

History of Pinot noir at FPS

by Susan Nelson-Kluk, Grape Program Manager, Foundation Plant Services

THE PINOT NOIR COLLECTION at FPS includes over 75 selections from six countries. Some of the selections came to UC Davis more than 50 years ago. Many are new introductions that advanced to California registered status in the last two years. A history of the FPS Pinot noir collection is presented here to show the original sources, relationships between the different selections and links to some of the industry clone names.

Assigning FPS selection numbers

All grape selections at FPS are uniquely identified according to their original single vine source. For example, Pinot noir FPS 09, 16 and 29 were all collected from the same vineyard near Jackson, California; however, they came from different vines and thus were given different selection numbers. Different selection numbers are also assigned when treatments are used to eliminate known or suspected virus disease. Each treated plant becomes a new single vine source and is assigned a unique FPS selection number. An example is FPS 106, which was created from FPS 29 using microshoot-tip culture to eliminate a suspected leafroll virus infection. FPS 106 is therefore likely to be genetically identical to, but healthier than, FPS 29 because microshoot-tip culture and heat treatments used for virus elimination do not usually affect the genotype of a plant.

Although some FPS selections are probably genetically identical to one another, in most cases, we do not know which selections are genetically unique clones. Replicated vineyard trials are currently the only way to determine whether selections have differences that justify identifying them as unique clones. Some trials of this sort have been conducted by private and public researchers using FPS selections, but horticultural evaluations have never been part of the prescribed process to qualify grape selections for any of the certification programs in the USA. Horticultural evaluations are a major component in the French and Italian grape certification programs, so they call their materials "clones." European clones, however, do not always perform the same in California as they did in Europe, so information from European clonal trials may not be applicable to U.S. conditions.



Someday, the DNA methods currently used to identify grape

varieties may become sophisticated enough to routinely distinguish clones, but the technology is not yet that advanced. Traditional ampelography (visual inspection) doesn't seem to be a reliable method for identifying specific clones/selections either. Consequently, the only way to know a vine's clonal/selection identity is to review the records for propagation wood sources.

Many of the older FPS Pinot noir selections were abandoned when a Saint George field index to detect Rupestris Stem Pitting (RSP) was added to the regulations for the California Grapevine Registration and Certification (R&C) Program in 1984. Microshoot-tip tissue culture was subsequently used to create new selections that tested negative for RSP from the old materials. However, research conducted by Dr. Adib Rowhani in the late 1990s showed that the Saint George index did not always give reliable RSP results, and a high percentage (25-30%) of the foundation mother vines might be infected. On January 1, 2001 RSP was dropped from the list of diseases targeted by the R&C Program because there wasn't good data showing that RSP was a harmful disease and test results were uncertain. Most of the selections that have been registered since January 1, 2001 have been tested for RSP using Saint George and a new PCR test, but their RSP status remains uncertain because there is still no definitive test.

Sources

The oldest sources documented in FPS records for Pinot noir are for two introductions made by Dr. Harold Olmo in 1951. One came from Pommard, France and was designated Pinot noir 04. It was registered in the R&C Program from 1963 until 1980 when it was removed because it tested Rupestris Stem Pitting positive (RSP+). FPS selections 05 and 06 were created from 04 in 1964 using thermotherapy. They were both registered from 1967 until 1980 when they were removed because they also tested RSP+. Recently, selection FPS 91 was created from 04 using microshoot-tip culture. It became registered in the R&C program in 2002. FPS

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selections 04, 05 and 06 have been called **Pommard clones** by the industry. FPS 91 is from the same genetic source as 04, 05, and 06 and it will become the new registered **Pommard** selection.

The other 1951 Pinot noir introduction by Olmo came from Spain, and was labeled "Beba." Spanish experts say that Beba is a variety unrelated to Pinot noir, so the meaning of this designation is unclear. The original material was designated selection FPS 10. FPS 11 and 12 were made from FPS 10 using thermotherapy. All three were registered in the R&C Program from 1967 until 1980, when they were removed from the registered list because they tested RSP⁺. Recently, shoot-tip culture was used to create FPS 107 from FPS 10. FPS 107 was planted in the FPS foundation block, and advanced to Provisional Foundation Stock status in 2003. FPS 107 is probably genetically identical to FPS 10, 11, and 12 and it will become the new **Beba** selection.

In 1952, three introductions labeled "Blau Burgunder" were sent to Davis from Wadenswil, Switzerland. These became FPS 01A, 02A, and 03A, which are known as the **Wadenswil** selections. All three became registered in the R&C Program in 1962. FPS 30 was a heat-treated selection of 02A, but was never registered. FPS 03A was dropped from registration in 1981 due to positive tests for leafroll. FPS 01A and 02A are still registered.

Another two selections were imported from Wadenswil, Switzerland in 1966. They were labeled "Clevner Mariafeld" selections of Blau Burgunder. In the FPS collection, they became Pinot noir FPS 17 and 23, and have become known as the **Mariafeld** selections. Both were first registered in the R&C Program in 1974. FPS 17 was removed from the program in 1980 because it tested RSP⁺. Plants produced from FPS 17 using microshoot-tip tissue culture are being tested to attempt to qualify them for the foundation block. FPS 23 is still registered in the R&C Program.

FPS 27 is from a selection imported from Geisenheim, Germany in 1968. It was registered from 1974 to 1980, when it was removed because it tested RSP⁺. Tissue culture has been used to create FPS 105 from FPS 27. FPS 105 was planted in the foundation vineyard in 2003. We expect to start distributing FPS 105 in about 2005.



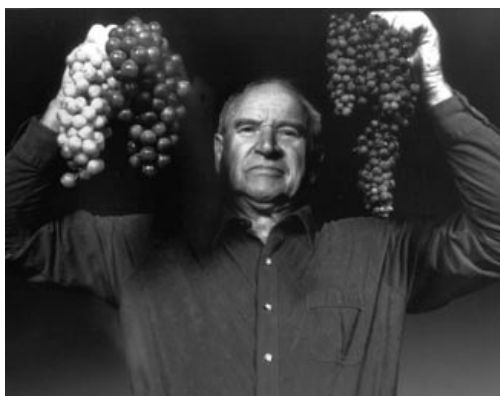
Professor Hilgard established the Jackson Experiment Station, source of some of the oldest Pinot noir selections at FPS.

In the early 1960s, Dr. Austin Goheen, USDA-ARS plant pathologist, collected three Pinot noir selections out of the Foothill Experiment Station near Jackson in Amador County, California. The 'Jackson vineyard' was one of seven experimental vineyards established around California by UC Berkeley Professor Hilgard in the 1880s.

Goheen rediscovered the Jackson vineyard in 1963 after it had been overgrown and abandoned by the University. He also found old maps and records for it in the UC Berkeley library and managed to

overcome resistance from the owner to get permission to visit the plot and collect cuttings from the vines. Goheen was interested in the Jackson materials, reasoning that they had been imported before phylloxera invaded Europe, and so were less likely to be infected with the viruses that were spread by the phylloxera-resistant rootstocks. Jackson selection #2 became FPS 09, and Jackson B block clone 1 became Pinot noir FPS 16. Both have been registered in the R&C Program since 1974.

The third Pinot noir selection Goheen collected out of the Jackson vineyard was initially labeled "Pinot Saint George". It was also called "Pinot Franc" and



Dr. Harold Olmo, an early pioneer of grape collection and breeding, collected Pinot noir selections from around the world.

Pinot noir FPS 29. This Pinot noir selection passed the disease tests necessary to qualify it for the R&C Program without any treatments in the 1960s, but it was not registered because of concerns about the varietal identification. Oregon researchers included FPS 29 in several of their Pinot noir clonal trials anyway, and rated it in the highest wine quality group. This generated a fair amount of interest in FPS 29, so the

disease tests were repeated at FPS in the late 1990s to attempt to qualify it for the current R&C Program. FPS 29 does not yet qualify for foundation status because of an inconclusive leafroll test result. Tissue culture was used to make FPS 106 from FPS 29. We expect to begin distributing FPS 106 in 2005. Visual inspections and DNA analysis are planned for verifying the varietal identity of FPS 106.

Sometime before 1966, two Pinot noir selections for FPS were collected out of the Martini clonal trial set up by Dr. Harold Olmo and Louis Martini in a vineyard located on Stanley Lane in Carneros. These selections were taken from two different vines in row 17 of the trial, and all of row 17 was designated Martini clone 58 by Olmo. Both selections were heat treated. One was heat treated for 105 days and was designated FPS 13, and the other was heat treated for 69 days and became FPS 15. FPS 13 was registered in the R&C Program from 1974 to 2002, when the vineyard in which it was planted was removed. Additional FPS 13 vines have been planted in a new foundation block and were registered in 2003. FPS 15 has been registered continuously in the R&C Program since 1974. The Carneros Creek "V" clone, which has now become registered FPS 66, was also derived from Martini 58. It is therefore likely that FPS 13, 15, and 66 originated from the same source.

Sometime before 1977, Meredith Edwards at the Mount Eden Vineyards sent the **Rae clone** to Goheen for clean up. Goheen heat treated it for 61 days and created FPS 37, which has been registered in the R&C Program since 1992.

A group of FPS Pinot noir selections that have been known as **Gamay Beaujolais** type include FPS 18, 19, 20, 21 and 22. The records show that all five were derived from the same UC Davis single vine source (I60 V15), but FPS 22 is the only one of the group that was created using thermotherapy. The other four are sister propagations that were individually tested for virus. FPS 18, 19 and 22 have been registered in the R&C Program since 1974. FPS 21 was dropped from registration in 1982 because it tested leafroll positive. In 1992, FPS 20 was also dropped off the registered list because many of the FPS 20 registered mother vines tested leafroll positive. A selection created from FPS 21 using microshoot-tip culture advanced to become FPS 104. We expect to start distributing FPS 104 by fall 2005. High vigor and an upright growth habit are

characteristic for the Gamay Beaujolais selections. Since FPS 18, 19, 20, 21, 22 and 104 all came from the same original source vine, they are expected to be genetically identical.

By the mid 1980s, interest in European clones was increasing, especially in Oregon. The Oregon Winegrower organization and Ron Cameron at Oregon State University (OSU) worked together and successfully established relationships with Raymond Bernard at the Office National Interprofessionnel des Vins (ONIVINS) in Dijon, France and Alex Schaeffer at the Station de Reserches Viticoles et Oenologiques, INRA, Colmar, France. OSU consequently was able to import more than 13 French Pinot noir clones which were later (1987 and 1992) sent to FPS.

The French clones sent to FPS from OSU are public and considered "generic." The source for generic French clones is shown as "reported to be French ###" in FPS records to distinguish them from the trademarked clones that are authorized by ENTAV and sent from the official ENTAV vineyards. Generic clones are assigned an FPS selection number that is different from the reported French clone number. There is no assurance of authenticity for generic clones.

Six clones that came to FPS from Dijon via OSU are included in the official French catalogue of certified clones. The reported French source and corresponding selection numbers used to identify these materials at FPS are French 113 (FPS 44), French 114 (FPS 46 and 47), French 115 (FPS 89), French 375 (FPS 94), French 459 (FPS 38), French 667 (FPS 72 and 93), and French 777 (FPS 71). All of these selections now have registered or provisional status.

Three clones that originally came to FPS from Dijon via OSU are not in the French catalogue. They may have been early candidates for the French program that did not advance to the certified level. The reported French source and corresponding FPS selection numbers are: French 59 (FPS 69), French 156 (FPS 43), and French 338 (FPS 70).

OSU also sent French 162, which they had acquired from Colmar, to FPS in 1987. It became registered as FPS 48 in 1997. Two selections from l'Espiguette, France were sent from OSU to FPS in 1987. Reported French 236 became registered FPS 40 in 2002 and reported French 374 became registered FPS 100 in 2001.

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Three Italian Pinot noir clones were sent to FPS in 1988 by Dr. Antonio Calo from the Istituto Sperimentale per la Viticoltura de Conegliano Veneto, Italy after Calo spent a year visiting UC Davis. Italian clone LB4 became registered FPS 86 in 2001, R4 became provisional FPS 101 in 2002, and LB9 is still in quarantine while tissue culture is being used to eliminate a leafroll infection.

Several private companies contracted with Goheen and later, directly with FPS to import French Pinot noir clones into California. Some of these clones became part of the FPS public collection and others stayed under the control of the customers who paid a premium for the private importation services.

In 1984 Goheen imported six Pinot noir selections from Roederer, Chouilly, France for the Roederer Estate in Anderson Valley and the public FPS collection. The reported French clone sources were 236, 386, 388, 290, 292 and 291. The reported French 236 and 386 were advanced to become registered FPS 31 and 32, respectively, in 1988 without any virus elimination therapy. FPS 32 has since become known as the **Roederer clone**, according to the current winemaker at Roederer, Arnaud Weyrich. He said FPS 32 is used for still as well as sparkling wine. Three of the clones tested positive for RSP, which disqualified them for the R&C Program at the time. French 290, 292, and 291 have therefore been offered by FPS as non-registered FPS selections 34, 35, and 36, respectively since the mid 1990s. French 388 became FPS 33 for a short time, but it was removed from the FPS collection in 1990 because of concerns about RSP.

Domaine Mumm contracted with FPS to import four Pinot noir clones from Champagne Perrier-Jouet, France in 1988 for their own vineyards and the FPS public collection. All of the clones in this set were duplicated in other importations, but multiple copies of the same clone have been kept in the FPS collection if they originated from different sources. Since there is no way to verify clonal identity, keeping multiple copies increases the chances of having an accurate copy of a specific clone. FPS imported clones reported to be French 115, 386, 389 and 665 for Domaine Mumm, which have since become FPS 73 (registered 2002), 39 (registered 1994), 88 (registered 2002), and 51 (registered 2001), respectively.

Gloria Ferrer arranged for the Saanichton Plant Quarantine Station in British Columbia to import 12 Pinot noir clones from Epernay, France in 1989. FPS importation services were very limited then, while new quarantine facilities were under construction in Davis. Saanichton was able to ship these clones to Gloria Ferrer in Sonoma in 1993 after completing all the tests to qualify them for certification in Canada. In 1996, Gloria Ferrer generously donated cuttings from all 12 clones to the FPS public collection. FPS retested all the clones and qualified them for registration in the R&C Program by 2002. The reported French clone sources and their corresponding FPS selection numbers are: French 389 (FPS 82), French 521 (FPS 84), French 665 (FPS 83), French 666 (FPS 77), French 668 (FPS 78), French 743 (FPS 79), French 779 (FPS 98), French 780 (FPS 80 & 99), French 870 (FPS 81), French 871 (FPS 54), French 872 (FPS 85), and French 927 (FPS 76).

The Vinifera Grapevine Nursery in California contracted with FPS to import one Pinot noir clone 666 from LaChaignee, France in 1995 along with nine other clones of different varieties. This reported French clone 666 became non-registered FPS 53 in 1997 and registered FPS 74 in 2002. Both FPS 53 and 74 were privately controlled by Vinifera until 2002, when they became available to the public without restriction.

The Etablissement National Technique pour l'Amelioration de la Viticulture (ENTAV) was the first foreign entity to contract with FPS for Pinot noir importation services. ENTAV is an official establishment certified by the French Ministry of Agriculture and responsible for the management and coordination of the French national clonal selection program. ENTAV maintains the French national repository of accredited clones and has created an ENTAV-INRA® Authorized Clone trademark to identify its official clonal materials internationally. This trademark is a good indication that the clonal identity of a vine is correct. Trademarked importations come directly from official French source vines and all the propagation work and records are checked

by the most authoritative French experts. ENTAV retains the exclusive rights to control the distribution and propagation of its trademarked materials which are only available to the public from nurseries licensed by ENTAV (Caldwell Nursery, California Grapevine



Nursery, Herrick Grapevines, and Sunridge Nursery). The selection numbers used to identify ENTAV-INRA® Authorized clones in the FPS collection correlate exactly with the official trademark clone numbers. For example, the four trademarked Pinot noir clones sent to FPS in 1997 are labeled authorized Pinot noir ENTAV-INRA® 667, 236, 943, and 743 and FPS 667, 236, 943, and 743, respectively. Authorized ENTAV-INRA® clones 667 and 236 became registered in the California R&C Program in 2002 and 2003, respectively. Authorized ENTAV-INRA® clones 943 and 743 are projected to become registered in 2004.

The second international entity to contract with FPS for grape importation services was Vivai Cooperativi Rauscedo (VCR) in Italy. VCR is a private nursery cooperative that was formed 70 years ago and which currently has an annual production capacity of over 45 million vines. More than 30 years ago, VCR started its own clonal selection program which includes micro vinification for evaluating winegrape clones. In 1997, VCR formed a joint venture with the NovaVine Grapevine Nursery in Santa Rosa, California, making NovaVine the exclusive U.S. producer and distributor of the private VCR clones. There are currently three privately controlled VCR Pinot noir clones at FPS: designated VCR 18 (FPS 68, registered in 2001); VCR 20 (FPS 92, registered in 2002) and SMA 201 (FPS 103, provisional in 2003).

In 1996, Francis Mahoney gave FPS what he thought were the five best California heritage Pinot noir clones (designated clones A, E, M, P, and V) from his Carneros Creek Pinot noir trial. Funding to test these clones was provided by the California Fruit Tree, Nut Tree, and Grapevine Improvement Advisory Board (IAB). An article about that trial and the clones appears in the 2002 *FPMS Grape Program Newsletter*. This set includes the **Swan** clone (clone A from Joe Swan and Martin Ray sources), which became registered FPS 97 in 2003, and the **Chalone** clone (clone P from Chambertin, France), which became FPS 90 (registered 2001) and 96 (registered 2003). Clone E, which was originally from the **Hanzel** Vineyards, is still being cleaned up at FPS. Mahoney also provided the two **Martini** selections. Clone M was from Martini 54 and became registered FPS 75 in 2001. Clone V was from Martini 58 and became registered FPS 66 in 2000.

The Domaine Chandon Winery in Carneros, California

also donated a California Pinot noir selection to the FPS collection in 1996. They called it the **Christina** clone. The original material only tested RSP positive, so it was advanced to become FPS 55. Later, a plant produced from the original material using microshoot-tip tissue culture to eliminate the RSP was advanced to become FPS 87. Both FPS 55 and 87 became registered in the California R&C Program in 2001.

Over the last seven years (1997-2003), two more Pinot noir selections were added to the FPS public collection. The original material of both selections is diseased, so tissue culture is in progress to clean them up. One came from a California vineyard in 1999 and is reported to be from Vosne Romanee, France (FPS#1999-15-6983). The other came from Bob Pool at the New York State Agricultural Experiment Station in 2001 (FPS#2001-3-7009).

FPS will continue to test and treat new grape selections, including Pinot noir, to qualify them for the R&C Program on a fee-for-service basis. Public materials of interest to the industry are often supported by grants from the IAB.

All of the registered public FPS Pinot noir selections are available from FPS as hardwood cuttings during the dormant season. Customers may also order mist propagated plants of provisional selections if they are willing to assume the risks of working with materials that have not yet been professionally identified. ❖



Francis Mahoney examines his Carneros Creek Pinot noir trial in 2003. Five heritage clones were donated to the FPS public collection.