# Carignane

## Synonyms

In Spain the cultivar is referred to as Cariñena and Mazuelo, while in France it is known as Carignan noir and Monestel. In Portugal it is called Pinot Evara, while in Italy it is known as Carignano.

## Source

The variety is originally from the northeastern Spanish province of Aragon, near the town of Cariñena. Known in France since the mid-twelfth century, Carignane was originally planted in the Pyrenees Orientales. From there plantings spread throughout the Midi region, where it is used for the production of common red table wine. It remains the most cultivated grape variety in southern France.

## Description

Clusters: medium to large; broad-conical, well-filled to compact clusters; medium-long, well-lignified peduncle.

Berries: medium; short oval; dark purple-black with a gray bloom and thick skin.

Leaves: large; moderately 5-lobed, closed U-shaped petiolar sinus and narrow lateral sinuses; leaf tissue does not lie flat near the petiole and puckers up into a "target patch" where the main veins join the petiole; relatively large, broad, sharp teeth in several ranks; glabrous to sparse tufted hair on lower leaf surface.

Shoot tips: felty white, slight red margin; young leaves yellowish green.

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## Growth and Soil Adaptability

Own-rooted vines grow vigorously on fertile, medium-textured to heavy soils. Due to potentially high vigor, the variety is also well adapted to hillsides or sites with limited soil depth or fertility in coastal regions. Growth is upright to semi-erect and often open, with large canes. Canes harden off early in the season and mature well. The recommended in-row spacing for bilateral cordon vines is 7 to 8 feet in the San Joaquin Valley and 6 feet in coastal regions.

## Rootstocks

Historically, Carignane was planted on its own roots in the San Joaquin Valley and on Rupestris St. George rootstock on hillside plantings in coastal regions. In coastal regions where phylloxera resistance is desired, moderate-vigor rootstocks such as 101-14 Mgt, SO4, Kober 5BB, and 3309C may be used. In hillside plantings, or in areas where soil depth or fertility is limited, 110R, 1103P, and 140Ru are acceptable choices. In the San Joaquin Valley, where nematode resistance is desired, Freedom, Harmony, and 1103P may be likely choices.

## Clones

Carignane FPS 02 and 03 are currently available as registered stock. They are subclones of Carignane FPS 01 and could be expected to perform identically. Commonly cultivated clones in California include selections 01 (non-registered) and 02; both have acceptable fruiting characteristics. Carignan

ENTAV-INRA® 6 is now available in California. (There is no "e" in the French spelling). Unfortunately, information regarding viticultural characteristics or relative performance of these Carignane selections is not available.

## Production

Carignane is a highly productive variety, with yields ranging from 10 to 14 tons per acre in the San Joaquin Valley, and 4 to 8 tons per acre in coastal regions.

## Harvest

**Period:** A late-season variety, typically ripening in late September to mid-October in the San Joaquin Valley, Carignane may be harvested earlier in this region if used for blush wine production. Harvested in mid- to late October in coastal regions.

**Method:** Clusters have moderately thick and short peduncles, which require that knives or shears be used when hand-harvesting fruit. Canopy shaking makes harvesting difficult, with fruit removed as single berries. Considerable force is needed to remove fruit, resulting in moderate to heavy juicing, excessive defoliation, and damage to spurs and canes. Vines are more difficult to harvest when soluble solids reach 23 to 24° Brix. Trunk shaking results in intermediate to difficult harvesting with medium juicing. Fruit is removed mostly as single berries and a few cluster parts.

## Training and Pruning

Carignane is commonly trained to bilateral cordons and spur pruned, retaining 12 to 16 two- to three-node spurs per vine. Many older vineyards in both the San Joaquin Valley and coastal regions were head trained and spur pruned. Twelve to 14 two- to three-node spurs are typically retained on head-trained vines. Fruit from head-trained vines is often preferred for the fresh juice grape market.

## Trellising and Canopy Management

Vines grown in coastal regions may be head trained or trellised to vertical-shoot-positioned systems. In the San Joaquin Valley vines are

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generally trellised to the traditional California two-wire system, although some head training is still used. Basal leaf removal may be performed to improve canopy microclimate and increase spray penetration into the fruiting zone.

## Insect and Disease Problems

Both foliage and berries are extremely susceptible to powdery mildew, especially bud penetration. A thorough mildew control program, including the use of sulfur and sterol-inhibiting fungicides, is recommended to prevent infection and manage resistance. Compact clusters may result in summer bunch rot complex in the San Joaquin Valley. Carignane is also sensitive to downy mildew and Eutypa dieback canker, and it is moderately susceptible to Botrytis bunch rot following rains near harvest. Susceptibility to both summer bunch rot and Botrytis is accentuated by fruit damage from powdery mildew infections. Basal leaf removal may be performed to increase fungicide penetration and reduce humidity in fruiting zone.

Many older vineyards may be infected with leafroll and fanleaf viruses, causing reductions in yield and overall fruit quality. Some older plantings also contain vines infected with tomato ringspot virus, commonly referred to as yellow vein virus. Infected vines produce excessively loose, poorly filled clusters with shot berries. This results in severe yield reductions and increased vine vigor or size, thus the expression "unfruitful Carignane" is often used to describe infected vines. For these reasons care must be taken to propagate only virus-free, certified planting stock.

## Other Cultural Characteristics

Budbreak is typically late, and the variety may not fully ripen in cool, coastal regions.

Care should be taken to avoid overcropping, which results in low sugar and acidity, as well as poor color development. Carignane produces a significant second crop, which ripens several weeks after the primary crop. Second-crop removal or selected hand harvest may be necessary in coastal regions.

## Winery Use

In the San Joaquin Valley, Carignane produces standard red table or blending wines with moderate to good color and significant tannin but little pronounced varietal flavor. In some cases the wine may be bitter or harsh. It is also used for the production of rosé or blush wines in the San Joaquin Valley. In coastal regions, Carignane produces a slightly more complex, varietal table wine and may also be used in Rhône-style blends. Carignane is also an important fresh juice grape variety for home winemaking.

*—Nick K. Dokoozlian*