



# Zinfandel

## Synonyms

None

## Source

Zinfandel is only grown under this name in California. As a result, historians have long debated the appearance of this variety in the state. Some believe Zinfandel was first imported from Hungary in 1852; others point to evidence that New England nurseries had cultured it as a table grape and introduced the variety in California during that decade. By the mid-1860s, wines made from Zinfandel grapes were seen as an improvement to those made from the popular Mission variety, and plantings of Zinfandel vines increased.

It was also speculated that Zinfandel came from southern Italy, as a similar variety, Primitivo, was found to have identical DNA. Most recently, DNA analysis has shown Zinfandel to be identical to a very obscure variety found in Croatia called Crljenak Kasteljanski, which translates to “the red grape of Kastela.” Crljenak probably originated in the Balkans on the Dalmatian coast. This is supported by numerous genetic relatives found in the area through DNA testing. One such relative, Plavac Mali, has been

shown to be a cross between Zinfandel and a rare Croatian variety, Dobricic. Exactly how Zinfandel came to California is still unknown.

## Description

**Clusters:** medium to large; cylindrical to long conical, often winged, sometimes with double wings, compact; short to medium-length peduncles; often with a wide range of ripe and under-ripe berries.

**Berries:** medium to large; round to oblate; deep blue-black; prominent rust-colored stylar scar.

**Leaves:** medium to large; deeply 5-lobed, often overlapping; lyre-shaped petiolar sinus; long, jagged teeth; dense hair on lower leaf surface.

**Shoot tips:** downy to felty; young leaves bronze-red.

## Growth and Soil Adaptability

Zinfandel is currently grown in many of the wine-growing regions of California in a wide range of soil types and climates. In fertile sites it must be managed carefully to avoid overcropping due to its naturally high fruitfulness. It is best suited for moderate- to low-fertility, well-drained soils where it is considered moderately vigorous if provided with supplemental irrigation. Vine spacing should be no less than 5 feet and should be increased as soil fertility increases.



## clusters

*Medium to large; cylindrical to long conical, often winged, sometimes with double wings, compact; short to medium-length peduncles; often with a wide range of ripe and under-ripe berries.*

## berries

*Medium to large; round to oblate; deep blue-black; prominent rust-colored stylar scar.*

## Rootstocks

Historically this variety was grown on its own roots or grafted to *Vitis rupestris* St. George. This practice continues in hillside plantings or on sites with limited irrigation water. A drought-tolerant rootstock, 110R, is also used in these sites. It can be successfully grown on other rootstocks as long as they do not impart increased fruitfulness to the scion since Zinfandel tends to set large clusters. Many older selections of Zinfandel grown on St. George are not certified, and latent viruses may cause disease when grafted to other rootstocks.

## Clones

Zinfandel FPS 01, 02, 03, and 06 have been registered for many years. They have a poor reputation among some winemakers due to large clusters and berries, poor fruit color, and lack

of varietal character. In addition, all of these selections are susceptible to bunch rot. In warm climates, research has shown that there are very few differences in growth and yield parameters among the registered selections of Zinfandel and only subtle differences in wine quality. Primitivo, a variety grown in southern Italy for 150–250 years, and Zinfandel are now considered to be clones of the same variety. When compared to Zinfandel, Primitivo has increased cluster numbers yet reduced yields due to fewer and smaller berries. Primitivo fruit ripens before Zinfandel and is much less prone to bunch rot. Primitivo 03, 05, and 06 are all commercially available as certified selections.

A heritage Zinfandel clonal program is underway at the University of California. Researchers are collecting budwood from vineyards that are at least 60 years old and preserving it in a secure collection. Selections are introduced into a long-term clonal evaluation program. This project is coordinated with simultaneous virus testing and registration of these selections. Preliminary results indicate a range of performance in yield parameters across the evaluated selections and the current registered Zinfandel selections are clustered around the mean of this range. The lack of popularity of the older registered selections may also be due to perceived problems in site and vine management practices.



## leaves

Medium to large; deeply 5-lobed, often overlapping; lyre-shaped petiolar sinus; long, jagged teeth; dense hair on lower leaf surface.

## shoot tips

*Downy to felty; young leaves  
bronze-red.*

### Production

Production is extremely variable throughout California and is dependent upon climate, soil fertility, crop level management practices, and irrigation. In addition, yields in vineyards that are harvested for white wine production will tend to be higher than yields of vineyards farmed for red wine production since lower sugar levels are acceptable in the former. In the Sacramento Valley and the Lodi area where supplemental irrigation is ample, grape yields for red wine production can range from 6 to 8 tons per acre in trellised vineyards with vines trained to bilateral cordons. Head-trained, spur-pruned vineyards will yield 3 to 6 tons per acre. In coastal or foothill Zinfandel vineyards farmed for red wine production, cluster thinning is common to maximize crop uniformity for color and ripeness. Yields for trellised vineyards could range from 5 to 6 tons per acre, with 4 tons not being uncommon. In these regions, typical yields for head-trained, spur-pruned vineyards would be 3 to 5 tons.

### Harvest

**Period:** A mid- to late-season variety, although the harvest period depends on crop load and whether the fruit is going for red or white wine. In the North Coast and Sierra foothills, grapes for red wine production are harvested midseason (September) while harvest of vines producing white Zinfandel will begin in early



to mid-August.

**Method:** Harvesting is most commonly by hand. The clusters are large and easy to pick unless bunch rot is severe and then infected fruit must be cut out of the bunches. Machine harvesting is more common with new vineyards established on trellises. Zinfandel tends to juice moderately easily, but levels are still acceptable for machine harvesting.

### Training and Pruning

Vines are spur pruned and either cordon or head trained. Zinfandel tends to overcrop easily, and if the fruit is not thinned, it will ripen with difficulty or not at all. As a result, many growers note that the fewer spurs there are, the less potential there is to accidentally allow too many clusters to remain on the vine. A head-trained, spur-pruned vine by default cannot have as many spurs as a bilateral cordon trained vine.

## Trellising and Canopy Management

Most vineyards have trellises that support a fruiting wire for the cordons and either two pairs of moveable wires to position the shoots vertically or a cross arm with a foliar support wire at each end. Cordons are 38 to 42 inches high. Shoot thinning is common as a means of crop load adjustment and encouraging uniformity of development. Depending on the year, clusters may be thinned prior to or at veraison, and some growers consistently drop clusters after veraison. Leaves are removed from the fruiting zone to minimize a microclimate conducive to bunch rot and improve fruit quality; however, excessive sun exposure will sunburn fruit.

## Insect and Disease Problems

Zinfandel's compact clusters are susceptible to physical damage, insect damage, or disease. Bunch rot is hard to avoid. Its severity may be reduced with leaf removal and shoot positioning. Insects that feed or lay eggs in the clusters such as omnivorous leafroller and orange tortrix will increase the incidence of bunch rot. Willamette mite infestations are common in the north half of the state and the coast, while Pacific mite is a problem in the southern San Joaquin Valley. Older vineyards are often infected with leafroll virus that may delay ripening. In some instances, this delay may cause the crop to be consistently sold for white Zinfandel wine production. Zinfandel is moderately resistant to powdery mildew and *Eutypa dieback*.

## Other Cultural Characteristics

Berry size is affected by water availability and irrigation strategy. If water is applied incorrectly, berry size will increase and bunch rot will nearly always occur. Uneven ripening is common in any climate, and the clusters contain immature pink berries as well as overripe, slightly wrinkled berries. In very warm climates a significant portion of the cluster may contain shriveled berries or raisins.

## Winery Use

Winemakers produce a single varietal Zinfandel wine or may prefer to add small amounts of other varieties, commonly found in old, mixed plantings, to enhance complexity. In cooler areas, the fruit will produce wines that have berry fruit and spice flavors while in warm areas varietal character is less obvious. Zinfandel can reach high sugar levels and, as a result, can produce a high-alcohol table wine or port-style dessert wine.

—*Rhonda J. Smith*