

# STEP-BY-STEP grafting

I left home with my father's fruit-tree pruning skills, but not his talent for grafting trees. Some of his trees had up to half a dozen different varieties of fruit on them that he'd carefully grafted. Now that I'm the owner of an old homesteader orchard, and some of the trees I planted when I first bought my farm have been damaged by rodents or deer, I decided to demystify the process and give myself (and you) a doable starting place. As it turns out, it isn't as confusing or technical as most of the info I've come across conveys. I'm starting with apples, and eventually I'll move to pears and plums.

## What is grafting?

You can grow an apple tree from the seed of a Granny Smith apple, but it won't produce a Granny Smith apple. Just like humans and animals, the seed will produce a similar, but unique, offspring every time. Fruit trees can only be reproduced by grafting. Grafting is the process by which a twig of the variety you want (the scion) is inserted into an existing tree (the rootstock).

Grafting is often used as a low-cost way to reproduce the varieties of fruits you want in your orchard. You can create the tree you want for only a few dollars, compared to \$30 or more for a nursery seedling. Grafting is also used as a shortcut to fruit production, since it bypasses the juvenile stage seedlings have to pass through before they can bear fruit (apple trees can take 5 years to produce fruit; grapefruit can take up to 15 years). Grafting can result in fruit production in as little as two years.

Grafting is also used to produce desired characteristics in a tree, like cold tolerance or dwarfing (to produce more

fruit in a smaller space). With multiple grafts, you can even produce a tree with more than one variety of fruit, called a "family tree" (my father loved to show off his apple tree with five different varieties of apples). An Oregon gardener, 84-year-old Nick Botner, developed the largest private collection of apple trees in the world—nearly 4,000 varieties—after his son learned grafting in science class in 1979. He's since shared his scion wood with more than 10,000 apple enthusiasts around the globe, and says he's grafted more than 20,000 apple trees.

## Grafting onto an existing tree:

To get you started, I'll stick with the easiest method, grafting onto an existing tree, using an apple tree, the easiest fruit tree to graft. (Stone fruits like peaches are harder to graft and require different methods.)

Choose a scion from a variety of apple with characteristics that you want: color, flavor, size. Do research on varieties that are best for your area. (Find an extensive

list of apple varieties at [www.orangeippin.com/apples](http://www.orangeippin.com/apples).)

## Timing:

It's best to collect your scions and graft in the early spring, before new growth begins, but after the chance of severe cold has passed. Graft onto trees that are at least 3 years old so that the root system is well established and the tree can handle the stress of cut branches.

## Supplies:

You'll need only a few supplies: a saw, a sharp knife, pruning shears, or a grafting tool to cut with; something to wrap the graft with (I used nursery grafting poly tape); and a protective coating (I used Trowbridge's grafting wax).

## Collecting and storing scion wood:

You can order scions from your local nursery or online to get new varieties (if ordering online, look for a nursery in your region to get scion wood that's acclimated to your climate) or you can cut your own if you have access to a different variety than the tree you're grafting onto.

Some people prefer to collect cuttings in the late fall, but I prefer early spring, since the less time you store the scions, the more chance you'll have for the graft to "take."

Scions should be branches that are about the same size as the branch you're grafting onto. Choose scions with two to four buds each and cut them early in the morning with a sharp, clean saw or pruning shears. If you need to store them before grafting, wrap the base of the scions in moist burlap, moss, or moistened paper towels; put them in a plastic bag; seal it; label it; and place it in a cool, moist place (between 32 and 45 degrees) until ready for use. Never store scions in a refrigerator where fruits or vegetables are kept; the produce releases ethylene gas, which can ruin the scions.

## DID YOU KNOW?

Because an apple tree cannot pollinate itself, it needs to be planted near other apples that bloom at the same time. And some apples, including Gravenstein and Jonagold, are sterile—they won't pollinate other trees, so they need two other varieties nearby for pollination. If there are other apple trees in your neighborhood, though, chances are your apples will be pollinated by your neighbors' trees and vice versa. And if you create a "family tree" with multiple grafts, the different apple varieties create a self-pollinating tree. When planting new trees, it pays to research varieties that are best for your area. Find an extensive list of apple varieties at [www.orangeippin.com/apples](http://www.orangeippin.com/apples).



grafting tool

When ordering scions, common diameters are  $\frac{3}{16}$ ,  $\frac{1}{4}$ , and  $\frac{3}{8}$  inch. When cutting your own, try to match the size of the branch you want to graft onto.





### Making the graft:

The most important thing to know about the graft is that the cambium (the growing part of the tree located just beneath the bark) of the scion must be aligned with the cambium of the rootstock in order for the graft to heal together. Choose a cool, overcast morning for best results.

### The whip-and-tongue grafting method:

This is the most successful method for grafting when both the scion and the rootstock are 1/4 inch to 1 inch in diameter. When the scion and the rootstock are the same diameter, the large amount of contact between the cambium layers helps the graft to heal quickly and to make a strong union. Both the rootstock and the scion should be dormant, very early in the spring.

Do not graft near a point where side twigs or branches have developed. Select a branch on your tree that's free of knots and cut off the branch with a saw or pruning shears, leaving a stub at least a foot long. Make a 1- to 2-inch smooth, sloping cut at the top of the branch (Fig. 1) with a sharp knife (a good, smooth cut is essential in order to have the pieces fit together well; practice first on extra twigs).

Starting a third of the way down the cut from the top end, make a second downward cut (Fig. 2), about half as long as the first, into the branch.

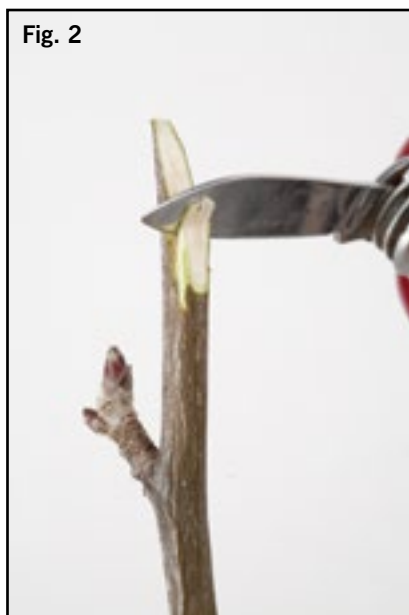


Fig. 2

Take a scion and remove an inch or two off the bottom end to eliminate wood that may have dried out during storage, leaving at least two buds above the cut. Also snip off the top end just above an outward-facing bud—one that's pointed in the direction you want the branch to grow. (You want the branches to grow upward and outward, away from the trunk.) Cut the bottom end of the scion just like you did the rootstock (Figs. 1 and 2) so the two pieces will fit together. After the cuts are made,

the scion must be inserted immediately. Fit the two pieces together with the tongues interlocking (Fig. 3). (If the scion is smaller in diameter than the rootstock, match the cambium layer of both pieces on one side.)

Alternatively, you can use a grafting tool (Fig. 4). The tool makes a notched cut in the rootstock and a corresponding cut in the scion (Fig. 5).



Fig. 4



Fig. 5

You'll then wrap the graft tightly with grafting tape, being careful to keep the cambium layers in place and making the seal as airtight as possible (Figs. 6-8). At the end of the wrap, cut the tape lengthwise a couple of inches, wrap the ends in opposite directions,



Fig. 6



Fig. 7



Fig. 8

and tie a knot. If your wrapping material doesn't decay naturally, you'll need to slit the tape vertically (being careful not to damage the graft) in about 4-6 weeks, after the graft takes, to prevent strangling the branch as it grows.

Then, cover the wrapped area with a protective coating (I prefer grafting wax). Also seal the top end of the scion with the wax. Tag the branch so you'll remember the variety you grafted on; remember, you won't see fruit for at least 2 years. After the graft has healed and the new branch starts to grow, cut off any side shoots or twigs from the tree that would shade or compete with the graft.

### Resources:

For further study, try *Grafting and Budding: A Practical Guide for Fruit and Nut Plants and Ornamentals* by Donald McEwan Alexander, a comprehensive and clearly written, practical guide on grafting techniques for both the professional and home gardener. Visit the website of your local Extension office for tips about grafting in your area.



How many apples fell on Newton's head before he took the hint? Nature is always hinting at us. It hints over and over again. And suddenly we take the hint. — Robert Frost

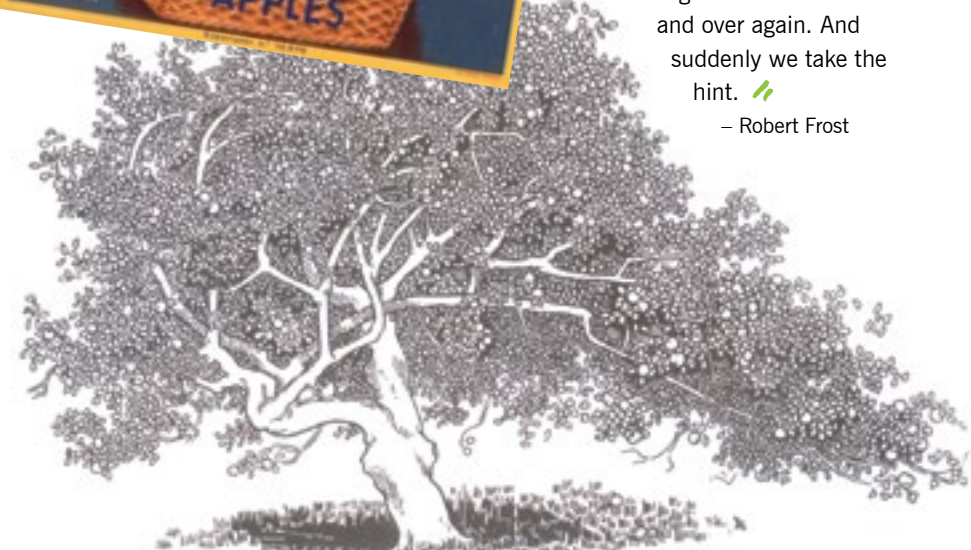


Fig. 1

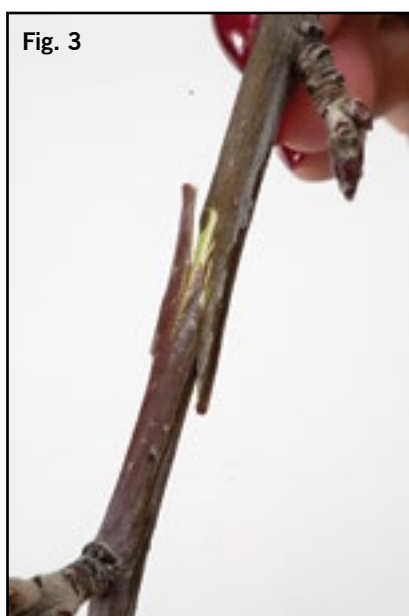


Fig. 3