FRUIT TREES

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Growing fruit is an important part of home gardening. In addition to the high quality and freshness of homegrown fruit, fruit trees also have considerable landscape value. Properly cared for, they are very attractive in form and display beautiful flowers in the spring. If judiciously placed, they can enhance a well-designed landscape. Because most nurseries carry fruit trees, nursery staffs need to be knowledgeable about fruit varieties and cultural practices such as pruning, planting, pollination, harvest dates, and control of insects and diseases.

Merchandising Fruit Trees

Retailers face decisions on how best to display or merchandise fruit trees. Depending upon the situation, bare root trees can be heeled- in or held in cold storage, containerized in pots, or occasionally container-grown.

In a retail outlet that supplies customer service, an area to heel in trees, located in a main traffic area and close to a cash register, is ideal. A picture tab with planting instructions attached to the trees enhances sales. Nurseries that have cold storage facilities can sell bare root plants longer in the spring. Posters or picture books are good sales aids. The roots on bare root trees must be wrapped with a protective covering to prevent the roots from drying out and dying between time of purchase and planting. When selling bare root plants a knowledgeable salesperson should educate the customer on the importance of prompt planting, proper watering and first year care. Most customers know very little about growing fruit trees, so every bit of help the salesperson offers can mean less plant failure, fewer complaints, and a return customer.

Before the bare root plants break dormancy any unsold plants should be potted up for sale as containerized stock. Newly potted trees are difficult to plant successfully because the soil falls off the roots and the plant is not able to support its newly sprouted leaves. In such situations, take extra care in transplanting and watering. These trees may not survive transplanting, so it's best to plant trees that have been in their pots for several months.

Containerized trees can be sold spring through fall. One advantage of containerized trees is that the root system is more developed, if it has been in the pot several months, and it is protected by soil until planting. Also if the plant is kept watered by the customer it doesn't have to be planted immediately after purchase as with bare root plants. For more information on planting procedures see Chapter 2.

Sometimes customers aren't sure what cultivar of fruit tree they want. With a complete knowledge of the fruit trees in stock, the salesperson should discuss with the customer the intended site and use, and suggest a species and cultivar that will meet the customer's needs taking into account zone hardiness rating, disease resistance, fruit qualities and length of growing season for bloom time and fruit ripening. For a list of suitable cultivars for your area contact the local extension service. Table 13-1 at the end of this chapter lists some suggested cultivars for Montana.

Location in the Landscape

Location is important. Full sun is necessary for good tree growth and good quality fruit production. Fruit trees should be planted well away from large trees and buildings. Shade is a major cause of poor fruiting.

Fruit trees should not be exposed to severe winds, nor should they be planted in an area with poor drainage. If drainage is a problem, the chance of root disease is greater. A deep, fertile loam is best for most fruit trees.

Microclimate can play an important role in avoiding problems with growing fruit trees. Microclimate is the climate of localized areas and of the lower layer of the atmosphere near the ground. Trees on a north or east-facing slope will escape sunscald damage compared to those on a south or west-facing slope. Trees on north or east exposures will also flower later perhaps avoiding frost damage. A shelterbelt to the northwest and northeast will help prevent wind damage, improve pollination and help retain heat to mature fruit in the fall. Low spots should be avoided as they are often a frost pockets and drainage is likely to be poor. Microclimates in town are often more protected than those in rural areas, because there are more buildings and large trees to break the wind.

Planting

Containerized fruit trees may be planted spring thru fall. Bare root trees are planted in the spring. The planting hole should be large enough to accommodate the root system without crowding. Allow six inches of clearance from the end of the roots to the sides of the planting hole.

Some plant professionals believe that when transplanting trees, only soil that came from the transplant hole should go back in with the plant. If the soil has a good loam texture and there is sufficient soil organic matter, this statement is true.

Modest amounts of organic amendments can be of benefit, however, in clayey, sandy, or very rocky soils. A few shovelfuls of peat moss or compost can improve the soil environment for the quick establishment of new roots. These amendments need to be thoroughly mixed with the original soil material. See Chapter 2 for more information on the use of organic amendments.

When planting a bare root tree, form a cone of soil in the bottom of the hole to support the roots. The cone should be tamped firm. Using sharp pruners, remove all broken, damaged or extra long roots. Place the tree into the planting hole, spread the roots evenly to give solid support without crowding or twisting, and add soil to cover the roots. Add some water. Gently raise and lower the plant to allow the soil to fill in between the fibrous roots, eliminating air pockets. Add water and soil alternately until the hole is filled to grade.

In general the tree should rest at the same depth at which it grew in the nursery, and the bud union or graft (place that the tree was budded or grafted to the rootstock) should be about an inch or two above the soil level. The area where roots emerge from the trunk, known as the root flare, should be at ground level or just above. Colored paint marks on the lower trunk identify the fruit tree cultivar, not planting depth. Tree planting is covered in depth in Chapter 2.

Do not fertilize at planting because young tree roots are easily burned. Any healthy soil will provide the nutrients required to transplant and re-establish a young tree. Excessive nitrogen, either commercial or in manure form can burn roots and cause nutrient deficiencies in the orchard for years. Vitamin B1 solutions are also not needed at time of planting. Research has shown no stimulation of plant growth from these products.

Trees that have been planted for a year or more can be fertilized in early spring, if they show pale leaves and weak growth. A small amount (1 cup or less) of balanced fertilizer (15-15-15 or 16-20-0) is applied at the drip line or edge of the canopy. A topdressing of compost makes a good mulch and is a mild slow release fertilizer.

Pest Control

Maximum success in growing fruit depends upon effective insect and disease control. Proper control requires recognition of pests, selection of effective control methods (see Chapter 6 on IPM), proper timing of treatments, proper pruning, and good sanitation.

Commercial fruit growers can afford to buy large equipment to apply pesticides. Home orchardists with a few fruit trees are at a disadvantage when it comes to equipment that will do a satisfactory job of spraying pesticides. In most cases, homeowners are restricted to hose-end sprayers or hand-operated sprayers. The capacity of most home pesticide sprayers is small, the pressure is low, and the energy expended to do an effective job is

considerable. The failure of homeowners to adequately chemically control pests on their fruit trees can generally be attributed to: (1) selecting the wrong pesticides, (2) using pesticides improperly, (3) not applying enough material to cover trees completely, (4) not making applications on time, and (5) not continuing spray programs late enough into the summer. Homeowners should hire a professional to spray large trees.

Dormant sprays are an important step in controlling insects and diseases. Some dormant sprays control only diseases and some control only pests. Pheromone or sticky traps can also be effective biological controls. Consult reference books or local extension service for recommendations on control of specific insects and diseases (See reference list at end of chapter). Always follow label directions and use pesticides with caution.

Protect young fruit trees from rodents and deer with tree wraps and or fencing. Wrap young fruit tree trunks up to the lowest branches in winter (November through March) to protect the bark from sunscald. Sunscald is the death of tissues on the south-west side of trunks caused by rapid freezing when temperatures fall at sunset on clear, cold winter days.

Rootstocks

Fruit trees are propagated either by grafting or budding a desired variety onto a rootstock. You cannot plant a seed and have it grow and produce the same fruit as its parent. Most fruit trees are self-sterile, meaning that pollen is needed from another tree for fertilization. This combination of genes will produce seed with different properties than either parent. It is very unlikely that the seed will produce a desirable cultivar. See Chapter 5 for more information on Propagation.

Fruit trees grow to different sizes depending upon species and, in some cases for grafted trees, the rootstock. Many fruit tree rootstocks are produced from cuttings or tissue culture and are referred to as clonal rootstocks. Clonal rootstocks can influence size, vigor, fruit production, cold hardiness and disease resistance. Rootstocks grown from seed are referred to as seedling rootstocks. Seedling rootstocks have a more aggressive root system, are more cold hardy, drought tolerant and disease resistant. When purchasing fruit trees request specific information from the grower regarding rootstock influence.

Apple trees are classified into three size categories: standard, semi-dwarf, and dwarf size trees.

Standard rootstocks provide a hardy, aggressive root system and are adaptable to most soil and seasonal conditions. All apple trees grown on standard rootstocks develop to 20’-25’ in height and produce large canopies spreading up to 25’ at maturity. Standard trees require a minimum of 20’ spacing; more if available. Standard trees will generally begin bearing fruit 5-8 years after planting. Most standard rootstocks are seedling rootstocks.

Semi-dwarf rootstock will produce a trees that are approximately 60% the size of standard trees. Trees are approximately 12-15’ tall and 14’ wide at maturity. These trees generally fruit a few years earlier than standard trees.

Dwarf rootstock will produce a tree approximately 45% the size of a standard tree (9-12’ tall and 10’ wide). Dwarfs can be planted much closer than standard trees. While several semi-dwarf and dwarfing rootstocks have proven hardy in Western Montana and Idaho, choices for Eastern Montana are limited. Dwarf fruit trees come into bearing earlier than a standard tree (often 3-4 years after planting), but may require staking or support in some situations. Dwarf trees are easier to prune, spray and harvest, however they tend to be less hardy than standard trees.

Nectarines, peaches, and apricots are grown on seedling rootstocks and on some clonal rootstocks. They form fruit on one-year-old wood. Pruning techniques are used to keep these trees at a manageable size and to enhance fruit production.

Sweet cherry trees are grown on large semi-dwarf (Prunus mahaleb) and standard (Prunus avium) seedling rootstocks. Many clonal cherry rootstocks are available, but few are cold hardy. Some genetic dwarf tart cherries are available. Tart cherries and cherry plums can be suitable substitutes for areas where sweet cherries are difficult to grow.

Pears are available on dwarf, semi-dwarf and seedling rootstocks. Seedling pear rootstocks are more cold hardy than clones, but produce a somewhat larger tree. Pear tree size is difficult to control with pruning, due to it's susceptibility to fire blight (see below).

Pruning

Pruning is the heart of good fruit tree management. Most horticulturists recognize three main reasons for pruning: to train a young tree, to maintain vigor and fruit production, and to correct problems.

Training is done primarily when the tree is young to get the framework of branches located for convenience of harvesting and spraying. Trees can be trained in many styles, the most common being either central leader or open center.

When a tree whip is planted, it is headed back or pruned at approximately 30 inches. When planting larger trees (5' to 8'), the leader can be tipped back and all side limbs should be headed back to a bud or two or removed completely. All limbs lower than 3 feet are removed.

For central leader trees, form the first whorl of 2 to 4 limbs at about 3' above the ground. No two limbs should arise at the same level on the trunk, nor directly above each other nor crossing each other. Select limbs with a wide branching angle to the trunk (45-60 degrees). Form additional whorls of 2 to 4 limbs at 18" to 24" intervals above the first.

For open-center trees, begin the scaffold system about 36" above the ground. No more than 2 limbs should arise at any one point. Three or four main scaffold limbs are used to form most open center trees. Open center trees are more apt to split out and are more prone to damage in heavy snows.

Maintenance pruning is used to renew fruiting wood, increase fruit size and to keep the tree at a manageable size. Trees must be pruned so that light can penetrate through to inner leaves for good flower production and fruit-set. Early spring is the best time to prune fruit trees before the buds swell. Maintenance pruning also removes dead, diseased or damaged wood. Remove no more than 30% of the canopy in any one year.

Corrective pruning, which is often severe, is sometimes needed to reduce tree size and to correct or remove poor limbs. It is also used to rejuvenate trees that have been injured, neglected or to graft in new varieties. Again remove no more than 30% of the canopy and do not top the tree.

Pruning remains a personal choice and no two people prune the same way. Every person pruning, however, should have a logical reason for each cut. Excessive pruning can reduce the amount of fruit production, encourage weak sucker growth, delay the onset of bearing fruit, increase the susceptibility to fire blight and deform the natural beauty of the tree.

Fruit Yields

Fruit trees generally begin bearing fruit within 5 years of planting. This varies with species and cultivar. Poor fruit yields can be attributed to several factors: (1) Physiological problems such as poor growing conditions during flower bud formation the previous year. (2) Lack of pollination due to no compatible tree in the vicinity, insecticide damage to bees or reduced bee activity because of cool weather. (3) Unfavorable weather for flower bud development such as high temperatures, or frost. (4) Insect or disease damage to flowers or developing fruit. (5) Cultural problems such as excessive pruning or shading from other trees.

Rarely is poor fruit production due to lack of nutrients. Unnecessary fertilization of fruit trees can lead to more problems.

How to Grow Fruit Trees

Apples and Crabapples

Apple and crabapple trees are among the most cold tolerant of fruit trees, but cultivars vary in their adaptability to different climates. There are many apple cultivars to choose from. They vary in hardiness, disease resistance, size of tree and fruit, ripening date, taste and storage life. There are several cultivars of edible crabapples that have high quality fruit for jelly or eating fresh. Cultural considerations are similar to apples.

Best growth and fruit production is in deep, well-drained soil, but given the proper rootstock, trees will tolerate heavier soils. All apples require pollination. Most cultivars will set some fruit on their own pollen, but two different cultivars flowering at the same time is best for proper pollination and good fruit-set. To enable proper pollination, cultivars should be no farther than 1000' feet away from each other. Fertilize with a well-balanced fertilizer only if leaves are pale and growth is weak. Many apple and crabapple cultivars are susceptible to fire blight. Choose fire blight-resistant cultivars when planting new trees. (See pear section below on fire blight treatment). Wrap the trunks of young apples in winter to protect from rodents and sunscald.

Apples are ripe when seeds have begun to turn brown and they taste good. Apples can tolerate frost and temperatures down to 25 degrees F. Some cultivars need a few light frosts to improve the flavor.

Apricots

Apricots flower very early in spring; consequently, fruit production is risky in regions subject to late frosts. Planting trees in a northern or eastern exposure (but not in shade) helps to reduce frost injury. These sites are cooler and flowers are slower to develop in the spring increasing the chance that hard frosts will be past. Apricots are less cold hardy than apples but more hardy than peaches or nectarines. Although most apricot varieties are self-pollinating, fruit-set is improved with cross-pollination.

Cherries

Both sweet and tart cherries are useful and attractive in home gardens. Cherries perform best in deep, well-drained soils. On shallow or poorly drained soils they will decline and die. Cherries are susceptible to sunscald and must be whitewashed or wrapped to prevent damage to the southwest side of the trunk. Birds love cherries; small trees can be protected with netting.

Sweet cherries are not reliably winter hardy in most areas of Montana and Idaho. They are successfully grown on protected sites near large bodies of water (such as Flathead Lake). Sweet cherries are planted at 30 foot spacing to avoid crowding and allow sunlight and air to penetrate the canopy. They require cross-pollination, so two trees of different varieties must be planted together to set fruit. Cross-pollination can be difficult. Check to be sure specific sweet cherry cultivars are compatible. Pie or tart cherries are easier to grow and hardier than sweet cherries. They are self-pollinating, meaning that a lone tree will bear fruit. Tart cherries are planted at 15 to 20 foot spacing.

Plums and Cherry Plums

Plums can be grown successfully in Montana and Idaho. While most of the large commercial-quality European plum cultivars are hardy only in protected areas of western Montana and Idaho, native plums and many American, Japanese and Manchurian hybrids are well-adapted to northern gardens. Other cherry x plum hybrids produce small, high quality fruits on hardy compact trees or bushes. Plant most plums on 20 foot spacing. In general, plums are intermediate in cold hardiness between apples and cherries. Cross-pollination must be carefully considered when selecting hardy plum hybrid cultivars, as many are not compatible. Some cultivars are self-fertile. Protect the trunks of plum trees from sunscald and winter injury. Prune to avoid V-shaped crotches. Fertilize mature trees with 1-2 lbs. of nitrogen per year for larger fruits. Harvest plums when fully ripe, usually they will start falling off the tree. Pit plums before canning as the pits can release cyanic acid.

Peaches and Nectarines

Peaches and Nectarines are a gamble in most areas of Montana and Idaho. They are the least cold hardy of temperate zone tree fruits. Generally these trees are damaged when winter temperatures go below -10 to -15 degrees F. Planting the hardiest varieties on a hillside where cold air drains to low-lying areas or near large bodies of water (which moderate winter lows) may let you grow these fruits in areas otherwise too cold for them. Plant in fall whenever possible, no less than 20 feet apart; cold-winter areas will have to be planted in early spring. Many cultivars of the hardier peaches and nectarines are self-fertile. Of all stone fruits peaches and nectarines prefer the lightest, more sandy soils. Compared to other fruit trees, peaches and nectarines require heavier fertilization and more pruning for good production. Good soil drainage is essential.

Pears

Pears are one of the most popular tree fruits in the world, but are not as cold hardy and require more attention than many other tree fruits. Pears are usually planted on 20 foot spacing and require cross-pollination to set fruit. Most pears that bloom at the same time are suitable pollinators. Because pear blossoms have small amounts of nectar and low sugar content, pears require more pollinators and bees than any other fruit. Pears are harvested slightly green and ripened for 5 to 10 days in cool storage. The flesh will give slightly to the touch when pears at their best.

Pears require specialized sprays for fire blight control. This problem should be considered before planting. No other fruit is so limited by it's susceptibility to just one disease, fire blight. The best cultural control is to use resistant varieties. Diseased wood must be pruned out 10" below infection and burned. Shears should be sterilized in a 10% bleach solution between each cut. Prune pears only to shape them, limiting cuts to smaller branches, if possible, as heavy pruning may stimulate vigorous growth. This new growth is highly susceptible to fire blight. Avoid high nitrogen fertilizers unless soil tests or foliage show nitrogen deficiency, as the resulting lush growth will be susceptible to fire blight.

Nuts

Nut trees such as hazelnuts, filberts and walnuts may grow in parts of Idaho and Montana, but nut production is difficult due to killing frosts at blossom time, marginal cold hardiness and short growing seasons. Seedlings tend to do better than grafted cultivars.

Table 13-1
Fruit Trees for Montana

Fruit tree cultivars vary in hardiness according to microclimates and dormancy requirements along with growing and fruiting habits. Knowledge of tree requirements and limitations are critical to proper species and cultivar selection. The following are a collection of suggestions. Successfully growing fruit is dependent on many factors. (W) Denotes those cultivars suitable only for Western Montana.

APPLES
Almata
Amur Red
Baldwin (W)
Beacon
Carroll
Cortland (W)
Dakota Gold
Discovery (W)
Duchess of Oldenburg
Empire (W)
Fireside (W)
Freedom (W)
Golden Russet
Goodland
Goodmac
Haralred
Haralson
Hazen
Heyer 12
Honeycrisp
Honeygold (W)
Idamac (W)
Idared (W)
Jerseymac (W)
Jonamac
Jonathan (W)
Keepsake
Liberty (W)
Lodi
McIntosh (W)
Norland
Northern Lights
Northern Spy (W)
Parkland
Red Gravenstein (W)
Red Sparkle
Rutherford
September Ruby
Snow (Fameuse')
Spartan
Summerred
State Fair
Sweet Sixteen
Wealthy
Winter Banana
Yellow Transparent

APRICOTS
Chinese (W)
Goldcot (W)
Harcot (W)
Hargrand (W)
Harogem (W)
M 604
Manchurian
Moongold (W)
Perfection
Scout
Strathmore
Sungold (W)
Sunrise
Westcott

CRABAPPLES
Chestnut
Dolgo
Kerr
McClean
Trail

CHERRIES
Sweet Cherries
Black Tartarian (W)
Bing (W)
Kristen (W)
Lamberts (W)
Lapins (W)
Rainier (W)
Royal Ann (W)
Stella (W)
Van (W)
Sour Cherries–
Mesabi
Meteor
Montmorency
North Star

CHERRY PLUMS
Compass
Sapalta
Red Diamond
Sapa

PLUMS
European:
Italian
Early Italian
Greenage
Mount Royal
Stanley
Yellow Egg
Asian/American:
Alderman
Assiniboine
Ember
Kaga
Kahinta
La Crescent
Pembina
Pipestone
Ptitsin #9
South Dakota
Superior
Tecumseh
Toka
Underwood
Waneta

PEACHES
Canadian Harmony (W)
Early Red Haven (W)
Red Haven (W)
Reliance (W)
Veteran (W)

PEARS
Clapps Favorite
Gold Spice
Gourmet
John
Luscious
Patten
Parker
Pioneer #3
Seckel (W)
Summercrisp
Ure

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Training and pruning your home orchard - PNW 400. R. Stebbins. 1992. OSU Agricultural Communications, Publications Orders, Oregon State University, Admin. Services A422, Corvallis, OR 97331-2119.

Western fruit, berries & nuts - How to Select, Grow and Enjoy. L. Walheim and R. Stebbins. HP Books.

The following publications are available from the Montana State University Extension Service. P.O. Box 172040, Bozeman, MT 59717-2040. (406) 994-3273. Web address: www.montana.edu/publications.

An Historical sketch of pomology in Montana. 1981. #1B690

Pruning fruit trees in Montana. 1999. # MT9215AG.

Preliminary evaluation of some summer and early fall apple cultivars for Montana. 1981. Order #1B739.

The following publications are available from the University of Idaho, Agricultural Communications Center, Idaho Street, Moscow, ID. 83843-4196. 208-885-7982; agpubs@uidaho.edu.

Apple scab - CIS 690.

Corneum blight of stone fruit & ornamental trees - CIS 230. W. Simpson et al. 1985.

Cytospora canker disease in Idaho orchards - CIS 726. A. Thostenson, A. Helton. and R. Dillbeck. 1984.

Fire blight - a bacterial disease of apple, pear and certain ornamentals - CIS 242. W. Simpson et al. 1985.

Grafting fruit trees - PNW 62.

Idaho fertilizer guide: orchards - CIS 655. S. Petrie, W. Colt, and W. Kochran. 1982.

Insect control on stone fruits in the home garden - CIS 605. H. Homan and C. Baird. 1990.

Insect control for apples and pears in the home garden - CIS 603. C. Baird and W. Colt. 1990.

Nutrient disorders in tree fruits - PNW 121.

Peach leaf curl - CIS 229. W. Colt et al. 1985.

Phytophthora collar-rot of orchard trees - CIS 752. A. Helton and R. Dillbeck. 1985.

Quality apples from your backyard tree - CIS 670. W. Kochran, W. Colt, and A. Boe. 1983.

Weed control in tree fruits - CIS 692. J. Torell, W. Colt. and S. Dewey. 1983.

X-Disease of cherry, peach and other stone fruit trees - CIS 668. A. Helton et al. 1983.

Chapter Review

A. Describe the difference between self-fertile and self-sterile fruit tree varieties, and name three types of fruit trees that can be self-fertile:

1. _____ 2. _____ 3. _____

B. Where should the graft union be relative to the soil or mulch surface when planting a bare root tree? And why?

1. _____

C. List five reasons why homeowners often fail in chemical control of fruit tree pests and diseases.

1 _____ 2. _____

3. _____ 4. _____

5. _____

E. Why must fruit trees be grafted or budded to obtain true-to-name varieties?

_____

F. Why is rootstock selection important in apple trees? _____

G. What are the size differences between dwarf, semi-dwarf, and standard when referring to apple trees?

_____

_____

H. What is the most serious pear tree disease?

1. _____

I. Describe for a customer the main reasons for pruning fruit trees.

1. _____

2. _____

3. _____