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Sweet Cherry Orchard Establishment in the Pacific Northwest

Important Considerations for Success

Lynn E. Long and Clive Kaiser

Regularly producing sustainable yields of high-quality cherries is possible only where site and other conditions are near optimal. Properly evaluating a prospective orchard location, determining available resources, and establishing the orchard take careful planning. Because establishing an orchard involves significant expense and long-term commitment, consider all factors before deciding to plant cherries.

Contents

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Photos by Corianne Denby.

Learn More: Orchard Economics

The Costs and Returns of Establishing and Producing High-Density Sweet Cherries in Wasco County
http://arec.oregonstate.edu/oaeb/files/pdf/AEB0032.pdf

Enterprise budgets for cherries in Oregon
http://arec.oregonstate.edu/oaeb/

Enterprise budgets for cherries in Washington
http://extecon.wsu.edu/pages/Enterprise_Budgets

Learn More: Financing

USDA Farm Service Agency
http://www.fsa.usda.gov/FSA/

Step 1. Understand Orchard Economics and Develop a Business Plan

Orchard Economics and Financing

Orchard establishment is costly, and it will take at least 3 to 6 years before there is any return on investment. Make sure you have the financial resources necessary to sustain the operation during that time. When determining potential return, understand that the price received for fruit depends on not only fruit quality but also harvest timing, market volumes, and other unpredictable aspects of the market.

Establishment and maintenance costs for cherries are higher than those for many other perennial crops because the intensive nature of cherry production requires large amounts of skilled manual labor. In addition, the possibility of damage to the delicate fruit makes cherry production a financially risky venture.

There are several resources available to help you learn about orchard establishment and development costs in the Pacific Northwest. The Oregon State University (OSU) Department of Agricultural and Resource Economics produces enterprise budgets and other publications that cover a wide range of scenarios, including high- and standard-density orchards and the return on investment in Wasco County. Washington State University (WSU) Extension also publishes enterprise budgets for cherries.

Research the availability of financing *before* making a commitment to buy land or establish an orchard. Make an appointment with the agricultural loan officer at your financial institution, or consult the USDA Farm Service Agency farm loans program.

Location and Marketing

Carefully consider your marketing options. You can sell small quantities of fruit at fruit stands or open markets. However, you need to market production from more than 1 or 2 acres through a packinghouse. Visit with packinghouse personnel in your area early in your planning process. Find out if they accept fruit from new growers and are willing to work with you. Establishing a relationship with a packinghouse field person will help you grow the quality of fruit that the packinghouse is looking for.

Also consider access to and distance from the packinghouse. Transport over rough roads can damage the delicate fruit, so road surfaces should be smooth. Packing facilities should be close enough to the orchard that fruit can be cooled to 50°F within 2 to 4 hours of harvest.

Monetary returns are often related to harvest timing. Cherry sales immediately after the Fourth of July holiday usually return less than early or late-ripening cherries. In years of oversupply, returns may even start dropping before the Fourth of July. Cultivar selection with respect to harvest date is crucial.

Helpful Programs and Agencies

Small Farms Programs

Both the OSU Small Farms Program and WSU Small Farms Team offer a significant amount of helpful information for your planning process. Resources available through these programs can help you develop a business plan, determine crop production costs and returns, and identify potential funding sources.

USDA Natural Resources Conservation Service (NRCS)

NRCS works with private landowners to conserve soil, water, and other natural resources. Participation in NRCS programs is voluntary, and programs and services are accessible to all segments of the agricultural community, including underserved and socially disadvantaged farmers and ranchers.

NRCS manages natural resource conservation programs that provide environmental, societal, financial, and technical benefits. Of particular interest to prospective cherry growers is the Environmental Quality Incentives Program (EQIP), a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers eligible participants financial and technical help to install or implement structural and management practices on eligible agricultural land. Each NRCS region has different initiatives. Obtain more information from your local NRCS office.

Learn More: Helpful Programs and Agencies

OSU Small Farms Program
http://smallfarms.oregonstate.edu/

WSU Small Farms Team
http://smallfarms.wsu.edu/

USDA Natural Resources Conservation Service (NRCS)
http://nrcs.usda.gov/

NRCS contact information and local office directory
http://nrcs.usda.gov/contact

Environmental Quality Incentives Program (EQIP)
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/

Step 2: Determine Site Suitability

Whether you plan to develop existing farmland into an orchard or purchase land, be aware of and evaluate several crucial issues: water requirements and water quality, climatic conditions, site conditions, and site optimization.

Water Requirements and Water Quality

The Pacific Northwest east of the Cascades is an extremely arid region. To establish and produce premium cherries, you must irrigate. To irrigate, you must have a legal water right that allows season-long irrigation. Consult your state water resource department or visit your local watermaster's office to determine whether the land you are considering has a legal water right and what options are available to you.

Analyze any potential irrigation water to identify possible problems. Pay particular attention to pH, sodium absorption ratio, electrical conductivity, boron, and bicarbonate levels. In general, fruit trees are sensitive to salt. High bicarbonates can break down the soil structure, which reduces irrigation water penetration. Consequently, you may need to acidify water before irrigating. Your local Extension office can help you find an accredited water analysis lab.

Learn More: Water Rights

Oregon Water Resources Department
http://www.oregon.gov/OWRD/

Washington State Department of Ecology
http://www.ecy.wa.gov/

Idaho Department of Water Resources
http://www.idwr.idaho.gov/

Climatic Conditions

Climatic conditions that have the greatest impact on cherry production are temperature, precipitation, and wind. Study regional weather data to determine the suitability of a site. Important things to consider include severe, sudden freezes during winter; average last frost date in spring; incidence of summer winds; rainfall patterns as harvest approaches; and potential for hail. Regional data may have significant limitations because of microclimates. If this is the case, consider installing a temperature data logger at the potential orchard site.

If possible, evaluate several years of data before making a decision. It may also be beneficial to ask local residents for a general description of climatic conditions.

Learn More: Hardiness Temperatures

Critical Temperatures for Blossom Buds – Cherries. WSU Extension publication EB1128E. http://pubs.wsu.edu

Temperature

Cherry trees are adapted to truly temperate climates and require significant chilling to break dormancy (up to 1,500 hours of cool temperatures ideally between 37°F and 48°F). Note that chill units do not accumulate below 30°F. This chilling requirement typically is not a problem in the Pacific Northwest. Some areas in California require additional treatments, such as application of rest-breaking agents. However, these treatments have limitations. Avoid planting cherries in areas that do not have at least 1,000 chill units.

Cherry buds become hardy sometime in mid- to late fall. At this time, buds are capable of withstanding temperatures several degrees below 0°F until the chilling requirement is met and the rest period is fulfilled. If the temperature drops slowly and buds remain frozen, buds can reach an ultimate hardiness of -30°F. In the Pacific Northwest, temperatures usually fluctuate between freezing and thawing, and buds quickly lose acquired hardiness back to their baseline hardiness. Under these circumstances, winter freezes kill flower buds, and a freeze below -10°F can damage the phloem and cambium to the extent that trees may even die. This is especially true if the freeze occurs in fall before trees are dormant or in late winter after sap flow has begun.

After the rest period is fulfilled, sometime in December or January, the temperature at which buds are damaged rises slowly but remains a few degrees above 0°F until just before bloom. The potential for winter damage depends on season, severity of temperature oscillations, rapidity of decline, and cultivar. Lapins and Sweetheart seem more sensitive to winter injury than many other cultivars.

As the weather warms in spring, buds begin to swell, and the hardiness temperature varies depending on the stage of development. During this period, the flower primordia and flowers themselves are most susceptible to freezing. Spring frosts may limit production by killing flower buds but can also affect fruit quality by causing superficial marking on the fruit surface.

During bloom, air temperatures of at least 55°F are required for honeybee foraging, and maximum foraging doesn't take place until 65°F. Similar minimum temperatures are needed for pollen germination, pollen tube growth, and fertilization to take place in a reasonable amount of time so a crop is set. Although temperatures near 80°F significantly raise bee activity, higher temperatures can result in poor fruit set due to rapid pollen desiccation (drying out), increased respiration of growing pollen tubes, and ovule deterioration.

During the fruit development stage, hot weather above 95°F inhibits fruit growth and can lead to softening of cherries. After harvest, in late July and early August, temperatures approaching 100°F can cause malformation of next year's flowers, which can result in "doubling" of the fruit.

Precipitation

Rainfall during fall, winter, and spring can create a favorable environment for serious diseases, including bacterial canker and brown rot. Fortunately, most of Idaho and central Oregon and Washington are dry enough that these diseases are rarely a problem.

As cherries begin to change color from green to yellow (straw color), they become susceptible to absorption of surface water through the fruit cuticle and uptake of high levels of internal water by tree roots. Both situations can lead to severe rain cracking (fruit cracking). In some years, rain cracking can be a serious problem that destroys the entire crop. Reduce the potential for loss by planting multiple cultivars that ripen at different times or rain-tolerant cultivars, such as Regina and Attika. No cultivar is completely resistant to rain cracking.

Know the average annual precipitation for the site, how much of it occurs during the ripening stage, and the duration of these events. Most cherries can survive some rain even at their most sensitive stage, but extended rainfall can damage any cherry crop.

Hail at any time during spring or summer can cause major loss. Avoid locations that are prone to frequent hail.

Wind

Winds of 10 mph during bloom affect bee foraging, and bee flights may stop altogether if winds reach 15 mph. If winds continue through bloom, fruit set can be significantly affected. These winds can also affect ripening fruit, causing scuff marks and bruising, increasing cullage, and reducing packout.

Constant daytime winds during spring and summer, as are common in the Columbia River Gorge, can interfere with pesticide applications. In these situations, it is often necessary to spray in the evening. But if orchards are near homes, nighttime spraying may be disruptive to neighbors.

Winds can also make tree training difficult. In windy areas, growers often tie branches into the wind to prevent lopsided trees. It may also be necessary to support trees grown on Gisela rootstock to prevent them from leaning away from the wind.

Find out how often the wind blows at the potential site, the average wind speed during the growing season, and the direction of the prevailing wind. Planting windbreaks may mitigate wind problems.

Site Conditions

Crucial conditions that affect a site's suitability for cherry production include herbicide residue, soil characteristics, and topography.

Herbicide Residue

Before purchasing land or planting an orchard, find out if the site was previously farmed, used for pasture, or in the USDA conservation reserve enhancement program (CREP). In all these situations, herbicides may have been used to control weeds.

Persistent herbicides used on agronomic crops (e.g., wheat, pea, chickpea, lima bean, soybean, alfalfa, lentil, corn, clover, hay grass, rangeland, or pasture) may last up to 4 years in the soil. Planting cherries in this soil before herbicides have broken down can result in stunted, debilitated plants that are unlikely to recover from effects of the herbicide.

Learn More: Soil Analysis

NRCS Web Soil Survey
http://websoilsurvey.nrcs.usda.gov/

SoilWeb app
More information and links to download for iPhone or Android:
http://casoilresource.lawr.ucdavis.edu/drupal/node/886

Soil Sampling for Home Gardens and Small Acreages. OSU Extension publication EC 628.

Laboratories Serving Oregon: Soil, Water, Plant Tissue, and Feed Analysis. OSU Extension publication EM 8677.

Soil Test Interpretation Guide. OSU Extension publication EC 1478.
All available from
http://extension.oregonstate.edu/catalog

Analytical Laboratories and Consultants Serving Agriculture in the Pacific Northwest. WSU database.
http://www.puyallup.wsu.edu/analyticallabs/

Ensure you know the complete history of herbicide applications on the potential orchard site. If herbicide records are not available and you suspect persistent herbicides were applied, submit a soil sample for chemical analysis or conduct your own bioassay. Because a chemical analysis can be expensive and may not identify all herbicides, a bioassay may be more feasible. Your local Extension office can help you determine the residual activity of herbicides identified in a soil analysis report.

Soil Characteristics

Soil is one of the most important things to consider when choosing an orchard site. It provides the anchorage, nutrients, water, and oxygen needed for root growth. Soil is also difficult to modify, so carefully evaluate and analyze all soil characteristics.

First, obtain a soil profile. Cherry trees need at least 3 feet of active rooting depth, and it is imperative that there are no impervious layers or other subsurface obstructions in the profile. If there is an impervious layer, you must use deep plowing to break it up.

Next, determine what soils are present at the site. Obtain printed soil maps from your local NRCS office, or use the NRCS Web Soil Survey. This website provides searchable, interactive maps that allow you to zoom in on individual farms or parcels. Enter your location, and view soil characteristics, slope, altitude and more. If you have a smartphone, you can download the SoilWeb app, which uses your phone's GPS coordinates to provide soil survey information for your exact location.

Evaluate soil texture. Cherries prefer light, well-drained soils. A silt loam is best, but cherries can tolerate soils ranging from sandy loam to clay loam as long as there is good drainage. Cherries will die in waterlogged soils or where oxygen in the soil is limiting.

To determine soil pH, nutrient levels, organic matter content, and cation exchange capacity, submit a soil sample to an accredited analytical lab for chemical analysis. Soil analysis reports and formats may vary from lab to lab. Contact your local Extension office for more information and help interpreting soil analysis results. An orchard site should have soil with at least moderate fertility levels and no extremes in pH or high electrical conductivity.

Finally, if a site has grown fruit trees in the last 6 to 8 years or you plan to replant an existing orchard, be aware that replant disease may be a problem. Replant disease can cause poor establishment, reduced precocity, and weak growth through the life of the orchard. In this situation, consider soil fumigation.

Topography

A gentle slope facilitates good drainage in both soil and air. On heavier soils, a slope causes water to move away from root systems and provides better aeration. Cold air flows downhill like water, moving away from the trees. This helps reduce the potential for frost just before and during bloom. Be sure there is a clear path for cold air to flow completely out of the orchard. Sites at the bottom of hills, on flat areas, or in low spots may be prone to frost. Slopes that are too steep increase the potential for soil erosion and are unsafe for equipment operation.

The orchard aspect (exposure) affects the potential for wind damage, time of bloom and harvest, and incidence of winter injury. North-facing sites do not warm as quickly during the day, retain moisture longer on trees, and delay bloom and ripening. Southern exposures are generally warmer and drier and have more intense sunshine throughout the year, which leads to earlier bloom and harvest. Eastern exposures warm up more slowly during the day, thereby retaining moisture longer on trees and surrounding vegetation. This causes high humidity and increases the potential for disease.

Temperatures generally decline with increased latitude and elevation. For every 1,000-foot increase in elevation, there is a temperature decrease of about 3.5°F. For example, an orchard at 1,400 feet elevation averages temperatures about 5°F cooler than an orchard at sea level. This may seem like a small difference, but when accumulated over the growing season, it can mean a delay in harvest of 14 or more days. It can also mean the orchard is more prone to frost and winter freezes.

Site Optimization

It is doubtful you will find the perfect site and likely that some modifications will be necessary. Modifications, however, are expensive and may not totally correct site deficiencies.

Temperature

One of the most common modifications is temperature, but you can change orchard temperatures by only a few degrees. In most cases, however, a few degrees may make the difference between losing the entire crop and harvesting near-normal yields.

Wind machines (fans) can help raise the temperature around flower buds when a temperature inversion occurs. The strength of the inversion (the difference in temperature between air at ground level and air above) will determine the effectiveness of the fan. One fan can protect 5 to 14 acres depending on terrain, conditions, and design of the machine. Fans are most effective when temperatures are no more than 2°F or 3°F below critical. Fans are not effective during a cold front event when there is no inversion.

Orchard heaters can help in either a temperature inversion or cold front but are much more expensive to operate than fans. Unlike old smudge pots that create considerable smoke and pollution, modern heaters can be clean burning. Heaters are more effective at protecting buds and, in combination with fans, can provide more protection than either method alone.

Because overhead irrigation increases the potential for disease, most cherry orchards use under-tree irrigation systems. Although under-tree sprinklers are not as effective as overhead sprinklers at protecting buds from frost, they can provide some protection during a frost episode. Heat is released when water freezes, and that heat warms the air around the bud. For this process to work, however, ice must form continually during the freezing spell. Applying water to orchards in early spring can cool the soil, which can delay bloom and waterlog soils, thereby damaging trees.

Rain

In many parts of the world, growers protect cherries from rain with plastic covers. In the Pacific Northwest, covers are economically feasible in only a few limited situations (e.g., with high-value cultivars, such as Rainier).

Wind

Windbreaks can reduce fruit damage and other negative effects from wind, but they also increase shading and compete with the cherry trees for nutrients and moisture. Synthetic windbreaks are expensive to purchase and erect.

Learn More: Soil Modification

Acidifying Soil for Crop Production: Inland Pacific Northwest. Pacific Northwest Extension publication PNW 599. http://extension.oregonstate.edu/catalog

Soil

Deep rip soils before planting to break up hardpans close to the surface. Deep ripping, sometimes called subsoiling, involves cutting through the lower soil levels with a strong, narrow-tine implement without inverting the soil. If drainage is a problem, consider tiling the site to remove excess water.

If the soil analysis indicated a need for fertilization, add nutrients before planting and incorporate them into the soil. Thoroughly mix the soil and fertilizer in the planting hole, otherwise tree damage can occur. This is particularly important for nutrients that do not move in the soil.

For example, because phosphorous does not move quickly through the soil when applied to the surface, growers often sprinkle about ½ cup of monoammonium phosphate fertilizer on the backfill before shoveling soil into the hole during planting. This puts the fertilizer near the roots where it can promote root growth.

When soil pH is outside the ideal range of 6.0 to 7.0, some modification is possible. If soils are acidic, you can incorporate lime before planting to raise pH. It is more difficult to modify alkaline soils, but it is possible to incorporate sulfur or inject phosphoric acid or other acids into the irrigation system to lower pH. Although you can amend sodic (high-sodium) soils, it is an involved process.

Soil treatments can reduce the impact of replant disease. Although treatments are expensive, they are well worth the cost. Failure to correct this problem before planting can lead to poor-quality fruit and low yields throughout the life of the orchard. Colt rootstock seems resistant to replant disease and may provide an alternative to treatment.

Learn More: Cherry Production

Extension publications
See the "For More Information" section at the end of this publication.

OSU Extension, Wasco County
http://extension.oregonstate.edu/wasco/horticulture

OSU Extension, Umatilla County
http://extension.oregonstate.edu/umatilla/mf/cherries

Columbia Gorge Fruit Growers
http://www.cgfg.org/

Washington Growers League
http://www.growersleague.org/

Step 3: Develop a Thorough Understanding of Orchard Establishment and Horticultural Practices Before You Begin Planting

Premier orchards result only when growers meet and maintain exacting standards. Learn as much as possible about orchard establishment, tree growth, fruiting, and orchard management. By having a thorough understanding of cherry production, you can avoid making many basic mistakes during tree establishment.

The Extension publications listed in the "For More Information" section at the end of this publication were developed specifically for the Pacific Northwest, and many provide information that is particularly helpful for new or prospective growers. Contact your local Extension office for more information and assistance. In Oregon, both Wasco and Umatilla County Extension offer extensive information on cherry production. Also consider seeking help from an orchard consultant and other growers.

Step 4: Investigate Plant Material

Cherry cultivars are now available that can provide a continual harvest for up to 35 days when planted at the same location. However, if the potential orchard site is in an early harvest area, it may be advantageous to grow early cultivars to take advantage of the higher prices often received for off-peak fruit. If the site is at a higher elevation or more northerly latitude, late cultivars may provide a financial advantage.

Mazzard has long been the rootstock of choice for the Pacific Northwest. It produces a tall, vigorous tree that takes 5 or 6 years to come into production. Semi-dwarfing rootstocks are also widely planted in the Pacific Northwest. These rootstocks grow less vigorous trees that are suitable for high-density orchards and produce fruit as early as the third leaf. However, without proper management, these trees overset easily and produce small fruit. Choose the right rootstock for your location and needs.

Nurseries usually need 2 years lead time to grow your trees. Occasionally, you can find nursery-grown trees that have not been purchased in advance, but these may not be the cultivar or rootstock you are looking for. Some nurseries grow potted trees in a greenhouse that are available in 1 year. In any case, expect to pay a deposit of about $1.00 per tree when you order.

Learn More: Cherry Cultivars

Sweet Cherry Cultivars for Brining, Freezing, and Canning in Oregon. OSU Extension publication EM 9056.

Sweet Cherry Cultivars for the Fresh Market. Pacific Northwest Extension publication PNW 604.

Sweet Cherry Rootstocks for the Pacific Northwest. Pacific Northwest Extension publication PNW 619.

All available from http://extension.oregonstate.edu/catalog

Step 5: Design the Orchard

Planting density and orchard layout depend on the training system, rootstock, and cultivar. Typical spacing for low-density orchards on Mazzard rootstock is 18 to 22 feet between rows and 15 to 17 feet between trees. Spacing for high-density orchards on semi-dwarfing rootstocks is closer to 15 feet between rows and 9 feet, or even as close as 6 feet, between trees.

Many newer cherry cultivars are self-fertile, so in most cases, you will not need to plant pollinizers. The exception is some of the less productive self-fertile cultivars, such as Skeena and Benton. Some growers who plant these cultivars plant pollenizers to increase fertility.

If you choose a self-sterile cultivar, such as Bing, Rainier, or Regina, plan where to put pollenizers in the orchard block. The normal pattern is to plant a pollenizer every third tree in every third row. Consult a compatibility and bloom chart to determine the best pollinizer for a particular cultivar. Pollinizers should be of a different compatibility group but need to bloom with the cultivar. Because it is difficult to set fruit on Regina trees, growers typically use three different pollinizers and plant a pollinizer after every five trees in every row. These pollinizers are grown on a dwarf rootstock and no extra space is provided for them in the row, so they must be pruned hard every year.

Learn More: Orchard Design

Cherry Training Systems: Selection and Development. Pacific Northwest Extension publication PNW 543.

Sweet Cherry Cultivars for the Fresh Market. Pacific Northwest Extension publication PNW 604.
Includes sweet cherry compatibility and bloom timing chart.

Both available from http://extension.oregonstate.edu/catalog

Step 6: Survey and Stake the Plot

Determine the amount of space required to safely turn a tractor with an attached sprayer, and stake the orchard plot just inside this area. You can complete this step yourself, but if the site is on difficult terrain with valleys and hills, you may choose to hire an engineer. This assures straight rows and even spacing.

Learn More: Irrigation

Simple Steps to Irrigation Scheduling Using the "Look and Feel" Method. OSU Extension Service, Wasco County.
http://extension.oregonstate.edu/wasco/sites/default/files/horticulture/simple_steps_to_irrigation_scheduling.pdf

Transitional Effects of Double-Lateral Drip Irrigation and Straw Mulch on Irrigation Water Consumption, Mineral Nutrition, Yield, and Storability of Sweet Cherry
Yin et al., 2012, HortTechnology, vol. 22, issue 4, pp. 484–492
http://horttech.ashspublications.org/content/22/4/484.abstract

Plant Trees Carefully

- Holes should be large enough to encompass the roots without having to bend them.
- If you are planting in heavier soil with clay, eliminate glazing (smooth, impenetrable soil) by roughing up the soil on the walls of the hole. This helps roots penetrate the walls and grow into the surrounding soil.
- If you lay trees next to the holes in preparation for planting, plant them within a few minutes or the root hairs or even primary roots will become desiccated and die, weakening or killing the trees.
- Remove any restrictive barriers to growth, such as plastic twine or wires.
- Make sure roots are spread out and facing down so they do not become "J" rooted.
- Do not twist or stuff roots into plant holes. This can cause abnormal growth and girdling several years later.
- Do not plant trees on clonal rootstocks too deep. Make sure the graft union is above the soil line.

Step 7: Plan for Irrigation

Design the irrigation system before planting trees. You can design it yourself or hire a consultant. You may also find it helpful to talk with other growers.

Microsprinklers are most common in the Pacific Northwest, but drip systems are becoming more popular and have been shown to produce high-quality fruit with significantly less water. In a study conducted in The Dalles, Oregon, use of a double-line drip system reduced irrigation water use up to 58% compared with the use of microsprinklers. For optimal watering efficiency, many growers install a drip system and also use microsprinklers so they can maintain a cover crop with short irrigation sets.

To produce high-quality cherries, it is important to irrigate at the proper time. Trees need supplemental irrigation shortly after planting to establish quickly. A common mistake is to over-irrigate in spring, but this tends to keep the soil cool longer than necessary and may damage the trees. As harvest approaches, many growers mistakenly under-irrigate at the critical fruit-expansion period.

Although irrigation requirements vary depending on orchard aspect, temperature, wind conditions, and tree age, you must always be able to supply sufficient water during the peak water use periods in midsummer. For example, gross water requirements for cherries grown in The Dalles, Oregon, are 8 acre-inches for July and 32 acre-inches for the year.

Use some form of soil-moisture monitoring to determine when water is needed. Watermark blocks and tensiometers are the most common instruments used to determine irrigation scheduling. Bury these at 12-, 24-, and 36-inch depths so you can best understand the trees' needs. Another option is to hire an irrigation consultant to provide and interpret the data.

Step 8: Transport and Plant Trees

Cover trees with a canopy when transporting them to the site because they will desiccate if exposed to wind or sun. Cover trees with wet burlap, or place them in moist (not wet) peat, vermiculite, or sawdust. If possible, soak trees in water overnight before placing them in moistened sawdust. Make sure the sawdust never dries out.

Sort through the trees, and set aside any marginal plants. Look for crown gall (enlarged globular growths on the roots or crown caused by a bacterium), obviously discolored roots or stems, rotted or decayed material, and desiccated plants. If you must plant these marginal trees, put them in the same row or edge so you can easily evaluate them in the future.

Plant trees carefully to avoid any injury to the plants. Careful planting can yield benefits throughout the life of the orchard.

After planting, sow a cover crop between rows. Cover crops reduce erosion and compaction, aerate the soil, and keep the orchard cool. Chemical dealers often sell seed mixes acclimated to local conditions.

Step 9: Determine Labor Needs and Sources

Growing cherries is labor intensive. If you have a small orchard, you may be able to manage alone for much of the year. However, even the smallest orchards need extra employees during harvest. On average, two to three employees are needed for every acre of fruit harvested at the same elevation. It is wise to determine how you will obtain this labor long before the trees mature.

If your harvest is not during peak production, you may be able to borrow pickers from a neighbor. Make these arrangements well in advance. If you need your own pickers, decide how you will recruit pickers, handle payroll, and provide housing for workers. These are only a few of the issues you need think about before the first harvest. Visiting with other growers can help you identify your best options.

If you plan to build housing for workers, first consult your county planning office. The U.S. Department of Housing and Urban Development and USDA Rural Development websites list federal requirements pertaining to worker housing. States must abide by these regulations but can be more restrictive. Check state policies before starting a housing project. Grower organizations also provide information about worker housing.

Step 10: Ask Questions

Establishing an orchard is a demanding and challenging undertaking with many risks. Nevertheless, producing cherries can be very rewarding and provide a worthwhile, satisfying lifestyle. It is important to carefully research all aspects of orchard establishment before deciding to proceed.

As you evaluate potential orchard sites and learn more about orchard establishment, you will likely have questions that are not fully answered in this publication. Obtain more information at your local Extension office. Extension faculty are local contacts who can answer questions about soil sampling, regional climate trends, and other topics and direct you to other useful resources. Find your local Extension Office:

- Oregon: *http://extension.oregonstate.edu/find-us*
- Washington: *http://extension.wsu.edu/locations/*
- Idaho: *http://www.extension.uidaho.edu/find.asp*

Learn More: Worker Housing

USDA Rural Development farm labor housing grant and loan information
http://www.rurdev.usda.gov/HAD-Farm_Labor_Grants.html

Oregon Bureau of Labor and Industries (Oregon BOLI) farm and forest labor information
http://www.oregon.gov/boli/WHD/FFL/

Oregon Housing and Community Services farmworker information
http://www.oregon.gov/OHCS/pages/ppr_Farmworkerinformationcenter.aspx

Oregon Occupational Safety and Health Division (Oregon OSHA) agricultural labor housing information
http://www.orosha.org/subjects/agricultural_labor_housing.html

Washington State Department of Health migrant farmworker housing information
http://www.doh.wa.gov/LicensesPermitsandCertificates/FacilitiesNewReneworUpdate/MigrantFarmworkerHousing.aspx

Columbia Gorge Fruit Growers
http://www.cgfg.org/

Washington Growers League
http://www.growersleague.org/

For More Information

Both OSU and WSU have an extensive list of Extension publications on various orchard topics. Pacific Northwest Extension publications (those numbered with a PNW prefix) are available through OSU, WSU, and the University of Idaho. Visit these universities' online Extension catalogs to browse by topic or search for the publication titles and numbers listed below.

OSU Extension Publications

Irrigation Monitoring Using Soil Water Tension. EM 8900.

Laboratories Serving Oregon: Soil, Water, Plant Tissue, and Feed Analysis. EM 8677.

Soil Sampling for Home Gardens and Small Acreages. EC 628.

Soil Test Interpretation Guide. EC 1478.

Sweet Cherry Cultivars for Brining, Freezing, and Canning in Oregon. EM 9056.

WSU Extension Publications

2009 Cost Estimates of Establishing and Producing Sweet Cherries in Washington. FS022E.

Cost of Establishing and Producing Sweet Cherries in Central Washington in 2007. EB2026E.

Critical Temperatures for Blossom Buds – Cherries. EB1128E.

Fertilizer Guide: Soil Samples/Orchards. FG0028C.

Frost and Frost Control in Washington Orchards. EB0634.

PNW Extension Publications

Acidifying Soil for Crop Production: Inland Pacific Northwest. PNW 599.

Cherry Training Systems: Selection and Development. PNW 543.

Four Simple Steps to Pruning Cherries on Gisela and Other Productive Rootstocks. PNW 592.

Sweet Cherry Cultivars for the Fresh Market. PNW 604.

Sweet Cherry Rootstocks for the Pacific Northwest. PNW 619.

Extension Catalogs

Oregon:
http://extension.oregonstate.edu/catalog/

Washington:
http://pubs.wsu.edu

Idaho:
http://www.cals.uidaho.edu/edComm/catalog.asp

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.

Pacific Northwest Extension publications are produced cooperatively by the three Pacific Northwest land-grant universities: Oregon State University, Washington State University, and the University of Idaho. Similar crops, climate, and topography create a natural geographic unit that crosses state lines. Since 1949, the PNW program has published more than 600 titles, preventing duplication of effort, broadening the availability of faculty specialists, and substantially reducing costs for the participating states.

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