

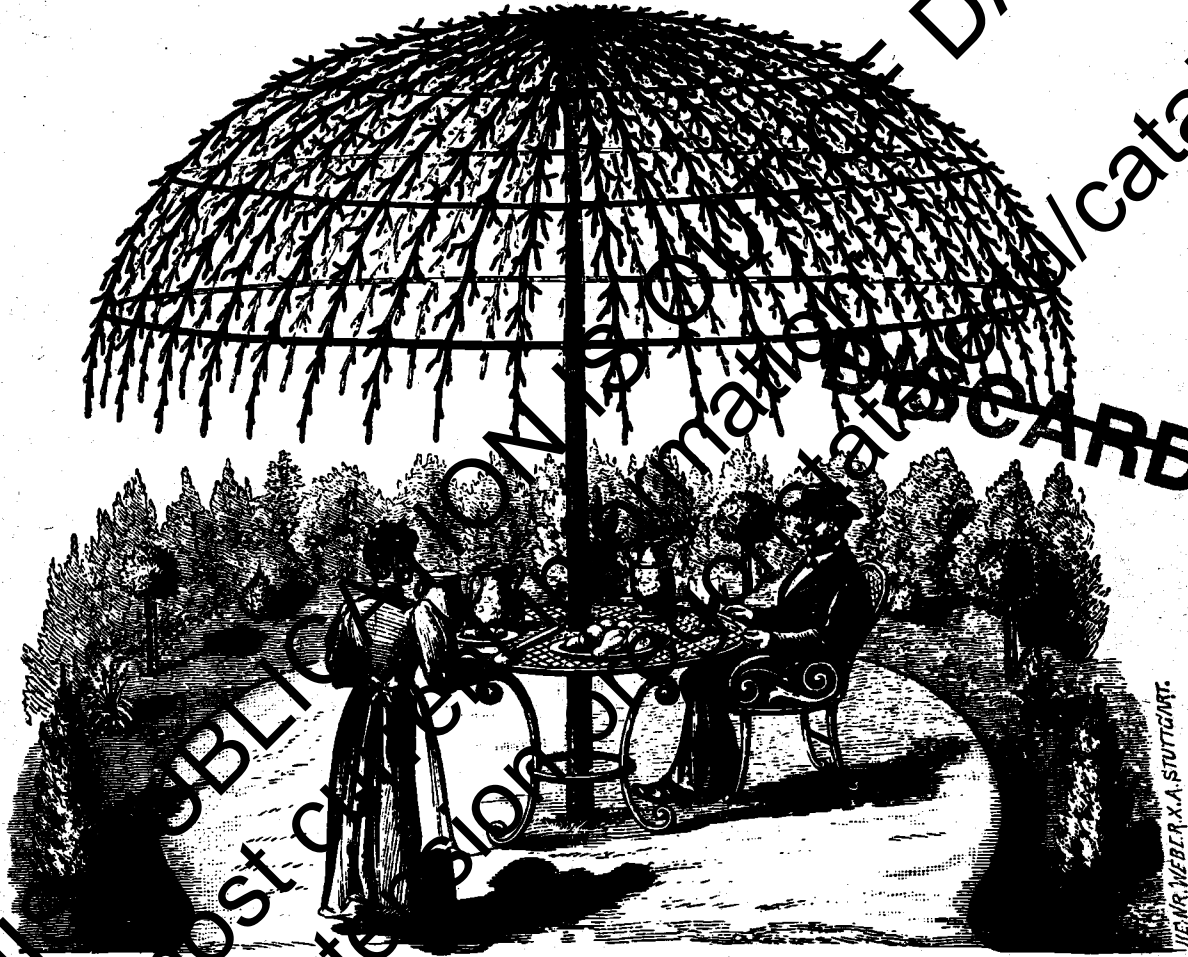
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Growing Tree Fruits and Nuts in the Home Orchard

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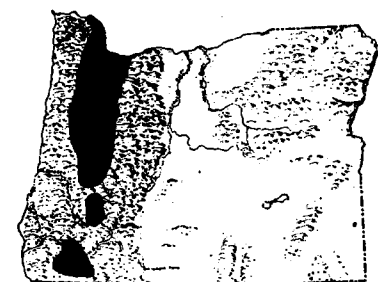
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Oregon State University Extension Service
Extension Circular 819
Revised May 1974

Fruits and Nuts for Oregon

Fruit-growing areas in Oregon are determined, largely, by climate. These maps show the growing areas by climatic zones. Table 1 shows which zones are suitable for various fruit and nut crops.



Area I. The Willamette Valley and Southern Oregon are noted for mild, uniform, and relatively humid weather. During the summer, temperatures are usually moderate with low humidity. Southern Oregon has a warmer, drier climate with frequent spring frosts.



Area III. Mountain and high plateau. This area is noted for extremes in temperature, lack of rainfall, and a short growing season. Only the hardiest fruit trees will survive.



Area II. The Mid-Columbia and eastern Oregon regions generally have warmer summers and colder winters than most of Area I. Spring frost is common.



Area IV. Coastal region. Low summer temperatures and rain limit fruit growing. Disease problems are especially severe.

Table 1. Growing Areas and Management for Oregon Tree Fruits and Nuts

Crop	Area best suited ^a	Space per tree in feet ^b	Pollinizer tree needed	Approximate years to bearing	Sprays usually required to control
Apples	I, II, III, IV	5-40	Sometimes	2-10	Codling moth ^c , scab
Apricots	II	15-24	No	6-7	Brown-rot, bacterial canker
Butternut	I, II, III, IV	30-40	Yes	3-5	None
Cherries, sweet	I, II ^d	20-35	Yes	6-7	Fruit fly ^c , bacterial canker
Cherries, sour	I, II, III, IV	14-20	No	5-6	Fruit fly ^c
Chestnut	I, II	20-40	Yes	5-7	None
Filberts	I, IV	15-20	Yes	5-6	Filbert moth ^c , bacterial blight
Figs	I	12-20	No	5-6	None
Hickory	I, II, III, IV	20-40	Yes	10-14	None
Papaw	I, II	15-20	No	12-14	None
Pears	II	10-20	Yes	5-7	Fire blight, scab, codling moth ^c
Peaches, nectarines	I, II	12-15	No	4-5	Leaf curl, borers, coryneum blight, brown rot
Plums & prunes	I, II, III ^d	10-20	Sometimes	5-6	Crown borers, brown rot
Persimmons	I, II	15-20	Yes	8-10	None
Walnuts, black	I, II, III, IV	30-40	No	10-12	Husk fly ^c
Walnuts, English	I, II ^d	40-50	No	10-12	Husk fly ^c , blight

^a Except Jackson County due to albino virus.

^b The vigor of the variety, rootstock, and the amount of pruning also determine space requirements.

^c Insect, if uncontrolled, results in wormy fruit or nuts.

^d Certain hardy varieties available—see text.

Growing Tree Fruits and Nuts in the Home Orchard

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With dreams of abundant supplies of their favorite fruits and nuts produced right in their own backyards, home owners every year plant backyard orchards. While some are rewarded with success in their venture, all too often, because some important factor was not considered, the results fall far short of expectations. Often the owners move before the seven or eight years required for some trees to reach bearing size have elapsed. The new owners may have no interest in the trees and fail to care for them.

Before deciding to plant fruit or nut trees, ask yourself if you will have the time and interest to spray, prune, and otherwise care for them; to harvest and use the possibly overabundant products; and whether your garden has room enough and soil suitable for the trees.

The space required for a home orchard ranges from 15 feet of wall for a couple of espaliered dwarf apple trees to a half acre or more of trees of various sizes. Fruit and nut trees can be planned as an integral part of the home landscape or isolated in a specified orchard area.

Large trees such as walnuts and chestnuts make good shade trees but are more difficult to prune and spray than smaller trees. The soil must permit rooting to a depth of at least three feet. It should be neither too sandy nor too clayey, although certain kinds of trees will tolerate these extremes in soil texture.

In addition to the trees and space, the home orchardist will need an adequate sprayer, ladder, and pruning tools. Spraying is covered in EC 631 "Spray Schedule for Home Orchards," which may be obtained from your local OSU Extension Office. For the serious gardener, the rewards from a well-kept home orchard are sufficient to justify the considerable effort involved.

Tree fruits and nuts *not* adapted to Oregon climate but grown elsewhere in the U.S. include: pecans, almonds (in most locations), oranges and other citrus, avocados, pistachio (with possible

exceptions of warmest areas), olives, loquats, and tung. These crops are not suited to Oregon either because winters are too cold, season is too short, spring too cool and wet, or summers are too cool.

All fruit and nut trees are grafted or budded in the nursery to a named variety which will bear fruit or nuts fitting a certain description.

Selection of the best varieties of fruits and nuts for each area is covered in RS 143 "Fruit and Nut Varieties for Home Orchards," available from your local OSU Extension Office. Plan for a sequence of ripening dates if you plant several trees of one species. The following are some general guidelines to growing specific kinds of fruits and nuts.

Apples: Apple scab is a serious disease of apples. It requires several sprays for control. The variety Delicious is especially susceptible to apple scab. Other varieties, such as Golden Delicious, Gravenstein, and McIntosh, are somewhat less susceptible. Tydeman's Early Red, Prima, Chehalis, Priscilla, Macoun, and Spartan are resistant or immune to apple scab. Apples may be purchased on dwarfing, semi-dwarfing, or standard rootstock. Rootstock and variety influence trees approximately as shown in Table 2.

The lower figures represent tree size for less vigorous varieties such as Delicious and Rome Beauty, and the higher figures such vigorous varieties as Gravenstein and Newtown. The rootstock numbers refer to specific rootstocks that can be ordered from nurseries. Trees on 9, 26, and some-

Table 2. Rootstock Influence on Size, Yield, and Years to Bearing

Rootstock type	Tree spread	Approx. height	Time to first bearing	Approximate yield	Rootstock numbers
	Feet	Feet	Years	Pounds	
Vigorous	30-40	25-60	7-10	300-400	Seedling
Semidwarf	15-25	15-25	5-7	180-300	106, 111, 2, 7, 4
Fully dwarf* ..	5-10	6-15	3-5	50-150	9, 26

* Requires support

times 7, usually require support of some kind. Trees on M9 or 26 roots can, with pruning, be held to a permanent spacing of five feet and eventually, depending on site, will not require support.

Spur-type strains of certain apple varieties such as Delicious, Golden Delicious, and others are available. Spur types are smaller, more compact, and often more productive than non-spur types.

Sometimes more than one apple variety is grafted on the same tree. This is reasonably satisfactory, but since varieties have different growth rates and maturity dates, it is more difficult to prune and spray such trees. You can avoid the problems by planting several dwarf trees of different varieties. Dwarf trees have the additional advantages of being easier to prune, spray, thin, and harvest.

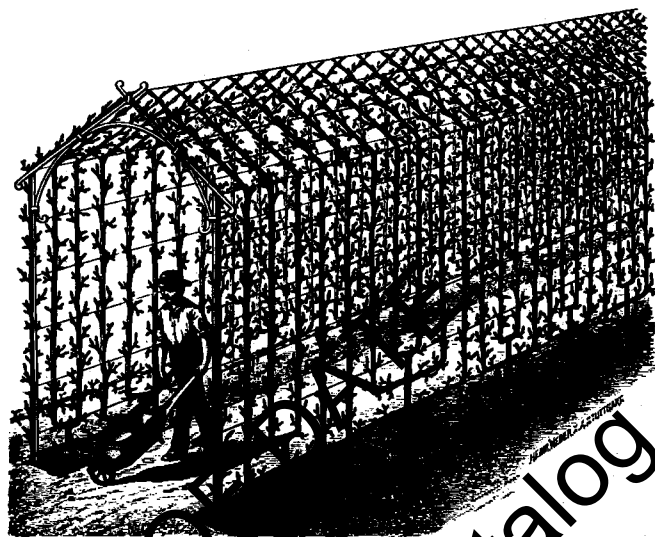
Apricots: Because they bloom early, apricot crops frequently are lost to spring frost. In areas of high spring rainfall they do not set fruit regularly and are subject to a host of diseases.

Chestnuts: The chestnut grows into a large, attractive shade tree that bears an abundance of fragrant, creamy white catkins in spring. Nuts are enclosed in golden-colored prickly hulls in fall. The nuts are delicious roasted fresh, but they mold easily in storage.

Since nursery-grafted Chinese Chestnuts often die from delayed graft-incompatibility, the home owner is advised to plant seedlings. All Chinese Chestnut trees are highly resistant to chestnut blight, which has almost completely killed the American Chestnut. While they will bear some nuts with their own pollen, nut production and size often is increased by pollen from a second tree.

Butternut: The butternut tree closely resembles black walnut. It is the most winter hardy of all nut species and is most likely to succeed in poor soil. It is an attractive landscape tree because of its grey bark and interesting tree form. The nut is pointed and oblong with deep ridges. Except for selected varieties, the kernel is thin and difficult to remove from the shell.

Sweet Cherries: In spite of the hazards of rain cracking, bacterial canker, bird depredation, and fruit-fly infestation, sweet cherries are popular home garden fruit trees. Sour cherry roots often are used to dwarf sweet cherry trees for the home owner, but the degree of dwarfing is slight and the percentage mortality of young trees is greater than on sweet cherry (mazzard) or *Prunus mahaleb* seedling rootstocks. A superior new dwarfing rootstock for sweet cherry, known as M x M 14, is



available from some nurseries. Bacterial canker often girdles and kills budding sweet cherry trees. Two sprays of Bordeaux 12-12-100, one in October and the other in January, may provide some protection against bacterial canker. This is a mixture of copper sulfate, lime, and water. Instructions for making the mixture are available from your county extension office or garden supply stores, but many home owners prefer to employ a commercial sprayer for this and other spray requirements. It can be avoided by planting mazzard F-2 root and trunk stocks and budding the varieties 12 to 18 inches out on the limbs a year or two later.

All sweet cherry varieties except Stella require pollination by some other variety. The three principle varieties, Bing, Lambert, and Royal Ann will not pollinate each other. Corum, Sam, Van, and several others are good pollinizers. It is practical to graft several cherry varieties onto the same tree. Sweet cherry trees are not tolerant of wet or clayey soils. Birds often eat much of the fruit on isolated cherry trees. Plastic netting or black thread thrown over the tree several times from different directions can be used to protect them. Black thread apparently confuses the birds so that they avoid the tree.

Sour Cherries: The principal variety of sour cherry, Montmorency, does not require a pollinizer. The tree is smaller, bears earlier, and has fewer disease problems than the sweet cherry. North Star on mahaleb rootstock is a smaller tree than Montmorency on mahaleb. Almost all sour cherries are frozen or canned and later used in pies or pastries.

Filberts: Unless suckers are removed from the crown of the filbert tree every year, they grow as a bush. Filbert trees can be propagated from

rooted suckers, but the nurseries usually can supply better trees. A single mature filbert tree occupying a space of 20 feet or more will produce only about 15 to 20 pounds of dried nuts. Especially if the blue jays and squirrels get half the nuts, the filbert doesn't produce much for the space it occupies. Pruning out the older, more pendulant wood from filbert trees increases their productivity.

Figs: The summer is really too cool in Oregon for figs, but a few varieties such as Lattarula (Italian Honey Fig), Desert King, and Neveralla (Partridge Eye) often will mature a crop. Temperatures around zero will kill the trees to the ground line. Especially if grown in a bush form, they will grow back to producing age in three or four years from the stem portions below ground. Plant fig trees in sunny spots, preferably on a south wall.

Hickory: Selections of the shagbark hickory and of some other species are desirable for home planting as fruiting ornamental trees. Some varieties from the Northeastern United States are winter hardy. The nuts are small to medium in size, with thick shells.

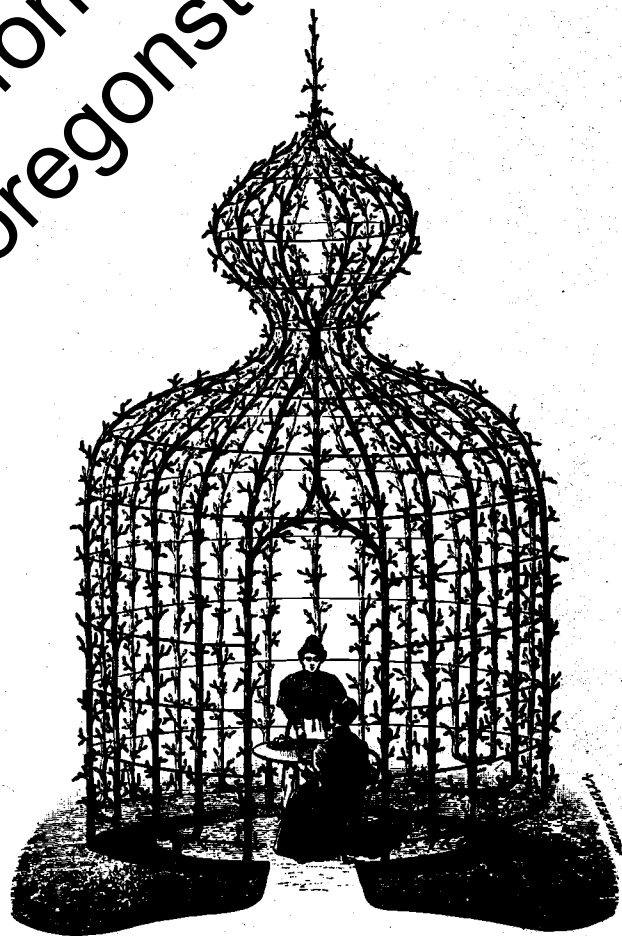
Papaw: Hobbyists in Michigan and New York have selected hardy, relatively large-fruited varieties of the Papaw from wild seedling populations. The fruit is sometimes five to six inches long and two or three inches thick; the skins are green until ripe, becoming yellow as they begin to ripen and bronze or brown when they are ripe enough to be eaten; the soft ripe flesh is creamy and yellow. The Papaw is sweet and has a resinous flavor and odor which some people enjoy. There are large brown seeds in the flesh. Isolated trees generally are unfruitful. The trees are slow-growing and slow to come into bearing, but live long.

Pears: Pear trees are available on vigorous rootstocks or on quince roots, which are semi-dwarfing. Since quince is not winter hardy, trees on this root should not be planted in areas II or III. Since pear trees are more upright and smaller than apple trees, they do not make good shade trees. Pears tolerate clayey or wet soils better than most other kinds of tree fruits. Especially in southern and eastern Oregon, pear trees are subject to fire blight, a particularly virulent bacterial disease. Control of fire blight requires frequent spraying and pruning to remove infected twigs. Bacterial blossom blast and codling moth infestation are problems in all pear districts.

Peaches, nectarines: A nectarine is nothing more than a fuzzless kind of peach. Peaches are ill-adapted to rainy climates. They bloom early in spring when weather is too cool and wet for good

pollination and when clear weather frequently brings frosts. Numerous serious diseases infest peach trees in wet weather: peach leaf curl, coryneum blight, and brown rot. Without frequent spraying, peach trees in cool wet climates will soon die. A few nurseries offer the Moyer variety which is reportedly resistant to peach leaf curl. Peaches also require heavy fertilization and pruning. They are one of the most difficult fruits to grow. Yet many home orchardists do grow them successfully.

Plums and prunes: There are three general kinds of plums and prunes: European plums, Japanese plums, and hybrid plums. Prunes are European-type plums that are suitable for preservation by dehydration. Japanese varieties bloom early and frequently fail to bear due to frost or cool wet weather. Brown rot which infects the blossoms and fruit, is the most common disease of plums. The Brooks and Italian varieties of European plums are among the easier fruits to grow in the home orchard. Japanese plums usually are eaten fresh, while most European varieties are good fresh, canned, or dried. The Parson European type plum and all Japanese plums require pollinizers. All hybrid plums require another variety for pollin-



ation. New hybrid plum varieties hardy in Wisconsin but as yet not grown here include Underwood, Pipestone, Superior, Ember, Toka, and South Dakota.

Persimmons: Some seasons in Oregon there are not enough warm days for persimmons of either the American type or the Japanese species to mature their fruit. American species, which are smaller and have seeds, will mature more often in our cool climate. Male trees, which bear no fruit themselves, are needed for pollination of American persimmons. The Japanese varieties that will mature in Western Oregon, such as Fuyu, bear seedless fruit and do not require a male tree for pollination. Hayachi is not hardy in Oregon. Until they are soft-ripe, most persimmon fruits are extremely astringent; Fuyu is much less so. The Japanese persimmon is not attacked by many enemies and is a rather beautiful and useful tree for home plantings. Usually persimmons are eaten fresh.

English Walnuts: Walnut trees make good non-bearing shade trees in western Oregon but are subject to several serious problems. English walnuts grafted on black walnut roots often die at age 15 or 25 or older from a graft union disorder known as blackline. Walnut trees in housing developments established in old walnut groves frequently die from the combined effects of root disturbance and the blackline disorder. To avoid blackline, walnut trees should be planted on Manregian or Carpathian roots. Presence of an insect pest new to Oregon, the walnut husk fly, requires home owners to spray to prevent infestation. Mature walnut trees are so large that they are quite difficult to spray. Early fall and winter freezes frequently damage walnut trees. Early blooming varieties are subject to spring frost. Hardy Carpathian walnut varieties can be grown in Area III. They resemble commercial English walnuts but are somewhat smaller.

Black Walnuts: Black walnut trees grow rapidly into very large shade trees. The nuts are delicious but hard to crack. Like English walnuts they are subject to infestation by the walnut husk fly. Named varieties available from nurseries usually have larger kernels and are easier to crack than seedling stock.

Black walnuts, in their hulls, are large and heavy, and are not to be lightly regarded when falling from the top of a tall tree.

Planning the Home Orchard

There is no need to align all the fruit trees in a row as in a commercial orchard. With a little thought, fruit trees can fit well into the overall landscape design. They can be used in at least six different ways: (1) as single specimen trees, (2) espaliered against a wall or fence, (3) as a fruiting hedge, (4) as shade trees, (5) as a row of individuals defining the limits of the landscape, or (6) in several rows of windbreaks. Use the showy flowers and bright colored fruit to compliment your landscape. When small fruits or vegetables are grown underneath the trees, one must consider the possible incompatibility of the spray schedules, but with ground covers, flowers, or mulches, there is no such problem. Dwarf apples, pears, and some plums are espaliered easily, but most other kinds of fruit trees are not.

Do not plant fruit trees over the drains or on property lines. Plant them where there is ample space so that excessive pruning will not be required to contain them. Avoid the problem of dropped fruit on walks and patios. Plant far enough from property lines so branches don't extend into your neighbor's yard.

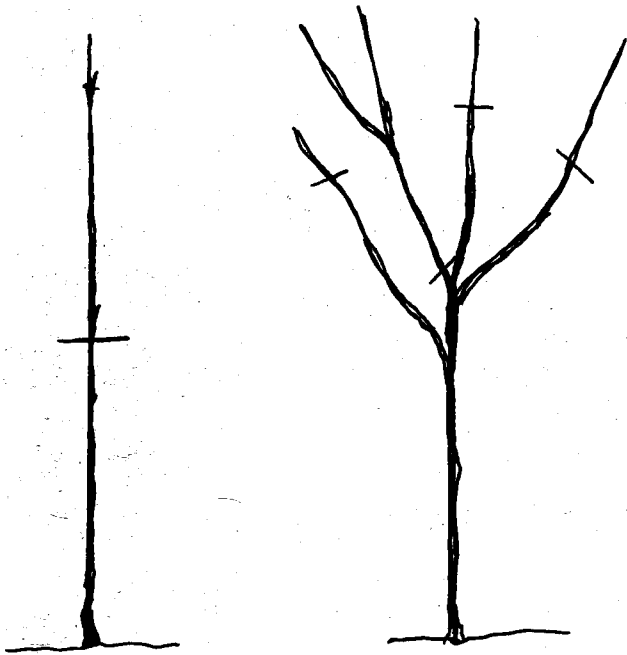
Planting and Early Care

Before buying by mail order, try your local nurseryman. He is likely to carry trees adapted to your region, can give you advice based on local experience, and you can go back to him if you have problems with his trees. If the trees arrive before you are ready to plant, cover the roots with damp sawdust, chips, or loose soil to keep them wet and protected from cold. Fruit trees usually are shipped bare-root. Plant as soon as possible in winter or early spring. Dig the hole 1½ to 2 feet wide and about 2 feet deep. Plant so that the uppermost root is no more than 2 inches below the ground level. With dwarf trees, be sure the graft union is several inches above the ground level. Spread the roots out in the hole, trim off dead parts, and tamp topsoil around as you fill in the hole.

Loss of newly planted trees usually is due to roots suffocated by too deep planting, water standing in the hole, top growing before roots (late planting), or drought due to lack of irrigation or weed competition, or fertilizer placed in the hole.

Mulching newly planted trees with several inches of sawdust, bark dust, gravel, or straw will help in establishment and early growth. Do not apply fertilizer or herbicides at planting or during the first year.

Many roots are lost from trees as they are dug from the nursery. This results in a tree which has



One-year whips and two-year branched stock are available commonly. Either are satisfactory, but whips are less disturbed by transplanting. At transplanting, prune as shown. Whips are cut at about knee height.

too much top for the remaining roots to supply with water and nutrients. The top should be pruned immediately after planting to restore the normal ratio of roots to top. Usually about half of the tree top should be pruned away. Trees thus pruned will soon outgrow trees not pruned at planting time.

Young trees with their limited root systems need irrigation, even on sites where mature trees do well on rainfall alone. About three to five gallons of water per tree every two weeks should be enough. Excessive irrigation brings on root and trunk rots. On windy sites, when the soil is wet, trees will lean unless staked. Trunks of young filbert trees should be painted with white latex paint, especially near the ground, to prevent sunburn. Deer are especially fond of young fruit trees. Fencing individual trees with poultry netting or fencing the whole garden may be necessary. Cats may use the trunks as scratching posts and mice sometimes burrow under the mulch and eat the bark at the ground level. Gophers are attracted to the roots of fruit trees.

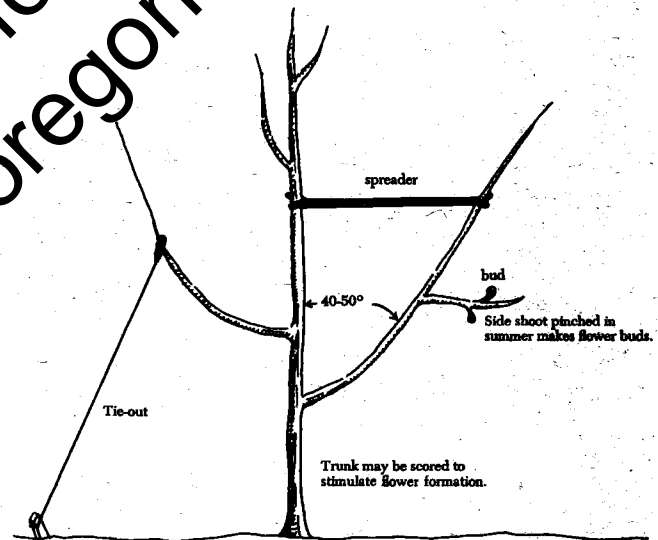
Severe infestations of such insects as the cherry slug, pear slug, aphids, leaf rollers, or skeletonizers reduce the growth rate of young trees and should be controlled. See your local Oregon State University Extension agent for current control measures.

After the first season, a little nitrogen fertilizer

may be needed to hasten tree growth. About $\frac{1}{4}$ pound of active nitrogen per year of age is a good rule of thumb. This would mean about $\frac{1}{2}$ pound of urea, 1 pound of ammonium sulfate, or $\frac{3}{4}$ pound of ammonium nitrate, or $1\frac{1}{2}$ pounds of 16-16-16 or 2 pounds of 10-10-10. Scatter it under the branches, away from the trunk, after leaf fall and before bloom. Peach and filbert trees require more fertilizer than other fruits and nuts. Trees in grass sod will require addition of much more nitrogen than where ground is mulched or clean cultivated. Generous application of lawn clippings or compost often will supply all the fertilizer required for optimum growth.

Stimulating Blossoming and Fruit Set

Apple and pear trees can be induced to bloom the following year by scoring them carefully through the bark, but not into the wood, using a sharp knife within two to three weeks for apple and six to seven weeks for pear after the normal bloom period. Do not score cherry or walnut trees. To increase fruit set in Avon and Comice pear trees which are blooming but not bearing, prune all shoots and spurs to stubs six to ten inches long in winter. Blossoming also is stimulated by removal of the tips of rapidly growing shoots in May or June.



Limbs bent and tied out or spread 40 to 50 degrees from vertical will bloom more than upright limbs.

Although usually there are enough wild bees, introduction of a hive of bees for pollination may improve fruit set. Hand transfer of pollen using a camel hair brush or rubber eraser is effective but tedious. Avoid using insecticides which kill bees during bloom.

Care of Bearing Trees

In western Oregon full size bearing trees often benefit from application of $\frac{1}{2}$ to 1 pound of borax every three years, in addition to nitrogen fertilizer, mulch, or compost. Occasionally potassium is also required. If leaves are small and pale and the problem is not corrected with nitrogen fertilizer, the tree may be deficient in potassium. Symptoms of potassium deficiency include brown, dead areas on margins of oldest leaves, smaller than normal fruit, and early leaf fall. Usually at least 10 pounds of muriate or 12 pounds of sulfate of potash per tree, banded around the drip line of the branches in a strip less than a foot wide, is required to correct a deficiency. Potassium deficiency can be brought on by poor soil drainage in which case fertilizer will not correct it.

Fruit trees in the home orchard usually don't need much, if any, fertilizer. Annual pruning will both maintain tree vigor and control size. Fruit and nut trees do not need phosphorus from fertilizers, but it won't hurt them if your fertilizer mix has some phosphorus in it.

Yearly dormant-season pruning is essential for peach trees and helpful with apples, pears, and plums. Filberts, sweet cherries, sour cherries, figs, and apricots benefit from pruning every two to four years. See Extension Circular 733, "Pruning the Home Orchard," for further details.

Fruit thinning often is required to obtain satisfactory fruit size and return bloom of apples, pears, peaches, and some plums. Thin apples and pears to one or two fruits per cluster about three to five weeks after full bloom. Space peaches six to ten inches apart, depending on the number set. Peaches and plums can be knocked off with a piece of garden hose on a broom handle. Many fruits will drop naturally and this should be taken into account when thinning.

Mature fruit trees in eastern and southern Oregon need periodic irrigation, and even in western Oregon an occasional irrigation may be helpful. Water long enough, usually 12 to 24 hours, to wet

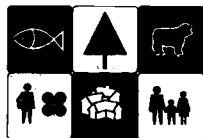
the top two to three feet of soil. It is not necessary to irrigate more than half of the tree's root system if water is supplied often enough. Usually every two or three weeks is enough.

Timely and thorough spraying is required to control the diseases and insects mentioned in Table 1. Occasionally other insects such as aphids, tent caterpillars, mites, slugs, fall web worm, and leaf rollers become sufficiently numerous to warrant spraying. It is best to watch for such pests but not to spray unless excessive damage appears imminent. Insect predators will aid in keeping populations under control.

Harvesting and Storage

Apples are mature when they separate from the tree easily when twisted upward and when they taste good. They should be picked before the core gets areas with a glassy appearance known as "water core." Sweet cherries, apricots, figs, plums, prunes, and peaches taste ripe when ready for picking. Ripening will continue after harvest. For canning or drying they should be left on the tree until completely ripe. Sour cherries are ready when they come off the tree easily without stems. Pears should be picked when still green, but when they separate easily from the tree. Most varieties other than Bartlett require a month or more of cold storage before they will ripen properly. Persimmons ripen late in fall when they become soft and lose astringency. Nuts fall to the ground when mature. For best quality, walnuts should be gathered and dried as they fall.

Store fruit where it is cool but will not be frozen. A good fruit storage room is insulated against daytime heat and freezing night temperatures and can be opened at night to let in cold air. Green pears will start to ripen if stored with ripe fruit. Keep the humidity high to prevent shrivel. Watch for and remove rotted fruits. Golden Delicious apples stored in plastic bags with holes punched in them will remain in better condition than if stored in paper bags or boxes.



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