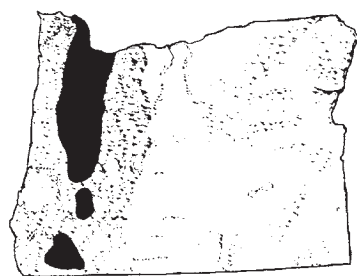


GROWING TREE FRUITS AND NUTS IN THE HOME ORCHARD



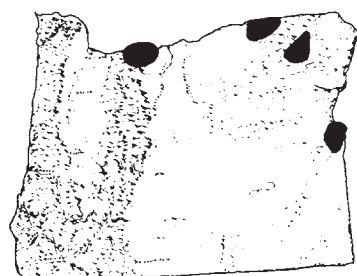
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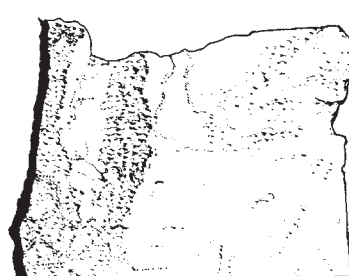
Area I. The Willamette Valley and southern Oregon are noted for mild, uniform, and relatively humid weather. During the summer, temperatures are usually moderate with low humidity. Southern Oregon has a warmer, drier climate with frequent spring frosts.



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. The southern coast is warmer. Coastal valleys 15–20 miles inland are more like Area I.

Figure 1.—Oregon growing areas for fruits and nuts; the areas are determined largely by climate. Table 1 shows which areas are suitable for various fruit and nut crops.

Table 1.—Growing areas and management for Oregon tree fruits and nuts.

Crop	Areas best suited	Space per tree (ft) ^a	Pollinizer tree needed?	Approximate years to bearing	Sprays usually required to control pests and diseases
Apples	I, II, III, IV	5–40	Yes	2–10	Codling moth ^b , scab
Apricots	II	15–25	No	6–7	Brown-rot bacterial canker
Butternuts	I, II, III, IV	30–40	Yes	3–5	None
Cherries, sour	I, II, III, IV	14–20	No	3–5	Fruit fly ^b
Cherries, sweet	I, II, IV	20–35	Yes	6–7	Fruit fly ^b , bacterial canker
Chestnuts	I, II, IV	20–40	Yes	5–7	None
Figs	I	12–20	No	5–6	None
Hazelnuts	I, IV	15–20	Yes	5–6	Filbertworm ^b , Eastern filbert blight, bacterial blight
Hickory	I, II, III, IV	20–40	Yes	10–14	None
Papaws	I, II	15–20	Yes	12–14	None
Peaches and nectarines	I, II	12–15	No	4–5	Leaf curl, borers, coryneum blight, brown rot
Pears	I, II	10–20	Yes	5–7	Fire blight, scab, codling moth ^b
Persimmons	I, II	15–20	Yes	8–10	None
Plums and prunes	I, II, III ^c , IV	10–20	Some varieties	3–5	Crown borers, brown rot
Walnuts, black	I, II, III, IV	30–40	No	10–12	Husk fly ^b
Walnuts, English	I, II ^c	40–50	No	10–12	Husk fly ^b , blight

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

^b Insect, if uncontrolled, causes wormy fruit or nuts.

^c Hardy varieties are available; see page 8.

Growing Tree Fruits and Nuts in the Home Orchard

J. Olsen

Is a home orchard right for you?

With a desire for abundant supplies of their favorite fruits and nuts produced right in their own backyards, homeowners plant backyard orchards every year.

Before you decide to plant fruit or nut trees, ask yourself:

- Will I have the time and interest to spray, prune, and otherwise care for these trees?
- Will I have the time and interest to harvest and use the possibly overabundant fruit?
- Will my garden have enough room?
- Is the soil suitable for the trees?

For the serious gardener, the rewards from a well-kept home orchard are enough to justify the considerable effort involved.

The space required for a home orchard ranges from 15 feet of wall for a couple of espaliered dwarf apple trees to ½ acre or more for trees of various sizes. You can plant fruit and nut trees as an integral part of your home landscape, or isolate them in a specified orchard area.

Large trees such as walnuts and chestnuts make good shade trees, but they're more difficult to prune and spray than smaller trees.

The soil must permit rooting to a depth of at least 3 feet. It should be neither too sandy nor too clayey, although certain kinds of trees will tolerate these extremes of soil texture.

In addition to the trees and space, you'll need an adequate sprayer, ladder, and pruning tools. If you grow only dwarf trees and keep them short by training and pruning, you won't need a ladder.

Note: This publication doesn't recommend specific pesticides. Recommendations and regulations change frequently. See your local Extension agent or local garden store personnel. Also, see EC 631, *Managing Diseases and Insects in Home Orchards* (see "For more information," p. 11).

Tree fruits and nuts not adapted to Oregon's climate but grown elsewhere in the United States include pecans, almonds, oranges and other citrus, avocados, and pistachios. These crops aren't suited to Oregon for one of these reasons: winters are too cold, the season is too short, springs are too cool and wet, or summers are too cool.

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

Plan for a sequence of ripening dates if you plant several trees of one species.

The next section covers general guidelines for growing specific kinds of fruits and nuts.

Guidelines for growers

Table 3 (pages 4–6) compares fruit and nut varieties by areas best suited and approximate time of maturity, and gives relevant comments.

Apples

Apple scab is a serious disease. It requires several sprays for control. The variety Delicious is especially susceptible to apple scab. Varieties resistant to scab are available. Most scab-resistant varieties are susceptible to powdery mildew, but you

can partially control this disease by regularly pruning off infected shoots.

Apple maggot is a pest controlled by spraying. Larvae infest the fruit, rendering it worthless.

You can purchase apples on dwarfing, semidwarfing, or fully vigorous rootstock. Rootstocks influence trees approximately as shown in Table 2.

The lower figures in Table 2 represent tree sizes for moderately vigorous varieties such as Delicious; the higher figures represent sizes for vigorous varieties such as Gravenstein and Newtown.

The rootstock numbers refer to specific rootstocks that you can order from nurseries. Trees on M-9, M-26, and sometimes M-7 usually require support of some kind.

Moderately vigorous varieties on M-9 or M-26 roots can, with pruning, be held to a permanent spacing of 5 feet; eventually, depending on site, they won't require support.

Spur-type strains of certain varieties such as Delicious, Golden Delicious, and others are available. Spur types are smaller, especially on dwarfing rootstocks, and they're often more productive than nonspur types.

Sometimes, more than one apple variety is grafted on the same tree. This is reasonably satisfactory, but varieties have different growth rates and maturity dates, so it's more difficult to prune and spray such trees.

(Text continues on page 7.)

Table 2.—Apple rootstock influence on size, yield, and years to bearing.

Rootstock type	Tree spread (ft)	Approximate height (ft)	Years to first bearing	Approximate yield (lb)	Rootstock numbers
Vigorous	30–40	25–60	7–10	300–400	Seedling
Semidwarf ^a	15–25	15–25	5–7	180–300	MM-106, MM-111, M-7
Dwarf	5–10	6–15	3–5	50–150	M-9*, M-26*, Bud 9
More dwarf	4–6	5–7	3–5	25–50	M-27

^a Requires support.

Table 3.—Fruit and nut varieties (areas best suited, approximate time of maturity, comments)

Variety	Areas suited	Approximate time of maturity	Comments
Apples			
Lodi	I, II, III, IV	July 15–30	Yellow, won't keep.
Earligold	I, II, III, IV	Aug. 1–15	Yellow, crisp.
Akane	I, II, III, IV	Aug. 15–30	Red, early, won't keep.
Gravenstein	I, IV	Aug. 15–30	Pollinized by Lodi, not hardy, best sauce apple.
Elstar	I, IV	Sept. 10–20	Tart, good flavor, cool climate.
Gala	I, II, III, IV	Sept. 15–25	Sweet, good flavor, heat-tolerant.
Jonagold	I, IV	Sept. 15–30	Big, good flavor, cool climate, needs pollinizer.
Empire	I, II	Sept. 20–30	Small, red, flavorful.
Delicious	I, II	Sept. 25–Oct. 5	Standard red, scabs badly.
Golden Delicious	I, II	Oct. 1–10	Yellow, flavorful, very productive.
Braeburn	I, II	Oct. 5–15	Flavorful, stores well, productive.
Newtown	I, II	Oct. 10–20	Green, vigorous tree, slow to produce.
Fuji	I, II	Oct. 10–25	Sweet, flavorful, stores well.
Granny Smith	I, II	Oct. 15–30	Tart, stores well.
Apples, scab-resistant varieties			
Chehalis	I, II, III, IV	Aug. 15–25	Yellow, big, long picking season.
Prima	I, II, III, IV	Sept. 1–10	Big, red, pits.
Liberty	I, II, III, IV	Sept. 20–30	Best flavor, red.
Apricots			
Puget Gold	I, II	July	Produces west of Cascades.
Rival	II	July	Mild flavor.
Royal (Blenheim)	II	July	Self-fruitful.
Moongold	II, III	July	Cold-hardy, pollinized by Sungold.
Sungold	II, III	July	Pollinized by Moongold, hardy.
Chinese	I, III	July	Resists frost.
Cherries, sour varieties			
Balaton	I, II	July	Dark skin and flesh.
Montmorency	I, II	July	Michigan strain best.
North Star	I, II	July	Dwarf variety.
Cherries, sweet varieties			
Van	II	Early	Black, pollinized by Bing, Lambert.
Royal Ann	I, II	Mid	White, pollinized by Corum.
Bing	II	Mid	Black, pollinized by Van, Corum.
Lapins	I, II	Mid	Black, self-fruitful.
Bada	I, II, IV	Mid	White, semidwarf, pollinized by Royal Ann, Bing, Lambert.
Stella	I, II, IV	Mid	Black, self-fruitful.
Compact Stella	I, II, IV	Mid	Smaller than Stella.
Sweetheart	I, II	Mid	Black, self-fruitful.
Kordia (Attika)	I, II	Late	Black, pollinized by Regina.
Lambert	I, II, IV	Late	Black, pollinized by Van, Corum.
Regina	I, II	Late	Black, pollinized by Kordia.
Chestnuts			
Chinese seedling	I, II, III, IV	September	Pollinizer for Layeroka.
Colossal	I, II, III, IV	September	Large nut.
Layeroka	I, II, III, IV	September	Reliable producer.
Okei	I, II, III, IV	September	Pollinizer for Colossal.

Table 3.—Fruit and nut varieties (areas best suited, approximate time of maturity, comments)—continued.

Variety	Areas suited	Approximate time of maturity	Comments
Figs			
Brown Turkey	I	August	Large, brown.
Desert King	I	August	Green, large, sweet.
Lattarula	I	August	Green, golden inside.
Hazelnuts (Regions II and III are too cold for hazelnuts)			
Barcelona	I, IV	October	Standard variety.
Clark	I, IV	October	More resistant to Eastern filbert blight (EFB) than Barcelona.
Jefferson	I, IV	October	Completely resistant to EFB. No blight sprays are required.
Lewis	I, IV	October	More resistant to EFB than Barcelona.
Sacajawea	I, IV	October	More resistant to EFB than Barcelona.
Santiam	I, IV	October	Completely resistant to EFB. No blight sprays required.
Delta, Zeta, Epsilon, Gamma	I, IV	October	Completely EFB-resistant pollinizers.
Yamhill	I, IV	October	Completely resistant to EFB. No blight sprays are required.
Nectarines (fuzzless peaches)			
Fantasia	I	August	Free-stone, quality fruit.
Harko	I, II	August	Better fruit set.
Redgold	I	August	Free-stone, quality fruit.
Stark Red Gold	I, II	August	Southern and northeastern Oregon only.
Genetic dwarfs	I, II, III, IV	August	Grown in pots, take inside for winter.
Peaches			
Red Haven	I, II	Aug. 5–10	Most popular, clingstone until fully ripe.
July Elberta	I, II	Aug. 15–20	Old favorite.
Veteran	I, II	Aug. 20–25	Regular bearer.
Early Elberta	I, II	Aug. 24–28	Old favorite.
Rochester	I	Aug. 24–30	Old favorite.
Frost	I, II	August	Resists leaf curl.
Genetic dwarfs	I, II, III, IV	Summer	Very small trees, grow in pots, indoors in winter.
Pears, European varieties			
Bartlett	I, II	Aug. 15–30	Pollinized by Anjou, Fall Butter.
Seckel	I, II	Aug. 20–Sept. 10	Pollinized by Anjou, Bosc, Comice.
Anjou	I, II	Sept. 5–20	Pollinized by Bartlett, needs 45–60 days of cold storage before ripening.
Bosc	I, II	Sept. 10–30	Pollinized by Comice, best in southern Oregon.
Cascade	I, II	Sept. 10–30	Red blush, good flavor.
Comice	I, II	Sept. 20–30	Pollinized by Bosc, best in southern Oregon, needs 45–60 days of cold storage before ripening.
Pears, red varieties			
Starkrimson	I, II	Aug. 1–15	Pollinized by Bartlett.
Red Bartlett			
(numerous strains)	I, II	Aug. 15–30	Pollinized by Anjou, Fall Butter.
Reimer Red	I	September	Pollinized by Bartlett.
Red Anjou	I	September	Pollinized by Bartlett.
Pears, Oriental varieties (Plant at least two or three varieties for cross pollination.)			
Kosui	I, II	August	Yellow-bronze fruit with slight russet.
Shinseiki	I, II	August	Yellow fruit.
Chojuro	I, II	September	Brown russeted fruit.
Hosui	I, II	September	Brown russeted fruit.
Nijisseiki (20th century)	I, II	September	Yellow fruit.

Table 3.—Fruit and nut varieties (areas best suited, approximate time of maturity, comments)—continued.

Variety	Areas suited	Approximate time of maturity	Comments
Persimmons			
Early Golden	I, II	November	American, small.
Fuyu	I, II	November	Japanese, seedless.
Garrettson	I, II	November	American, small.
Hachiya	I, II	November	Asian, large.
Plums, cold-resistant varieties			
Mount Royal	III	September	Self-fruitful.
Superior	III	September	Pollinized by Pipestone.
Ember	III	October	Pollinized by Superior.
Plums, European varieties (prunes when dehydrated)			
Parsons	I	Sept. 1–15	Sweet, pollinized by Stanley.
Stanley	I, II	Sept. 1–15	Bears but brown rots.
Italian	I, II	Sept. 10–30	Tart, "purple plum."
Brooks	I, II	Sept. 20–30	Bears regularly, large.
President Plum	II	Sept. 20–30	Pollinized by Stanley.
Moyer Perfecto	I (south only)	Oct. 1	Best dried, sweet.
Plums, Oriental varieties			
Early Golden	I, II	July	Apricot-like flavor.
Shiro	I, II	August	Pollinized by Red Heart.
Burbank	I, II	August	Pollinized by Elephant Heart.
Red Heart	I, II	September	Pollinized by Shiro.
Walnuts, black varieties			
Thomas	I, II	October	Seedlings inferior.
Ohio	I, II	October	
Myers	I, II	October	
Walnuts, English varieties			
Carpathian	II, III	Late October	Cold-hardy.
Chandler	I	Late October	Pollinized by Franquette.
Franquette	I	Late October	Standard variety, limited hardiness.
Hartley	I	Late October	Harvest is 10–14 days before Franquette.
Howard	I	Late October	Medium to large nuts.
Spurgeon	I	Late October	Late bloomer, hardy.

You can avoid these problems by planting several dwarf trees of different varieties. Dwarf trees have the additional advantage 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 don't set fruit regularly and are subject to a host of diseases.

Butternuts

The butternut tree closely resembles black walnut. It's the most winter-hardy of all nut species and the most likely to succeed in poor soil. It's an attractive landscape tree because of its gray 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.

Cherries, sour

The principal variety, Montmorency, doesn't require a pollinizer. Trees are smaller, bear earlier, and have fewer disease problems than sweet cherries.

Cherries, sweet

In spite of the hazards of rain cracking, bacterial canker, bird depredation, and cherry fruit fly infestation, sweet cherries are popular home garden fruit trees.

New dwarfing rootstocks for sweet cherry are available from some nurseries. Gisela rootstocks are the most popular dwarfing rootstocks for sweet cherry.

Bacterial canker often girdles and kills budded-low sweet cherry trees. You can avoid this problem by (1) planting mazzard F-12-1 root and trunk stock or mazzard seedlings, and (2) budding or grafting the varieties 12 to 18 inches out on the limbs a year or two later. It's practical to graft several cherry varieties onto the same tree.

The three principal varieties (Bing, Lambert, and Royal Ann) won't pollinize each other. Corum, Sam, Van, Bada, and several others are good pollinizers. Stella, Sweetheart, and Lapins are self-fruitful and therefore don't require pollinizers.

Sweet cherry trees don't tolerate wet or clayey soils. Birds often eat much of the fruit on isolated cherry trees. You can protect fruit by placing plastic netting over the tree or just around the lower limbs.

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 some nursery-grafted chestnuts die from delayed graft incompatibility, it's safer to plant either seedlings or own-rooted trees.

All Chinese chestnut trees are highly resistant to chestnut blight, which has almost completely killed the American chestnut. While they'll bear some nuts with their own pollen, nut production and size often is increased by pollen from a second tree.

Because of blight, chestnut trees may not be shipped to Oregon from eastern nurseries.

Figs

A few varieties such as Lattarula, Brown Turkey, and Desert King often will mature a crop in Oregon. Temperatures around 0°F will kill parts of the trees. Especially if you grow them in a bush form, they'll grow back to producing age in 2 or 3 years from the lower stem portions. Plant fig trees in sunny spots, preferably on a south wall.

Fig trees require no sprays and deer don't eat them. Prune them in late winter to keep the height below about 8 feet.

Hazelnuts

Unless you remove suckers from the crown of a hazelnut tree every year, it grows as a bush. You can propagate hazelnut trees from rooted suckers, but nurseries usually can supply better trees. *Every* hazelnut variety requires another variety for pollination.

A single mature hazelnut tree, occupying a space of 20 feet or more, will produce only 15 to 20 pounds of dried nuts. Especially if blue jays and squirrels get half the nuts, the hazelnut doesn't produce much for the space it occupies. To increase a tree's productivity, prune out the older, more downward-hanging wood.

Eastern filbert blight (EFB), caused by a fungus, is killing many trees in the northern Willamette Valley. For this reason, it's inadvisable to plant hazelnut varieties that are susceptible to EFB in that region.

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. The trees are very large.

Papaws

Hobbyists in Michigan and New York have selected hardy, relatively large-fruited varieties from wild seedling populations. The fruit is sometimes 5 to 6 inches long and 2 or 3 inches thick; the skins are green until ripe, becoming yellow as they begin to ripen and bronze or brown when they're ripe enough to eat. The soft, ripe flesh is creamy and yellow.

The papaw is sweet and has a resinous flavor and odor that some people enjoy. There are large brown seeds in the flesh.

Isolated trees generally are unfruitful because of the lack of cross-pollination, so plant two trees

for pollination. These trees are slow-growing and slow to come into bearing, but they live a long time.

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 soon will die. Varieties Frost and Rosydawn are resistant to peach leaf curl.

Peaches also require heavy fertilization and pruning. They're one of the most difficult fruits to grow, yet many home orchardists grow them successfully.

Plant them in a sunny spot with good air movement.

Nectarines bloom earlier and are more sensitive to diseases than peaches.

Pears

Trees are available on vigorous rootstocks on quince roots, which are semidwarfing. Quince isn't winter-hardy, so don't plant trees on this root in areas II or III (Figure 1, page 2).

Since pear trees are more upright and smaller than apple trees, they don't 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. A dormant lime sulfur and oil spray is required to control pear blister mite.

European pears are harvested unripe and ripened off the tree. In contrast to European pears, which have a soft, melting flesh when ripe. Oriental pears ripen on the tree and are crisp like apples.

Persimmons

Some seasons in Oregon, there aren't enough warm days for persimmons of either the American or the Japanese species to mature their fruit. American species, which are smaller and have seeds, will mature more often in our cool climate. Two or more varieties or seedlings of American persimmon must be planted for pollination.

The Japanese varieties that will mature in western Oregon, such as Fuyu, bear seedless fruit and don't require a male tree for pollination. Until they're soft-ripe, most persimmon fruits are extremely astringent; Fuyu is much less so.

The Japanese persimmon isn't attacked by many enemies, and it's a rather beautiful and useful tree for home plantings. Usually, persimmons are eaten fresh, but they can be dried.

Place unripe persimmons in a box in a clean, dry place (such as a garage) for ripening.

Plums and prunes

There are three general kinds of plums and prunes: European, Japanese, and hybrid. Prunes are European-type plums that are suitable for preservation by dehydration. Japanese varieties bloom earlier than European plums, and they frequently fail to bear because of 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, but most European varieties are good fresh, canned, or dried.

The Parsons European-type plum and all Japanese plums require pollinizers. All hardy hybrid plums require another variety for pollination.

Walnuts, black

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

Black walnuts, in their hulls, are large and heavy—don't regard them lightly when they fall from the top of a tall tree!

Walnuts, English

Trees make good nut-bearing shade trees in western Oregon, but they're subject to several serious problems. English walnuts grafted on black walnut roots often die at age 15 to 25 or older from a graft union disorder known as *blackline*.

Walnut trees in housing developments established in old walnut orchards frequently die from the combined effects of root disturbance and the blackline disorder. To avoid blackline, plant walnut trees on Manregian or Carpathian roots.

If the walnut husk fly is present, you'll need to spray to prevent infestation. Mature walnut trees are so large that they're quite difficult to spray.

Early fall and winter freezes frequently damage or kill walnut trees. Early-blooming varieties are subject to spring frost. Hardy Carpathian walnut varieties can be grown in area III (Figure 1, page 2). They resemble commercial English walnuts but are somewhat smaller.

Planning your home orchard

There's no need to align all the fruit trees in a row as in a commercial orchard. With a little thought, you can fit fruit trees well into your overall landscape design. You can use them in at least six different ways:

- Single specimen trees
- Espaliered against a wall or fence
- A fruiting hedge
- Shade trees
- A row of individuals defining the limits of the landscape
- Several rows of windbreaks

Use the showy flowers and bright-colored fruit to complement your landscape. When you grow small fruits or vegetables underneath the trees, you must consider the possible incompatibility of the spray schedules—but with groundcovers, flowers, or mulches, there's no such problem.

Dwarf apples, pears, and some plums are espaliered easily, but most other kinds of fruit trees are not.

Even in many urban areas, deer depredation to fruit trees can be severe. Depending on the severity of the problem, the following measures will protect your trees:

- Deer repellent
- Fencing individual trees
- Fencing the entire orchard

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

Planting and early care

Before you buy by mail order, try your local nursery dealers. They're likely to carry trees adapted to your region; they can give you advice based on local experience; and you can go back to them if you have problems with their trees.

Fruit trees usually are shipped bare-root. If the trees arrive before you're ready to plant, cover the roots with damp sawdust, bark chips, or loose soil to keep them wet and protected from cold.

Planting and pruning

Plant as soon as possible in winter or early spring. Dig the hole 1½ to 2 feet wide and about 1½ 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 2 to 3 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 caused by:

- Roots suffocated by too deep planting
- Water standing in the hole
- Top growing before roots (late planting)
- Drought (lack of irrigation or weed competition)
- Fertilizer placed in the hole

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

Many roots are lost from trees as they're dug from the nursery. This results in a tree that has too much top for the remaining roots to supply with water and nutrients.

Prune the top immediately after planting (Figure 2) to restore the normal ratio of roots to top—usually, you should prune away a fourth to a

half of the treetop. Trees you prune this way soon will outgrow trees you didn't prune at planting time. Less pruning is required if you water the trees every few days during warm, dry weather.

Irrigation

Young trees, with their limited root systems, need irrigation, even on sites where mature trees do well on rainfall alone. About 3 to 5 gallons of water per tree every week should be enough.

Irrigate one or more times a week during hot weather. However, excessive irrigation can bring on root and trunk rots.

Protection against weather and pests

On windy sites when the soil is wet, trees will lean unless staked.

Paint trunks of young trees with water-based exterior white latex paint (especially near the ground) to prevent sunburn and reduce the risk

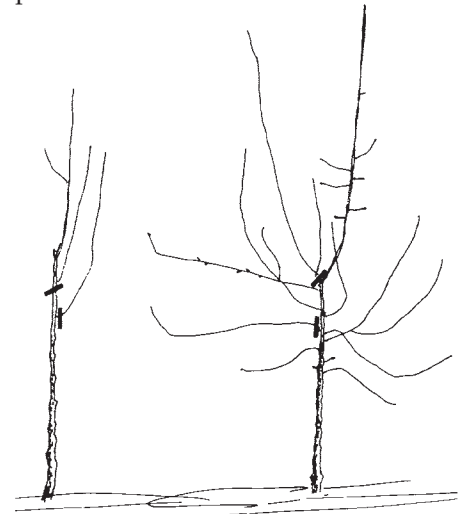


Figure 2.—Prune trees immediately after planting. Prune an unbranched or poorly branched tree (left) at about 30 inches above ground; remove the 1 or 2 branches present. If you plan to water a well-branched nursery tree regularly (right), you can leave a central leader and 5 or 6 side branches. Remove branches that compete with the leader or that are over or under another branch.

of freeze injury. Thin the paint with water to around 50 percent to allow easier application.

Cats may use the trunks as scratching posts. Mice sometimes burrow under the mulch and eat the bark at the ground level. Gophers eat the roots of fruit trees, often killing the trees.

Severe infestations of such insects as cherry slugs, pear slugs, aphids, leafrollers, or skeletonizers reduce the growth rate of young trees—you need to control them. See your local garden store or Extension office for current control measures.

Fertilizing

After the first season, your trees may need a little nitrogen to hasten growth. About $\frac{1}{8}$ lb of active nitrogen per year of age is a good rule of thumb. This would mean about $\frac{1}{4}$ lb of urea, $\frac{1}{2}$ lb of ammonium sulfate, $\frac{1}{3}$ lb of ammonium nitrate, $\frac{3}{4}$ lb of 16-16-16, or 1 lb of 10-10-10.

Peach and hazelnut trees require more fertilizer than other fruits and nuts. Trees in grass sod will require 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 good growth.

Scatter the fertilizer under the branches, away from the trunk, after leaf fall and before bloom.

Stimulating blossoming and fruit set

Limbs bent and tied out or spread 50° to 90° from vertical will bloom more than upright limbs. See Figure 3.

To increase fruit set in Anjou and Comice pear trees that are blooming but not bearing, prune 2-year shoots back to a flower bud at bloom time. Fruit set also is stimulated by remov-

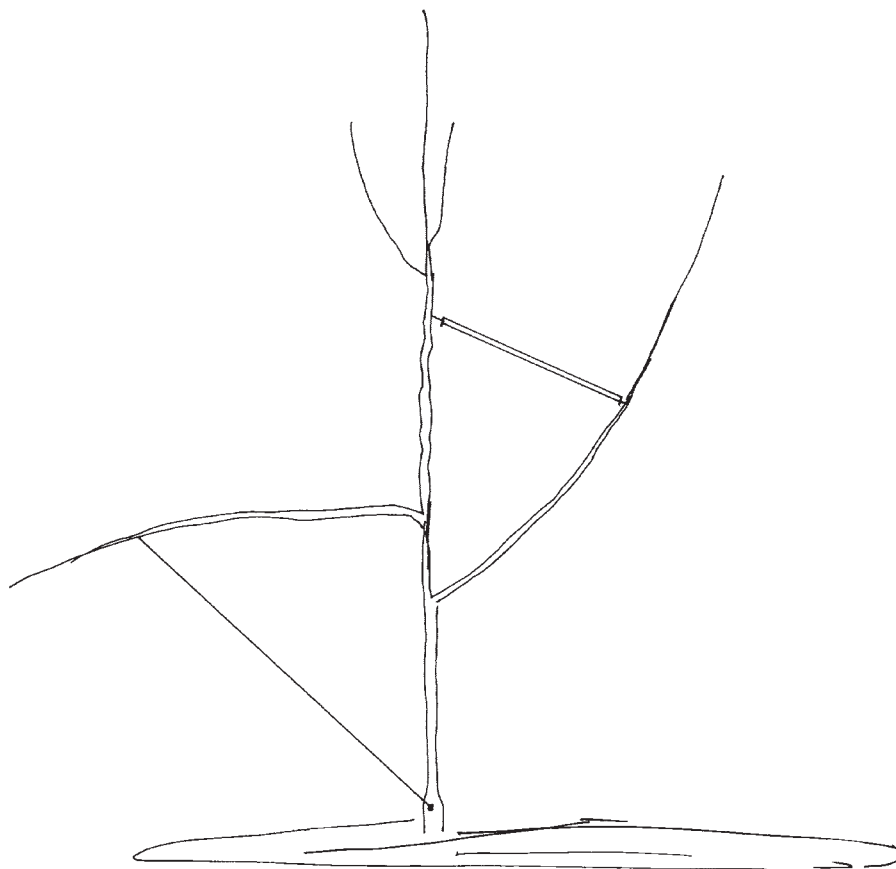


Figure 3.—To stimulate earlier blossoming and fruiting, spread, weight, or bend limbs downward. Tie your spreaders, weights, or string to a nail in the trunk.

ing the tips of rapidly growing shoots in May or June.

Wild bees are in short supply, so introducing 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. During bloom, avoid using insecticides that kill bees.

Care of bearing trees

Fertilizing

In western Oregon, full-sized bearing trees often benefit from $\frac{1}{2}$ lb of borax every 3 years, in addition to nitrogen, mulch, or compost.

Occasionally potassium also is required. If leaves are small and pale, and the problem isn't corrected with

nitrogen, 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 lb muriate or 12 lb 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 that case, fertilizer won't correct it.

Fruit and nut trees don't need phosphorus from fertilizers, but it won't hurt them if your fertilizer mix has some phosphorus in it.

Pruning

Annual pruning will help maintain tree vigor and control size. Yearly dormant-season pruning is essential

for peach trees and helpful with apples, pears, and plums. Hazelnuts, sweet cherries, sour cherries, figs, and apricots benefit from pruning every 2 to 4 years. See PNW 400, *Training and Pruning Your Home Orchard*, for further details.

Fruit thinning

Fruit thinning often is required to obtain satisfactory fruit size and annual bloom of apples, pears, peaches, and some plums. Many varieties of apple will produce a crop only every other year unless they're thinned within 3 to 4 weeks after full bloom.

Thin apples and pears to one fruit per cluster and space clusters 6 to 8 inches apart, 3 to 5 weeks after full bloom.

Space peaches 6 to 10 inches apart, depending on the number set.

Peaches and plums can be knocked off with a piece of garden hose on a broom handle or with a length of PVC pipe.

Thin fruit within 45 days of full bloom for apple and Asian pears and 60 days for peaches.

Irrigation

Mature fruit trees in eastern and southern Oregon need periodic irrigation—even in western Oregon, an occasional irrigation may be helpful. Water long enough, usually 12 to 24 hours, to wet the top 2 to 3 feet of soil.

It's not necessary to irrigate more than half of the tree's root system if you supply water often enough. Usually, every 2 or 3 weeks is enough.

Controlling insects and diseases

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 webworm, and leafrollers become numerous enough to warrant spraying.

It's best to watch for such pests but not to spray unless excessive damage appears imminent. Insect predators will aid in keeping populations under control. See EC 631, *Managing Diseases and Insects in Home Orchards*, for more information.

Harvesting and storage

Apples are mature when they easily separate from the tree when twisted upward, and when they taste good. Pick them 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, leave them on the tree until completely ripe. Sour cherries are ready when they come off the tree easily without stems.

European 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. Pick Oriental pears when they're sweet and juicy.

Figs are ripe when they're very soft and droop on their stems.

Use pesticides safely!

- **Wear** protective clothing and safety devices as recommended on the label. **Bathe or shower** after each use.
 - **Read** the pesticide label—even if you've used the pesticide before. **Follow closely** the instructions on the label (and any other directions you have).
 - **Be cautious** when you apply pesticides. **Know** your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.
-

Persimmons ripen late in fall when they become soft and lose astringency.

Nuts fall to the ground when mature. For best quality, gather chestnuts and walnuts and dry them as they fall.

Store fruit where it's cool but won't freeze. 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 will remain in better condition if they are stored in plastic bags with a few small holes punched in them, rather than in paper bags or boxes. Late-maturing apples such as Braeburn, Fuji, and Granny Smith are best if left on the tree and harvested just before they are consumed.

For more information

Olsen, J. and C. Raab, *Harvesting, Handling, and Storing Nuts from the Home Orchard: Hazelnuts, Walnuts, Chestnuts*, FS 146. Revised September 2002.

Pscheidt, J.W., N. Bell, J.L. Olsen, and S. Castagnoli, *Managing Diseases and Insects in Home Orchards*, EC 631. Revised June 2007.

Stebbins, Robert L., *Training and Pruning Your Home Orchard*, PNW 400. Reprinted 1997.

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