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Propagating and Grading Pear Trees

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Planting a pear orchard is an investment in the future. The orchardist expects to wait at least four or five years before harvesting his first small crop. He expects his trees to produce for at least 30 years, probably more.

Before buying trees, he should have a general knowledge of how a pear tree that will thrive and bear heavily is produced in the nursery. The root system of a pear tree is called the stock, rootstock, or understock. The upper portion which bears the fruit is termed the scion. Often there is an 'interstem' or 'stem piece' of variable length between these two, and such trees are said to be "double worked." Trees are double worked to provide compatibility or disease resistance, or both.

Rootstocks

French pear seedlings of the species *Pyrus communis* and clonal (vegetatively propagated) rootstocks, primarily Quince (*Cydonia oblonga*), are the most common rootstocks for pear trees. Most existing pear orchards in Oregon are on seedling rootstocks.

Clonal rootstocks are propagated by cuttings or layers. As with seedlings, when the clonal rootstock reaches the proper size in the nursery, it is budded to the desired scion variety.

Pear rootstocks vary in their growth habits, soil and climatic adaptability, and resistance to diseases, woolly aphis, and nematodes. Trees can be obtained with Old Home interstem pieces, a disease-resistant clonal selection, and Quince or Bartlett seedling roots. If the bud union is slightly below the ground level, roots will form on the Old Home interstem. Any variety of pear including Bartlett can then be budded on the Old Home piece, whereas Bartlett directly on Quince is not satisfactory.

The names 'domestic French' and 'native French' designate the source of the pear seed. Either source has its advantages and disadvantages. If seed is taken from cider or Perry mills, the parentage is usually a mixture. This gives variable seedling types, germination, and size in the nursery row.

The parentage of 'domestic French' is usually more certain than that of 'imported French.' Having at least one known parent, such as Winter Nelis, is better than guessing what the mixture might be.

The ideal pear rootstock would be immune to pear decline and resistant to fire blight, nematodes, woolly aphis, mushroom root rots (oak root fungus), and crown gall. It would be vigorous, hardy, well-branched, and compatible with the variety upon it. It would thrive on a diversity of soils, including those that are shallow and wet as well as those that are deep and well drained. The ideal pear stock would have a long budding season.

Fire blight, a bacterial disease, readily infects Quince or French rootstock, whereas Old Home, Farmingdale, and most Old Home X Farmingdale seedlings are resistant. French pear rootstock are quite resistant to oak root fungus, but Quince roots are not. Winter hardiness will vary with the rootstock; Old Home is more winter hardy than Hardy. Quince is more susceptible to lime-induced chlorosis.

Propagation

A typical propagation schedule for a Bartlett pear tree budded on a French seedling is as follows: a nursery seed specialist collects or buys pear seed after the harvest. During the winter, he stratifies the seed by cold treatment or other methods to soften seed coats and break dormancy. He broadcasts the seed in beds the following spring.

In the fall or early winter, he digs, grades, bundles, and labels the pear seedlings for sale to other nurserymen. In the spring, they are lined out in rows, 6-12 inches apart in the rows, and 4-8 feet between rows, depending on the equipment available. By late July or August, most of the seedlings have made enough growth for budding close to the soil line. The following spring, budded seedlings are cut off just above the bud.

From March to October, the bud grows to a whip or branched tree from 2-6 feet tall, depending on the vigor of the root system. After leaves have fallen, the nurseryman prepares trees for sale from December through April or May. The elapsed time from collection of seed to sale of the pear tree has been 3-3½ years.

Bench grafting

The shortest cycle of less than two years by-passes budding by a more expensive method of propagation—bench grafting. Either seedling rootstock or clonal root-

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stock can be used in bench grafting. Instead of a bud, a small piece of scion wood is grafted on by hand.

Graft unions are wrapped with grafting tape, coated with a grafting wax, and allowed to callus in moist, cool, and well-drained storage. Bench grafts are lined out in the spring, usually by hand, since most machine planters may jar the graft union or unions.

By the following November, growth from the scion variety will usually caliper at least 1/4 to 3/8 inch, 2 inches above the graft union. However, bench grafted trees never grow as large as trees that have been budded the previous summer. The main advantages of bench grafting are providing winter work and flexibility in filling custom orders. The nurseryman has to maintain good inventory of rootstock, interstock, and scion material in order to assemble trees wanted by orchardists.

Quince rootstock is used to give a smaller than standard pear tree. There are several different quince types. Malling Quince A is the preferred rootstock at this time. Quince B and Quince C are among the other types, but their performance, including amount of fruit produced, has not been as consistent as Quince A.

Grades for pear trees

Most Oregon nurseries follow fruit tree grade standards established by the American Association of Nurserymen. Caliper governs the grade of pear and other fruit trees. Caliper is taken 2 inches above the bud or graft union.

In the Pacific coast states, whips or partly branched pear trees are graded in intervals of 1/8 inch as follows: 1/4 to 3/8 inch; 3/8 to 1/2 inch; 1/2 to 5/8 inch; 5/8 to 3/4 inch; and 3/4 inch and up. One-half inch or 5/8 inch whips are the sizes most in demand.

Branched trees are graded in intervals of 1/8 inch with the smallest grade being 5/16 to 7/16 inch. Others are 7/16 to 9/16 inch; 9/16 to 11/16 inch; and 11/16 inch and up. Branched trees should have three or more side branches.

Pear trees are tied 10 per bundle with two labels per bundle. Labels should indicate variety, rootstock, and grade. An example would be Bartlett/Old Home 1/2 which means a Bartlett tree (whip) on an Old Home rootstock with the caliper being 1/2 inch, 2 inches above the bud or graft union.