major limb. Scion wood can be narrow (about pencil width) or can be large (up to three inch diameter) Scion wood can be young (cut from last year's growth) or several years old. Depending on the size and age of the scion wood and stock, you will need to choose the appropriate type of grafting.

Begin the grafting process either in the fall or in the early-spring by collecting the scion wood; while the plant is dormant. Store the scion wood in a plastic bag, with moist peatmoss or sawdust, in a refrigerator until you are ready to use it.

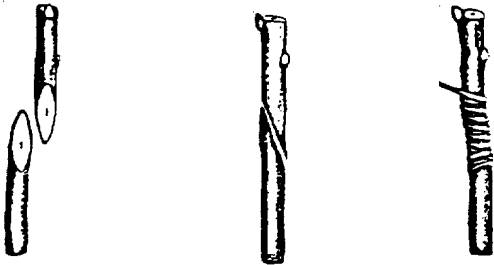
The actual grafting process should be done in the spring, while the plants are still dormant, but when

the plants will start to grow fairly soon after grafting.

With any grafting style it is crucial to align scion cambium with the stock cambium. When that is done, the two cambium layers will unite, the cuts will callus over, and the scion will be ready to grow. Use a very sharp knife for making all cuts; the cleaner the cuts, the better the chance for a successful union. When the operation is completed, cover the union with some sort of sealing agent to keep air from getting to the area. The best material is bees wax, but some pruning compounds may also be used.

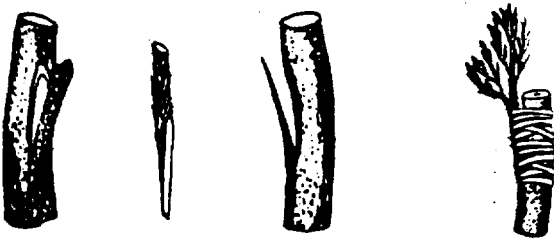


Types of Grafts



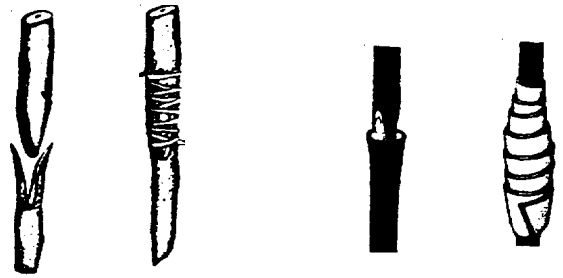
Splice Graft

The splice graft is generally used in grafting plants which unite quickly. It is best to do this type of graft in a greenhouse or other structure, where there is wind protection. The graft consists of stock and scion of equal diameter, with long slanting cuts on both parts.



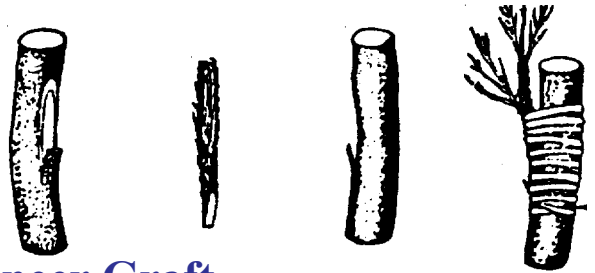
Side Graft

The side graft is used for grafting junipers but it can also be used with pines and spruces. This graft is done by making a long sloping cut on the side of the stock. Cut the scion to a sharp long-pointed wedge and insert it in the cut of the stock. Be careful not to break the flap of the cut stock. Tie the flap securely to the scion. Tie and wax the area securely.



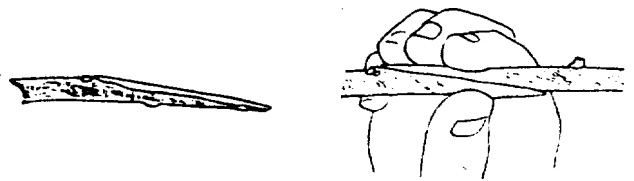
Saddle or Wedge Graft

The saddle or wedge graft is used most in the grafting of rhododendrons, lilacs, and many other kinds of nursery stock. The scion and stock should be of equal size, to permit the matching of the cambium layers. Cut the stock with two oblique cuts on each side, making a blunt point or saddle. Cut a matching section at the base of the scion. Fit the ends together, tie and wax. This type of graft is often used with a grafting machine



Veneer Graft

The veneer graft is similar to the side graft and is used for narrow leaf evergreens. The difference is that in veneer grafting, the wedge cut on the scion is shorter in length. Cut the flap on the stock off, leaving only a small piece at the end of the cut.



Whip or Tongue Graft

These types of grafts are used to combine stocks and scions that are small and the same size in diameter. Both the whip and tongue graft begins with a diagonal slice along the stock; starting to cut close to a bud. Use a razor-sharp knife to cut an even diagonal: about 1 1/2 inches long. Trim the cut, if necessary, for an absolutely flat surface. Make the same size and shape cut on the scion, so it matches as closely as

possible. Compare the buds so when the scion is cut, the cambium will match the stock, and the buds will point outward from tree; not inward.

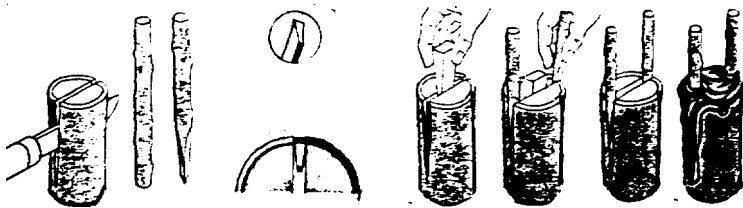


For the tongue graft, make a second cut on each piece, parallel to the first, about an inch below it, but only cut to the center of each stem. Carefully remove the piece of wood to make the tongue-shape. When fitted together they form a tongue and groove joint.

For both types of graft, place the cut surface of scion against the slice made on the stock, to check the fit. The bark edges should meet all around. If the two pieces do not match identically do not just center one piece inside the other: make sure you line up as much of the cambium as possible: at least on one side.



Cut a six inch length of plastic electrical tape and wrap it around the joint from the middle to one end. Wrap a second length of tape from the middle to the other end. Add three or four more layers of tape, winding them tightly. Cover the area with grafting wax to prevent dehydration. Remove the wrapping in the third year. New shoots on the scion will show that the cambium layer was matched properly.



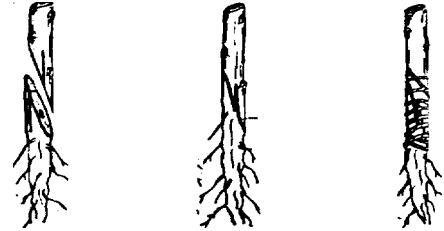
Cleft Graft

To make a cleft graft prepare the stock by splitting it several inches (at least three to four inches), through a smooth straight-grained section of the stock, so the split will be smooth and even. The stock should be a least one inch in diameter.

The scion wood should have two or three buds per piece. Shape one end into a long, gradually tapering wedge. The outside edge (bark edge) of the wedge

should be slightly wider than the inside edge (heartwood edge). Hold the split in the stock open. Insert the two scions into the stock; one at each end of the split. The scions must be carefully placed so the cambium layers match. After the scions are properly placed, cover the entire union with grafting wax.

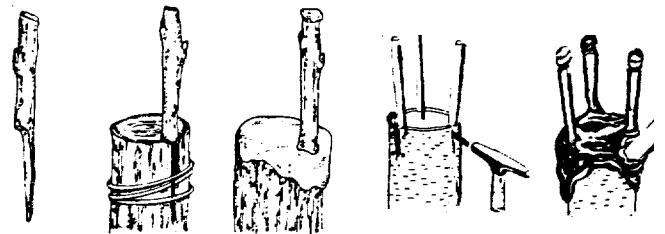
If both grafts start to grow, remove the weakest piece within a year or two.



Root graft

Grafts can be made directly to the root zone area. It should be used when special root stocks are desired. The root graft consists of a short scion grafted on either a whole root or a portion of a root. The roots are usually dug, and the work is done at a table or bench. The whip or tongue graft is commonly used.

After completing the graft, root grafts should be stored in cool, moist sand, or they can be planted directly in the field. They should be planted deep enough so that only one bud of the scion is above the ground. This graft is often used to produce several plants from the roots of only one plant.



Bark Graft

Bark grafting is best for grafting scions onto larger branches. Many scions can be attached to the stock, depending on the size of stock. The scion should be five inches long. Make a two inch downward diagonal cut on one side of the bottom of the scion. Make a smaller cut on the other side of the scion; just removing a little of the bark at the tip of the scion to make a sharp, thin wedge.

Make a two inch slit in the stock. Peel the bark slightly, leaving the cambium exposed. Place the scion under the bark of the stock, with the longer cut side of the scion facing the inside, against the cambium. Use a small nail to fix the scion in place. Wax the area to keep it from dehydrating.