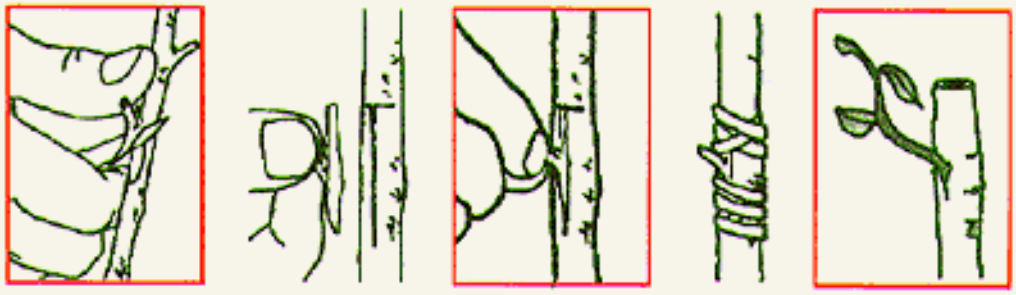
# Apple Activities

## The Life of an Apple Tree

Growing the kind of apple tree that grows in an apple orchard is much more complicated than you might believe. You might think that it is merely a matter of planting an apple seed in the ground and then waiting for the tree to grow. But in reality it is much more complicated then that. In fact, historically, specialized fruit farming was the last type of farming to be developed.

The difficulty is that an apple tree grown from an apple seed will not produce a tree (or fruit) like the one the apple(seed) came from. For example, a seed from a McIntosh apple will not grow into a McIntosh tree. The reason for this is that genetically the seed is only half McIntosh - the other half of the seed's genes came from the pollen that the bee picked up from the blossom of another tree before he visited and fertilized (with the pollen) the blossom of the McIntosh tree. The other tree could have been any other apple variety within a mile or two of the McIntosh tree. So when that apple seed is planted, you never know what the tree will grow up to look like, or what the apples will taste like. If the other tree the bee visited first was a Crab Apple tree, for example, then the tree that would grow from the seed would be a cross between the two, i.e., half McIntosh and half Crab Apple. While such a tree might be interesting, it would likely be of no use to an apple farmer. (Though crossbred trees are grown experimentally to develop new varieties, and some older varieties, such as the McIntosh, are the result of natural crossbreeding.) Apple farmers have to have apple trees that are of known varieties so that they know what the apples will look like, taste like, how they will keep, and what to tell consumers they are. An apple tree grown from a seed is called a "wild" apple tree; they are the ones you see growing in ditches and woods. To make all of the apple trees in their orchards be of known varieties, apple growers use one of two processes - budding and grafting.



Both processes start with what is called a "rootstock." A rootstock is just a small, young apple tree. (Rootstocks are not grown from seeds. A small tree is bent over so it lays along the ground. A thin layer of soil is then put over the tree. Shoots from the tree push up through the soil and grow into small tress in a year. In the spring, these

shoots are dug up and removed from the original tree. The bottoms of these small trees have roots of their own, and these small trees are the rootstocks that the grower uses.) The grower buys a number of rootstocks and plants them close together in his or her nursery. If left alone, these rootstocks would grow into apple trees, but the apples would probably not be very good to eat. Rather the grower uses budding or grafting (described below) to grow the variety of apples they want from the rootstock. A rootstock is used because the ultimate size and hardiness of a fully grown apple tree is governed by the type of rootstock selected. For example: a McIntosh tree grown on a dwarf rootstock will grow into a dwarf McIntosh tree. Dwarf rootstocks are very popular these days because dwarf trees are easier for growers to manage and easier for pickers to pick. But exactly how is the McIntosh tree (or other variety) grown from the rootstock?

As noted above, there are two methods whereby desired varieties are grown from the rootstocks - budding and grafting.

### Budding:

The grower buys rootstocks in the spring and plants them in their nursery. During the first summer, a bud is taken from a tree of the variety of apple tree that the grower wants to reproduce. (The bud is a very small piece of the tree that would grow into leaves and blossoms the following spring. They are found just where a leaf is attached to a branch.) The grower then makes a small cut in the bark of the rootstock about a foot (30 cm) up from the ground. The bud is then carefully slipped into the the cut (i.e., under the bark). The cut in the tree is then wrapped tightly with an elastic band; however, the grower is careful not to cover the bud. The next spring, the bud begins to grow and becomes a shoot growing out from the side of the rootstock. The grower then cuts off the rootstock just above the shoot growing from the bud they implanted the summer before. The grower removes any other shoots that may grow out from the rootstock, i.e., below the new shoot growing from the implanted bud. In other words, the shoot growing from the implanted bud is the only one the grower allows to grow. Without any other shoots to compete with, this shoot grows upwards vigorously. The following spring, the tree in dug up and planted in the orchard.

An apple tree in an orchard is actually made up of two different varieties. The root of the tree is the same variety as the rootstock. The top of the tree, i.e., the visible part of the tree, is the same variety as the tree the implanted bud was taken from. Because the only part of the tree allowed to grow is the part that grows from the implanted bud, the tree will grow up to only produce apples of the same variety as the tree that the bud was taken from. However, the size of the tree is governed by the variety of the rootstock. This gives growers complete control over the varieties of apples in their orchards and over the sizes of the trees.

### Grafting:

Growers graft apple trees for all the same reasons that they bud trees. The only only difference is in how the desired variety is grown from the rootstock. In grafting, rather

then using a bud, the grower uses a short section of a small branch (about the diameter of a pencil) from the desired variety. The grower cuts a section of the branch about four-inches (10 cm) long. The section should be the same diameter (or slightly smaller) as the rootstock . The grower then cuts off the rootstock about one foot (30 cm) above the ground. A sharp knife is then used to cut one end of the branch into a wedge shape; the knife is also used to make a corresponding notch in the end of the rootstock. The branch is then placed into the notch and sealed in place with wax. The grafted branch then begins to grow. As with budding, all shoots that grow from the rootstock are removed, leaving only the grafted branch to grow. The following spring, the tree is set out in the orchard, and a tree of the desired variety grows.

After trees are set out in the orchard, growers have to wait three or four years (depending on the variety) before they get any apples from the trees. Apple trees can live for over 100 years, although most are only kept for 20 to 30 years.

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