



# Pinot Family

**P**inot noir appears to be genetically unstable and new clones, resulting from “point mutations” of this variety, have been selected by growers who were attracted to their unique fruit color or shoot growth. In Pinot noir vineyards, it is not uncommon to find one or more vines with a single shoot that has characteristics quite unlike the others on the same plant. Depending on the type of mutation that has occurred, these characteristics may or may not be maintained when buds from the shoot are used to propagate new vines. However, if all buds on the new vines display the same attributes that were present on the original shoot, then a new clone or variety is born.

Pinot blanc, Pinot gris, and Meunier are all descendants of Pinot noir. Each differs from its parent in various ways, most notably in fruit color, and in the case of Meunier, the copious amounts of white hairs on the shoot tips. These varieties differ in fruit flavor and wine aroma that sets them even further apart from Pinot noir.

## Pinot noir

### Synonyms

There are numerous synonyms for Pinot noir and each of its variants that have become known as varieties. This is to be expected given its seven centuries of regular cultivation in the Old World and subsequent movement to several other wine grape-growing countries. Many synonyms are out of use; however, it is not uncommon for Pinot noir to be known by several different names in various growing regions of France as well as in other countries. The list of synonyms given here is far from complete and there are variations of these names in use.

In France, Pinot noir is known as variations of the following: Pineau de Bourgogne, Franc Pineau, Noirien, Franc Noirien, Salvagnin, Morillon, Auvernat, Auvernaut noir, Plant Doré, and Vert Doré. In Germany it is called Burgunder blauer,

Blauer Spätburgunder, Clävner, Blauer-Klävner, Schwarzer Riesling, Möhrchen, and Schwarzer Burgunder. In Italy, it is known as Pinot nera; in Austria, Blauer Nürnberger; and in Hungary, Nagyburgundi.

### Source

Pinot noir is perhaps the oldest cultivated variety of the genus *Vitis*. It is thought to be the cultivated vine described by Roman authors in the first century. By the fourteenth century it was known by several names—including Pinot—in different growing regions in France.

### Growth and Soil Adaptability

Pinot noir tends to be a moderate- to low-vigor variety when grafted onto rootstocks that do not have *vinifera* in their parentage. To meet fruit quality objectives, higher-vigor vines must be aggressively managed to control crop level. As a result, deep, fertile soils are usually not considered optimal for this variety. In California, Pinot noir is grown in a wide variety of soil types, from sandy loams to heavy clays.



Although soil type and depth will impact vine growth, climate will also affect growth and play a large role in determining site suitability for Pinot noir. To optimize fruit quality, cool areas are strongly preferred. Vines are spaced 4 to 6 feet apart in the vine row in most sites.

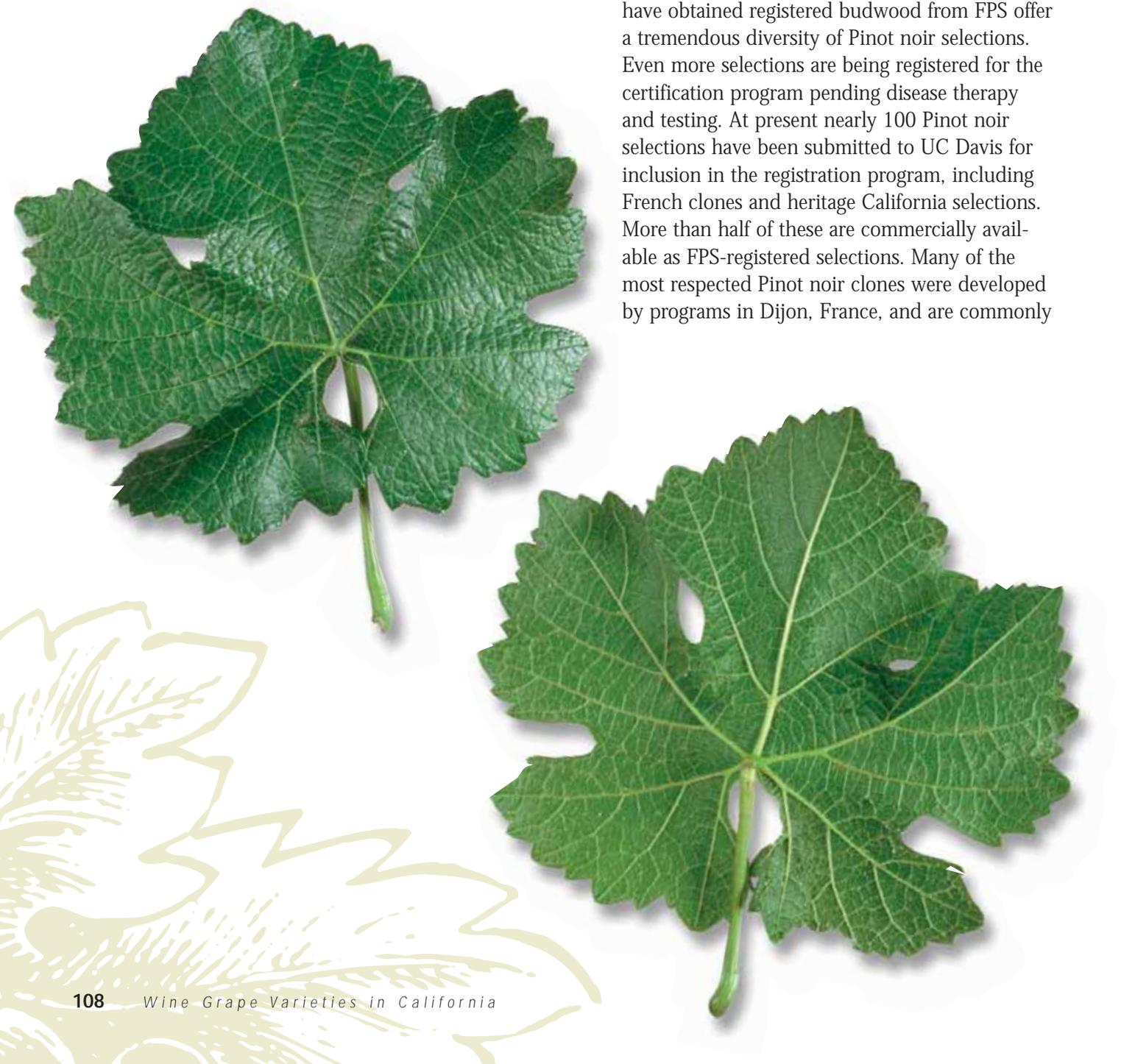
Pinot noir has among the earliest budbreak and harvest dates when compared to most varieties. Since it is a short-season variety, it is chosen for marginal sites where temperatures preclude other varieties from reaching full maturity. Early budbreak often puts it at risk for spring frost. Likewise, temperatures are more likely to be cool and damp during the bloom period, which can result in coulure or millerandage, thus reducing fruit set and yield.

## Rootstocks

Several different rootstocks are used for Pinot noir, including those that tend to reduce vine growth as well as those that impart vigor. In extremely cool areas, rootstocks that may delay the development of ripe fruit characters, such as 110R, should not be used. Occasionally, virus-infected budwood will result in severely diseased vines when grafted onto specific rootstocks. Rootstock selection is a function of the site's soil and climate as well as production goals.

## Clones

There are more clones of Pinot noir than of any other wine grape variety, and, not surprisingly, most are from France. California nurseries that have obtained registered budwood from FPS offer a tremendous diversity of Pinot noir selections. Even more selections are being registered for the certification program pending disease therapy and testing. At present nearly 100 Pinot noir selections have been submitted to UC Davis for inclusion in the registration program, including French clones and heritage California selections. More than half of these are commercially available as FPS-registered selections. Many of the most respected Pinot noir clones were developed by programs in Dijon, France, and are commonly



known as “Dijon clones” in California. The most authentic Dijon clones are available through the ENTAV-INRA® trademark program. These include Pinot noir ENTAV-INRA® 115, 165, 236, 375, 459, 667, 743, 777, and 943. There are also Dijon clones of varied source and disease status in the trade.

The viticultural performance of Pinot noir clones as well as wine quality evaluations often produce inconsistent results for the same clones due to differences in site, climate, and management practices. Also, growers have access to clones that have not been planted in California previously and for which there is little, if any, performance information. This makes it extremely difficult to do more than generalize about the behavior of specific clones. There are four main groups of Pinot noir clones: standard quality (Pinot fin), highly fruitful (Pinot fructif), upright shoots (Pinot droit), and loose-clustered (Mariafeld). Past experience has shown that excellent quality wines have been produced from clones within each group, although they often do not achieve this reputation in France.

Wine-making goals are the driving force behind clonal selection in Pinot noir. In extremely cool areas, early ripening is a necessity, hence lower-yielding clones would be chosen over high-yielding, later-maturing clones. In warmer areas, moderate-yielding clones can be successful. Practical considerations such as managing Botrytis bunch rot may cause growers to consider clones that reportedly tend to have looser clusters, such as FPS selections 17 and 23. However, experience has shown that in areas with high rot potential, clonal differences in cluster architecture seldom significantly reduce disease severity.

Pinot noir clones affect vine fruitfulness primarily by impacting the number of berries per cluster, although they also affect berry weight and cluster number. Due to the different aptitudes of the Pinot noir clones, many growers prefer to plant more than one clone of this variety in a vineyard. Higher-producing clones such as FPS selections 31 (French 236), 32 (French 386), and 33 (French 388) are commonly used for sparkling wine production since they are harvested at lower sugar maturity. There are several more clones from France’s Champagne region that have been introduced to California recently.



Several clones are used in coastal vineyards for table wine production. These include (but are not limited to) ENTAV 114, 115, 667, and 777 as well as FPS selections 04 and 05, both known as Pommard. Field selections have produced high-quality fruit and wines when located in optimum sites. These are commonly known by grower names such as Swan and Martini. Single-vine accessions of these field selections and others from selected California vineyards are in the registration process at FPS.

## Production

Pinot noir tends to be fruitful and can over-crop itself for a specific wine quality target. It is thought that large crops preclude ultra-premium wine production. Depending on vine density, 3 to 5 tons per acre is acceptable for table wine production. Higher yields usually result in quite acceptable, yet unremarkable red wines. Tonnage for sparkling wine production may be the same or it may be slightly higher depending on the winemaker’s preference.

Weather conditions at budbreak and bloom will affect set. In warm years, most clones may set too much fruit, and cluster thinning would be required to reach desired yields. Because Pinot noir vines produce shoots from latent buds, early season shoot thinning is required to achieve one shoot per count bud. Depending on the vines and management style, shoots may be thinned a second time prior to bloom to re-establish optimum shoot number. Clusters may be thinned to a prescribed method during the period of time that they are acquiring color. Cluster thinning may occur again near the end of veraison. For sparkling wine production, shoot thinning will occur only once, and vines may not be cluster thinned.

Cool and rainy weather during bloom can reduce fruit set dramatically. It is not uncommon for yields to be half the average under these conditions. Low-yielding clones exacerbate this effect.

## Harvest

**Period:** An early season variety, harvested in August to early September for sparkling wine and throughout September for table wine.

**Method:** Pinot noir is often harvested by machine for sparkling wine production; however, it is also hand harvested and transported to the winery in small tubs or half-ton bins. When machine picked for sparkling wine, it is essential to press the grapes soon after harvest to reduce color in the must. Harvesting Pinot noir grapes for table wine is done by hand for ultra-premium production. It is also machine harvested. Harvestability is easy to medium, with single berries and some cluster parts removed. Juicing is light to medium, with less juicing with bow rods than straight rods. Trunk shaking harvestability is medium, with light juicing.

## Training and Pruning

Pinot noir vines are spur pruned and cordon trained, or they may be head trained with fruiting canes and renewal spurs. In low-vigor sites, the Guyot training system of one cane and one spur is sometimes preferred to maximize uniform maturity by minimizing the amount of fruit arising from a large number of renewal spurs. In small-cluster clones or in very cool production areas, cane pruning is often practiced. In more vigorous sites, shoots will be hedged as needed.

## Trellising and Canopy Management

The height of the fruiting wire for a vertical-shoot-positioned system is commonly 30 to 36 inches. Two pairs of moveable wires are used to position shoots vertically. In vigorous sites, lyre or U-shaped horizontally divided canopies are used. GDC should be avoided since fruit tends to sunburn. Depending on row orientation, vertically separated or divided canopies such as Scott Henry or Smart-Dyson may result in over-exposed fruit without leaf removal. Leaf removal is practiced to enhance air movement around the fruit and reduce the severity of Botrytis bunch rot. Often leaf removal is minimal to avoid sunburn.





### Insect and Disease Problems

This variety is very susceptible to Pierce's disease and Botrytis bunch rot. Powdery mildew susceptibility is a result of the mild temperatures common in the regions where the variety is grown. Early budbreak may make it more susceptible to thrips.

### Other Cultural Characteristics

Cool conditions just prior to bloom may cause small necrotic areas to form at the attachment point of the petiole to the blade in the distal leaves of some shoots. The blades will abscise and lateral shoots will push at those nodes, which gives the affected shoot a bushy appearance. Occasionally, the cluster stem will also become necrotic in one spot, and often this will cause the entire cluster to desiccate. This variety is extremely susceptible to coulure when temperatures are low just prior to bloom.

A large number of lateral shoots is common. A significant second crop (1 to 1.5 tons per acre) may develop. Depending on the season, vines harvested for sparkling wine may mature second crop clusters by early fall, allowing growers the option to harvest them for table wine if the price warrants.



### Winery Use

Pinot noir may be harvested at 18 to 20° Brix to produce a sparkling wine that is usually white. For red table wine, grapes are harvested beginning at 23.5° Brix. The wines usually do not have an intense color even in cool areas; however, they are known for their aroma and flavor under these conditions. When grown in hot areas, both color and flavor are reduced.

—Rhonda J. Smith