

Rootstocks, Grafting, and Pruning Basics

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Rootstock Basics

What is a *rootstock*? To answer this question, let's first take a look at the modern fruit tree. Most fruit trees today basically consist of two different trees joined into one via grafting. The roots of the tree are one variety, and the top of the tree is another. So not only must we choose what kind of tree we want to grow, we must also choose what roots we want to grow that tree on! These roots are called *rootstock*.

In general, trees are grafted onto rootstocks of their own kind. For example, a Red Delicious apple must be grafted onto an apple rootstock. But there are many different apple rootstocks available, so which one should we use? Our choice will affect the mature size, root anchorage, disease resistance, cold-hardiness, soil adaptability, of our tree.¹

I recommend that we first 1) decide what size of tree we want (Remember, in many cases rootstock determines tree size.), and 2) focus on rootstocks that will offer resistance to any serious tree diseases in our areas. Beyond this, we should note the other characteristics of the available rootstocks.

Grafting Basics

The LORD has given plants an amazing ability to heal, and with grafting, we utilize this healing ability. First, we make a wound in two different pieces of living wood. Then we bind the wounds together. As the plant heals these wounds, the two pieces of wood literally grow together into one piece of wood. The two pieces of wood are now grafted together.

In this paper I will discuss three types of grafting that are used in fruit production.

Whip-and-tongue graft – [step-by-step pictures of grafting procedure available here](https://www.dropbox.com/s/iro2sgxexm40alf/Whip-and-Tongue%20Grafting%20Step-by-Step.pdf?dl=0)²

A very popular form of graft, this graft is carried out in spring.

Gather straight, one-year-old scion wood (cuttings from the tree you are propagating) in winter and store them in a plastic bag with moist paper towel. This bag should be placed in the fridge. Order your rootstocks in winter as well, and plan to have them arrive in spring. When they arrive, put their roots in a bag with moist dirt or mulch and put the entire bag and rootstocks in the refrigerator. I recommend that you make sure your fridge is set well above freezing temperature. After your last frost date, remove the rootstocks and scions from the fridge, graft them, and plant them outside in a bed or in their permanent location. Don't forget to slit the grafting tape during the growing season if necessary.

¹ Rootstock selection will affect these things in the case of apples and some other fruits, but I believe there are exceptions, especially with less-familiar fruits.

² <https://www.dropbox.com/s/iro2sgxexm40alf/Whip-and-Tongue%20Grafting%20Step-by-Step.pdf?dl=0>

Bark graft – [step-by-step pictures of grafting procedure available here](#)³

The bark graft is primarily used for grafting larger trees, trees anywhere from ½ inch to four inches in diameter.

Once again, gather scion wood in winter and store in a plastic bag with moist paper towel. Place this bag in the refrigerator. The rootstock is already established in the ground, so it won't be placed in the fridge. As the first spring leaves peak from the buds of your rootstock, proceed with grafting. If the rootstock is much over one inch in diameter, leave a nurse branch below the graft to reduce shock to the established rootstock. Check your graft often as it grows and break off any suckers that arise from the rootstock. As the growing season progresses, slit the tape that bound the graft so that it doesn't girdle your tree.

Chip bud graft – [Step-by-step pictures of grafting procedure available here](#)⁴

The chip bud graft is different in that it is carried out in *late summer* and that the scion will ultimately consist of a single bud rather than a small cutting. Select scion wood of the current season's growth from the variety you want to propagate. I recommend that you collect the scion wood at the time of grafting. Proceed with grafting, but leave the rootstock in the ground where it has been growing; don't dig it up to graft it. The grafted rootstock will stay in place until the next spring, when you can cut off all growth above the bud. Remove all shoots that arise from below the graft, and watch carefully for the grafted bud to sprout and grow; the entire tree will grow from this one bud.

Pruning Basics

Several principles underlie effective pruning. Let me touch a few of them.

The fruit grower should prune for *light penetration* and *air circulation*. He should strive to have an open, airy tree canopy free of twiggy growth and congested branches. Achieving this will take practice, but the beginning pruner should be aware of pruning too little. Retain branches that spread outward and upward in a graceful fashion, but don't be afraid to remove congesting branches.

The fruit grower should also prune with *fruit production* in mind. Significant surface area in the canopy of the tree improves yield—yet another benefit of a spreading tree structure. Consider what angle each branch leaves the trunk and picture a load of fruit on it. A spreading limb which leaves the trunk at a wide angle will support fruit very well, but a branch that shoots toward the sky at an acute angle to the trunk may tear away from the trunk under the strain of a fruit load. Tie such a branch into a more desirable position, or remove it completely.

When you remove a branch entirely, cut it off cleanly without leaving a stub of wood. The cut does not need to be (and shouldn't be) completely flush, but it mustn't leave a stub of wood which will collect disease.

“What time of year should I prune?” This question will receive different answers from different people. My recommendation for people in the eastern U.S. is that pruning happen just

³ <https://www.dropbox.com/s/5a8ugx7b4cv4mce/Bark%20Grafting%20Step-by-Step.pdf?dl=0>

⁴ <https://www.dropbox.com/s/odobigii38ieqv3/Chip%20Bud%20Grafting%20Step-by-Step.pdf?dl=0>

before leaves appear in the spring. This ensures that the tree is preparing to grow, so healing will occur rapidly, and it also ensures that the pruning doesn't have the stunting effect of summer pruning.