

Barbera Finds a Second Home in California

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Barbera... ‘the Italian variety that best reproduces its characteristics in California.’
— Guido Rossati, 1900

Vitis vinifera ‘Barbera’ has been described as a high-quality Italian red wine cultivar that is adaptable to different climates and soils, amenable to multiple management techniques and demonstrably fertile. Mannini, 2004. The characteristics of the grape allow for multiple wine styles. As a result, this versatile cultivar flourishes throughout Italy, as well as in several other regions of the world including North and South America.

Barbera is an ancient cultivar that is believed to be native to Italy. A common theme in the works of ampelographers and historians who have written of Barbera is that nothing can be said definitively about its age or origin. Many of those works refer to documents and texts from as early as the 13th century to define the time and place of the cultivar’s origin.

Barbera produced popular wines in Italy prior to the Renaissance and was known as the ‘people’s wine’. Gily, 2001. Wine writer Burton Anderson refers to the cultivar as ‘...a vine that had ranked for ages as a commoner, a bourgeois,... [prior to a renaissance of its own in Italy in the 20th century]’. Anderson, 2000, page 5. Notwithstanding its popular roots, documentary evidence (described below) shows that Barbera was also known to the upper classes in Italy where it was served at the curial and royal tables in important cities.

Early references to the Barbera grape were oblique. In the 13th century, Casale Monferrato was the capital city of the Marquisato of Monferrato in the province of Alessandria, Piemonte region, in northwest Italy. The archives of the cathedral chapter of Casale Monferrato reportedly contain contracts covering the period 1246 to 1277 requiring the lessees of church vineyard lands to plant and maintain vines of ‘de bonis vitibus barbexinis’. Gily, 2001; Robinson, 2006, page 62. It has been suggested that the Latin ‘barbexinis’ refers to the grapevine ‘Barbesina’, an ancient synonym for the Barbera grape. Busso, 2000, page 25.

During Medieval times, it was customary for families in the Piemonte region of Italy to take their names from the



‘Uva Barbera’,
Pomona Italiana,
Giorgio Gallesio,
Special Collections,
Shields Library,
University of
California, Davis

grapevines which were common in the territory, from botanical sources or from the type of agricultural activities in which they engaged. The family names *Barbieri*, later modified to *Barbero* and then *Barberis*, date from this period and suggest a linguistic connection to the vines of the region. Busso, 2000, page 25.

An Italian jurist by the name of Pier de’ Crescenzi (1230-1320) wrote a treatise on agriculture in 1303 that included a section about viticulture. In that treatise, de’ Crescenzi referred to a grape variety by the name ‘Grisa’ or ‘Grisola’ (which signifies either ‘crispness’ or ‘grey’ in Italian). The inference was drawn in one recent source that de’ Crescenzi referred to Barbera when he mentioned ‘Grisola’, making an analogy to *Uva Spina* (gooseberry with a sharp taste) and the acidity or sharpness of both the *Uva Spina* and Barbera. Calò et al., 2001, page 176.

It is not clear whether or not de’ Crescenzi was referring to the Barbera cultivar by the reference to ‘Grisa’ or ‘Grisola’ in his 14th century text. *Uva Spina* is the analogy cited by the above secondary source and is translated in Italian to ‘gooseberry’, which is included in genus *Ribes* (*Grossulariaceae*). However, that same secondary source also mentioned the name *Berberis* (*Berberidaceae*) in con-

nection with the analogy to Barbera. *Berberis* is a plant genus that includes the very tart barberry species, which has red berries. Early names for Barbera included 'Barberi' and 'Barberis', names similar to *Berberis*. *Busso, page 25*. Regardless of any taxonomic confusion, both gooseberry and barberry exhibit spines and a sharp taste. *Brennan, 1992; Ahrendt, 1961*.

A prominent Italian viticulture professor and grape breeder, Dr. Giovanni Dalmaso, did not make the same analogy from *Uva Spina* to Barbera. Dalmaso wrote in the early 1960's that no historical allusion to the Barbera variety appeared in the writings of Pier de' Crescenzi. Dalmaso indicated that de' Crescenzi lived in Asti for 30 years and would not have overlooked such an important variety if Barbera were being cultivated there at that time. *Dalmaso et al., 1960-61, Ch. II, page III*.

Dalmaso further noted that a second author, Giovanni Battista Croce, jeweler to the House of Savoy, similarly made no reference to Barbera in his 1606 work on the 'Excellence and Diversity' of wines made in the hills of Torino. *Schneider, 1992; Dalmaso et al., 1960-61, Ch. II, page III*. This latter omission might be explained by the fact that conditions in Torino are too cold for Barbera to achieve much success.

Other references from the Renaissance era specifically name the cultivar. The varietal name 'Barbera' appeared in less formal contexts in the 16th century. One of the earliest written references to the cultivar by the name 'Barbera' appeared in 1514 on a cadastral map (public register of land ownership) of Chieri, a town east of Torino. *Gily, 2001*.

The cultivar name 'Barbera' is again mentioned in 1609 in a letter in the communal archives of Nizza Monferrato, a municipality in the province of Asti in the Piemonte region. The letter was sent to officials in Nizza Monferrato (aka Nizza della Paglia) from the influential Dukes of Mantova in nearby Lombardia and requests that envoys be received to 'taste the wines of the vineyards [of] Nizza Monferrato and, in particular, the Barbera'. *Garoglio, 1973, page 245*.

A note in 1685 in the personal diary of Count Francesco Cotti of the Langa (Langhe) region in Piemonte shows that he ordered cuttings from various cultivars common to the Asti region, including Barbera. *Busso, 2000, page 26*.

Several sources indicate that the first 'official' mention of the name Barbera was in a 1799 paper on the cultivation of the vine entitled 'Istruzione letta dal Conte Nuvolone'. Nuvolone was the Vice Director of the Agricultural Society of Torino. *Dalmaso et al., 1960-61, Ch.II, page III; Robinson, 2006, page 62*. Conte Nuvolone's 'Istruzione' on

cultivation of vines and wine-making mentioned Barbera by name. He described two types of Barbera grown in the Asti area near Alessandria: (1) Barbera with large oblong berries; and (2) Barbera with smaller berries and tighter clusters. Nuvolone stated that the second grape type made better wine. Dalmaso speculated that Barbera was a spontaneous product of some of the more ancient local vines, resulting in good cultural and productive characteristics which found favor with growers in the area. *Dalmaso et al., 1960-61, Ch.II, page III*.

Although nothing has been established definitively, the conclusion of a majority of Italian ampelographers, viticulturists and historians is that the ancient grape Barbera originated in the Piemonte region of northwestern Italy near the area known as Monferrato. *Robinson, 2006, page 62; Schneider et al., 2003; Dalmaso et al., 1960-61, Ch.II, page III*. Dalmaso wrote that everything pointed to a homeland in the Marquesato, later the Duchy, of Monferrato. Barbera is the principal vine in the Monferrato region in Piemonte, where it has been planted and grown widely for centuries. *Schneider et al., 2003*. In the 1960's when Dalmaso published his work, Barbera was vinified as a single varietal only in the Piemonte region. *Dalmaso et al., 1960-62, Ch.II page XII*. A Monferrato origin is further supported by 'Pomona Italiana' (1839) by Italian botanist Giorgio Gallesio and 'Remembrances' (1839) from Abbot Milano, both of which refer to the Barbera cultivar as *Vitis vinifera montisferratensis*. *Calò et al., 2001; Dalmaso et al., 1960-61, Ch.II, page III*.

There is an alternate theory for the area of origin of Barbera. In his 1909 *Ampélographie*, French ampelographer Pierre Viala proposes the Oltrepò Pavese as Barbera's original home. *Robinson, 2006; Viala et Vermorel, 1909, page 38*. The name Oltrepò Pavese means 'Pavia across the Po [River]' and refers to an area bordering Piemonte in the Province of Pavia to the south of the Po River. Oltrepò Pavese was formerly a part of Piemonte and was known as 'Old (Antico) Piemonte'. When Italy was unified in the 19th century, the region became part of Lombardia. *Viala et Vermorel, 1909, page 38*. Viala observes that Barbera has been important in the culture of the Province of Pavia. The cultivar has had a major presence in the Oltrepò region since 1820, where it thrives on the mountain slopes in deep clay soils. *Dalmaso et al., 1960-61, Ch.II, page XII*.

The effort to determine the parentage of Barbera has been as problematic as has determination of its time and area of origin. Despite efforts by Italian scientists to identify the parentage using DNA technology, Barbera's parentage remains uncertain. Scientists who studied the genetic relationships among grape cultivars from northwestern Italy reported in 2003 that Barbera was the variety most

frequently excluded from possible parental relationships with other varieties from that area. The results caused the scientists to surmise that either Barbera was introduced to Italy relatively recently (16th century or later) or that Barbera is more closely related to the local wild grape *Vitis vinifera* subsp. *silvestris* than to other cultivated grapevines. *Schneider et al., 2003.*

Barbera, or Barbera nera, is the preferred prime name for the cultivar. There are no official synonyms for the grape. Qualifying adjectives or descriptive modifiers were used in connection with the prime name, e.g., Barbera fina, Barbera grossa, Barbera dolce, Barbera forte, Barbera piccolo. *Viala et Vermorel, 1909, page 38; Calò et al., 2001, page 176.* Additionally, Italian geographical names are used on occasion to qualify the cultivar's name for wines made from Barbera, e.g., Barbera d'Asti, Barbera d'Alba, or Barbera del Monferrato.

Barbera is the second most widely planted red winegrape cultivar in Italy. The regions that favor the cultivar are Piemonte, the Emilia-Romagna and Lombardia. Barbera is the most widely cultivated variety in the Piemonte region (34% of the vineyards). *Ferrandino et al., 2007; Schneider, 1992.* Piemonte is a mountainous region with a continental climate. Viticulture in the region is unirrigated, and vineyards are typically located on hillsides with an average elevation of 400 meters (~1300 feet) above sea level. *Mannini et al., 1997.*

Notable Characteristics of Barbera in Italy

In a 1992 interview with FPS Grape Program Manager Susan Nelson-Kluk, Italian ampelographer Anna Schneider described Barbera as 'very adaptable and a good bearer'. The cultivar's adaptability allows for planting in almost all regions in Italy. *Schneider, 1992.* Barbera is easy to grow and exhibits medium-high vigor, good productivity and good basal fertility. *Mannini, 2004; Viala et Vermorel, 1909, page 38.*

Barbera clusters are typically medium sized and well-filled to compact. The berries are ovular and dark purple-black, producing juice with good color and relatively high acidity at maturity. Most sources report that the variety has long, green peduncles that make hand harvesting easy. *Christensen, 2003, pages 25-26; Dalmaso et al., 1960-61.* Anecdotal reports for observations of current Barbera grapevines in both Italy and California suggest that the predominant peduncle color is green, with perhaps a partial or complete browning as the grapes mature or a browning as a result of stressful environmental conditions.

Notwithstanding the references to long green peduncles, two ampelographers of the 19th century describe

a 'Barbera fina' grape cultivar with long reddish-brown or wine-colored peduncles, without mention of green peduncles. *Odart, 1854; Gallezio, 1817-39.* The Italian grape reference book *Vitigni d'Italia* refers to 'peduncolo abbastanza lungo, bruno rossiccio' (peduncle rather long, reddish brown). *Calò et al., 2001.* The discrepancy in the descriptions of peduncle color could suggest multiple clones; however, no literature on clonal variation for that characteristic was discovered.

The Barbera grape characteristically produces full-bodied wines with good alcohol and color and high natural juice acidity. *Dalmaso; Viala; Mannini, 2004.* Good endowment of anthocyanins results in juice with deep color and polyphenolic character. Low tannin levels make the wines apt for wood ageing. *Lanati, 2000, page 11; Mannini, 1997.*

The first appellations of origin for the Barbera cultivar were in Italy. Barbera gave its name to the three initial DOC (Denominazione d'Origine Controllata) areas, which are in the Piemonte region: Barbera d'Asti (including sub-area Nizza Monferrato), Barbera d'Alba and Barbera del Monferrato. DOC is an indication of the viticultural area from where the grapes originate and according to which the wine is made. The first official production figures for Barbera in the appellations of origin were in 1971. *Robinson, 2006, page 62.*

In the late 20th century and despite a 1986 methanol scandal, a growing number of Piemontese winemakers saw Barbera as 'the start of the future[showing] extraordinary promise and potential for quality and a large production capacity.' *Anderson, 2000, page 5.* The cultivar can be incorporated into wine both on its own as a varietal and in mixtures. The wine is often used in blends due to its acidity and good color. The more traditional, less expensive varietal wine style exhibits a medium to light body with pleasant fruit and berry flavors but often a tart finish due to high acidity. *Anderson, 2000, pages 5-7; Gily, 2000, page 13.* Its acidity and low tannin levels make Barbera suitable for different wine styles, which may vary from wine that is sold quite young to wine that has undergone lengthy aging in barrel or bottle. *Robinson, 2006, page 62; Lanati, 2000, page 11; Gily, 2000, page 15; Anderson, 1980, page 65.* The enological characteristics of the cultivar suggest a high potential as a single varietal wine. *Mannini, 2004.*

Experts familiar with the evolution of Barbera wine styles in Italy opine that a prerequisite for making a quality Barbera varietal wine is production of grapes under specific unique conditions, i.e., the particular *terroir* in Piemonte. The most favorable site for production of quality grapes is described as a hillside vineyard (up to ~300 meters)

with ample sunshine and heat on well-drained soil. The optimum protocol for managing the grapevines speaks in terms of limiting yields. *Anderson, 2000, page 8; Gily, 2000, page 14-15*. The quality of wine may be impaired (overly acidic) if vines are allowed to overproduce or environmental conditions do not produce full ripening. *Mannini, 1997*.

Some say Giacomo Bologna in Rocchetta Tanaro, province of Asti in Piemonte, was the first to really appreciate the possibilities of Barbera as a varietal in producing an important wine in that area. His wine was made from a single vineyard of Barbera grapes from the Bologna estate, 'Braida'. Bologna believed that Barbera could mature very successfully in *barriques*, which are small French oak barrels. In the 1980's, he combined lower crop levels, malolactic fermentation and aging in new wood to create three well-regarded wines: Bricco dell'Uccellone, Bricco della Bigotta and Ai Suma (from late harvest grapes). Bologna's work showed that Barbera could be a wine that would impress the world market. In Bologna's wines, the variety revealed its many facets when its profile changed from a high acid, sharp thin wine to a richer, smoother and sweeter wine that is full-bodied and wood-tannin enhanced. *Anderson, 2000, pages 7-9; Lanati, 2000, pages 11-12*.



Barbera O4 is a popular clone in Italy.

Barbera outside of Italy

The tendency of Barbera to produce good yields of fruit with relatively high acidity has helped establish it as an important cultivar in several countries other than Italy, including the United States, Argentina, Australia and South Africa. *Fidelibus et al., 2009; Robinson, 2006, page 62; Christensen, 2003*.

In the United States, Barbera has a small but dedicated community of growers on the East Coast in the warmer regions of Virginia, Maryland, and Pennsylvania. Barboursville Vineyards near Charlottesville, Virginia, has been growing Barbera since 1976, and their first varietal wine was produced in 1991. *Paschina, 2011*. There are about 15,000 young vines planted in Maryland's Eastern and Southern Shore. Growers in the region attribute high fruit acidity retention for the popularity of the cultivar. *Fiola, 2011*.

Barbera also has a small presence in the States of Oregon and Washington on the West Coast. However, the cultivar has had by far its largest presence and longest tenure in the United States in the State of California, where friendly climatic conditions and *terroir* have enabled Barbera to thrive as both a blending wine and a quality varietal.

The Early Years of Barbera in California

The California wine industry began to emerge as a future competitor for European wines in the late 19th century. Influential viticulturists and nurserymen were eager to diversify California cultivars beyond the Mission grape and the few *Vitis vinifera* cultivars present in the state. Serious efforts to expand the number and quality of European wine grape cultivars were begun between 1860 and 1880. *Pinney, 1989, page 347*.

Agoston Haraszthy, a vineyard owner in Sonoma, campaigned to upgrade the varieties planted in California and lobbied the government for assistance. In 1861, he was appointed by Governor J.G. Downey as a 'commissioner' to study ways to improve the grapevine culture in California. Haraszthy ultimately received state 'sponsorship' (but not financing) for his 1861 trip Europe, where he acquired about 300 mostly *Vitis vinifera* grape varieties for import to California. *Sullivan, 1998, page 147*. Barbera was not included among those varieties.

U.C. Experiment Station Work

The California grape and wine industry became more institutionalized in the latter part of the 19th century. The State Board of Viticultural Commissioners was created by act of the legislature in 1880, as were the University of California's Department of Viticulture and Viticulture Experiment Station system. *Pinney, 1989, pages 342, 350*;

Hilgard, 1886^a. The university began a systematic program to analyze the grapes then being grown within the state, as well as the resulting wines which were made therefrom, in a new wine cellar at U.C. Berkeley.

The Experiment Station system was tasked with developing sites in various locations throughout California to determine suitable grape varieties to be grown in the various regions. The Central Station at Berkeley was established first, and four other substations were created in Chino Valley, Paso Robles, Tulare (San Joaquin Valley Substation) and the Sierra Foothills in Amador County (Foothill Experiment Station). Two other stations under private auspices were developed in 1883 at Cupertino (West Side Santa Clara Valley Station) and Mission San José (East Side Santa Clara Valley Station). *Hilgard and Paparelli, 1892; Bioletti et al., 1896.*

Charles Wetmore was a real estate promoter and journalist who was appointed to be the first Chief Executive Viticultural Officer of the California Board of State Viticultural Commissioners. Eugene W. Hilgard, Dean of the College Agriculture at the University of California, was designated Director of the U.C. Agricultural Experiment Station system. The two men would have an acrimonious relationship, but the ultimate result of their respective efforts was positive for the California grape and wine industry.

In 1884, in his capacity as Chief Executive Officer, Wetmore wrote a report on the state of California's vineyards and the varieties known to be in the state at the time, which did not include Barbera. In his *Ampelography*, Wetmore lamented the lack of systematic planting in the state of varieties necessary to reproduce quality European wines and encouraged the import of those European grapes to improve California viticulture. *Wetmore, 1884.*

It was not for lack of awareness of the cultivar that Barbera had not been imported to California by the early 1880's. Beginning in the mid-19th century, Italian immigrants had begun to move into the areas that would become home to the California grape and wine industry. Additionally, the university meant to include grape varieties from the Italian region of Piemonte in its work, but Barbera had not yet been included in the 'early' university importations to California. *Hilgard and Paparelli, 1892.*

The first to import Barbera to California was neither an Italian immigrant nor a U.C. Experiment Station viticulturist. John T. Doyle was a noted trial lawyer, scholar and important leader in the California wine industry in the 19th century. In the 1880's, he purchased land near what later became Cupertino on the Peninsula in the California Bay Area and founded a winery. He was also a member of the State Board of Viticultural Commissioners. Doyle was

a close associate of Eugene Hilgard, to the extent that in 1883 Doyle donated a parcel of land to U.C. Berkeley for the U.C. Experiment Station system. *Sullivan, 1998, page 91.* Doyle imported a large number of European wine grape varieties to California directly from Italy. Among his first imports in the early 1880's were Nebbiolo and Barbera, 'which [he felt] held in northern Italy the place that the Cabernets held in the Bordeaux region'. *Hilgard and Paparelli, 1892, page 118; Sullivan, 1998, page 19.*

The new U.C. Experiment Station system evaluated the performance of the Barbera grape over a period of time between 1884 through 1893. The variety was planted and/or evaluated at the Experiment Stations in Cupertino, Tulare and Amador County. Those findings in the late 19th century were consistent with the findings of Piemontese viticulturists that Barbera requires elevated temperatures at a constant level in order to thrive.

Doyle and Hilgard experimented with the Italian varieties (including Barbera) early on in Cupertino and Mission San José. In a report written for the 1883-84 season, Hilgard notes that Doyle's Barbera vines in the experiment plot in Cupertino were probably the only vines of that variety in the state at that time. *Hilgard, 1886, page 111.* Following three years of evaluation, the researchers concluded in 1886 that the reportedly productive and vigorous Barbera was not a very strong grower in Cupertino and did not show the early and profuse bearing attributed to it in Italy. Hilgard did note that the wine produced from the Cupertino vines exhibited very high acid, as well as beautiful and deep color. *Hilgard, 1886^a, page 85.*

A new source of the Barbera grape arrived in California in 1886. An important collection of valuable Italian grape varieties (including Barbera) was imported by the University to California 'through the kindness of Count G. [Giuseppe] di Rovasenda of Turin, the well-known Italian ampelographer'. Count Rovasenda maintained a grape collection in Italy containing approximately 4,000 varieties, which still exists at Gruliasco. Hilgard noted that the Italian grapes were very valuable to California, 'whose climate is so similar to that of Italy', for their remarkably high acidity along with a good proportion of sugar and good color. *Hilgard and Paparelli, 1892, page 118; DiRicaldone, 1974.*

The first draft of the U.C. Experiment Station Viticulture Report for Season 1887-1889 continued the evaluation of Barbera grapes and wines in the Experiment Station system, but that study was still limited to the Cupertino and Mission San José stations. That initial report, authored by Viticulture Instructor Louis Paparelli under the direction of Dr. Hilgard and issued in 1889, concluded that Barbera

was a good but uneven and irregular bearer in Cupertino (3.5 to 6 tons) and Mission San José (3 tons). The grapes achieved high sugar levels along with high acidity, a result the researchers noted could be of special importance for warm locations in the state. *Hilgard and Paparelli, 1892, page 142.*

Fermentation experiments led the U.C. researchers to conclude that satisfactory Barbera wines could be vinified in warm as well as cool locations. They recommended that the wine be bottled later than other wines because it seemed to them that Barbera required a longer time to age to lose some of the high acidity and astringency and acquire an agreeable bouquet and flavor reminiscent of Bordeaux wines. *Hilgard and Paparelli, 1892, page 144.* Paparelli and Hilgard concluded that the Barbera wines produced in California had good keeping qualities and could be aged to reduce astringency to be very delicate. They predicted that Barbera would be one of the most important of the Italian varieties that would thrive in the California conditions to produce a 'first-class dry wine of excellent keeping quality'. *Hilgard and Paparelli, 1892, page 118, 144.*

By 1893, Barbera had been installed as well at the U.C. Experiment Stations in Tulare and the Sierra Foothills in Amador County.

One Barbera selection planted at the Foothill Experiment Station (Amador County) in 1889 was named 'Barbera fina' and was obtained from the Central Station at Berkeley (Block D r1 v 1-14, Block N r1 v 1-13). John Doyle had a Barbera cultivar with the name 'Barbera fina' at his Cupertino vineyard [the remainder of his Barbera vines were named simply 'Barbera']. *Hilgard and Paparelli, 1892, pages 134-144.* There is no further source information indicating whether or not the 'Barbera fina' at the Foothill Experiment station originated at Doyle's vineyard in Cupertino or was plant material obtained by Rovasenda from Italy. Nothing in the files at FPS or on the old maps of the Department of Viticulture & Enology vineyards suggest that the 'Barbera fina' from the Foothill Experiment Station was ever planted in the Department vineyards on the Davis campus. Nothing in the FPS records shows that a selection named 'Barbera fina' from the Amador Station was ever processed through FPS.

Barbera seemed 'particularly well suited' to the Tulare (Fresno) Station area where it produced strong and healthy growth (5 tons per acre) in the sandy soils. The grapes ripened well without losing acid, and, due to a low tannin level, the resulting wines needed blending to make a good commercial wine. *Bioletti, 1896, pages 136-137.*

Frederic Bioletti, then Foreman of the University cellar,

prepared the final report for Experiment Station Viticultural Work for 1887-93, in which he incorporated final data from the 1887-89 season and added comments from the years 1889 through 1993. Bioletti modified slightly the previous conclusions on the North Italian grapes with which the Experiment Station system had worked in Tulare, Asti (Sonoma County), Cupertino and San José. No grapes from the Foothill Experiment Station in Amador County were included in the evaluation.

The North Italian grapes were praised for their high acid and high sugar content and durable and prolific grape production. The researchers noted that Barbera produced good dry, red wines when grown in the hot climate of the San Joaquin Valley but would probably not succeed well in coastal counties except for some 'extra hot location'. *Bioletti, 1896, page 134.* Barbera was recommended for blending with other varieties whose acid content falls low. Bioletti concluded that the Northern Italian grapes (particularly Refosco, Fresa [sic.] and Barbera) had maintained their characteristics remarkably in California, showing their special adaptation to California conditions. *Bioletti, 1896, page 12.*

Italian Swiss Agricultural Colony

Barbera was imported to California in the late 19th century also by some of the Italian immigrants who settled in the counties that later became synonymous with quality wine. In 1881, a former Genoan named Andrea Sbarboro and some associates formed a cooperative grape-growing business in a village they named Asti near Cloverdale in Sonoma County, California. The cooperative was formed with idea of helping Italian immigrants become self-sufficient. The Italian Swiss Agricultural Colony (ISC) began planting vines in 1882. *Pinney, 1989, page 327.*

The absence of Italian varieties in the initial plantings motivated Italian Swiss Colony to seek the assistance of Dr. Giuseppe Ollino, one of its directors, who imported cuttings of leading Piemontese varieties to Asti, California, in 1885. Barbera was included among those varieties, although Sangiovese would later become ISC's most important varietal. *Hilgard and Paparelli, 1892, page 118; Florence, 1999, page 49.*

The ISC winery was constructed in the late 1880's. In 1888, Sbarbono hired Pietro Carlo Rossi, who had a degree in agricultural chemistry from the University of Torino, to be the winemaker. The quality of the wine thereafter made a dramatic improvement. *Florence, 1999, page 53; Sullivan, 1998, page 161.* In the 1890's, several of ISC's successful red table wines contained Barbera, which contributed deep color, brilliant tartness, and sharp tannins and astringency. *Sullivan, 1998.*

Pietro Rossi's son, Edmund A. Rossi, later became President of Italian Swiss Colony. He wrote in a 1941 letter to Dr. Harold Olmo (Professor of Viticulture & Enology, U.C. Davis):

'Some of the earliest plantings of vineyards at Asti in the 1880's had beginnings in importations of grapevines selected on a trip to Italy by Dr. G. OllinoOf course, there were imported the Italian varieties that went into Chianti wine such as San Giovese, Lambrusca, and Albana. Then, there was the Barbera of which we had about 25 acres Of course, the Barbera and Chianti varieties have been maintained at Asti as they give not only a fair crop but very fine quality.'
—Rossi letter to Olmo, 1941.

Professor Guido Rossati was an enologist sent to the United States by the Italian Ministry of Agriculture in the late 19th century for the purpose of investigating the state of wine-making in the United States. He visited the major localities where wine grapes were grown on both coasts in the United States. *Rossati, 1900, page 324; Sbarboro, 1900.*

In travelling through Sonoma County, Rossati observed that Barbera was a wine grape of special importance in Italian Swiss Colony plantings in Asti. Rossati reported that Barbera 'succeeds well in the warm locations on the slopes in Sonoma, Napa, Santa Clara and in the internal valleys of San Joaquin and Sacramento' but not so well in the counties on the coast. He saw that the variety gave 'an abundant harvest (5 tons per acre)' in California, even in the sandy alkaline soil of Tulare. It was Rossati's opinion that Barbera 'is the Italian variety that best reproduces its characteristics in California'. *Rossati, 1900, page 162.* He reported that the Barbera wine in California was good, less acidic and aromatic than that of Italy, but 'eminently drinkable'. *Rossati, 1900, page 300.*

In a report to the Italian government in 1900, Rossati stated that wine could be made in several states, but that 'fine wine in inexhaustible quantities could be produced only in the State of California, where, on account of the similarity of the soil and climate to that of the wine-growing countries of the world, the *vitae vinifera*thrives as well as and produces larger crops than it does in Europe'. *Sbarboro, 1900.*

Barbera was also planted in the 19th century in small amounts by other Italian-American winegrowers in Sonoma County, including Louis Martini (Monte Rosso Vineyard), Eduardo Seghesio, and Samuele Sebastiani. *McGourty, 2011; Sullivan, 1998, pages 203, 321-322, 324.* The Sebastianis were still winning awards for their Barbera in the 1930's, with a deep flavored, well-aged, dry yet fruity red wine. *Adams, 1973, page 187.*

Barbera in California in the 20th Century

After twenty years of observation and evaluation by scientists in the university Experiment Station system, the University of California in 1907 issued a recommended list of grape varieties appropriate for planting in the various regions of California. By this time, Frederic Bioletti had become the university's first Professor of Viticulture. *Alley and Golino, 2000.* Barbera was included on the list of red wine grapes for dry wine appropriate for growing in the interior valleys of California (San Joaquin, Central, and Sacramento Valleys). Barbera was omitted from the recommended list of 'quality grapes' for vineyards in the coastal counties or the coast ranges. *Bioletti, 1907.* By the start of Prohibition (1919), there were approximately 5,000 acres of Barbera planted in California. *McGourty, 2011.*

Bioletti, who had become the Chair of the U.C. Department of Viticulture in 1916, produced a publication in 1929 (revised 1934) on 'The Elements of Grape Growing in California', in which he included a section describing the grape varieties then being grown in California. Barbera was included on the list of 'varieties of merit but not largely planted'. He indicated that Barbera 'bears well in good, heavy soil in California where it has been tried in the North Coast region, and makes an excellent wine'. *Bioletti, 1929, rev. 1934, page 34.*

When winemaking investigations were initiated on the U.C. Davis campus in 1935 following repeal of Prohibition (1933), it became necessary to establish production blocks of the leading wine varieties. The Department of Viticulture (which became the Department of Viticulture & Enology in 1948) initiated experiments on clonal selection. The first mother vine selections were made in 1937 and a number assigned to each. In 1937, Bioletti began progeny tests at U.C. Davis on Barbera vines from Italian Swiss Colony vineyards in Asti, Sonoma County. *Olmo, H.P., undated.* It appears as though no data on the results of such clonal work were ever published.

U.C. Davis Professor of Viticulture Albert J. Winkler indicated that, in the 1930's, the university provided California growers throughout the state with cuttings or rootings of cultivars of interest, and those growers grew them out and in turn provided the university with grapes for the wine-making evaluations. *Winkler, 1973, pages 23-24.* Those growers were the source of some of the vines in the Department vineyard in Davis.

In addition to the Italian Swiss Colony Barbera vines, two other clones of the cultivar planted in these early years in the Department of Viticulture's Armstrong vineyard at U.C. Davis were Horace Lanza and Secundo Guasti. The source information for one of the Barbera clones in the

university vineyard was listed as 'Lanza', who was Horace O. Lanza (California Grape Products) in Delano, California (UCD Department of Viticulture vineyard, Block E76).

A second Barbera selection whose source designation was 'Guasti' came from a vineyard that once belonged to Secondo Guasti of the Italian Vineyard Company in Guasti (near present day Cucamonga) in Southern California. The Guasti clone was donated to the Department collection prior to 1939 (UCD Department of Viticulture vineyard, Block E10, v 9-10). *Winkler, 1973, pages 23-24; Olmo, Harold, notes on grape selections used in research blocks, index cards maintained in FPS files.* Horace Lanza bought the Italian Vineyard Co. during World War II to gain control of the huge Guasti grape crop. *Adams, 1973, page 283.* The Lanza and Guasti clones were donated to the U.S.D.A. National Clonal Germplasm Repository at Davis in 1983 (DVIT numbers 648 and 649).

Dr. Olmo also imported a Barbera selection from Italy in 1949, sent by Luigi Pirovano, Viticultural and Horticultural Establishment in Milan (USDA P.I. number 173259).

It appears that some or all of the Barbera clones in the Department of Viticulture's vineyard still existed in the Department's collection until at least the 1980's. The first Barbera clone processed through Foundation Plant Services was Barbera FPS 01; FPS records show that plant material from Barbera 01 vines was first distributed to nurseries and the public in 1966. Old FPS distribution cards show that orders from throughout California requesting the Barbera cultivar were filled by FPS from the Department of Viticulture and Enology vines in the 1950's and 1960's. Unfortunately, the source information indicating from which Department vines the orders were filled is incomplete and unspecific.

Prohibition severely impacted Barbera acreage in California. After Repeal (1933), the variety did not immediately regain the popularity it had previously enjoyed prior to 1919. *Sullivan, 1998.* In 1968 the total Barbera acreage in the state was reported by the California Agricultural Statistics Service to be 1,214 bearing acres. *California Grape Acreage - 1968, California Crop and Livestock Reporting Service, Sacramento, California, 1969.*

In 1944, U.C. Enology and Viticulture Professors Maynard Amerine and A.J. Winkler published the comprehensive review of the performance of grape cultivars in California and defined the five climate zones that are referred to as the 'Winkler regions'. Those five regions are based on heat summation calculations of the number of degree days above 50° F between April and October. *Amerine and Winkler, 1944, page 505.* The Winkler regions can be characterized generally as: I – cool; II – moderate-

ly cool; III – intermediate or warm; IV – moderately hot; V – hot.

In the 1944 publication, Amerine and Winkler reviewed the prior Experiment Station work on winegrape growing and wine making, beginning with Eugene Hilgard's reports in the 19th century. Each Winkler region (I-V) is featured with a discussion of the appropriate wine grape varieties to be grown therein.

Region I, Region II and cool areas of Region III

The university researchers concluded that all their years of research and observation showed that Barbera needs some heat to do well. They stated that the cultivar did not ripen normally year after year in the cool Winkler region I, represented by the primarily-hillside areas within North Coast counties. Amerine and Winkler concluded that the same would be true to a degree in region II, the moderately cool areas in the valley floors and hillsides of North and Central Coast counties, and in all but the warmer areas of region III. Barbera was excessively acidic even when it matured in those areas. *Amerine and Winkler, 1944, pages 505, 517-533, 552-553.*

Warm Region III and Region IV

The U.C. Professors saw Barbera as a promising red wine variety for standard, quality or blended table wines for the warmer areas in regions III and for the moderately-hot region IV. In the climates of those regions, the cultivar appeared to be productive and ripened sufficiently.

Region III includes the Livermore Valley in Alameda County, Mendocino County (Hopland, Ukiah), Calistoga, San Luis Obispo and parts of Sonoma County (Alexander Valley, Asti and Cloverdale). *Amerine and Winkler, 1944, pages 505, 552-553.* Most of the vineyards are reportedly on 'fairly flat land', although some of the soils are rocky. *Amerine and Winkler, 1944, page 533.* Amerine and Winkler believed that the Barbera wines from region III were the most balanced in character, although they indicated that 'it is a mistake to hope for dry wines of the finest quality' in this region.

Region IV includes the Sierra Foothills, parts of northern San Joaquin Valley, and Davis in Yolo County. The soils in the valley floors of region IV are usually fertile.

In 1944, the U.C. Professors were pessimistic about whether the 'low-producing vineyards' in the foothills in the Sacramento and San Joaquin Valleys should be planted to grapes at all. *Amerine and Winkler, 1944, page 540.* However, by the time of the 1970's, the Barbera grape was rediscovered in several regions in California, including the inland coastal and foothill areas, where acreage increased substantially. *Adams, 1973, page 180.* The warmer

temperatures, low hills and well drained soils approximate those conditions described as ideal for Barbera in the hills of the Piemonte. *Gily, 2000, page 15*. The growers in those areas sought to develop Barbera as a quality varietal wine grape. *McGourty, 2011; Christensen, 2003*.

Winemaker Cary Gott planted the first Barbera at Monteviña in Amador County in the Sierra Foothills in 1971, at Sacramento wine merchant Darrell Corti's suggestion. The first Barbera wine produced from that area was Monteviña Barbera 1974. *Clarke, 1998*. By 2010, there were approximately 300 total acres planted in the Sierra Foothill region (Amador, Calaveras, El Dorado, Nevada and Placer Counties). *California Grape Acreage Report, 2010 Crop*. One wine writer has referred to the increase in interest in Amador County to 'a small Barbera revival taking place'. *Sullivan, 1998, page 19*.

The Central and North Coast regions accounted for 97 acres and 178 acres of Barbera, respectively, in 2010.

Glenn McGourty, Winegrowing and Plant Science Advisor, University of California Cooperative Extension, included Barbera in a Mediterranean wine grape cultivar trial in the Red Hills, a sub-appellation of Lake County, which is a warm Winkler region III area. The research was conducted between 1998 and 2000. Fruit yields averaged 3.2 kg/meter of cordon for three years. Fruit chemistry results showed average titratable acidity at 10.3, % Brix at 25.9 and pH at 3.13. McGourty agreed that the best Barbera wines (good fruit, dark color, good tannic structure) have been produced outside of the San Joaquin Valley. However, when grown in moderately cropped vineyards in the Northern San Joaquin Valley (Winkler region IV), and carefully vinified, Barbera has also made very good quality wines in recent years. *McGourty, 2011*.

Other U.C. researchers concur and report that, in cooler regions in California [Winkler regions III and IV] and at lower yields, Barbera produces a quality varietal wine. *Christensen, 2003, page 27*.

Region V

In their publication in 1944, Amerine and Winkler concluded that Barbera was a suitable planting for the hot, fertile irrigated valleys of Winkler region V, which includes Fresno, Madera, Merced and Tulare Counties. *Amerine and Winkler, 1944*. They indicated that '[Barbera] is among the best varieties tested for the production of average and above average quality dry table wines in region V, but its planting is less well indicated for that region than for III and IV'. *Amerine and Winkler, 1944, page 553*. The Professors opined that wines from the 'warmer regions (IV, and more particularly V)' were less delicate, heavier and generally lower in quality. *Amerine and Winkler, 1944,*

page 552. The typical product of region V was described by them as bulk quality red table wine produced from the higher acid varieties.

A truly impressive increase in acreage occurred in the Central and San Joaquin Valley regions in the 1970's, where Barbera became a prominent red wine variety. Julio Gallo encouraged planting in California's warmer regions recognizing that Barbera's high acidity would make it highly desirable for blending. Barbera was used to raise the quality of inexpensive red table wines by its contribution of acid and color. *Sullivan, 1998, page 19; Adams, 1973, page 180*.

The cultivar achieved its peak acreage in California in 1980 at about 21,000 total acres, most of which was located in California's warm interior valleys. By 2010, however, the total for the entire state had declined to approximately 6800 acres, 6200 of which were in the large counties in the southern Central Valley. *McGourty, 2011; California Grape Acreage Report – 2010 Crop; Christensen, 2003*.

Barbera's characteristics in California

A general explanation on how Barbera performs in California was included in the section of the 1944 Amerine and Winkler publication in 'Notes on Recommended Red Varieties'. The Professors indicated that Barbera is well above average in vigor and produces moderately well in California. *Amerine and Winkler, 1944, page 552*. A more recent report from U.C. researchers has quantified production. Vines usually bear 6 to 9 tons per acre, except on hillsides and non-irrigated sites where lower yields are normal. Yields have also been lower in the Sierra foothills (3-5 tons per acre), even if irrigated. *Christensen, 2003, page 26*.

Barbera is adaptable to many soil types but may show a lower tolerance for alkaline soils. *Christensen, 2003, page 25; Hilgard, 1886*. The vines leaf out relatively late, and Barbera is usually harvested 'midseason' (mid-September to early October) in the state. *Christensen, 2003, page 25; Amerine and Winkler, 1944, page 552*. Barbera adapts to various rootstocks, and there are no known incompatibilities. *Christensen, 2003, page 26; Kasimatis, 1980*.

The Barbera grapes grown in California consistently maintain high fruit acidity retention. U.C. researchers saw that the degree of acidity in the musts appeared to be affected less by maturity and by region of production than in most varieties. The wines produced were distinctive in aroma and flavor, fruity, medium to high in acidity, heavy or full-bodied and usually good in color and finish. None of the wines were above normal in tannin content. *Christensen, 2003, page 25; Amerine and Winkler,*

1944, page 552. Amerine and Winkler concluded that the characteristic heavy body, high acidity and average tannin level meant that Barbera would require and greatly profit by aging. *Amerine and Winkler, 1944, page 552.*

BARBERA SELECTIONS AT FPS

Foundation Plant Services never received any of the Barbera clones mentioned earlier in this article directly from the vineyards maintained by the Department of Viticulture & Enology on the U.C. Davis campus. The first Barbera selection came to FPS around 1959 or 1960 from a California vineyard. It is possible that that first selection originated indirectly from the Department collection, but there is no documented chain of evidence leading to that conclusion.

Barbera FPS 01/ Barbera FPS 06

The plant material that became Barbera FPS 01 came to Foundation Plant Services around 1959 or 1960 from a California vineyard – Marshall 32v7. The FPS files give no additional identifying information about the ‘Marshall vineyard’. One educated guess is that the Barbera vine came to FPS from the vineyards maintained by L.K. Marshall in Lodi, California.

Lawrence K. Marshall moved to Lodi, California, in 1917, where he established a vineyard and began clonal experimentation and wine making with various grape cultivars. He was a prominent member of the California grape and wine community in the 1930’s. *Winkler, 1957.*

After Prohibition was repealed, Marshall established a wine cooperative in Lodi in 1934 called the Bear Creek Vineyard Association, and East-Side Winery. Bear Creek and other wineries joined in the Wine Growers Guild, a federated cooperative, in 1937. Marshall became the first Chair of the Research Committee of the Wine Institute in 1934. *Winkler, 1957.*

Following World War II, Marshall was one of the first in the industry to recognize the seriousness of the virus threat to the grape industry. He helped form the California Grape Certification Association, an organization to produce grape planting stock that could be certified free of known viruses and true to variety name. *Winkler, 1957.*

Wine writer Charles Sullivan describes L.K. Marshall as follows: ‘A power in the twentieth century development of winegrowing in the Lodi area and a founder of Guild Wineries. André Tchelistcheff considered him, along with Louis M. Martini and Herman Wenthe, one of the three ‘apostles of the modern California wine industry.’” *Sullivan, 1998, page 201.*

U.C. Davis Viticulture Professor Winkler and L.K. Mar-

shall were close friends. Marshall was one of the growers to which the university provided grape plant material for use in the university wine-making evaluations. Marshall’s vineyard in Lodi had 30-40 different varieties which the university could access for grapes. *Winkler, 1973, pages 11-12, 22-24, 50, 85.* The old FPS grape distribution records show that FPS program technician Curtis Alley exchanged grape cuttings with L.K. Marshall in 1956 and 1957. It is known that Barbera was being grown in the Lodi area in the 1930’s. *Wines & Vines, 1938.* A reasonable inference can be drawn that the ‘Marshall’ referenced in the FPS database as the source of Barbera FPS 01 was L.K. Marshall of Lodi.

Assuming that the plant material that became Barbera FPS 01 did come from L.K. Marshall’s vineyard in Lodi, it is not clear whether or not that material had previously been provided by the university to Marshall for planting in his variety blocks or whether Marshall had obtained the material from another source prior to involvement with the university program. In either case, there is no definitive source information for Barbera 01 that precedes the reference to the Marshall vineyard.

The Marshall Barbera selection underwent heat treatment for 119 days and tested negative for disease in the 1960’s and 1970’s. Barbera 01 (also assigned the super-clone number 115 by USDA Plant Pathologist Dr. Austin Goheen) was planted in the foundation vineyard in 1964 and again in 1965. The selection first appeared on the list of registered vines in the California Registration & Certification Program in 1970.

University of California Extension Viticulturist Peter Christensen recalls that most of the Barbera plantings in California in the 1970’s and 1980’s were in the San Joaquin Valley where the variety was used mostly for blending because of its relatively high acidity. When Barbera 01 was first released, most of the existing Barbera vines in California were infected with leafroll virus, resulting in less fruit color and sugar. *Kasimatis et al., 1980.* Christensen stated that, by contrast, the own-rooted Barbera 01 material was clean and vigorous and proved to be a productive source of wood. *Christensen e-mail, 2008.*

In 1980, FPS began using a new Cabernet franc index test that was designed to detect ‘mild forms’ of leafroll virus. It was thought that the Cabernet franc index would be an improvement over the prior Mission index. Dr. Goheen reindexed 81 selections of 20 important FPS registered grape scion varieties in 1981-82. *Minutes of the Grape Growers Meeting held April 27, 1982, FPS Grape Growers’ Newsletter, no. 2, August, 1982.* The Barbera 01 vines in the foundation vineyard tested positive for ‘mild leafroll’

in 1982. Barbera 01 was removed from the Registration & Certification Program in 1984.

Meanwhile, Christensen had conducted a clonal trial of Barbera 01 vis à vis the plant material that later became Barbera 02 (Rauscedo clone 6) at Kearney Agricultural Center in the San Joaquin Valley. He was impressed with the performance of Barbera 01 in that trial. Christensen reported in 1995 that Barbera 01 produced smaller berries and clusters of earlier maturation. Barbera 02 yielded larger clusters and berries but matured later and suffered more rot. Christensen concluded that Barbera 01 should be preserved in the FPS collection after undergoing disease elimination therapy. *Fidelibus et al., 2009; L.P. Christensen, unpublished data, 1995.*

In a 1995 letter to FPS, Christensen recommended that Barbera 01 (the Marshall clone) be scheduled for virus elimination therapy because: 'The Marshall clone represents the best planting material used by the industry during the cultivar's more extensive planting from the mid 1970's to the early 1980's. Additionally, it exhibits good fruit characteristics for wine making, increases the diversity of clonal material available to our industry, and adds to the base of future clonal testing and importation of this important cultivar.' *Christensen letter to Golino, April 11, 1995.*

FPS was thereafter able to locate a source for Barbera 01 that did not appear to have symptoms of leafroll virus. In February of 1996, plant material for that selection was retrieved from a private increase block managed by John Gist in south Davis. The Gist Barbera 01 plant material underwent reindexing and tested negative for virus. The newly-tested plant material was renamed Barbera 06, which first appeared on the list of registered vines in the California Grapevine R&C Program in 2000-2001. A new selection number was given because the plant material had been outside the control of FPS for a period of time, and FPS could not guarantee that the selection was from the original FPS vines of Barbera 01.

While the original Gist plant material was undergoing retesting and reindexing, FPS also subjected tissue from that Barbera 01 plant material to microshoot tip tissue culture disease elimination therapy. The resulting plant was maintained in the FPS foundation vineyard from 2000 to 2010 as a backup plant to Barbera 06. In 2010, the new National Clean Plant Network for Grapes established a more rigorous standard for grapevine material associated with the network. FPS, as the headquarters for the NCPN for Grapes, was granted land on the U.C. Davis campus to establish a new foundation vineyard that incorporates the stricter standard. In order to qualify for the new foundation vineyard at Russell Ranch, grapevine material must undergo microshoot tip tissue culture ther-

apy and test negative for an extensive list of pathogens that are listed in the '2010 Protocol'. The backup plant for Barbera 06 has met both of those criteria and will be planted in the foundation vineyard at Russell Ranch in 2011 under the new name Barbera FPS 6.1.

Barbera 06 was included in a clonal trial managed by U.C. Extension Viticulturist Matthew Fidelibus in Parlier, California, between 2003 and 2006. The other Barbera selections in the trial were Barbera 02, 03, 04, and 05. Dr. Fidelibus found that Barbera 06 produced lower yields than many other selections but suggested that the selection might nevertheless be desirable for growers in warm climates. The berries were fewer and smaller; the clusters were less susceptible to sour rot; and the fruit composition was comparable to most selections. Over the course of the study, the fruit of Barbera 06 had similar or greater soluble solids at harvest than the fruit of the other clones, even in the year in which FPS 06 was the last to begin ripening but the first (by a week) to be harvested. Juices from Barbera 06 generally had similar or lower titratable acidity than juices from other selections. *Fidelibus et al., 2009.*



The Marshall clone has less rot and is suitable for warmer climates.

Barbera 02

Dr. Austin Goheen imported the plant material that became Barbera 02 to FPS from Italy for evaluation in February of 1983. The supplier of Rauscedo clone 6 was Rauscedo Grapevine Nursery. Rauscedo clone 06 never appeared on the approved registry of Italian clones and was removed from the Rauscedo selection program prior to microvinification. Barbera FPS 02 is not a proprietary selection at FPS.

Barbera 02 tested negative for viruses at FPS and did not undergo treatment. The selection was planted in the foundation vineyard in 1986 and first appeared on the list of registered vines in the California Registration & Certification Program in 1988-89.

In 1995, Peter Christensen summarized his findings for four years of data for Barbera 02 as follows: 'Results to date have shown [Barbera 02] to be more fruitful and to produce heavier berries and clusters, as well as higher yield, as compared to [Barbera 01]. However, [Barbera 02's] fruit maturation is 7 to 10 days later and shows high bunch rot potential. Wine color also tends to be lower with [Barbera 02]. This is probably due to the greater pulp to skin ratio of [Barbera 02], as the skin anthocyanin contents are similar.' *Christensen letter to Golino, 1995*. Christensen felt at that point that Barbera 02 had potential in the industry due to its production capacity.

Dr. Fidelibus also evaluated Barbera 02 based on four years of data (2003-2006). He concluded that Barbera FPS 02 was the least desirable selection because of large berries and high rot potential. He cited prior research that Barbera's large berries can cause clusters to become compacted and susceptible to rot. In Fidelibus' trial, Barbera 02 consistently had the largest berries and was most susceptible to sour rot. *Fidelibus et al., 2009*.

Barbera 03 and 05

Barbera FPS 03 and Barbera FPS 05 are both clone CVT AT 171 from the Centro di Studio per il Miglioramento Genetico della Vite (CVT), CNR (Grapevine Breeding Center), in Torino, Italy. The CVT-CNR center is involved in research regarding grapevines and cooperates with viticulturists at the University of Torino. Viticulturists Anna Schneider and Franco Mannini are experts in clonal selection and ampelography at the center.

CVT AT 171 was evaluated in Italy with the following results: medium-high vigor, high yield, medium-large cluster, and medium wine quality. *Mannini, 1995*. Ampelographer Anna Schneider commented that the clone is phenologically a bit earlier (bud break, veraison and fruit ripening) than the average Barbera population. She stated that the large clusters have small berries with moderate



Barbera 02 has heavier berries and larger clusters than other FPS clones.

acidity, suitable for young wines. *Schneider, 1997*. The clone was selected in the Piemonte region and first registered in Italy in 1990.

CVT AT 171 came to FPS in 1993 and was first offered for sale by FPS in 1997 with Provisional status. Selections 03 and 05 first appeared on the list of registered vines in 1999-2000 and 2000-2001, respectively.

At the time of the release of Barbera 03 and 05, the policy of issuing 'duplicate releases' of FPS plant material was explained in the FPS newsletter. More than one selection from a single source or single European clone was on occasion processed through the FPS program. 'Duplicate selection' sometimes signified that the two selections originated from different source vines for the same clone in Europe or that multiple selections from the same source vine underwent different heat treatments at FPS. Maintaining duplicate selections was one way to insure that materials that were true to variety and clone were

eventually included in the FPS collection. Barbera CVT 171 was cited as an example for which there were two FPS selections, 03 and 05. See *FPMS 1997 Grape Program Newsletter*. The FPS newsletter article did not clarify whether Barbera 03 and 05 were from the same or separate source vines in Italy, only that they were the same Italian clone.



Barbera 05 is clone CVT 171 from Italy.

In his clonal evaluation, Dr. Fidelibus found that the two selections were almost identical with respect to every variable measured, regardless of year. Berries of selections 03, 04 and 05 were less heavy than Barbera 02 and heavier than Barbera 06. In every year, Barbera 03 and 05 produced 20 to 30 % more fruit, by weight, than Barbera 06. In two of the four years, the two produced 20% more fruit than Barbera 04. The higher yields for Barbera 03 and 05 were attributable either to production of more clusters or to heavier clusters, while the greater cluster weights of the two selections was attributable to those selections having more berries per cluster. *Fidelibus et al., 2009*.

Barbera FPS 04

Barbera FPS 04 was imported to Foundation Plant Services in 1993 from CVT-CNR in Torino, Italy. The plant material is clone AT 84, which was selected in Piemonte by CVT and first registered in Italy in 1980.

The clonal performance in Italy indicates medium vigor and yield, small clusters, high wine quality, moderate acidity, and suitability both for early consumption and aging. *Mannini, 1995*. Anna Schneider commented that this clone was usually less affected by grey rot than the average Barbera clone. She agreed that the wine produced from the clone is high quality and suitable for aging. *Schneider, 1997*.

Diego Barison, director of field operations and customer relations for Novavine Grapevine Nursery, spoke at Foot-hill Grape Day 2011 'Focus on Barbera' and discussed clonal and wine trials of Barbera clones he has done in Italy and California. He indicated that Barbera FPS 04 (AT 84) is a popular clone in Italy which exhibits small-to-medium clusters and berries and early-to-medium budbreak and maturity. *Barison, 2011*.

Barbera FPS 04 received no treatment and first appeared on the list of registered selections at FPS in 2000.

Barbera FPS 07

Barbera FPS 07 was imported to Davis in 1998 by Novavine Grapevine Nursery from Vivai Cooperativi Rauscedo in Italy. The selection is a proprietary clone to Novavine.

The Italian clonal designation for FPS 07 is VCR 19. Diego Barison characterized this clone as one of the most suitable for producing wine through aging, given its good body, color and structure. The clusters are smaller and have higher fertility than average. This clone may be planted in rocky, dry soils. *Barison, 2011*.

Barbera FPS 07 received no treatment at FPS and appears on the list of registered vines in the California R&C Program.

Barbera FPS 08

Barbera FPS 08 was imported to Davis in 1998 by Novavine Grapevine Nursery from Vivai Cooperativi Rauscedo in Italy. The selection is also proprietary to Novavine Grapevine Nursery.

The Italian clonal designation is VCR 15. Barison states that the clone produces small to medium clusters of lower than average weight and small berries. The vine exhibits medium vigor and yields a consistent production. The wine is 'nice and strong and a deep ruby red, if the canopy is managed properly'. Wine from this clone is also suitable for a long period of aging. *Barison, 2011*.

Barbera 08 received no treatment at FPS and has registered status in the California R&C Program.

CONCLUSION

Barbera was one of the early European grape cultivars imported for the emerging California wine industry. The versatility of the cultivar enabled it to thrive through various eras of California wine making and wine styles. The FPS collection contains Barbera selections that are suitable for winegrowers in all appropriate regions of California and elsewhere.

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