SWEET CHERRY GROWING IN EASTERN WASHINGTON

By

John C. Snyder, Extension Horticulture Specialist
David H. Brannon, Extension Entomology Specialist
& M. R. Harris, Extension Plant Pathology Specialist

The sweet cherry is an excellent fruit that grows well in relatively few areas. It is somewhat more exacting in its soil and climatic requirements than are some fruits. Low fall temperatures before the trees are fully hardened, usually injure the tree. The tree blooms relatively early so frost is more of a limiting factor than with some fruits that bloom later.

At the present time the most important commercial varieties grown in Washington are self-sterile and inter-sterile. With this situation, weather conditions during the bloom period, should be favorable for pollinating insect activity.

Orchard Soils

The soil is no better than its water holding capacity. It should hold water enough to last for two weeks during the period of high water use. Loamy sands should be at least five feet deep. Loams and heavier soils may be less than five feet deep but coarse or loose sand is not good. Two feet of loam soil, which holds a total of four inches of available water, is a bare minimum. The cherry trees are highly susceptible to poor drainage.

Planting and Spacing

The sweet cherry as grown in commercial orchards of Eastern Washington is a large tree and requires a spacing of 30-40 feet. Cherry trees start bearing at about the fifth or sixth year and reach full production at about 25 years. It is a fairly common practice to interplant with peaches or apricots but interplanting with cherry trees as fillers has some advantages.

When filler trees are used and the square system is used with permanent spacing 36' x 36', the initial spacing can be 18' x 18'. When this plan is followed, there are two removals.

The trees can be set on the rectangle with permanent spacing in the row closer than between the rows. A permanent spacing might be 24' x 36'. Then the initial spacing would be 24' x 18'. This arrangement gives more permanent trees per acre than a 36' x 36' spacing. This arrangement assumes that the permanent tree will develop a spread of 24 feet. At maturity, the trees will then touch in the row and leave a 12' work space between rows.

Varieties

Main crop varieties in Washington are limited mainly to Bing, Lambert and Royal Ann. Many orchardists are now making substantial trial plantings of Chinook.
Bing is a large, attractive "black" cherry which originated as a seedling of Republican in Oregon in 1875. The tree is vigorous and upright-spreading. The fruit is firm and of high quality, attaining a bright mahogany color when ripe. It is the standard of comparison where it is well adapted.

Chinook is a Bing type variety that ripens four to eight days ahead of Bing. It is similar to Bing in resistance to cracking. The tree is very vigorous, upright-spreading and productive. Limited shipping tests with it have been encouraged. It is a good pollinator for Bing and Lambert and can be pollinated by Bing, Van and Rainier.

Lambert is a large, conical "black" cherry which originated as a seedling of Royal Ann at about the same time Bing originated. The tree is vigorous, upright and very productive. The fruit ripens about a week later than Bing and is lighter in color.

Van is a Bing type variety that ripens in Bing season. For canning it should be picked several days after Bing. It is resistant to cracking. It has a short stem and is very firm. It should not be propagated on Mahaleb rootstock.

Sam is an attractive "black" cherry originating as a seedling of the variety Windsor. The fruit approaches Lambert shape but ripens a few days earlier than Bing. The stem length is similar to that of Bing but fruit quality is somewhat inferior. Tree spread is slightly greater than that of Bing and the canned products of the two are similar. Sam is a good pollinator but occasionally may bloom too late for some varieties.

Royal Ann (Napoleon) is a medium-large "white" cherry with an attractive red blush. It is thought to have originated in Europe in the 17th century. The fruit is fairly acid but of good quality. The variety is well adapted to brining uses.

Rainier is a light cherry in the Royal Ann class. It ripens three or four days ahead of Bing. And appears to be slightly more resistant to rain cracking. It is as hardy as Van and susceptible to cracking. The tree is vigorous, spreading and very productive. Rainier is a good pollinator for Bing and can be pollinated by Bing, Van and Chinook.

Pollination

Three varieties, Bing, Lambert and Royal Ann, are self-sterile and inter-sterile. Each of these, whether planted by itself or with trees of one or both of the other varieties, requires cross pollination from a variety not of this group. Van and Sam are good pollinizers for Bing, Lambert, and Royal Ann and vice versa. Chinook and Rainier are good pollinizers for Bing. Rainier is a good pollinator for Lambert.

Several other varieties are good pollinizers but ordinarily there is little or no demand for their fruit. These include, in the approximate order of ripening, Seneca, Black Tartarian, Republican, Deacon, and mazzard seedlings.

Since all sweet cherry varieties apparently are self-sterile, special provisions for adequate pollination are essential. A good rule to follow is to plant a pollinator every third space in every third row. Honey bees and wild bees do most of the pollination. Of these the honey bee is most important in Washington. It is a fairly common practice to use one strong colony of bees per acre and place the hives in groups of three or more. In areas where such factors as wind hinder insect activity more are needed. If pollinizers are young or widely spaced, using bouquets may be profitable.
Cover Crops and Fertilizers

A cover crop in the cherry orchard is the most economical source of organic matter. An active organic matter seems to be essential for the maintenance of good soil fertility, tilth and water infiltration. Both annual and perennial cover crops are adapted to the sweet cherry orchard.

Alfalfa is an excellent soil builder, a good soil conditioner and a source of nitrogen, but it has not found much favor as a cover crop in sweet cherry orchards. It seems to delay maturity and definitely introduces a gopher problem.

Of the grass cover crops, creeping red fescue orchard grass and Chewings fescue are satisfactory. When using a grass sod, you must apply additional nitrogen and water to maintain desired tree vigor.

Barnyard manure, when used in the cherry orchard, aggravates a zinc deficiency. Use it sparingly and look to orchard cover crops as the main source of organic matter.

Nitrogen is the element most needed for cherry production. A relatively high level of nitrogen gives best results. For bearing trees this means two to five pounds of actual nitrogen per tree per year. A leguminous cover crop may supply enough nitrogen but not so with a sod cover crop.

Phosphorus has not been found to influence growth of tree or fruit except as it benefits the leguminous cover crop. Neither has it produced cherries of firmer texture. No instance of potash deficiency on sweet cherries in eastern Washington.

Zinc has been found deficient in many sweet cherry orchard soils. Late dormant sprays and fall foliage sprays of zinc sulphate will correct this deficiency. Under severe conditions of zinc deficiency both dormant and fall foliage spray applications may be required.

Pruning and Training

Pruning, whether it is with cherry trees or some other fruit plant, delays bearing. This delay is objectionable and to be avoided as much as possible. Of the numerous objectives of pruning cherry trees, keeping the tree low deserves special attention. Sweet cherry trees, if allowed to go unpruned during the early years, produce "leggy" frameworks. In some trees, the first lateral on the bottom scaffold branch originates six or more feet above the base of the scaffold branch. This height adds very materially to the ultimate tree height.

Heading the Tree at Setting Time

It is a fairly common practice to head average-sized trees at 24 to 30 inches. This practice, which usually forces several strong branches at this height, is quite satisfactory on strong trees. If the condition of the tree suggests that this heading will not force strong branches, the heading can be lower. Heading very severely at about 12 inches usually insures the production of a strong shoot with numerous wide-angled branches. Severe heading also involves some added susceptibility to winter damage. Heading at higher than 30 inches, on the other hand, often forces branching at the top only and tends to make the tree head too high.
Selecting the Leaders

Selecting the leaders is the main thing to be accomplished during the first two or three years. There is no need for more than three permanent leaders. Space them 12 to 18 inches apart on the trunk and evenly around the trunk. Although narrow crotches may not be as injurious on cherry trees as on apple trees, they are decidedly objectionable. Avoid them as much as possible. It may require a second and rarely even a third year to select all leaders.

The trunk space from which the leaders originate should be great enough to allow the framework branches to develop to maturity without crowding or pinching. The trunk space between the bottom and top leader should be at least two feet. If there are to be more than three leaders this space should be increased by about 12 inches for each additional leader over three. That is, a tree with five leaders should have a central stem extending four feet above the bottom leader.

Pinching

Pinching must go hand in hand with leader selection. Pinching consists simply of pinching out the top three or four inches of the shoot during the growing season. Because you want branching 14 to 18 inches from the base of the branch, you should pinch when the branch is a little longer than this. Because all of the branches are not at the pinching stage at the same time, it is usually necessary to go over the orchard two or three times the first growing seasons. Some orchardists like to pinch once the second season also. Leaving the leaders a little longer than the inter-scaffold branches when pinching helps to develop laterals at about 18 inches on the scaffold branches where you want them. The shorter inter-scaffold branches then produce fruiting wood which becomes very effective on the inside of the young tree.

Pinching is practiced more on trees that are headed conventionally at setting time than on those headed severely. Severely headed trees usually produce a strong shoot which, in turn, produces wide-angled lateral shoots. Pinching the non-terminal shoots on the severely headed tree should have the same good branching effect. Because pinching removes very little wood, it delays bearing only slightly. This slight retardation in early fruiting is a distinct advantage pinching has over dormant heading.

The effectiveness of pinching is variable. It nearly always forces branching. But sometimes the resulting branches are sharp-angled. This condition seems to be more serious when only the tip rather than several inches of the shoot is removed. The main accomplishment you are after is a flush of branches below the pinching. These pinched shoots can be organized into a desirable framework later, provided, of course, some attention is given to selecting permanent framework branches from the beginning.

Training Montmorency Framework Trees

Montmorency trees are sometimes used as frameworks for sweet cherry varieties. No attempt is made here to promote or discourage this practice, but rather to suggest techniques that will help make it as successful as possible. The practice tends to bring sweet cherry trees into production earlier and supply hardiness sometimes lacking in conventional sweet cherry trees. But using Montmorency trees as frameworks has one very definite weakness. Montmorency frameworks are not strong unless a special effort is made to avoid weak crotches. The purpose here is to suggest techniques for avoiding weak crotches and to urge the use of these techniques.
Conventional one-year-old Montmorency trees are branches. When set in the orchard the branches usually form narrow angles with the trunk and are not suitable for scaffold branches unless their angles are widened. A simple and fast way to widen these angles is to prune the tree to a whip at setting time and head it at about 24 inches. The tree then forces new and wide-angled branches, some originating at the pruning scars and some on the uppermost new shoot. Another way is to head the newly set tree very severely at about 12 inches or less. Then a fast-growing shoot with numerous wide-angled branches develops.

The foregoing discussion assumes that the sweet cherry variety is grafted or budded onto framework branches of the Montmorency tree. It can be placed directly onto the Montmorency trunk. Grafting onto the framework branches provides hardiness in the framework crotches.

Pruning Three- to Ten-Year-Old Trees

There is a tendency to be cautious about heading cherry trees in regions with climate similar to that of Washington. Trees of the more popular varieties, particularly during the early years, are susceptible to winter damage. Pruning almost inevitably intensifies this susceptibility. And there is the old tradition that cherry trees should not be pruned. Notwithstanding these reasons for caution, heading during the early years at least, has significant advantages. But heading is not imperative, because you can produce an early bearing and low tree by artificially spreading the branches. Spreading of this kind requires considerable time for tying but it gets the tree into bearing earlier.

The purpose of heading is to keep the framework branches from producing long sections without any side branches. The end result is a lower tree. How much to head depends upon the length of the terminal growth and how far beyond the last whorl of branches you want the next one. Ordinarily, lateral branches on a main branch should not be closer than about 18 inches. This means that branches which have not grown more than 18 inches may not need heading. Although, to be sure a branch produces laterals, it is well to clip the tip out. Of those branches longer than 18 inches, some may not need heading. In general the upright main branches are the ones that need it. They are the ones, which if not headed, make the tree high. Most horizontal and nearly horizontal ones need not be headed.

Heading may well start with the first dormant pruning and continue for five or six years or until the framework is well established. As the tree gets older, the percentage of branches to be headed decreases. Also, as the tree gets older, you may want to shorten some branches to less than 18 inches. Eventually some thinning is necessary to allow the permanent branches to develop properly. Thinning is particularly necessary following intensive pinching or dormant heading.

Artificial Spreading of Branches on Young Trees

Pruning delays bearing. Because of this fact, you are inclined to prune only as much as absolutely necessary. That is why artificial spreading has advantages over pruning. Even at greater cost and inconvenience than pruning artificial spreading can be very profitable.

There are almost unlimited techniques and devices for spreading narrow crotched and upright branches of a young tree. Crotched boards and forked sticks are common. But these sometimes come out, particularly in windy areas. A short piece of 1" by 1" board with a finishing nail in each end is good. For very small branches, wire pins are
effective and easy to use. For large branches, the wire must be stiff, but for most branches during the first growing season, telephone wire is satisfactory. When using pins, be sure to remove them near the end of the growing season or earlier. Tying the branches to stakes is a dependable but inconvenient technique. When tying branches down it is well to avoid pulling them down too far. Pull them so they form an angle of about 45 degrees with the trunk. If this tying is done in early May, the stakes can be removed by July.

The time to do the spreading is when you are in the mood to do it, and the time to be in the mood is when you see the need for it.

Pruning the Bearing Tree

During the training period the tree develops fruiting wood and tree structure. At first, there is but little fruiting wood. But by about the fifth year the tree should produce 20 to 50 pounds of cherries and by the tenth year there should be an abundance of fruiting wood throughout the tree. Up to this point, little effort need be made to produce fruit size or renew fruiting wood. Most attention should be given to tree structure. The pruning may well consist mainly of heading vigorous and upright branches. Only slight attention to thinning out temporary branches that crowd permanent branches is needed.

But as the tree gets into heavy production, attention must be given to renewing fruiting wood. Previous heading usually forces ample fruiting wood throughout the tree. As the tree gets older and the spurs get several inches long, more severe heading, along with thinning, is necessary. In very old trees it may be necessary to take out considerable one- to three-inch wood. As with all pruning, the pendent and horizontal wood is least desirable. To a considerable extent, pruning can help thin the fruit, if thinning is needed. Pruning should certainly help to maintain a good supply of new fruiting wood, distributed evenly over the entire tree.

Lowering Tall Trees

Removing a large branch from a bearing cherry tree is a major operation. At best it more-or-less jeopardizes the life of the tree. Even so it is sometimes advisable to take out large branches. In doing so, cut to a large lateral branch and leave a two- to three-foot stub for several years at least. Leaving a stub and keeping it alive helps to keep decay that may by chance start in the wound, from going directly to the heart of the tree.

Irrigation

Cherries are very susceptible to "wet feet". For this reason, irrigate only when the trees need moisture. Do not over-irrigate. Start the season with the soil moisture at field capacity to the full depth of rooting and then irrigate only when soil sample at three foot depth shows the need for it. On most soils there is no need to irrigate if the soil sample can be squeezed into a ball that holds its shape when jarred slightly. If the soil crumbles after squeezing, it probably needs water. If upon examination the soil is dry, irrigate immediately. Don't allow it to remain dry. If there is a possibility that the soil is too wet, sample three or four days after irrigating and adjust the irrigation schedule accordingly.

Intercropping

Intercropping is not recommended. Certain crops such as potatoes and tomatoes are susceptible to verticillium wilt. There are cherry trees suffering from this disease,
brought in by the intercrop. The Bing variety seems to be especially susceptible to
Verticillium. Competition for moisture and nutrients as well as interference with
normal orchard operations, are other factors to consider when thinking about inter-
cropping.

Rootstock

Practically all cherry trees grown in Washington are on either Mazzard or Mahaleb
cherry rootstocks.

The mazzard is a wild sweet cherry that produces large trees. Its fruit shows a wide
range of color, type and size. It produces fruit similar to that of the known sweet
cherry varieties. These mazzard seedlings generally make good unions, produce large
vigorous trees and are probably long lived. Until the last few years most sweet cherry
trees in the west were produced on mazzard roots.

The mahaleb is a wild cherry known in Europe as St. Lucie. The leaves are smaller and
more round than those of mazzard. The tree is more spreading and bushy. The fruit is
round, very small, usually black and very bitter. There is evidence that some trees on
mahaleb do not live as long as those on mazzard. This stock is not suitable for the
Van variety.

Influence of Temperature

Doubles - This disorder in sweet cherry fruits is the result of high temperatures during
the fruit bud differentiation period of the preceding summer. In California, temperatures
of 105°F. at this period seem to cause doubling with the Bing and Royal Ann varieties.
Temperature has considerable influence on maturing sweet cherries. Both low and high
temperatures tend to delay maturity. Moderately cool nights and warm days promote sugar
accumulation to produce fruit of good size and quality.

Insect Control

Black Cherry Aphid - A shiny, black aphid which curls the terminal leaves.
Control: This aphid generally appears early in the season and stays until mid-summer.
The cherry fruit fly program of Diazinon, malathion, TEPP or parathion gives
good control. If cherry fruit fly is no problem, an application of parathion,
1/2 pint (4 pounds per gallon) emulsifiable concentrate or 1/4 pint TEPP per
100 gallons of water when aphids appear, gives good control. If aphids reappear,
additional sprays may be necessary.

Cherry Rust Mite - A microscopic mite, light brown in color and triangular in shape.
Control: Apply 1 1/2 pounds of 18.5% Kelthane wettable powder or 3 pounds wettable
sulfur per 100 gallons of water at pre-bloom, petal fall or within 35 days of
harvest. If spider mites are also a problem, use Kelthane. Do not apply
Kelthane closer than 7 days from harvest.

Leafroller - A small light brown moth. The larva is a very active green worm with a
dark head. The larva drops, suspended on a silken thread, when disturbed.
Control: Apply 2 pounds 50% DDT wettable powder plus 1/2 pound 25% parathion wettable
powder per 100 gallons of spray at petal fall.
Pandemis - A light yellow-green larva, differing from the fruit tree leafroller in that the head is the same color as the body.

Control: Apply 2 pounds of 50% DDT wettable powder plus 1/2 pound parathion wettable powder at petal fall. Parathion 25% wettable powder at 1 pound or malathion 57% emulsifiable concentrate at 1 pint per 100 gallons of water is recommended also.

San Jose Scale - A scale about the size of a pinhead, grayish in color and with a dark nipple-like projection.

Control: Apply a dormant or delayed dormant application of 1 1/2 gallons of oil or 2 gallons dormant oil plus 3 gallons of lime-sulfur per 100 gallons of water. Parathion 1 pound 25% wettable powder or malathion 1 pint 57% emulsifiable concentrate to 100 gallons of water at petal fall will give control also.

Shot-hole Borer - A small, shiny black beetle about the size of a pinhead. It causes a shot-hole effect in the wood of unhealthy trees particularly.

Control: Keep the trees healthy and vigorous. Prune out and burn as many infested twigs and branches as possible at pruning time. Apply a spray of 1 pound parathion per 100 gallons of water when the beetle becomes active, usually in May. A second spray using 3 pounds of 50% DDT wettable powder per 100 gallons of water should be made immediately following harvest.

Cherry Slug - An olive green or black slug. Its slimy body is enlarged in front and tapers behind.

Control: Most any of the sprays or dusts will control this pest. No damage should occur if you follow the recommended schedule for cherry fruit fly control.

Cherry Fruit Fly - The flies are in the trees from about mid-May to the last of July. Apply the first cover spray when the first few flies are reported in your district and spray at 10-day intervals. Any of the following may be used:

Phosphates:
1. Parathion, 1/2 pint (4 pounds per gallon) emulsifiable or 25% wettable powder, 1 pound per 100 gallons. Do not apply this wettable powder within 42 days of harvest because of visible residues.
2. Diazinon, 1 pint (2 pounds per gallon) emulsifiable per 100 gallons.
3. Malathion, 1 pint (5 pounds per gallon) emulsifiable per 100 gallons.

Nonphosphates:
1. Perthane, 1 quart (4 pounds per gallon) emulsifiable concentrate per 100 gallons.
2. Methoxychlor, 2 quarts (2 pounds per gallon) emulsifiable or 50% wettable powder, 2 pounds per 100 gallons.

You may also use 2% parathion dust at 7-day intervals at 40 pounds per acre.

The emulsifiable formulations are preferred because they leave almost no visible residue on the fruit. The wettable powders leave heavy visible residues on cherries.

Do not apply parathion less than 14 days before harvest or Diazinon less than 10 days before harvest. Methoxychlor may be used up to seven days before harvest; malathion, up to three days; and Perthane
up to two days. During the harvest period, spray every seven days with 1/4 pint 40 per cent TEPP (or equivalent) per 100 gallons of spray or dust every seven days with 0.75 per cent rotenone or 1 per cent TEPP at 40 pounds per acre.

After the fruit is off, apply a clean-up spray of 1 pound of 25 per cent parathion wettable powder or 1 pint (2 pounds per gallon emulsifiable plus a miticide recommended for rust mites, or 1 pint (2 pounds per gallon) demeton (Systox) per 100 gallons of spray.

**Fungal and Bacterial Disease Control**

**Brown Rot** - Early in the season a few blossoms on a tree may blight and turn brown. From these the fungus spreads to other flowers; it may also grow down into and kill the fruiting spur.

Small brown spots appear on the fruit. These enlarge rapidly, covering the entire fruit. Ashy gray, moldy tufts of spores appear later. The fruit rots as it ripens. The disease is caused by a fungus organism which overwinters on old decayed fruit, and to a limited extent in the buds and twigs. It is serious on sour cherries in western Washington and occurs occasionally on sweet cherries along the Columbia and Snake Rivers.

**Control:** Spray in the popcorn stage, again at full bloom, and at shuck fall using Captan 50% wettable powder at the rate of 4 pounds per 100 gallons of water, using up to 20 pounds per acre.

**Shot-Hole Disease** - Purplish spots, which later turn reddish brown, appear on the leaves and then fall out, leaving a shot-hole effect. The leaves frequently turn yellow and fall when heavily infected. Under severe conditions, trees may be completely defoliated. Cherry fruit stems may be girdled, causing fruit to dry up and fall.

**Control:** Spray the trees as for brown rot. If the summer infection is severe, put on another spray of Captan after harvest at the rate of 2 pounds in 100 gallons of water or dusting sulfur at the rate of 40 - 50 pounds per acre.

**Coryennum Blight Disease** - On the twigs, dark brown spots appear with sunken borders. These spots are frequently around a bud which has been killed by the fungus. On the leaves, long oval spots parallel with the veins may sometimes be found. On the fruit, small brown spots develop. They differ from spots caused by this organism on other fruits in that they have no colored edge. The spots may enlarge, become target-like, and cover a large portion of the fruit surface when it is ripe. On green fruit, the spots have sunken centers which may penetrate to the center of the fruit.

**Control:** Spray in October or earlier just before the fall rains begin. Use Phygon XL, 6 - 8 pounds actual per acre, or Bordeaux, 72 pounds actual per acre, or Ziram, 18 pounds actual per acre, or Ferbam, 18 pounds actual per acre. In pre-bloom, spray with Phygon XL 50% wettable powder at the rate of 1 1/2 to 2 1/2 pounds per acre. Repeat at shuck fall.

**Crown Gall** - Gall-like growths ranging in size from a match head up to several inches in diameter appear on the roots and around the crown of the tree. Small galls almost always grow larger after the tree is planted and may reduce its vigor or kill the tree.

**Control:** Plant only healthy trees which are known to come from a reputable nursery. Do not plant trees in soil known to be infested with Crown Gall or from which trees having the disease have been removed. Avoid wounding the trees around the
crown at the soil surface if at all possible. Remove and burn trees showing
galls unless a very large proportion of them has the disease. Where too many
show the disease it may be practical to keep them as long as they are profitable.

**Powdery Mildew** - A white felt-like growth or mold appears on the leaves in the late spring.
The mold may become very heavy near harvest or later. Tiny black
bodies later appear in the mold giving it a dirty gray appearance. Infected
leaves may become somewhat curled. Sometimes the fruit is stunted
or poorly formed and coated with a white powdery covering.

**Control:** Dust at shuck fall or a week later with dusting sulfur at 16 to 30 pounds per
acre and again three weeks later. At higher elevations, consider local conditions.
It may be necessary to change the time of dusting to suit the season. If spraying
is used, apply 3 pounds of wettable sulfur per 100 gallons of spray at shuck fall
and 2 to 2 1/2 pounds per 100 gallons about three weeks later. Keep the orchard
free of tall weeds and cover crop growth through the growing season. After harvest,
spray with 3 pounds of wettable sulfur or dust with sulfur at the rate of 1 pound
per large tree. Mildew occurs more often on sour cherries than on sweet cherries.

**Virus Diseases**

**Twisted Leaf** - The leaves are twisted and curled at the ends of twigs. Other leaves are
small and poorly shaped. The Bing variety is most severely affected and
may have misshapen fruits.

**Control:** Remove diseased trees promptly.

**Rasp Leaf** - The lower surface of the leaf has tooth-like growths along the midrib. The
edges of the leaves have teeth like a rasp. Severely affected leaves are
small, narrow, and extremely misshapen. One to several limbs or the whole
tree may be affected.

**Control:** Remove diseased trees as soon as found.

**Lambert Mottle** - The buds on the ends of twigs fail to grow and they eventually die.
Other leaf buds and fruit buds grow irregularly. New shoots grow out
part way down the previous season's growth. Crops are light and many
fruits do not mature. Found on the Lambert variety only.

**Control:** Remove diseased trees when found.

**Little Cherry** - This disease affects the fruit only, making it small and late in ripening.
At picking time many cherries may be half normal size, pinkish and of a
very poor flavor.

**Control:** Remove diseased trees promptly.

**Mottle Leaf** - Severely affected leaves show irregular yellowish mottling and are poorly
shaped. Leaves may be small and may show a shot-hole effect but do not
fall from the tree prematurely. Fruit may be abnormally small; it ripens
late, has a poor flavor, but is normal in shape. Severely affected trees
may be stunted.

**Control:** Remove affected trees after harvest where disease is severe and trees are non-
productive.

**Rusty Mottle** - Four or five weeks after bloom, some leaves take on a yellow mottled color.
Later these leaves show bright colors and fall two or three weeks before
harvest. Other leaves may become mottled and later have a general rusty
appearance. On trees affected for more than two years, fruits are normal
in shape, but may be small, late-maturing and of poor flavor.
Black Canker - Cankers on 1-year-old twigs are slightly swollen with the bark split lengthwise. Cankers may be few to many and increase in size with each year's growth, some dieback may occur. Fruit and leaves are normal in size and shape.

Control: Use only clean budwood. Remove unprofitable trees.

Ring Spot - Leaves show yellow rings, spots, and patterns made up of rings and spots. On some varieties stunting, dead buds, and killed areas in leaves and bark may be seen. Other varieties may show symptoms only when first infected and later seem to recover.

Control: Remove trees when no longer profitable.

Bud Sports

Crinkle - Leaves are poorly shaped but normal or nearly so in size. Many leaves are so oddly shaped that they do not look like cherry leaves. Fruit may be small, pointed and often have a raised suture. Affected trees usually have light crops. One or more limbs on a tree may be affected. Normal leaves may be found next to crinkle leaves.

Control: Remove trees when no longer profitable.

Deep Suture - Affected fruits have a deep crease along the suture side. Leaves may be more or less leathery, thicker than normal and somewhat ruffled. Some leaves are longer and narrower than normal leaves. Trees vary widely in symptoms of the trouble and those severely affected, from a distance, appear to be wilted.

Control: Plant healthy trees from reliable budwood sources. Remove trees as they become unprofitable.