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Dwarf Fruit Trees
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Repairing Fruit Trees by Bridge Grafting

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Bridge grafting is a method used to "bridge over" areas, particularly those on the trunks of trees where the bark and cambium have been severely injured or destroyed. Such damage is frequently caused by mice and rabbits, disease such as fire blight, winter injury or the careless use of tillage implements.

The treatment given an injured tree will depend on 1) the kind of tree, 2) its age, and 3) the degree of injury.

Young apple and pear trees between 1 and 2 inches in diameter, which have been completely girdled may best be treated by sawing them off below the injury in the spring and placing scions in the stub by cleft grafting. If badly damaged, it may be preferable to replace them with new trees. Apple and pear trees 2 or more inches in diameter may be successfully repaired by bridge grafting.

Peach, cherry and plum trees which have been girdled are not usually bridge-grafted successfully. If they are not more than 2 or 3 years old they may be cut off below the injury to induce the growth of sprouts to develop a new top. If this is done it is important that the shoot selected to renew the top does not originate below the

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Repairing Fruit Trees by Bridg

original graft union. Usually it is best to replace such trees. Old peach and cherry trees can seldom be saved unless enough inner bark remains on the wood to regenerate new bark.

Unless about $\frac{1}{4}$ to $\frac{1}{3}$ of the bark of a bearing tree has been removed down to the wood, bridge grafting usually is not necessary. Sometimes mice gnaw the bark entirely around the tree, but do not damage the cambium or inner bark. In such cases bridge grafting may not be needed if proper attention is given before drying has occurred. Mounding with earth or covering with brush wax will give sufficient protection until new bark is formed.

Wounds made by tillage implements during the growing season when the bark slips readily are best treated by leaving them alone. Usually new bark will form over the injured area if the exposed surface is not touched.

If the injury occurs during the winter the wound should be covered with grafting wax as soon as discovered to prevent drying out. This is particularly important if the exposed surface is large, and some time must elapse before grafting can be done.

Season for Bridge Grafting

Bridge grafting should be done in early spring after growth has started and when the bark slips readily, usually in early May. Before this time it is difficult to separate the bark from the wood and good cambial contact is not obtained. The grafting may be done much later with reasonable success if dormant scions are available.

Selection of Scion Wood

Collect scion wood well in advance of the grafting season while it is dormant. Wrap it in damp cloth or sphagnum moss and store in a cool place where it can be kept dormant. Either water sprouts or well hardened terminal growth of the previous season may be used. Special effort should

be made to get long scions. Those $\frac{1}{4}$ to $\frac{3}{8}$ inch in diameter are easiest to use. If too large, it is difficult to spring them into place. If too small, it is hard to secure the ends in proper position.

Use only the more hardy and blight-resistant varieties of apples such as Duchess, Fameuse, McIntosh and Wealthy for scion wood. Avoid, if possible, using varieties such as Baldwin, Delicious, Grimes, King or other equally tender varieties. Seckel and Kieffer are satisfactory pear varieties.

Suckers coming up from the base of an injured tree can be used as scions by grafting the top of the sucker into the trunk above the injury.

Equipment Needed

- Sharp knife.
- Small hammer.
- No. 18 $\frac{5}{8}$ - or $\frac{3}{4}$ -inch wire nails.
- Grafting wax or asphalt grafting compound.
- Wax melter if brush wax is used.
- Small brush, 1 or $1\frac{1}{2}$ inches wide.

Preparing the Tree

Whenever possible, prepare the tree for the setting of scions a day or two before the grafting is done.

Remove all dead bark and, if the wound is old, any unhealthy live bark. Trim bark evenly at the edges of the wound. It is not necessary to keep the bridged area short. Proper unions can be made more easily with long scions than with those that are very short.

If the injury extends to the roots, remove soil from the base of the tree and the larger roots until sound bark is found. If the soil is removed several days before the grafting is done, the bark will slip more readily.

In cases where the roots are extensively injured young seedling trees may be planted near the base of the tree and their tops grafted into the trunk above the injured area.

e Grafting

Setting the Scions

Various methods of setting the scions are employed. The methods in most common uses are:

1. The L-cut, best suited to trees with thin or moderately thick bark.

2. The inlay, generally preferred for trees with very thick bark or where the scions are set into the roots.

Regardless of the method the essential requirement is that the cambium layer (between the bark and the wood) of the scion be brought into close contact with the cambium layer of the tree and held in that position until they grow together.

The scion is made slightly longer than the distance it will cover when set. This is necessary in order that there will be some spring or bow

in the scion as it is finally set. The advantage of the spring is that better contact between the scion and tree is obtained, and some swaying of the tree is permitted without disturbing the union.

The spring or bow of the scion may be secured by bending the scion over a wedge about an inch thick. This may be removed after the scion is nailed in place.

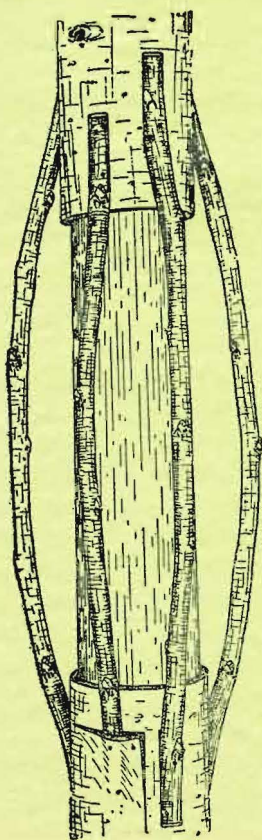


Fig. 1. Bridge graft, showing some of the many methods of setting scions. Note the spring of the scions. This is particularly important in young trees which sway most.

Set scions right side up, as they grow in the tree, and at intervals of 2 to 2½ inches around the trunk. It is usually best to set the lower end of the scion first.

The **L-cut** is the simplest and most easily made union. An L-shaped incision is made in the bark an inch or two above and below the edges of the wound. Below the wound the L is inverted. Each arm of the L is made about 1½ inches long. Cut scion to a rather sharp wedge as shown in Fig. 2, with a longer slope or bevel on the side that is to

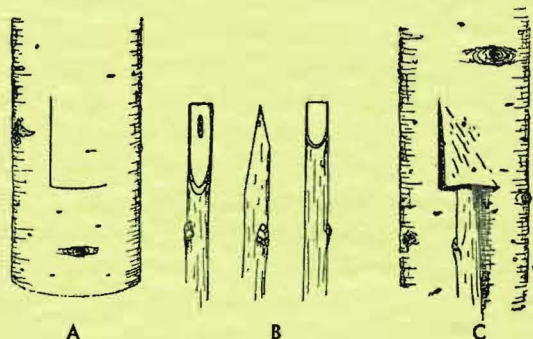


Fig. 2. The L cut graft.

A. L-shaped cut in stock; B, scion prepared with double bevel; C, scion inserted under the bark of the L cut and ready for waxing. The long bevel of the cut goes against the wood.

be set against the trees. Raise bark of the L-cut, insert scion and drive nails through the bark and scion to hold the scion in place.

The **inlay graft** is made by removing a small piece of bark to form a slot in which the end of the scion is inserted. The slot may be made directly on the edge, or an inch or two away from the edge of the wound as shown in Fig. 3.

Prepare scion by making a long sloping or bevel cut for a distance of 2 inches or more on the same side and at each end of the scion. This cut should extend about half way through the scion or nearly to the pith and parallel with it leaving a flat surface at the end. Hold one end of the scion against the bark of the spot it is to occupy, trace around it, and then remove the piece of bark as outlined with the knife. Repeat operation at the other end.

Whatever the type of union used, all cut or exposed surfaces should be well covered with grafting wax or prepared asphalt compound as soon as all the scions have been set. A brush wax

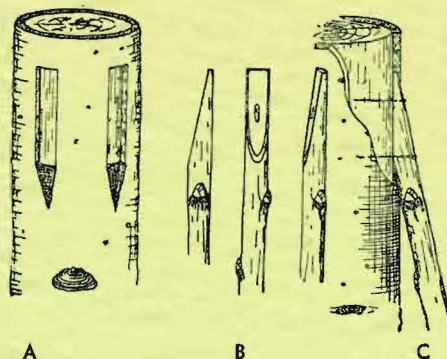


Fig. 3. The inlay graft.

A. Bark removed for the insertion of scions (the notches below the slots may not be necessary); B, scion prepared with long bevel cut; C, scion properly set and ready to be nailed in.

is preferred for this purpose. The use of asphalt grafting compound eliminates the necessity of heating wax in the orchard, and it is quite satisfactory.

As soon as the grafting and wound covering is completed, replace soil that may have been removed. Mound slightly around the base of the tree to prevent mice from working on the newly set scions.

FORMULA FOR BRUSH WAX

Resin (or rosin).....	5 pounds
Beeswax	1 pound
Raw linseed oil.....	¼ pint
Lampblack	½ pound

Melt resin and beeswax together, then add the linseed oil. Remove from fire and stir in the lampblack a little at a time to prevent boiling over. Pour into shallow pans to a depth of about an inch and allow to cool.

Prepared grafting compound may be obtained from garden and orchard supply stores or from dealers in beekeepers' supplies.

Prevent Damage by Mice and Rabbits

Most of the injuries of fruit trees that necessitate bridge grafting are caused from gnawing by mice and rabbits. Much time and labor may be saved by using proper measures for the prevention of damage by these rodents. Information on this subject may be found in Michigan State College Extension Bulletin 196, "Protecting Fruit Trees Against Mice and Rabbits."