

# OLD HOME PEAR

*is proving valuable as a rootstock  
in combating pear decline and fire blight*

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The Old Home pear variety is resistant to fire blight and pear decline, has a well-shaped trunk, a good scaffold system, and is easily propagated on its own roots by hardwood cuttings. For these reasons, Old Home stock is expected to be of even greater value to the pear industry in the future than it has been in the past.

Old Home has been widely used to provide a blight-resistant trunk and scaffold system for Bartlett and other commercial varieties. It makes an ideal intermediate stock because it forms strong, wide-angled scaffold branches which make smooth, compatible unions with Bartlett

and other commercial varieties. It has also served as a compatible intermediate stock between quince roots and pear variety tops. Such trees are usually developed by budding Old Home on domestic pear seedlings or rooted quince cuttings. After the Old Home trees have developed an adequate framework, in from two to four years, they are top-worked to a commercial pear variety.

Bartlett and other commercial varieties top-grafted on Old Home intermediate stocks have shown high resistance to pear decline if a root system has developed about the Old Home-rootstock

Old Home pear nursery trees developed from hardwood cuttings.  
(Photographed August 15, 1961.)



Bartlett pear branch showing (left) normal bark, and (right) symptoms of measles.

graft union. Old Home intermediate stocks which have become self-rooted are also highly desirable from the standpoint of blight control since both domestic pear seedling and quince roots are subject to blight infection through root suckers.

Old Home may be induced to develop its own root system by grafting scions on quince roots and then planting with the graft union several inches below the soil surface. Under certain favorable conditions, vigorous Old Home roots have developed when the trees were planted with the graft union at the soil surface. Scion rooting is slow and uncertain, however, and deep planting of Old Home invites attack from crown rot fungi.

The most feasible way to propagate Old Home on its own roots is by hardwood cuttings. A practical method developed at Davis during 1957-1959 gave excellent nursery trees from 53.3 per cent of the cuttings collected and treated during late November and early December of 1959. An average of 72 per cent of cuttings treated by the method in late October and November, 1960, produced vigorous trees

## THE COVER PHOTO . . .

was taken in the experimental orchard operated by the Department of Pomology on the Davis Campus. The pear tree in the foreground is a victim of pear decline, the subject of considerable research by University scientists. Photo was taken on a day devoted to giving Farm Advisors from pear-growing counties up-to-date information about the work being done on pear decline.

now growing in the nursery at Davis. A few of the replicates gave trees from 75 per cent of the cuttings. Old Home trees propagated from hardwood cuttings develop extensive, deep-growing root systems.

In developing the rooting method described below, many treatments were tested. Several growth-regulating chemicals were used at different concentrations, both alone and in various combinations. They were also used in combination with indolebutyric acid (IBA). None of these materials or combinations increased the number of nursery trees over that obtained with IBA treatment alone. Rooting was not increased by removing narrow strips of bark from the bases of the cuttings or girdling them by removing a narrow ring of bark 2 inches above the base before IBA treatment. Holding the cuttings in a vertical position in moist peat moss or a 50-50 mixture of vermiculite and perlite, with bottom heat so that their bases were at 70, 80, or 90° F and their tops were in cool air, following treatment, also failed to increase rooting.

#### Obtaining Measles-free Propagating Stock

Pear bark measles is a disease, possibly caused by a virus, that reduces the vigor and productivity of pear trees. No natural vectors of the disease are known. The symptoms are not apparent on the Old Home wood, but appear on the branches of the commercial variety from a few to several years after it has been top-worked on Old Home carrying the measles causal agent. During 1959 and 1960 it was noted that the incidence of pear bark measles was much higher in Bartlett trees on Old Home intermediate stocks than in Bartlett trees of comparable age on seedling rootstocks alone. The disease is not confined to pear trees on Old Home intermediate stocks, however, but is also found in commercial varieties on seedling rootstocks. Evidently the disease is usually spread by selecting bud and graft wood for propagation from measles-affected trees. It has been shown, however, that varying percentages of pear seedlings will develop measles symptoms if the seed from which they grew came from trees with bark measles.

Enough measles-free, mature Bartlett trees on Old Home have been found to warrant the conclusion that many Old Home intermediate stocks are not contaminated. Scion wood was gathered from the Old Home trunks and scaffolds of a

#### Rooting Old Home Hardwood Cuttings

1. Cutting material should be obtained from parent trees about October 25 to November 15. Shoots should have just completed their first growing season. If leaves are still attached, they should be pulled off. Shoots  $\frac{1}{4}$  to  $\frac{3}{8}$  inch in diameter and 1 to 3 feet in length are satisfactory. It is important to obtain and prepare the cuttings at this time of year. Cuttings made later in the winter or in spring root very poorly or not at all.

2. Cuttings should be 7 to 8 inches long. They may be cut with hand shears, or the shoots may be tied in bundles of 50 to 100, and cut to length with a fine-bladed band saw to insure a smooth cut.

3. Shortly after the cuttings are prepared, the basal ends should be soaked for about 24 hours in a 200 parts per million (ppm) solution of IBA. If more than an hour elapses between the time of making the cuttings and their soaking in the IBA solution, a fresh cut should be made at the base to insure uptake of the chemical. One gallon of a 200-ppm solution of IBA can be prepared by placing  $\frac{1}{2}$  level teaspoon of the chemical in a small amount of alcohol—just enough to dissolve it—and adding this to 1 gallon of water. The cuttings should be set upright in a container—basal ends down—in enough solution so that the base of each cutting is immersed to a depth of about  $1\frac{1}{2}$  inches. Without this IBA treatment, no rooting will occur. These solutions should be used only once, then discarded.

4. After the IBA treatment, the cuttings should be removed from the solution and stored in damp peat moss at 65 to 70° F until the first signs of roots appear—usually about three to four weeks. For storage, the cuttings can be laid horizontally in orchard lug boxes and completely covered by layers of peat moss. This treatment prevents drying, and the warm temperature stimulates development of the adventitious root initials. It is very important that the 65–70° temperature be maintained, otherwise few root initials will develop. The peat should be only damp (not wet enough for moisture to be squeezed from it), otherwise the cuttings may decay. If 10 pounds of peat moss (Canadian

peat moss packed in 5.6 cubic-foot, polyethylene-lined paper bags) are wet with 5 quarts of water, the moisture level should be about right. A sheet of polyethylene plastic laid over the top of the box and tucked in around the edges is useful in preventing drying of the peat moss and the upper layers of cuttings. After about 10 days the contents of the boxes should be examined for moisture content. If drying has occurred, the cuttings should be removed and repacked in peat moss containing the proper moisture.

5. Toward the end of the storage period the cuttings should be inspected each day. As soon as the first evidence of roots appears, all cuttings should be immediately planted in the nursery. If the cuttings are left longer in the warm storage, masses of roots will develop at the base of each cutting, and will be broken off during planting. Cuttings should be planted upright, about 3 inches apart, with only 1 or 2 inches above ground, in a trench about 6 inches deep. They should be gently covered with soil so that the callus and incipient roots at the base will not be broken. It is inadvisable to insert these cuttings by pushing them into loose soils. If the weather is rainy or the soil unsuitable for planting at the end of the storage period, the boxes of cuttings may be moved to a lower temperature—about 40° F—to retard further root development. Cuttings should be planted, however, as soon as practicable.

6. At the end of the following growing season, strong nursery trees with good root systems should have developed. To take advantage of the blight-resistant properties of Old Home, the trees should not be budded to Bartlett at this time, but should be planted directly in the orchard so that the trunk and primary scaffold system can develop. Top-budding or grafting in the orchard—a Bartlett bud or scion in each of three or four primary scaffolds—will produce a tree with a blight-resistant root, trunk, and scaffold system.

This method for rooting Old Home hardwood cuttings is not satisfactory for Bartlett.

number of such trees during the fall and winter of 1960, and used for hardwood cuttings. A number of Old Home trees developed from these cuttings are now in the University nursery. These trees will be used to establish measles-free Old Home wood for propagation. When available, this wood will be distributed through the University of California Foundation Plant Materials Service. The Bartlett portion of several mature trees consisting of measles-free Bartlett on Old Home intermediate stocks was removed during the winter of 1960-61. The new growth produced by the remaining Old Home trunks and scaffolds of these trees

will also provide sources of measles-free Old Home wood.

A number of nursery trees of Old Home that were produced by cuttings have been heat-treated. If measles is caused by a virus, and if the heat treatment destroys it, these trees will give another source of measles-free Old Home.

In the spring of 1961, scion wood was obtained from the Old Home tree at Medford, Oregon, which was developed over 50 years ago from wood of the original Old Home tree in Illinois. The Medford tree has never been top-worked. Since it is the source of practically all of the existing Old Home wood, and since Old

Home is not universally affected, the Medford tree undoubtedly is free of measles. The wood received from this tree has been top-worked on several domestic French seedlings to develop another source of Old Home propagating wood.

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## WANTED . . . Citrus Bud Variants

*New citrus varieties are needed to fill a marketing gap; a variant in your grove might be the answer*

R. G. PLATT

Attention has recently been focused on bud variations in standard citrus varieties. This has been brought about largely by the occurrence and recognition of variants which have had one or more undesirable characteristics from the standpoint of what is recognized as typical and desirable fruit of each variety.

For some years, the grower, the industry and the consumer have come to look for certain characteristics which identify California citrus fruits. Variations which detract from or lessen these desirable characteristics must be avoided, if California is to continue to hold its enviable position in the production of high quality citrus.

Even though the standard selections of navel orange, valencia orange, grapefruit, lemon and mandarin are of generally acceptable quality, they could be better. An effort should be made to further improve quality and find varieties that fit an ever-changing picture.

What are the improvements, the varieties, for which to look?

### AREAS OF PRODUCTION

One of the most pressing needs has arisen from the changes taking place in California's areas of citrus production.

Weekly Fresh Domestic Shipments of California-Arizona Valencia Oranges

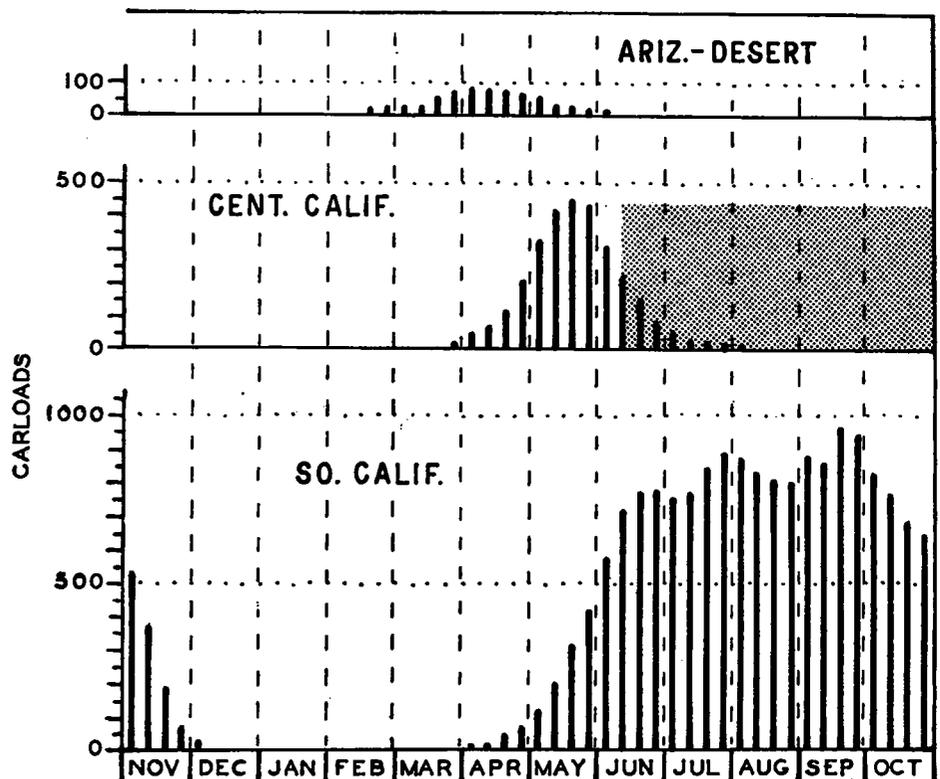


Chart shows 6-year average; 1953-54 through 1958-59. The gray area indicates a time during which larger shipments from central California would be desirable. (Source: Valencia Orange Administrative Committee. Less than 10 cars per week not shown.)