

Establishing a vineyard in Oregon: A quick-start resource guide

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A newly planted vineyard in Oregon's Willamette Valley was designed based on the topography of the land. Vines are protected by grow tubes and drip irrigation installed to ensure a healthy start.

Photo: Patricia A. Skinkis

Many questions come to mind when planting a vineyard: Is the land suitable for growing grapes? What soil types are best for successful wine grape production? How much does it cost to establish and manage a vineyard?

The early decisions about vineyard location and design are critical to the success and sustainability of the vineyard business you imagine. This guide outlines the main factors to consider when establishing a commercial vineyard and suggests resources to assist in planning.

Step 1: Learn about viticulture and business before planting

The most important step in deciding whether to establish a vineyard is to learn as much as possible about viticulture and the business of growing grapes. This learning process includes understanding key factors of farming, such as vine growth and physiology, vineyard design, farm inputs, crop management, labor needs, business management and marketing. Understanding both production and business will help you avoid costly mistakes during establishment and once the vineyard is in full production.

Some of the resources below were developed for Oregon and/or the Pacific Northwest. They provide vital information for developing and managing vineyards.

Oregon State University Extension Service

The OSU Extension Service provides information for commercial wine grape growers and homeowners who have small vineyards. Extension provides important resources in wine grape production, crop production, pests, pest management, soils and agribusiness. The educational materials (such as practical guides, articles and videos) are created by OSU experts and are available online for free. The most relevant resources are in the [Wine Grape Production \(https://extension.oregonstate.edu/crop-production/wine-grapes\)](https://extension.oregonstate.edu/crop-production/wine-grapes) section of the OSU Extension website. There, viticulture Extension faculty provide helpful resources and details about upcoming wine grape industry events. Different programs important to establishing a vineyard and/or winery business include:

- [OSU Small Farms Program \(https://extension.oregonstate.edu/smallfarms\)](https://extension.oregonstate.edu/smallfarms)
- [Wine, Beer, and Spirits \(https://extension.oregonstate.edu/food/wine-beer\)](https://extension.oregonstate.edu/food/wine-beer)
- [OSU Extension Service online catalog \(https://catalog.extension.oregonstate.edu/\)](https://catalog.extension.oregonstate.edu/)

Industry newcomers find OSU Extension events enhance their knowledge and allow them to engage with industry colleagues.

Oregon State University's Oregon Wine Research Institute

Comprised of Oregon State University faculty and U.S. Department of Agriculture researchers, Oregon Wine Research Institute conducts research and outreach in viticulture, enology and applied economics. OWRI experts provide research-based solutions to Oregon's vineyard and winery technical issues. The [OWRI website \(http://owri.oregonstate.edu/\)](http://owri.oregonstate.edu/) provides research (such as newsletters and webinar recordings) and information about upcoming events.

Vineyard development companies and consultants

While it is best to learn as much as possible about viticulture and business before starting your vineyard, a vineyard consultant or management company can assist you with the planning and establishment phases. Contact your [local Extension office \(https://extension.oregonstate.edu/find-us\)](https://extension.oregonstate.edu/find-us) or [OWRI \(https://owri.oregonstate.edu/\)](https://owri.oregonstate.edu/) for a list of consultants serving Oregon vineyards.

Step 2: Develop a business plan

A vineyard operation is an agribusiness. Establishing a successful vineyard requires thoughtful business planning. Those who dream of a vineyard are often unprepared for the high costs involved. Vineyards are more costly to establish and maintain than many other perennial crops, such as fruit or nut trees, due to costs of trellising, hand

labor during the early years and the demands of maintaining a pleasant aesthetic appearance for vineyards associated with a winery and/or agritourism. The resources below provide basic information to assist you in the business planning process.

Status of the Oregon wine industry

[Oregon Vineyard and Winery Production Report](https://industry.oregonwine.org/research/oregon-vineyard-and-winery-report/) (<https://industry.oregonwine.org/research/oregon-vineyard-and-winery-report/>)

This report summarizes acreage, yields, fruit prices and other vineyard and winery production statistics. The information is organized by cultivar and region, and it can help you understand Oregon's current production economics. By compiling data from historical reports, you can observe trends in pricing and production that can help you plan your business. The report is updated annually and available online through the Oregon Wine Board.

Economics of vineyard establishment

Below are resources to help assess vineyard establishment and development costs. These resources are useful for new and experienced growers.

[Vineyard enterprise budgets](https://appliedecon.oregonstate.edu/oaeb) (<https://appliedecon.oregonstate.edu/oaeb>)

OSU Extension faculty developed enterprise budgets for wine grapes in Oregon. These publications outline the costs and returns of a vineyard business from establishment to full production. These guides are found on the Oregon Agricultural Enterprise Budgets website. You can search by commodity (such as grapes (wine)) to find available publications. See [Vineyard economics: Establishing and producing pinot noir wine grapes in the Willamette Valley, Oregon.](https://agsci.oregonstate.edu/sites/agscid7/files/oaeb/pdf/aeb0060.pdf) (<https://agsci.oregonstate.edu/sites/agscid7/files/oaeb/pdf/aeb0060.pdf>)

[Northwest grapes cost-of-production calculators](http://www.nwgrapecalculators.org/) (<http://www.nwgrapecalculators.org/>)

These online calculators were developed by the Washington Wine Industry Foundation and the USDA's Risk Management Agency for vineyards in the Pacific Northwest. It is a menu-driven site that assists you in developing an enterprise budget for wine or juice grapes using conventional or organic farming methods.

Financing

You should determine whether financing is available before committing to buy or lease land to establish a vineyard. The [OSU Extension Service Small Farms Program](http://smallfarms.oregonstate.edu/) (<http://smallfarms.oregonstate.edu/>) has resources and educational programs available.

Marketing and location

It is important to plant your vineyard in an area where you can produce a consistent crop of high-quality grapes. An equally important factor is proximity to a viable market. Many vineyard owners agree that it is easy to grow grapes and make wine, but selling wine is the most difficult part of the business. For this reason, you should locate your vineyard in an area that facilitates the sale of your fruit to wineries or marketing your wine to consumers if you intend to establish a winery.

Some vineyard production regions in the United States are located within regions known as American Viticultural Areas. Wineries may prefer to obtain fruit from particular viticultural areas and label wines with that distinction. Locating a vineyard or winery business within a specific viticultural area can improve marketing, but land values may come at a higher price for well-known regions.

American Viticultural Areas are under federal regulation by the [Alcohol and Tobacco Tax and Trade Bureau](http://www.ttb.gov/wine/ava.shtml) (<http://www.ttb.gov/wine/ava.shtml>) within the U.S. Department of the Treasury (Code of Federal Regulations Title 27, Part 9). You can find information about established viticultural areas on the bureau website.

Oregon Wine Board (<http://www.oregonwine.org/>)

This organization develops and markets the Oregon wine brand for the state's commercial wine grape industry. Contact the Oregon Wine Board for information about the state's vineyard growing regions and collective marketing initiatives.

Step 3: Determine site suitability

Whether you already own land or are searching for the perfect property, you must determine whether the site is suitable for grape production. Climate, topography, soils and water determine whether a site is suitable.

Climatic factors

Not all cultivated varieties (cultivars) of wine grapes grow or produce quality fruit under the same climatic conditions. The goal is to grow healthy grapevines and ripen fruit consistently each year. Cultivars differ in their winter hardiness, season length and heat requirements, so know the climate data for the area. You will need data on minimum winter temperatures, seasonal temperatures, growing degree days and frost-free days to determine which grape cultivars will be suited to your site or whether you can grow grapes sustainably or at all.

Growing degree days and frost-free days

Two important climatic factors are how warm and how long growing seasons are in your region. Growing degree days are a measure of heat accumulated during the growing season. They are calculated using the average daily temperature for each day, with a daily minimum threshold temperature of 50°F. Growing degree days for a growing season are calculated by adding together all daily growing degree days for the season, typically from April 1 through Oct. 31 for most of Oregon's wine grape production regions.

Seasonal growing degree days determine whether you can produce cool-, warm-, or hot-climate grape cultivars. In general, cool-climate cultivars require 1,800 to 2,500 growing degree days in a growing season to ripen properly. Examples include Pinot noir, Pinot gris, Riesling, Gewürztraminer, Muscat and Chardonnay. Warm-climate cultivars such as Cabernet Sauvignon, Merlot, Viognier and Tempranillo typically need 2,500 to 3,500 growing degree days. Finally, hot-climate cultivars require more than 4,000 growing degree days. These hot-climate grapes include

cultivars grown for raisin and table grape production, and they are not typically grown in Oregon.

Frost-free days are the number of days that are above freezing during the growing season. During the growing season, when grapevines are green and growing, frost can limit grape production. Typically we observe frost-free days from April 1 to Oct. 31 to define the season length for grapes. Most grape cultivars require a minimum of 150 frost-free days to produce successfully. Frost mitigation strategies (such as wind machines, frost fans or overhead irrigation) may be used in vineyards with known frost risks during the season. This should be included in the vineyard development plan.

The following online resources provide growing degree days and frost-free days data and daily temperatures, precipitation and other weather data for many locations throughout Oregon.

- [Oregon climate summaries \(https://wrcc.dri.edu/summary/Climsmor.html\)](https://wrcc.dri.edu/summary/Climsmor.html)
- [AgriMet Cooperative Agricultural Weather Network \(https://www.usbr.gov/pn/agrimet/wxdata.html\)](https://www.usbr.gov/pn/agrimet/wxdata.html)

Topography

Slope and aspect determine the site's sunlight exposure patterns and duration, heat accumulation, and air and water drainage. Topography is important to consider for vineyard design and equipment safety, particularly on hillsides. Other considerations related to topography are elevation and air drainage (to avoid frost and freeze pockets).

Soils

When choosing a vineyard site, avoid land with a high water table, shallow soils, and/or impervious soil layers. Before purchasing land or planting vines, be sure to collect soil samples for analysis of soil properties, chemistry and nematodes. If possible, arrange for a local soils consultant to do detailed soil mapping of the site. To find a soil consultant, contact your local Extension office or local [Natural Resources Conservation Service \(https://www.nrcs.usda.gov/state-offices/oregon\)](https://www.nrcs.usda.gov/state-offices/oregon) office.

Identify soil types

The [Web Soil Survey \(http://websoilsurvey.nrcs.usda.gov/app/\)](http://websoilsurvey.nrcs.usda.gov/app/) created by the conservation service provides online access to soil maps. These maps help identify characteristic soils of a given site. You can input an address and view soil and topographic characteristics. Printed soil maps are also available from [local NRCS offices \(https://www.nrcs.usda.gov/wps/portal/nrcs/site/or/home/\)](https://www.nrcs.usda.gov/wps/portal/nrcs/site/or/home/).

These maps are based on regional soil sampling and do not provide a fine resolution mapping of soil types on a given property.

Test for nematodes

Nematodes are tiny, soil-borne roundworms that may be parasitic to grapevines, depending on species. The parasitic species may cause damage to the roots or transmit viruses that can jeopardize vine health. A wide range of soil types can host nematodes. Also, if an orchard or vineyard was on the land previously, there may be nematode populations in the soil. It is best to test soils on the property even if a vineyard was not on the land previously.

Soil Testing

The following publications can be found online at the [OSU Extension Catalog \(http://extension.oregonstate.edu/catalog/\)](http://extension.oregonstate.edu/catalog/):

- [A guide to collecting soil samples for farms and gardens \(EC 628\) \(https://catalog.extension.oregonstate.edu/ec628\)](https://catalog.extension.oregonstate.edu/ec628)

- [Soil test interpretation guide \(EC 1478\)](https://catalog.extension.oregonstate.edu/ec1478) (<https://catalog.extension.oregonstate.edu/ec1478>)
- [Get actionable results from a soil, plant or environmental testing lab](https://extension.oregonstate.edu/catalog/em-8677-get-actionable-results-soil-plant-or-environmental-testing-lab?reference=catalog_) (https://extension.oregonstate.edu/catalog/em-8677-get-actionable-results-soil-plant-or-environmental-testing-lab?reference=catalog_) (EM 8677)

Irrigation and water availability

In many areas of the state, including southern and eastern Oregon and the Columbia Gorge, it will be difficult to produce wine grapes without supplemental irrigation. While it is possible to produce wine grapes without irrigation (dry farm) in many areas of the Willamette Valley, it is important to have access to water for the establishment years (years 1–3). Before buying land or developing a vineyard, determine if water is available and investigate water rights using the [Oregon Water Resources Department website](https://www.oregon.gov/owrd/pages/index.aspx) (<https://www.oregon.gov/owrd/pages/index.aspx>).

Irrigation systems

The vineyard enterprise budgets provide detailed information on irrigation costs. Contact an irrigation company or vineyard consultant who can help you design systems suitable for your vineyard and soil characteristics.



Land has been cleared and prepared in advance of installing trellis and planting grapevines.

Photo: Patricia A. Skinkis

Step 4: Investigate cultivars, clones, and rootstocks

Choosing the best cultivars and clones to grow depends on many factors, including climate, soils, diseases, pests and cultural practices. To narrow down cultivar options, begin with site, climate and marketability. Marketability factors were addressed in Step 2, and some climatic factors were addressed in Step 3.

Cultivars and clones

Much like a plant genus (such as *Vitis*) has different species (*Vitis vinifera*, for example), and different species have different cultivars (Pinot noir, for example), a cultivar may have different clones. In viticulture, “clone” refers to a grape cultivar with multiple “variants.” These clones have specific characteristics that are maintained when propagated.

Selecting the appropriate cultivar will depend on your climate. Pinot noir is the most commonly grown cultivar in Oregon, making up more than 60% of the state’s acreage. Pinot noir does especially well in the major grape growing regions of the state because it is a cool climate cultivar. Much of western Oregon is a cool climate region (< 2,500 growing degree days annually). Some regions of the state are able to produce warm climate cultivars such as Cabernet Sauvignon, Syrah and Merlot. See Step 3 for more information.

Many Oregon growers select specific clones of Pinot noir (Pommard, Dijon 115 and Dijon 777, for example) for their ripening timing and/or fruit quality characteristics. Selecting specific clones within a cultivar can be difficult and depends on qualities of interest, including agronomic characteristics (yield and cluster size) and winemaking characteristics. However, many clonal differences within a given cultivar are subtle, and these can only be detected once wines are produced. Therefore, it may be informative to contact local winemakers for input. The resources below provide helpful information.

Oregon Wine Research Institute Scholars Archive at OSU

OSU has researched rootstocks and clones of Pinot noir and Chardonnay. [Research summaries \(https://ir.library.oregonstate.edu/collections/nz806494j?locale=en\)](https://ir.library.oregonstate.edu/collections/nz806494j?locale=en) are available online from these studies conducted in the 1990’s to early 2000’s.

Foundation Plant Services Grape Program

Growers sometimes wish to grow unique cultivars and clones in their new vineyards. They may assume that the vines do not exist in the U.S. and try to acquire them without regard to the U.S. and Oregon plant quarantine rules. The [Foundation Plant Services Grape Program’s \(https://ngr.ucdavis.edu/fgrmain.cfm\)](https://ngr.ucdavis.edu/fgrmain.cfm) online resource helps determine which cultivars and clones exist in the United States. Use this website’s search feature to determine if the cultivars and clones you are interested in growing are registered in the US.

Rootstocks

The primary reason for using rootstocks is to prevent vine damage and subsequent death due to soil-borne pests, namely grape phylloxera and plant-parasitic nematodes. Grape phylloxera is an aphid-like insect that feeds on grape roots and is native to the eastern United States. The pest has spread to all established grape-growing regions of the world. The European grape species utilized for wine grape production, *Vitis vinifera*, is susceptible to damage by this pest and will ultimately die from infestation. Thus, vineyards should be planted to vines grafted to phylloxera-resistant rootstocks even if the new planting is on land not previously planted to grapevines. Nematodes are soil-borne microscopic roundworms that can parasitize grapevine roots and may vector viruses, both of which may

reduce vine productivity. It is important to thoroughly examine soil pest conditions before making rootstock decisions (see Step 3). Unfortunately, not all phylloxera-resistant rootstocks are resistant to all plant-parasitic nematodes. Therefore, testing the vineyard soils before planting will help determine which pests are of greatest concern. [Grape phylloxera: Biology and management in the Pacific Northwest \(EC 1463\)](https://catalog.extension.oregonstate.edu/ec1463) (<https://catalog.extension.oregonstate.edu/ec1463>) provides more information about grape phylloxera. Contact your local Extension agent and nursery supplier for information on rootstock performance important for your region.



These grapevines were bench grafted by the nursery when dormant and are now growing and ready for planting in the vineyard.

Photo: Patricia A. Skinkis

Vines with the virus often have reduced vigor, yield or fruit quality and may pose an infection threat to other vineyards. Ask the nursery whether the cultivars, clones and rootstocks you are interested in are propagated from a certified source.

Nurseries that sell certified grapevines obtain their plants from certified “mother” blocks, from which they propagate and sell certified plant materials. The nursery maintains certification of those plants by regularly testing plant tissues from those mother blocks, ensuring that they are free of the most important grapevine viruses. It is important to talk with your industry colleagues before ordering plants to determine which nurseries have a good track record in delivering quality plants. Learn more about plant certification from the [National Clean Plant Network](https://www.nationalcleanplantnetwork.org/) (<https://www.nationalcleanplantnetwork.org/>) in the resources below:

- [What does certification mean? \(https://www.nationalcleanplantnetwork.org/state-certification\)](https://www.nationalcleanplantnetwork.org/state-certification)
- [Economic benefits of using clean plants \(https://www.nationalcleanplantnetwork.org/economic-benefits\)](https://www.nationalcleanplantnetwork.org/economic-benefits)

Step 5: Order plants

Oregon grape quarantine

Rules and regulations govern the shipment of plant materials to Oregon from outside the state. It is important to be aware of these rules when buying plants. The quarantine is enforced by the Oregon Department of Agriculture. Read more about the [Oregon grape quarantine](https://www.oregon.gov/oda/programs/PlantHealth/Pages/Grape-Quarantine.aspx) (<https://www.oregon.gov/oda/programs/PlantHealth/Pages/Grape-Quarantine.aspx>) at the department’s website

Plant materials

To obtain the best plant material, be sure to place your order with the nursery at least 12 to 18 months before you plan to plant your vineyard. Always buy your grapevines from reputable nurseries, and choose plants from a “certified” source. Vines that are not certified are not from a source that has met testing and inspection standards of that state’s agriculture department and may not be free of the important grapevine viruses, including leafroll, red blotch and fanleaf.

Need more information?

Be sure to check out [Considerations and Resources for Vineyard Establishment in the Inland Pacific Northwest \(https://catalog.extension.oregonstate.edu/pnw634\)](https://catalog.extension.oregonstate.edu/pnw634) (PNW 634) for more information on vineyard establishment and management.

Many questions are likely to arise when planning a vineyard and winery business. If you have consulted the resources above and need additional help, contact one of the [OSU Extension offices \(http://extension.oregonstate.edu/locations.php\)](http://extension.oregonstate.edu/locations.php) in the nearest grape-growing region (Table 1). Horticulture, Agriculture and Small Farms Extension faculty in regions throughout Oregon can assist with farm and vineyard-related questions.

Table 1. OSU Extension Service contacts

Region	Location and website	Phone
Southern Oregon*	Southern Oregon Research & Extension Center, Central Point	541-772-5165
Central Oregon	Deschutes County Extension, Redmond	541-548-6088
Columbia Gorge	Wasco and Hood River County Extension	541-296-5494
Eastern Oregon/Walla Walla Valley	Umatilla County Extension, Milton-Freewater	541-938-5597
Statewide Viticulture Extension	OSU main campus, Corvallis	541-737-1411
Statewide Enology Extension	OSU main campus, Corvallis	541-737-6494

*Includes the AVAs of the Umpqua, Rogue, Illinois and Applegate valleys.

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