Growing tree fruits in short-season gardens

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YOU ARE A SHORT-SEASON, HIGH-ALTITUDE GARDENER IF:

You live in Idaho at an elevation above 4,500 feet, **OR**

Your USDA hardiness zone is 4 or lower, **OR**

You have a frost-free growing season of 110 days or less

University of Idaho Extension

INTRODUCTION

Commercial tree fruit production is commonly located in areas with at least 150 frost-free days and a USDA hardiness zone of at least 5. These regions provide optimal growing conditions for most tree fruit crops. Idaho's cool-season, high-altitude regions do not have the luxury of these ideal conditions. As a result, producing homegrown fruit in Idaho's harsher climates can be challenging, but not impossible.

The main tool in successful tree fruit production is selection of appropriate crops and varieties. Plant breeding has produced many tree-fruit varieties that will grow in harsh climates. Selecting the right variety can mean the difference between success and frustration.

Even with adapted varieties, tree fruit production can be demanding. Learning and practicing some simple management techniques will help your plants survive and produce consistently.

Tree fruits specifically adapted to Idaho's harsher climates include apples, pears, pie cherries, plums, and some late-blooming apricots. Varieties of each fruit crop vary widely in winter hardiness and timing of fruit maturity. Hardiness and early maturity are both critical for consistent production in short-season areas. Caring for fruit trees in harsh climates, even fully adapted varieties, brings unique challenges, and knowing the proper maintenance procedures will help bring fresh fruit to the table.

Table 1: Some apple varieties adapted to Idaho's short-season, high-altitude regions.

VARIETY	HARVEST TIME	COLOR	USES AND QUALITY
Earligold	August	Yellow	Fresh, cooking; high quality
Haralred	Late September	Red	Fresh, cooking, cider
Haralson	Late September	Red-striped	Cooking; tart
Hazen	September	Red	Fresh, cooking; mild flavor
Honeycrisp	Late fall	Red striped	All-around; stores well
Honeygold	Early October	Yellow	Fresh, cooking
Liberty	September	Dark red	Scab resistant; good fresh, fair for cooking
Lodi (Transparent)	July	Yellow	Cooking; fair quality
McIntosh	September	Red blush	All-around; tart
Northern Spy	Early October	Yellow-striped red	All-around; high quality
Spartan	Early October	Red	All-around; high quality
State Fair	August	Red striped	Fresh; excellent quality
Sweet Sixteen	September	Red striped	Fresh, cooking; high quality
Wealthy	September	Red striped	Cooking; high quality

APPLES

HARDINESS AND MATURITY

In most of Idaho's short-season, high-altitude regions, apple trees will be consistently hardy if you plant appropriate varieties. But there is another important consideration: the rootstock. Trees sold in any commercial nursery are made up of two parts, the rootstock (the root part of the tree) and the variety or scion (the top of the tree). The "bump" usually located about 8 to 12 inches above the ground is called the "bud union" and is the point where the chosen variety was grafted onto the rootstock.

Just like the chosen variety, some rootstocks can withstand frigid winters, while others cannot. The best rootstocks for Idaho's short-season, high-altitude regions are of Russian derivation, including the dwarfing rootstock Bud 9 and the standard rootstock Antanovka. Bud 9 is desirable not only for its hardiness, but because it produces dwarf trees (10-12 feet tall) that can be easily managed in a small space. However, trees grafted onto Bud 9 can droop and may need the support of a pole or trellis.

When you purchase an apple tree, ask your local nurseryman to identify the rootstock and explain its characteristics. When the rootstock identity cannot be confirmed, you can follow this rule of thumb: Dwarfing rootstocks are typically less hardy than those that produce semi-dwarf or standard trees. So, in a harsh climate, if rootstock identity is unknown, your best option is to find room in the yard for a full-size tree.

Even among varieties hardy enough to survive the winter, many will not properly mature in short-season climates. Consequently, it is important to choose varieties that will mature and give high-quality fruit under conditions of cool temperatures and short growing seasons. In most cases, apples should mature by early October and definitely before temperatures consistently fall into the low to mid 20s.

ADAPTED VARIETIES

A number of apple varieties have proven themselves adaptable to Idaho's short-season, high-altitude climates. In addition to those listed here (table 1), with a little work you can find other good varieties. New varieties are constantly being developed, and some may be worth considering if they can survive in USDA hardiness zone 3 and mature relatively early. Varieties developed specifically for cold climates are usually more dependably hardy.

MANAGEMENT ISSUES

Slow bearing—Apples trees have some specific characteristics that influence their management in short-season, high-altitude climates. First of all, they are often slow to bear fruit. This can be an especially difficult problem in short-season climates where the trees may take longer to reach bearing size. If given proper care, apple trees should begin to bear decent quantities of fruit in 4 to 6 years. Use of dwarfing rootstocks can result in earlier bearing. Trees on Bud 9 rootstock will bear fruit as early as the third year after planting. If apple trees are growing rapidly at the end of several years, but not bearing fruit, it can be an indication of too much nitrogen fertilizer, improper or excessive pruning, or poor training.

When slow bearing occurs, try eliminating fertilizer applications until the tree begins to bear. If the tree is in a lawn area, avoid fertilizing the grass around the tree. Another trick to encourage bud formation and fruit production is to bend the branches downward. Do this by pulling the major branches downward to form a 90 degree angle from the trunk and tie them (under tension) in place using ground stakes.

Lastly, avoid excessive pruning because it encourages growth of immature, nonbearing wood. Information on pruning and training techniques for home orchards can be found in other University of Idaho Extension publications.

Alternate bearing—Another common problem in harsh climates is alternate bearing. This problem is typified by heavy bloom, fruit set, and fruit yield in one year followed by very light fruit production the next year. Alternate bearing is caused by poor flower initiation (buds for next year's fruit) during a heavy crop year. This problem is common in harsh climates because bloom loss due to spring frost can eliminate fruit in one year and trigger the alternating cycle to begin the next.

It takes conscious, consistent effort to interrupt alternate bearing using fruit-thinning techniques during the heavy-bearing years. Thin by hand during heavy-bearing years by removing all apples in each cluster except one and spacing the remaining apples about 4 to 6 inches apart along each branch. Do this within 4 to 6 weeks of full bloom. If you wait too long, the intended effect of encouraging the tree to bear fruit the next year will be reduced.

Be careful when thinning not to break off or damage the small fruit-bearing branches. Sometimes more than half of the fruit will be removed during thinning. This may seem wasteful, but the tree will make up for lost numbers by growing bigger, better-quality apples.

Poor pollination—Some apple varieties do not bear well when growing alone because they have problems with self-pollination. They need a tree of a second, "pollenizer," variety close by. This problem can be aggravated in a harsh climate when cold, wet spring weather reduces the presence of bees and other insect pollinators. The solution is to plant a self-fertile variety or to plant two compatible varieties that can help pollinate each other. When selecting an apple variety, be sure to ask your nurseryman about the need for a pollenizer.

APRICOTS

VARIETIES

Apricots are usually hardy throughout Idaho's zone 3 and 4 regions, but that does not mean all gardeners in these areas will be successful in growing a consistent crop of fruit. Apricots bloom very early, and the most difficult aspect of apricot production in Idaho's short-season, high-altitude regions is the loss of blossoms due to spring frost. Consequently, choosing varieties that are hardy, but also late-blooming, is essential (table 2). Even the hardiest varieties may not bear every year in Idaho's zone 3 or 4 areas.

Late-flowering apricots are adapted to Idaho climates.

BLOOM PROTECTION

Apricots will produce more consistently if planted in a protected area. Urban gardeners will have more success than those living in outlying locales. When damaging frost is imminent, you can protect one or a few blooming apricot trees growing near a house by providing a source of heat underneath the tree. Warm air will rise through the branches and ward off cold air. Heat sources include space heaters, ignited charcoal briquettes, and heat lamps. This technique will work well on a calm night with radiation-type frost, but not as well when cold temperatures are accompanied by wind.

THINNING

It is important to thin apricots when fruit set is excessively heavy. This is not designed to prevent alternate bearing as in apples. Instead, it allows the remaining fruit to grow larger and develop better quality. Also, too much fruit on a tree predisposes the fall-forming flower buds to be sensitive to winter injury.

Table 2. Apricot varieties for Idaho's short-season, high-altitude regions.

VARIETY	HARVEST TIME	FRUIT SIZE	NOTES
Chinese (Mormon)	Early July	Small-medium	Good for frost-prone areas
Debbie's Gold	Late July	Medium	Consistent producer in Alberta
Harcot	July	Medium-large	Late blooming and frost hardy
Harlayne	Late July	Medium	Late blooming, hardy
Moongold	Late July	Large	Frost-resistant bloom, hardy
Perfection	July	Large	Late bloom, hardy
Sungold	Late July	Large	Late bloom, hardy
Westcot	July	Large	Dependable cold-climate producer

Ripening cherries must be protected from birds.

Early maturing pear varieties are a must in short-season regions of Idaho.

European plums are usually large and dark blue.

Thin by removing all but one fruit in large clusters. Try to achieve a density equal to a single fruit every 2 to 4 inches along each branch. Fruit should be thinned when they are about half grown and after fruit drop (also known as "June drop"), which occurs naturally as part of the growth cycle.

POLLINATION

Most apricots are at least partially self-fertile. However, many varieties will produce a heavier crop if a second variety is present to act as a pollenizer.

CHERRIES

The only types of cherry sufficiently hardy for the short-season, high-altitude regions of Idaho are pie (sour) cherries (table 3). They are hardy anywhere in Idaho, including zone 3 locations. Sour cherries do not have flavor suitable for fresh consumption, but are outstanding for canning and freezing. Though winter hardy, tart cherries bloom very early in spring, and loss of flowers due to frost damage is common in cold, short-season areas.

Pie cherries are self-fertile and can bear well with only one tree present. The trees are naturally small and are suitable for small yards. Pie cherries well cared for should begin bearing in 2 to 3 years, even in cold climates.

PEARS

Winter-hardy pear varieties will survive and consistently bear fruit in all but the very coldest of Idaho's short-season, high-altitude regions. However, many pear varieties, though hardy, will not ripen where the growing season is short. Consequently, early ripening varieties are essential for consistent production (table 4).

Most pear varieties are self-infertile and need a second, pollenizer, variety, of similar hardiness and blooming period, planted nearby. This makes pears suitable only for larger yards.

PLUMS

Plums are classified into three groups: European, Japanese, and hybrids with native plums (table 5). The European varieties are preferred by most homeowners because of their large, blue, late-maturing, prune-type fruit. As a group, they are moderately hardy. Early ripening European varieties are essential to ensure harvest before cold temperatures occur in the fall.

Japanese varieties come in various colors, including red and yellow. The fruits are smaller than the European varieties, and the trees are generally less hardy.

The third type includes hybrids with native plums. As a group, these are the hardiest plums, but they have the least consistent quality.

Selection of the hardiest varieties will allow production of any of the three types in Idaho's short-season, high-altitude climates. However, in the coldest mountain valleys, the hybrid varieties will give the most consistent production.

Many plums are self-infertile and need a pollenizer variety planted nearby. Generally, the European varieties are self-fertile. The hybrids and Japanese varieties are generally self-infertile, but there are exceptions. Be sure to determine the need for a pollenizer before making a purchase, especially if you have room for only one tree. Plums require very little in the way of special management to produce in short-season climates.

OTHER TREE FRUITS AND NUTS

Most other tree fruits are not adapted to the short-season, high-altitude regions of Idaho. This is also true of nut crops. Only black walnuts and butternuts (similar to black walnut) will consistently survive the winter cold. Hazelnuts, Persian walnuts, and almonds will survive and produce only in the warmest regions of Idaho.

Table 3. Cherry varieties for Idaho's short-season, high-altitude regions.

VARIETY	HARVEST TIME	FRUIT SIZE	NOTES
Meteor	Early summer	Medium-large	Small tree, very hardy (-50°F)
Montmorency	Early summer	Medium-large	Small tree, hardy (-40°F)
Northstar	Early summer	Large	Small tree, very hardy (-40°F)

Table 4. Pear varieties for Idaho's short-season, high-altitude regions.

VARIETY	HARVEST TIME	COLOR	NOTES
Clapp's Favorite	August	Red blush	Not suitable for storage
Flemish Beauty	Late September	Red blush	Medium-size, good-quality fruit; very hardy
Gourmet	Late September	Green	Round, crisp, and sweet fruit; hardy
Honeysweet	Late August	Tan	Rich flavor, partially self-fertile
John	September	Yellow	Small fruit, fair quality, extremely hardy
Luscious	Late September	Yellow	Large, sweet, and juicy fruit; hardy
Moonglow	Late August	Red blush	Bartlett type, very hardy
Parker	Mid-September	Yellow/red blush	Large fruit, moderately hardy
Sauvignac	September	Yellow	Medium-size, juicy fruit; one of the hardiest
Summercrisp	August	Yellow blushed red	Good storability, good pollenizer
Ure	September	Red blush	Small, good-quality fruit; extremely hardy

Table 5. Plum varieties for Idaho's short-season, high-altitude regions.

VARIETY	HARVEST TIME	COLOR	NOTES
European			
Mount Royal	Late August	Purple skin, yellow flesh	Self-fertile, very hardy
Stanley	Late September	Purple skin, yellow flesh	Self-fertile, hardy
Italian	September	Purple skin, yellow flesh	Productive, hardy
Ember	August	Yellow skin with reddish blush	Medium-sized fruit
Underwood	August	Red skin, yellow flesh	Hardy, vigorous tree with large fruits
Japanese			
Methley	August	Purple skin, red flesh	Sweet, hardy
Satsuma	Early September	Red skin, red flesh	Sweet, hardy
Hybrid			
Alderman	Late August	Burgundy skin, yellow flesh,	Sweet, hardy
Pembina	Late August	Red skin, yellow flesh	Large fruit, sweet, hardy
Sapalta	Late August	Purple skin, red flesh	Excellent quality, very hardy
Tecumseth	Mid-August	Red skin, yellow flesh	Good quality, hardy
Toka	August	Reddish-orange skin, yellow flesh	Very hardy

Spring frosts are a constant danger to fruit blossoms.

Occasionally, gardeners will bravely attempt to grow some of the marginally adapted fruit crops, such as peaches and sweet cherries. Peaches will survive some winters in urban zone 4 locations, but they bear fruit inconsistently even following mild winters. The flower buds may be damaged or killed by subzero temperatures, and the trees will often die when temperatures fall below -15°F. The hardiest varieties available in the local nursery trade are Reliance and Polly.

Sweet cherry trees can survive even the harshest of Idaho's climates. However, the flower buds are killed by winter temperatures of about -10°F, and successful fruit set is rare. You can grow a nice cherry tree for shade and hope for the occasional cherry to eat.

TREE FRUIT CARE

PLANTING AND ESTABLISHMENT

When selecting a tree for planting in short-season climates, the most important factor is size. Buy trees that are affordably large up to a trunk diameter of 1 inch (measured 6 inches above the ground). Smaller trees will have fewer transplanting problems, but may take longer to reach bearing size. Trees that are larger than 1 inch may suffer more from the shock of transplanting.

Trees will establish quicker and reach bearing size sooner if they do not have competition from other plants, especially grass. Because slow growth is one of the biggest issues for trees planted in short-season climates, it is important to capitalize on every advantage. Competition can best be eliminated by maintaining a mulch zone 5 to 6 feet in diameter around young trees and increasingly wide as the trees grow to mature size.

Be aware, however, that mulching trees provides habitat for mice and voles, which can girdle the trunk when they feed on the bark. If you choose to mulch, you will need to monitor rodents and take action to eliminate them through the use of traps or baits.

WINTER PROTECTION

In high-altitude locations, bright sunlight causes alternate day/night temperature fluctuations that can cause stress in the bark and trunks of young fruit trees and make them crack. During the first 2 to 3 years after planting, the trunks of young trees should be wrapped with burlap or white tree wrap fabric to lessen the tendency for damage.

SPRING FROST PROTECTION

Spring frost is a serious barrier to tree fruit production in Idaho's short-season, high-altitude regions. The damage from frost becomes more serious as the blooms get closer to being fully open. Open blooms will be damaged or killed at temperatures of 28°F or colder.

For home production, where the number and size of fruit trees is limited, it is possible to protect the flowers by placing space heaters, containers of charcoal briquettes, or heat lamps around the base of the trees when frost is forecast.

Overhead irrigation applied during freezing temperatures can also provide protection, but may be difficult to apply to a full-size tree. In addition, the weight of the ice can damage weak trunks and branches. If you irrigate to provide frost protection, leave the water running into the following morning until all evidence of ice is gone.

PROTECTION FROM WILDLIFE

In many of Idaho's high desert or mountainous regions, wildlife move into the outskirts of communities to spend the winter. Rabbits and rodents can be the most destructive of these visitors due to their tendency to chew away the bark around the base of young trees. These girdled trees subsequently die. Trees can be protected by wrapping the base of the trunk with metal screening or other nonchewable material that blocks access to the trunk.

Deer can also damage young trees as they browse on the buds and young branches. Moose damage trees severely by breaking branches and trunks. If you have deer or moose in your area, you may find a sturdy fence 8 to 10 feet high is required to protect your trees. Spray-on deer repellent materials have generally proven ineffective.

PROTECTION FROM WIND

Spring and summer winds cause blossom drop, leaf burn, and fruit injury. Consistent winds also alter growth, making the trees "heavy" on one side. In winter, winds desiccate branches and buds and lessen the hardiness of the trees. For this reason, fruit trees should be planted where they are protected from prevailing winds by buildings or other landscape plants. In some cases, it may be worthwhile to establish a windbreak that includes evergreens prior to planting fruit trees. The fruit trees should be planted at least 40 or 50 feet from a windbreak to avoid shade and competition from tree roots.

Rabbits damage young trees by chewing the bark.

Proper irrigation is critical to growing good fruit.

FERTILIZATION

Proper fertilization of fruit trees is more important in short-season areas than in warmer regions. Excessive or improperly scheduled fertilizer applications can cause the trees to delay winter acclimatization. Because many fruit trees are already marginally adapted, this can result in losses of trees or in reductions in their fruit-bearing capacity. A good practice is to apply fertilizer, especially those containing nitrogen, in early spring through the first of July and avoid late-summer applications.

During the first few years after planting, it is best to fertilize trees with a complete fertilizer such as a 10-5-5 formulation. Established trees are more self-sufficient and need fertilizer that contains only nitrogen. A typical fertilizer rate for fruit trees is 1/10 pound of actual nitrogen per inch of diameter of the trunk as measured 1 foot above the ground. (For a 10-5-5 fertilizer, which is 10% nitrogen, that would mean applying 1 pound of product per inch of trunk diameter).

However, many variables influence decisions to apply fertilizer. If a tree is located in a lawn area that is frequently fertilized, no additional fertilizer will be needed or desired. If a tree is growing rapidly, has a tendency to sucker, is slow to bear, or has been severely pruned, you could cut back on—or eliminate—fertilizer applications for a year or two. In short-season climates, too much fertilizer is a more common problem for fruit trees than too little.

Iron chlorosis—In regions with alkaline soils, micronutrient deficiencies appear on many fruit tree species. These deficiencies usually express themselves on the youngest leaves at the ends of branches as light-yellow leaves with dark-green veins. We often call this problem "iron chlorosis."

Iron chlorosis is a difficult problem to manage, especially in high-desert soils. These soils cannot be easily amended to adjust pH. Planting a tree in a lawn or applying a heavy layer of mulch aggravates the problem by slowing soil warming and increasing moisture retention, both of which make iron less available to plants. This is especially true in soils with pH of 7.5 or above. If the deficiencies become pronounced and affect tree health, it may be necessary to begin a spring and summer regime of foliar applications (dilute solutions sprayed on the leaves) of fertilizer products that contain iron, zinc, and boron. To work properly, these applications must be frequent (every few weeks), consistent, and made over a period of years.

IRRIGATION

Fruit trees need consistent, but not excessive, irrigation to produce good quality fruit. They should be watered about every 10 days to 2 weeks with enough water to wet the soil to a depth of 2 to 3 feet. In cool areas with loam and silt loam soils, you may not need to irrigate as frequently. The object is to keep the soil moist, but not waterlogged. Continue to irrigate, as needed, until late fall. It was once thought that water stressing plants in the fall increased their cold hardiness. That practice actually weakens the trees and increases winter damage.

Find more gardening resources and publications online at
extension.uidaho.edu/homegard.asp

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