



FPS GRAPE PROGRAM NEWSLETTER

OCTOBER 2003

UC DAVIS

Lower Minimums and New Selections for 2003-2004

The *FPS Registered Grape Selections for the 2003-04 Dormant Season* list has been updated. Wine, table/raisin/juice and rootstock selections are now organized separately and include more source notations.

This year, the minimum order to qualify for volume discount pricing has been lowered from 100 to 25 cuttings/selection. The price per cutting for orders of 5–24 cuttings/selection will remain \$5.00 per cutting. The discount price for orders of 25 or more cuttings/selection will be \$3.00 per cutting.



The list of registered selections and ordering information are available from the FPS office, or may be accessed on the Web at <http://fps.ucdavis.edu>. Dormant grape cuttings in short supply will be allocated among those whose orders are confirmed by November 15, 2003.

About 49 public and private grape selections were advanced to registered status this year. Some of the selections have simply been re-registered because newly planted vines from older foundation blocks were professionally identified this year. Others are new selections registered for the first time. If you received Provisional California Foundation Stock from FPS in the past, check this list to see if your materials have advanced to foundation status. Retroactive Foundation Stock tags will be provided, upon request, for qualified materials.

Twenty- three grape selections that were planted in the foundation block in 2003 are now available to order as provisional mist-propagated plants. Plants will be
continued on page 2

Name Change and Logo

AS OF June 1, 2003 the name “Foundation Plant Materials Service” (FPMS) changed to “Foundation Plant Services” (FPS). This name better reflects the FPS mission to provide a broad range of plant-related services as well as plant materials. In recent years, there has been increasing emphasis on services that give the public access to new technology developed by UC researchers for improving planting stock. The distribution of elite plant materials produced by using state-of-the-art science and technology will continue as an important service provided by FPS.

Custom services now available from FPS on a fee-for-service basis include: importation and quarantine services for grapes, strawberries, and chestnuts; biological and laboratory testing for plant viruses and bacteria; and DNA analysis to determine grapevine varietal identity. In spring 2004, DNA identification testing services for walnuts will be added.

We are also pleased to introduce the FPS logo, designed by senior artist Margarita Camarena of the UC Davis College of Agricultural and Environmental Sciences.



INSIDE:

- 2 Upcoming Meetings
- 3 Challenging Times Ahead for FPS
- 4 New DNA Grape Variety Identification Service
- 5 UC Patented Nematode-Resistant Rootstocks
- 6 Updating Grape Variety Names
- 9 History of Pinot noir at FPS
- 14 FPS Winegrape Selections Evaluated
- 15 Oregon Grape Programs
- 15 Washington's Grapevine Foundation Program
- 16 New Book Available on Wine Grape Varieties

Lower Minimums, New Selections... continued from page 1 propagated after orders are received, and supplied in about six to nine months. Disease testing of these selections was completed in the fall of 2002. After the vines fruit, those that are professionally identified will advance to Foundation Stock status. Selections that are available only as mist-propagated plants are shown on the *New Materials Available from FPS in the 2003-2004 Season* list. Highlights include:

- Biancolella FPS 01, a white wine variety from Zanzivivai Ferrara in Italy;
- Cabernet Franc 13, reported to be French 312 from France via a California vineyard;
- Cabernet Sauvignon FPS 40 from Mt. Eden vine yard via Kendall Jackson;
- Carmenere FPS 03, a popular wine grape variety in Chile, made from Carmenere FPS 01 using tissue culture;
- Chardonnay FPS 104, reported to be French 118 from Saanichton, BC via a California vineyard;
- Mourvedre FPS 02, reported to be French 249 from a Mendocino County, California vineyard;
- Roussanne FPS 03, from a UC Davis Department of Viticulture and Enology vineyard; this selection matched Roussanne references in a preliminary DNA check;
- Sangiovese FPS 21, from the Rutherford/St. Helena clone via the Pepi Winery, CA;
- Semillon FPS 13, from the Concha clone at the Oakville, CA field station; and
- Verdelho FPS 06 from Galt, California. 🍇

Upcoming Meetings

2003 FPS Annual Meeting will be held November 6, 2003 at the University Club, UC Davis. To make reservations or for information, please contact the FPS office by phone: (530) 752-3590 or email: fpms@ucdavis.edu

NAPPO Annual Meeting is set for October 20–24, 2003 in New Orleans, Louisiana. Contact Nancy Klag at narcy.g.klag@aphis.usda.gov or phone (301) 734-8469 for further details.

2004 Unified Wine and Grape Symposium to be held January 27–29, 2004 at the Sacramento Convention Center, Sacramento, California. Information is available at <http://www.unifiedsymposium.org>

7th International Symposium on Grapevine Physiology and Biotechnology to be held June 21–25, 2004 at UC Davis. Topics include: photosynthesis, respiration and carbon relations, water and nutrient relations, stress physiology dormancy, temperature responses, cold hardiness physiology, fruit development, genetics, molecular biology and other aspects of raisin, table grape and wine grape physiology. More information is available on the Web at: <http://grapevinephysiologysymposium.uckac.edu>

55th Annual Meeting of the American Society for Enology and Viticulture (ASEV) to be held June 29–July 2, 2004 at the Manchester Grand Hyatt, San Diego, California. Details will soon be available on the Web at: <http://asev.org>



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Challenging Times Ahead for FPS

by Deborah Golino, Director, Foundation Plant Services

THE NEWS HAS BEEN FULL OF STORIES about how the budget difficulties for the State of California have resulted in serious cuts in funding for the University of California and, in particular, to our Agricultural Experiment Station and Cooperative Extension.

Foundation Plant Services is also going through difficult financial times. FPS does not receive state or federal funds directly to support its programs. Each of our commodity programs is supported by funding from the industries which are served. However, our California state budget problems reflect the general trends of the state's economy. The last few years have been difficult for the industries we serve. In turn, this has a big effect on our income.

For our grape program, this has meant that sales of plant materials are down, custom service contracts are down, and grape user fee payments are down. This year, the IAB was very generous in its funding of the FPS grape program but made the decision to focus on improving the quality of future planting for our "next generation program" rather than funding the introduction and clean-up of new selections into the program.

The result is that we are in the process of reducing the size of our staff and re-evaluating the projects that we can accomplish.

Over the last year, six career FPS positions have been eliminated by a combination of layoffs and leaving positions open when staff leave. Several staff members have enrolled in the University's voluntary work reduction program. We have also greatly reduced the amount of contract labor we employ to help with vineyard maintenance and winter harvest of cuttings.

To adjust to these losses, we have made a careful review of our collections. Some redundant germplasm has been eliminated. In other cases, where interesting varieties and/or clones have been made available, we are planting them in our new field quarantine and domestic blocks for future testing and disease elimination; this allows the new accessions to be preserved without investing immediately in the intense staff effort needed for testing, therapy and registration.

The focus of our FPS grape program will continue to be on producing the highest quality virus-tested and



true-to-variety plant materials, using state-of-the-art technology. Our connections with foreign researchers and curators serve to facilitate the exchange of information as well as grape clones, varieties, and germplasm. This enables us to continue moving ahead, adding new varieties and clones of interest to the industry to the collection as funding allows.

With the help of the grape nurseries, growers, and winemakers we serve, the FPS grape collection has become one of the premier grape clean stock programs in the world. We have planned ahead for this downturn in our income with the guidance of our advisors. Although challenging times lie ahead, we expect to be able to preserve our collections, continue to offer unique services to industry, and employ the most up-to-date technology for disease detection, disease elimination and variety identification. ✿

U.S. Secretary of Agriculture Ann Veneman hosted agricultural ministers from countries around the world, and included Foundation Plant Services on the tour itinerary. FPS Plant Pathologist Adib Rowhani led them through the laboratory, while Production Manager Mike Cunningham (bottom photo) explained the intricacies of the FPS clean stock programs to the interested officials.



New Grape Variety Identification Service Offered

GRAPE GROWERS, wineries, nursery managers and industry representatives now have access to reliable DNA profiling services for the identification and characterization of grapevines. Much of the technology and database for grapevine DNA profiling was developed in the laboratory of Dr. Carole Meredith, professor in the UC Davis Department of Viticulture and Enology. Her lab used these methods to discover that Sauvignon blanc and Cabernet franc are the parents of Cabernet Sauvignon and confirm that Crljenak kasteljanski is identical to Zinfandel.

As of March 2003, FPS accepts grape samples for DNA profile identification from the public sector. The service identifies grapevine cultivars by comparing the DNA profile of the sample to a database which contains over 600 profiles of the major winegrape, tablegrape, raisin and rootstock varieties grown in California, as well as most of the grape varieties grown in other major viticultural regions. Jerry Dangl, a staff researcher recently hired by FPS with years of experience in grape DNA typing, is managing the service.

A sample of a plant in question is typed at eight microsatellite markers, and the resulting DNA profile is compared with the database. For grapevines, eight markers are sufficient to uniquely identify any cultivar to an extremely high degree of confidence. The grape genetics research community considers six markers to be sufficient to distinguish all existing cultivars.

Results are returned in six to seven weeks, unless a "rush option" (\$40 extra per sample) is specified, in which case results are returned in three to four weeks.

A second service is also offered for grape breeders and/or owners of patented or proprietary plant cultivars who would like to use DNA profiling to characterize and protect their new cultivars. For this purpose, two separate samples of a cultivar are typed at ten microsatellite markers each, and a genetic profile is identified that is unique to that cultivar.

Optimally, a sample is collected from tiny leaves on actively-growing shoot tips. Older leaves, roots, fruit and dormant cuttings, while less desirable, can be used. The typical leaf sample is dried down chemically to preserve the DNA. The dried samples are very stable. Drying eliminates the need to keep the samples chilled and moist, and since the samples are dried, dead tissue, they are not subject to federal quarantine regulations governing the importation of living grapevine tissue. Materials and instructions for collecting and drying the leaves will be provided as part of the service.

COSTS:

Service 1: Genetic (DNA) identification of plant cultivars
 \$225.00/sample for lots of six or more samples per submission
 \$300.00/sample for lot sizes of less than six samples per submission

Rush service:

\$40.00/ extra per sample (\$265.00 per sample)
 Results returned in 3-4 weeks vs. standard 6-7 weeks

Service 2: Genetic (DNA) profiling of plant cultivars
 \$1,000.00/cultivar

For information, contact Jerry Dangl, gsdangl@ucdavis.edu, (530) 752-7540. 🍇

Many of the reference samples for the DNA identification process come from the INRA grape collection at Domaine de Vassal, France, shown at right. The white outline on the aerial photo shows its location by the Mediterranean Sea.

Photos courtesy of J-P. Bruno, INRA Domaine de Vassal, France



Release of UC Patented Nematode-Resistant Rootstocks

TWO NEW GRAPE ROOTSTOCK varieties developed by Dr. Michael McKenry, nematologist in the UC Riverside Department of Nematology, have been released by the University this fall. The nematode-resistant varieties, RS-3 and RS-9, were described in the October 2001 *FPMS Grape Program Newsletter*. Characteristics of the rootstocks RS-3, RS-9, Freedom, Harmony and O39-16 are compared in Table 1.

An initial release of limited quantities of propagating material was made by FPS in October 2003 to nurseries in the California Grapevine Registration & Certification Program under license agreement with the UC Office of Technology Transfer (UC-OTT). Mist-propagated plants (4" green growing plants on their own roots) can now be custom ordered for delivery in 2004 by completing and submitting a signed FPS Order Form/Grower Agreement and 50% prepayment to the FPS office. Requestors must at the same time contact UC-OTT Licensing Officer Bill Tucker (phone 510-587-6000, email william.tucker@ucop.edu) to complete the required licensing process to receive these materials. Depending upon demand, plants may be delivered in stages beginning in the spring and continuing through the fall of 2004 and beyond. Dormant cuttings of RS-3 and RS-9 will not be available for the 2003-04 season. ❁

RS-3 and RS-9 mist-propagated plants are shown growing at FPS for custom orders. Since extra plants are not kept on hand, customers must plan ahead and allow time for their plants to root and develop before delivery.

PROBLEM	FREEDOM/ HARMONY	RS-3/9	039-16
Replant rejection component	S	S	S
Root-Knot Nematodes [all common populations]	R	R	S
Root-Knot Nematodes [all aggressive populations]	HS	R	S
<i>Mesocriconema xenoplax</i>	HS/S	S	S
<i>Pratylenchus vulnus</i>	S	R	S
<i>Tylenchulus semipenetrans</i>	S	ss	S
<i>Xiphinema americanum</i>	S	S	S
<i>Xiphinema index</i>	R	MR/R	R
Grape Fanleaf Virus	NT	T/?	T
Phylloxera	ss/S	?	S
Vigor (1 is high, 10 is low)	1/3	3/9	2-5
LEGEND: ss=slightly susceptible, S=susceptible, HS=highly susceptible, R=resistant, MR=moderately resistant, T=tolerant			

Table 1: The new RS rootstocks provide reduced vine vigor with broader, more durable resistance. The vigor of RS-3 is suitable for finer-textured soils of the valley. It provides the only grape option where Harmony or Freedom have been removed. The vigor of RS-9 is suitable for coastal soils or close vine spacing in San Joaquin Valley soils.



Updating Variety Names in the Foundation Blocks

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

ONE OF THE MISSIONS of FPS is to distribute correctly identified propagating materials to the public. Assigning the correct variety names to Foundation Stock is essential because small quantities are often multiplied through many generations, affecting large commercial planting areas. FPS materials may be used as variety references, and truth-in-labeling laws require accurate reporting of variety names on wine labels.

Visual inspections have been the primary method used to check foundation mother vines for variety correctness before they advance to registered status in the California Grapevine Registration and Certification Program. During the 1970s and 1980s parts of the FPS collection were checked by UC Davis Professors of Viticulture and Enology (VEN) Harold Olmo and Lloyd Lider, USDA-ARS scientist Austin Goheen, and Antonio Calo, Director of the Istituto Sperimentale per la Viticoltura, Conegliano, Italy. Over the last 13 years, funding by the California Fruit Tree, Nut Tree, and Grapevine Improvement Advisory Board (IAB) was used to hire international and local ampelographers to inspect and professionally identify vines at FPS. Jean-Michel Boursiquot, past professor of viticulture at the Ecole Nationale Supérieure Agronomique de Montpellier, France and current director of ENTAV in France, checked many of the vines in the FPS collection in 1990, 1996 and 2000. Anna Schneider and Franco Mannini from the Centro di Studio per il Miglioramento Genetico della Vite, CNR, Torino, Italy inspected the Italian varieties in 1992 and 1995 respectively. Andy Walker, associate professor of viticulture (VEN), UC Davis, has checked vines in the foundation blocks annually since 1996. For the last 10 years, DNA analysis has also been used to compare some of the foundation mother vines in the FPS collection to local and international grape variety standards.

Determining a single “correct” variety name, however, is not always a straightforward proposition because several different names are sometimes associated with the same variety by different countries/experts. Variety names assigned in the countries of origin and names used most commonly in California were retained in the FPS collection most of the time. This has been confusing in cases where several different names have been

used for different selections of the same variety. Also, as communication between viticulturists in different countries improves, “New World Names” are becoming more of a hindrance than a help in identifying grape materials.

Guidelines for naming grape varieties are provided by the newly formed Federal Alcohol and Tobacco Tax and Trade Bureau (TTB). The TTB is currently the authority designated by the U.S. government to approve variety designations for American wine labels. It was split off from the Bureau of Alcohol, Tobacco and Firearms (ATF) on 11/24/02 by the Homeland Security Bill. The TTB stayed in the Treasury Department but the other part of the old ATF was added to the Department of Justice on January 24, 2003 where it became the Bureau of Alcohol, Tobacco, Firearms and Explosives. A list of the TTB-approved prime names is available on the Web at: <http://www.ttb.gov/rulesandregulations.htm>; choose “Code of Federal Regulations” Title 27, Part 4.91.

Most of the varieties at FPS are already labeled with prime names approved by the TTB. This year the names of an additional 27 selections were changed to prime names approved by the TTB using records of visual inspections and recently completed DNA analysis. These include:

Black Malvoisie→Cinsault

The Black Malvoisie FPS 02 selection came from Sonoma County, California sometime before 1964. In 1990 and 1996 Boursiquot reported that Cinsault would be a more correct name. Later in 1999 Black Malvoisie FPS 02 matched Cinsault using DNA analysis. This year the name was therefore changed to Cinsault FPS 02 since Cinsault is the prime name approved by the TTB. Black Malvoisie is approved by the TTB as a synonym for Cinsault.

Bastardo→Trousseau

Bastardo was imported from Portugal for Dr. Harold Olmo in 1984. Boursiquot said that Trousseau is a more correct name for this variety when he inspected it in the field quarantine block in 1990. Bastardo FPS 01 was produced from the original quarantine material

using tissue culture and planted in the foundation block in 2000. DNA analysis conducted in 2001 showed that Bastardo FPS 01 matched a Trousseau reference. The TTB is phasing out the name Bastardo, so Trousseau is the only approved name for wine bottled after 1997. This year the name was therefore changed from Bastardo FPS 01 to Trousseau FPS 10. Bastardo will be shown as a synonym.

French Colombard→Colombard

There are currently two registered selections identified as French Colombard at FPS. FPS 01 came from a vineyard near Santa Rosa, California and FPS 03 came from a UC Davis vineyard in the 1960s. Boursiquot noted in his 1990 and 1996 reports that Colombard would be a more correct name. Colombard is the prime name approved by the TTB and French Colombard is an approved synonym. The French Colombard FPS 01 and 03 were changed this year to Colombard FPS 01 and 03 respectively. French Colombard will be shown as a synonym.

Gray Riesling→Trousseau gris

The five registered selections of Gray Riesling at FPS came from two different California vineyards. Gray Riesling FPS 01 came from a vineyard north of Ukiah and was used to create FPS 04 and 05 using thermotherapy. FPS 02 came from Snelling, California and was heat treated to make FPS 03. DNA results show that the FPS Gray Riesling selections match references for Trousseau but not Riesling. Boursiquot said that the correct name is Trousseau gris in 1996. The TTB is phasing out the name Gray Riesling, so Trousseau gris will be the only approved name for wine from this variety bottled after January 1, 1999. The name for Gray Riesling FPS 01, 02, 03, 04, and 05 has therefore been changed to Trousseau gris FPS 01, 02, 03, 04, and 05. **It is important to note that Trousseau gris and Trousseau are different varieties.** Trousseau gris is a light-colored mutation of Trousseau, which has black fruit.

Grignolino FPS 02→Arneis

In the 2002 *FPMS Grape Program Newsletter*, we reported that the Grignolino FPS 02 (CVT 275) that came from Torino, Italy in 1993 was misidentified and matched Arneis FPS 01 (Italian CVT32), using DNA analysis. This year, Grignolino 02 matched another

Arneis 02 (FPS 02 from VCR2, Italy) using DNA, but Grignolino FPS 02 did not match Grignolino FPS 03 (CA vineyard) which is correctly identified, according to a visual inspection. Grignolino FPS 02 was therefore changed to Arneis FPS 03 this year. Grignolino and Arneis are both prime names approved by the TTB.

Malvasia Nera FPS 01→Tempranillo

Boursiquot said that Malvasia nera FPS 01, which was imported from Italy in 1995, looked like Tempranillo during visual inspection conducted in 2000. DNA analysis confirmed this observation, so this year, the name was changed from Malvasia Nera FPS 01 to Tempranillo FPS 07. Tempranillo is a prime name approved by the TTB.

Mataro and Esparte→Mourvedre

Mataro FPS 01 was a registered selection that came from a vineyard in Lodi, California before 1965, and registered Mataro FPS 03 was made from FPS 01 using thermotherapy. Both Mataro FPS 01 and 03 matched Mourvedre references from France using DNA analysis. Another selection imported from Australia in 1970 and labeled Esparte FPS 01 also matched the DNA for Mataro and Mourvedre. Mourvedre is a prime name designated by the TTB and the best internationally recognized name for this variety. The names for Mataro FPS 01 and 03 have therefore been changed to Mourvedre FPS 04 and 03, respectively. The name of Esparte FPS 01 will be changed to Mourvedre when testing and treatments required to qualify it for the foundation block are completed.

Napa Gamay→Valdiguie

Napa Gamay FPS 01 came from a vineyard north of Saint Helena, California sometime before 1963. FPS 02 and 03 were derived from 01 using thermotherapy. We have known for some time that the internationally recognized name for Napa Gamay is Valdiguie. This information was confirmed in 1999 by DNA analysis which showed that all three Napa Gamay selections matched Valdiguie. Valdiguie is currently the prime name approved for this variety by the TTB. The name of Napa Gamay FPS 01, 02, and 03 has therefore been changed to Valdiguie 04, 02 and 03 respectively. Napa Gamay will be shown as a synonym, but it is not approved by the TTB for labels on wine bottled after January 1, 1999.

continued on page 8

Updating Variety Names... continued from page 7

Pinot Saint George→Negrette

Pinot Saint George FPS 01 came from a vineyard near Ukiah, California sometime before 1960, and Pinot Saint George FPS 02 was made by heat-treating FPS 01. FPS 05 came from a Jackson, California vineyard around 1965. Boursiquot reported in 1990 that a more correct name for all three selections would be Negrette. Pinot Saint George is another name that the TTB has decided to phase out, so the name cannot be used on wine bottled after January 1, 1999. Pinot Saint George FPS 01, 02, 04 and 05 have therefore been renamed Negrette FPS 06, 02, 04 and 05, respectively.

Petite Sirah→Durif

Although the name Petite Sirah is a prime name approved by the TTB, it is ambiguous because it has been shown to be associated with three different

varieties– Durif, Peloursin and Syrah. We know that the registered Petite Sirah FPS 03 is Durif from visual inspections and DNA analysis, so the name will be changed to Durif, and Petite Sirah will be shown as a synonym. Petite Sirah FPS 03 has been changed to Durif FPS 03.

White Riesling→Riesling

White Riesling is a synonym approved by the TTB, but Riesling is better recognized internationally and the prime name according to the TTB. This year DNA tests showed that the FPS White Riesling selections matched Riesling imported from Germany. White Riesling FPS 02, 04, 09, 10, 12, and 16 have therefore been changed to Riesling 17, 04, 09, 10, 12, and 16, respectively. A table summarizing the name changes described here is shown below.

NAME CHANGES EFFECTIVE FOR THE 2003-04 SEASON

Previous Name/Selection #	Registration status	→	New Name/Selection #	Registration status
Black Malvoisie FPS 02	R	→	Cinsault FPS 02	R
Bastardo FPS 01	N	→	Trousseau FPS 10	R
French Colombard FPS 01	R	→	Colombard FPS 01	R
French Colombard FPS 03	R	→	Colombard FPS 03	R
Gray Riesling FPS 01	R	→	Trousseau gris FPS 01	R
Gray Riesling FPS 02	R	→	Trousseau gris FPS 02	R
Gray Riesling FPS 03	R	→	Trousseau gris FPS 03	R
Gray Riesling FPS 04	R	→	Trousseau gris FPS 04	R
Gray Riesling FPS 05	R	→	Trousseau gris FPS 05	R
Grignolino FPS 02	N	→	Arneis FPS 03	R
Malvasia Nera FPS 01	N	→	Tempranillo FPS 07	R
Mataro FPS 01	R	→	Mourvedre FPS 04	R
Mataro FPS 03	R	→	Mourvedre FPS 03	R
Napa Gamay FPS 01	R	→	Valdiguie FPS 04	R
Napa Gamay FPS 02	R	→	Valdiguie FPS 02	R
Napa Gamay FPS 03	R	→	Valdiguie FPS 03	R
Pinot Saint George FPS 01	R	→	Negrette FPS 06	R
Pinot Saint George FPS 02	R	→	Negrette FPS 02	R
Pinot Saint George FPS 04	P	→	Negrette FPS 04	P
Pinot Saint George FPS 05	R	→	Negrette FPS 05	R
Petite Sirah FPS 03	R	→	Durif FPS 03	R
White Riesling FPS 02	R	→	Riesling FPS 17	R
White Riesling FPS 04	R	→	Riesling FPS 04	R
White Riesling FPS 09	P	→	Riesling FPS 09	R
White Riesling FPS 10	R	→	Riesling FPS 10	R
White Riesling FPS 12	R	→	Riesling FPS 12	R
White Riesling FPS 16	P	→	Riesling FPS 16	R

Key: R = registered, N = non-registered, and P = provisional status in the R&C program

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

continued on page 10

Updating Variety Names... continued from page 9

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.



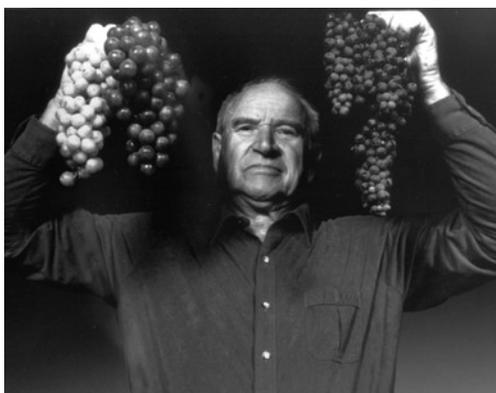
Professor Hilgard established the Jackson Experiment Station, source of some of the oldest Pinot noir selections at FPS.

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.

continued on page 12

Updating Variety Names... continued from page 11

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.

FPS Winegrape Selections Evaluated for Warm Regions

PETE CHRISTENSEN, UC Extension Viticulture Specialist, Emeritus, has been evaluating promising virus disease-tested FPS wine grape selections for the San Joaquin Valley since 1997. His research provides the grape industry with performance information and recommendations for important warm climate cultivars-- French Colombard, Chenin blanc, Barbera, Muscat of Alexandria, Muscat blanc, Grenache, and Sangiovese. The trials are the first and only to be conducted on these cultivars in California with the exception of Sangiovese. The data assists nurseries, growers and vintners in selecting the best-performing selections and avoiding selections with inferior or undesirable characteristics.

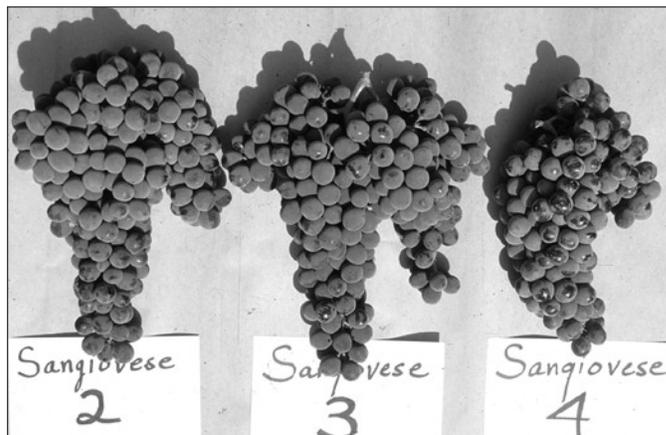
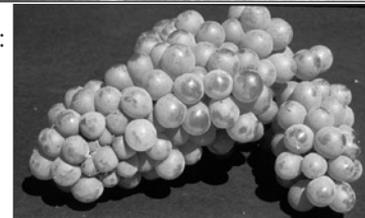
Examples include his recommendation to grow Chenin blanc FPS 01 or 04 and to avoid FPS 05, which produces very tight clusters with a 75% higher bunch rot level than the others. Future Muscat blanc plantings should use FPS 04 from Milan, Italy; widely-planted FPS 01 with its lower fruitfulness of heavy, rot-prone, and larger-berried clusters should be avoided. Grenache growers can choose between FPS 01A with high cluster numbers, smaller berries, and less rot potential or FPS 03 for higher yield, although with heavier clusters and berries, some delayed fruit maturation and a greater rot potential. Sangiovese FPS 04 should be avoided in warm districts due to poor fruit composition (low TA and high pH), high bunch rot incidence and lower anthocyanin content in the wine; FPS 02 is more fruitful and of smaller berry size than FPS 03. Other cultivar selection preferences from this research include Muscat of Alexandria FPS 02A, French Colombard FPS 01 and Barbera FPS 06.

Christensen has also conducted clonal trials in the San Joaquin Valley for virus-tested FPS selections of Chardonnay (FPS 04, 06, 15, 18, 20, 37), Cabernet Sauvignon (FPS 02, 08, 10, 21, 22, 24), Merlot (FPS 01, 03, 09, 10, 11, 14), Primitivo (FPS 03, 05, 06) and Zinfandel (01A, 02, 03).

Copies of his reports are available from FPS upon request. 🍇



Chenin blanc clones tested: from left, FPS 01, FPS 04 and FPS 05. At right, Chenin blanc FPS 05 had smaller, tighter clusters and more rot.



Sangiovese FPS 02 fared best in the trials, with its smaller berries and greater fruitfulness; 03 had larger berries but lower quality and yield, while 04 had poor fruit composition and greater amounts of rot in the warm climates.



French Colombard clones tested, from left, included FPS 01, 02 and 05. FPS 01 outperformed the others in the warm climate trials. *Photos courtesy of Pete Christensen*

Oregon Grape Registration/Certification and Quarantine Programs

THE REGULATIONS RELATED TO GRAPEVINE REGISTRATION and certification in Oregon were established in 1970 and last amended in 1999. There have been no recent changes to this program. There are currently 14 Oregon nurseries growing Oregon certified grape stock.

The Oregon grapevine quarantine regulations were last amended in May of 2002. Currently the regulations require that all grape plants shipped into Oregon be accompanied by a phytosanitary certificate issued by the state of origin. It must certify that the grape cuttings or rooted plants have been inspected and are apparently free of dangerous pests and diseases. Field-grown plants are still prohibited, including dormant field-grown bareroot vines. Healthy potted vines growing in artificial soil are allowed into the state.

The Oregon Glassy-winged Sharpshooter (GWSS)/Pierce's Disease Quarantine was established in December 2002 and is still being enforced. The areas under quarantine include the southeastern states and California. Grape plants from these areas must

(i) originate from nurseries under compliance agreement ensuring that shipped plants are free of GWSS; or (ii) have been treated with a registered pesticide effective against all stages of GWSS. Additionally, grape plants from areas under quarantine, including the entire state of California, must be tested and found free of *Xylella fastidiosa*. The approved testing procedure is spelled out in the quarantine regulations.

New emergency quarantine regulations in Oregon require that anyone importing plant material from outside the state notify the Oregon Department of Agriculture by email Quarantine@oda.state.or.us or FAX 503-986-4564. The Department is inspecting about 5-6% of these shipments for disease. They are particularly interested in looking at high-risk plant material (trees, shrubs and vines) originating from sudden oak death-infected areas.

Anyone needing more information about Oregon regulations can contact Gary McAninch at 503-986-4644 or by email at gmcainc@oda.state.or.us ☛

Washington's Grapevine Foundation Program

by Markus Keller, Associate Horticulturist/Viticulturist, Washington State University, Prosser

WASHINGTON STATE IS THE LARGEST PRODUCER of juice grapes and the second largest producer of premium wine grapes in the United States. There are approximately 25,000 acres of juice grapes planted in Washington, and the rapidly emerging wine industry has grown from 11,000 acres of grapes in 1990 to more than 28,000 acres in 2002. Oregon and Idaho add another 12,000 acres of wine grapes, creating a regional industry proud of the excellence of its products but dependent on the quality of plant material. With its focus on quality, the Pacific Northwest's wine industry has created increasing consumer demand for its premium products. However, the resulting rapid expansion of the state's vineyard area poses a threat to the industry if introduced plant viruses are allowed to spread across the region. The industry has already seen problems from unclean and non-certified plant material that was infected with viruses, such as leafroll, and diseases, such as crown gall.

A grapevine foundation block was established in 1961 by Dr. Walter Clore at Washington State University's Irrigated Agriculture Research and Extension Center (WSU-IAREC) in Prosser. Its primary purpose was to test selections of wine, juice, and table grapes from around the world and supply clean cutting wood to certified nurseries in Washington. Today the block is mandated by the Washington State Department of Agriculture (WSDA), and maintained by WSU staff. Recent changes in the rules governing the state's grapevine certification program make it possible for grapevines to enter certified mother blocks from approved foundation blocks including, but not limited to, the WSU foundation block. Thus, propagants taken directly from foundation grade material in approved programs, such as FPS, can be placed in the mother blocks of certified



Markus Keller

continued on page 16

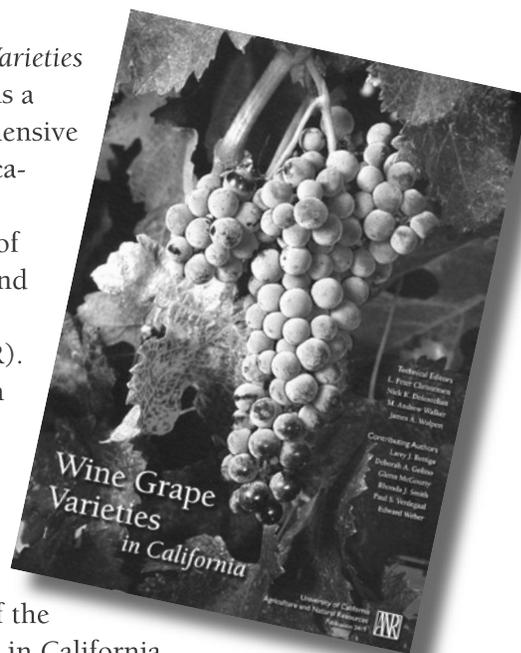
Washington's Grapevine Programs... continued from page 15 nurseries. This modification has shifted the focus of the WSU foundation block to amplify a limited number of selections that are in particularly high demand by the region's expanding wine industry and to house selections that may be important to the Pacific Northwest but of low priority to other foundation programs. WSU scientists are currently working with Washington's wine industry to relocate and expand the foundation block, and to secure long-term funding for its maintenance and periodic re-certification.

Over the last two years the industry, through the Washington Association of Wine Grape Growers (WAWGG), has developed a solid plant improvement plan that focuses on a regional foundation block to provide high-quality, certified virus-tested planting material to the Pacific Northwest region, and an education program for growers and nurserymen to increase awareness of the importance of clean propagation material and overall plant improvement. The block is also intended as a backup for FPS, should disaster ever strike in California. Industry members have identified varieties and clones they consider to be in demand for the foreseeable future. Thus, in addition to 43 selections from the current foundation block, 30 selections were recently obtained from FPS, and another nine were donated by Stimson-Lane Vineyards and Estates. Following virus testing, all selections are currently being shoot-tip cultured for elimination of crown gall before they will be planted in a new foundation block on a WSU-IAREC site that has never before been planted to grapes. At the same time, a search is underway for a foundation block manager to oversee day-to-day vineyard management, coordinate virus indexing, re-certification, propagation and cutting distribution, and assist with educational programs.

Funding for this program at present comes from WAWGG and the Washington Wine Commission through a fundraising drive termed "The Foundation Block Campaign", a joint WSU/industry Congressional request through the USDA, a 5% WSDA assessment on all grapevine propagants produced in Washington, and sale of propagation material from the foundation block to certified nurseries. However, participation in the foundation block is open to all members of the grape, juice, and wine industries in the Pacific Northwest region including Washington, Oregon, Idaho, and British Columbia. Negotiations with representatives from state regulatory agencies and industries will determine the amount of "buy-in" from states other than Washington. ☘

Wine Grape Varieties in California—Now Available

Wine Grape Varieties in California is a new comprehensive variety publication from the UC Division of Agriculture and Natural Resources (ANR). It was written by University of California viticulture specialists and advisors to cover all of the wine districts in California.



Included are five extensive tables on ripening periods of California wine grape varieties, ripening dates by growing district of California wine grape varieties, rootstock selections, trellising systems with illustrations, and minor wine grape varieties. Also included are up-to-date summaries of available and registered clones, detailed illustrations of grapevine structure, a glossary and a bibliography.

The star of the show is the discussion of the 36 major wine grape varieties grown in the state, covering synonyms, sources, descriptions (clusters, berries, shoot tips, leaves), growth and soil adaptability, rootstocks, clones, production, harvest periods and methods, training and pruning, insect and disease problems, other cultural characteristics, and winery use. Each variety is highlighted by close-up photography of its clusters, leaves and leaf shoots. There are 143 lush color photos.

The book costs \$30, and can be ordered by calling ANR Communication Services at 1-800-994-8849 or on the Web at <http://anrcatalog.ucdavis.edu>. ☘



FPS ANNUAL MEETING
NOVEMBER 6, 2003