



FPS FRUIT



NUT TREE NEWS

JULY 2003

UCDAVIS

Exciting Changes This Year in Name and Programs

by Mike Cunningham, Fruit and Nut Tree Program Manager, Foundation Plant Services



FOUNDATION PLANT MATERIALS SERVICE has undergone a name change. As of June 1, 2003, we became Foundation Plant Services, reflecting the fact that sales and distribution of virus-tested

plant material is only one of many services that we now offer. ELISA and PCR testing, DNA fingerprinting, importation services, disease elimination technologies and many types of field and greenhouse virus tests have been integrated into our crop programs. We trust that our clientele will also find the shortened name easier when discussing Foundation Plant Services around the cafés and water coolers of California.

At Foundation Plant Services (FPS), we have begun to familiarize ourselves with a commodity that is new to the department, the genus *Castanea*, the chestnut. Dr. Deborah Golino, FPS director, has been granted a permit to import chestnut seed and scion wood. This material will initially be maintained under strict quarantine restrictions in the FPS screenhouse facilities. Establishment of a chestnut orchard that would eventually be included as a part of the collections of the USDA-ARS National Germplasm Repository will greatly facilitate chestnut research and breeding work in California. More information can be found inside on pages 4 and 5.

Production of UCB #1 hybrid pistachio rootstock seed has been an extremely labor-intensive effort, and as the program continues to be transferred from the Kearney Agricultural Center to Foundation Plant Services, improving efficiency in production techniques has become a priority. Take a look at the article and photos of our new UCB #1 pollination "house" beginning on page 6.

Securing land assignments that provide adequate isolation for the foundation plant collections has been an ongoing concern for Foundation Plant Services.

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June buds of foundation almond trees are cut, trimmed of leaves, bundled and shipped to customers. The field crew from right: **Matt Gallagher**, FPS field manager; **Eriberto Ortiz**; **Delfino Gaona** and **Marcos Arriaga**.

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Exciting Changes... *Continued from page 1*

Incomplete long-range development plans for the University have made decisions about new land assignments difficult to make. However, last fall, FPS received confirmation that the 18 acres contiguous to the existing foundation planting site will be made available for our programs. Plans are being made for an 'elite' vineyard planting, and trees have already been budded in the nursery row as a start to replacing the Brooks Foundation Orchard. We will evaluate the inventory currently planted in the orchard to eliminate accessions that are no longer of interest to the industry, and we are always interested in receiving new accessions. ∞

How to Order Budwood and Seed from FPS

DISEASE-TESTED FRUIT AND NUT TREE propagating material may be purchased from FPS from early May through January each year. An order form, price list and list of cultivars maintained in the Foundation Orchard can be obtained by calling the office at (530) 752-3590, by email request to fpms@ucdavis.edu or by downloading them from the FPS Web site at <http://fps.ucdavis.edu>.

Available material for each distribution period will be allocated among all who request it by the ordering deadlines listed below. After the initial allocations, any remaining material will be sold on a first-come, first-served basis.

June (green) budwood	May 1
Fall scion buds	August 1
Cherry, peach & plum seed	August 1
Fall rootstock cuttings	October 15
Betulaefolia pear seed	November 1
Dormant wood	November 15
Pistachio seed	November 15

To place an order, please submit a completed and signed FPS order form along with 50% prepayment to Ginnie Dixon in the FPS business office. If you have questions about placing an order, you can contact her by phone at (530) 752-3590 or by email at vndixon@ucdavis.edu. For technical or cultural questions, contact FPS Fruit & Nut Tree Program Manager Mike Cunningham by phone at (530) 752-3888 or by email at macunningham@ucdavis.edu. ∞

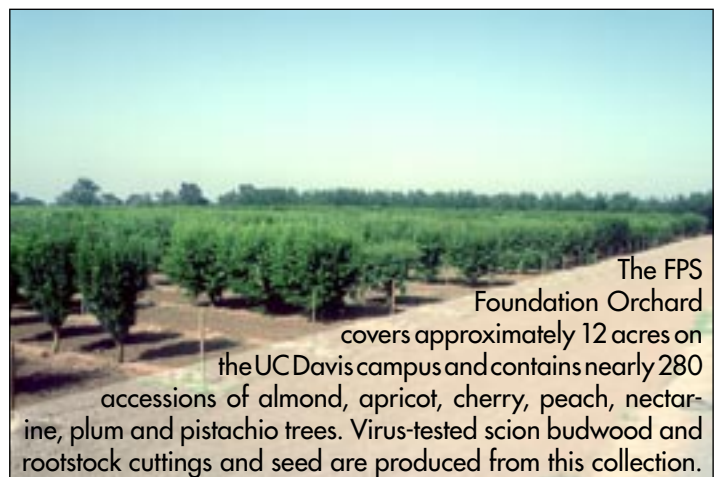
Fruit and Nut Tree Sales and Distribution Update

by Cheryl Covert, FPS Distribution Manager

AFTER DISTRIBUTING A RECORD of over a million fruit and nut tree buds in UC fiscal year 1999-2000, annual budwood sales have returned to their normal average of just under 100,000 buds during the last two fiscal years (2000-01 and 2001-02). In the last four fiscal years, sales of budsticks, cuttings and graftsticks have alternated yearly between averages of 1,300 and 4,000 units. In the same time period, combined sales of cherry and plum seed have ranged between 100 and 340 pounds per year, and annual peach seed sales have ranged from 55,600 to 348,100 seeds.

In spite of annual fluctuations in plant material sales, the FPS fruit and nut tree program continues to function from year to year on an even financial footing thanks to the industry's commitment to supporting the program in the form of funding from the Fruit Tree, Nut Tree, and Grapevine Improvement Advisory Board (IAB) assessment.

Over the last three years, FPS has coordinated the release of three new UC fruit and nut tree cultivars developed by breeders in the UC Davis Pomology Department. These include 'Winters' (13-1) almond, released in May 2001, and 'Goodwin' (Early #3) and 'Lilleland' (Late #1) processing clingstone peaches, released in winter 2001/spring 2002. FPS wrote and distributed release notices, coordinated with UCD Technology Transfer Center staff regarding completion of licensing by nurseries, determined allocations of material in short supply, and distributed allocated material to licensed nurseries. Anyone interested in licensing for these cultivars should contact Clint Neagley at the UCD Technology Transfer Center by phone at (530) 757-3471 or by email at chneagley@ucdavis.edu. ∞



The FPS Foundation Orchard covers approximately 12 acres on the UC Davis campus and contains nearly 280 accessions of almond, apricot, cherry, peach, nectarine, plum and pistachio trees. Virus-tested scion budwood and rootstock cuttings and seed are produced from this collection.

Plum Pox Virus Of Stonefruit

by Kathleen Kosta, Associate Plant Pathologist, California Department of Food and Agriculture

ALSO KNOWN AS SHARKA, Plum Pox Virus (PPV) is considered to be the most devastating disease of stonefruit. First reported in 1915 in Bulgaria, the disease was limited to Europe and Russia, until it was detected in Chile in 1992. In late 1999, the disease was detected in orchards in Pennsylvania, and shortly after was found in Ontario, Canada in the area of the Niagara Peninsula.

Immediately upon finding PPV, the State of Pennsylvania and United States Department of Agriculture (USDA) began a survey and eradication program. Initially, the disease was limited to one county, but by the end of that season, the disease had been found in orchards in both Adams and Cumberland counties. Orchards that were found to have even one infected tree were destroyed in an effort to control the spread of this disease. Surveys of the nurseries in the area demonstrated that the stock was clean; however, thousands of nursery trees were destroyed as a precaution. The USDA initiated surveys across the country to ensure the disease was not in other states. Most states with stonefruit production participated in the survey, which is ongoing, although after three years of negative testing, some states have discontinued the survey.

Plum Pox Virus has variable symptoms on the different hosts, or may be symptomless, and is unequally distributed in a tree. It affects all *Prunus* species, but the viral strain found in Pennsylvania (the D Strain) has not been found in cherries. PPV is reported not to cause damage to almond trees, but almonds can harbor the disease. The virus is spread by aphids and can be spread through budwood.

With over 800,000 acres of stonefruit in production and a very large nursery stock industry, the task of adequately surveying California is a daunting one. The California Department of Food and Agriculture (CDFA) tested the trees registered in the Nursery Certification Program; these are used as budwood sources for the production of certified nursery stock. Over the course of two years, 100% of the registered trees were tested. Any new trees entered into the program will have been tested for PPV



Nectarine displaying mottled symptoms of PPV infection.

as part of the routine testing completed to qualify a tree to enter the program. Some trees used as a budwood source for the production of common nursery stock were also tested; most of that material is collected from commercial orchards and the sources can change from year to year as demand for certain varieties changes.

The survey method to detect this disease in commercial orchards is a systematic sampling of 25% of the trees in an orchard, as opposed to the 100% sampling of registered trees. The sampling pattern is fashioned after that which is used for Citrus Tristeza Virus, developed by Dr. Tim Gottwald, USDA/ARS. Due to the unequal distribution of the virus in the tree and because it may be symptomless, leaves are collected from all major scaffold limbs for testing. Samples are processed by ELISA at the CDFA Plant Pest Diagnostic Lab.

The survey in California begins around April first and continues through June, or until daily temperatures rise. As with many viruses, as temperatures rise, the level of virus in leaf tissue declines, severely limiting our ability to confidently detect the disease. The survey is time consuming and labor intensive, and it will take years to survey all the acreage in California. The survey plan includes sampling of some commercial acreage in each major stonefruit-producing county in an effort to spread the survey sites generally around the state.

Since the surveys began across the nation, the quarantined area in Pennsylvania has expanded to include four counties. The eradication efforts continue, with entire orchards or all trees within 500m of the infected tree being removed and burned. Survey results in all the other states involved have been negative. In California, approximately 99,000 trees used as budwood sources have been tested and found negative. (This includes registered trees and trees used to produce common stock). In 2002, CDFA targeted commercial acreage and a total of 1,186 acres were surveyed. All test results have been negative.

For further information, literature or posters, call Kathy Kosta at CDFA (916) 445-6214. ∞

Chestnuts are On Their Way to FPS

by Deborah Golino, Director, Foundation Plant Services

CHESTNUT ENTHUSIASTS including researchers, nurseries, growers, and breeders have asked FPS to develop a new program for the importation of chestnuts. As a result, I have applied for and received an importation permit for chestnut from USDA-APHIS. We expect to fund the costs of importation, observation and testing by charging fees to cover our expenses. This year, the Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board (a nursery funding group) has provided \$10,000 in funds to get this work off to a good start.

Because California has a very strict state quarantine for *Castanea*—the genus that includes both cultivated and forest species of chestnut—it is difficult for our industry to obtain diverse *Castanea* germplasm from either foreign sources or the rest of the country. Only limited chestnut germplasm exists at present in California. However, California nurseries are an important source of chestnut trees for the rest of the country, and new varieties and germplasm which clear quarantine in California should be easy to distribute to other states since California is relatively pest free. This will allow increased access to this important genus, which is of interest as both a nut and lumber tree.

Since our country imports large amounts of chestnuts for food each year, it seems that there is potential to better establish this genus as a domestic crop if improved varieties can be introduced to our growers. Further, the American Chestnut Foundation is working to breed cultivars with the resistance to blight of the Chinese chestnut, *Castanea mollissima*, while retaining the characteristic sweet tasting nut and straight timber of the American tree. New imports are expected to facilitate that work as well.

The pests of quarantine concern for *Castanea* are the pathogens *Cryphonectria parasitica* and *Phytophthora cinnamomi*, and the gall wasp *Dryocosmus kuriphilus*. There is excellent expertise at the Davis campus to monitor for these pests. Dr. Neal Van Alfen (Department of Plant Pathology, UC Davis) has extensive experience working with the blight fungus, *C. parasitica*, and other pathogens of trees; his research group first proposed this importation and quarantine effort. Dr. David Rizzo, a faculty member of the Department of Plant Pathology, UC Davis, has agreed to participate in this project; an



The chestnut program received a jumpstart with the donation of over thirty seedlings from Lucienne Grunder of Waterford, California. The FPS nursery staff keeps a close eye on these 'Colossal' and various Chinese species in the shadehouse; they may be needed to serve as rootstock for future chestnut budwood acquisitions.

international expert in *Phytophthora* pathogens of trees, he has recently discovered the cause of Sudden Oak Death of oak trees, *P. ramorum*. Dr. Lynn Kimsey, director of the UC Davis Bohart Insect Museum, has agreed to provide assistance with monitoring for the gall wasp.

I hope to import *Castanea* selections which will eventually pass through quarantine at FPS, be established in the USDA-ARS National Germplasm Repository at Davis and be distributed to nurseries and growers in California and the rest of the country. This is an excellent fit with the needs of the chestnut community and the mission of the National Germplasm System. Dr. Charles Simon, curator of the Davis Repository, has already received permission to include chestnuts in the Davis repository. FPS and repository staff are currently repropagating the existing UC Davis Department of Pomology chestnut collection in preparation for establishing it in pomology's Wolfskill collection. ∞

Groundwork Laid for Chestnut Rootstock Propagation

DURING THE SUMMER of 2002, FPS began planning the initial phases of the new chestnut germplasm importation program. Though FPS is well grounded in the propagation and cultural practices for a variety of crops, chestnuts are unique in our experience. FPS staff has begun to investigate the propagation and growth requirements for this crop. A search of the internet and campus library has resulted in the gathering of more than a few documents which contain both research data and anecdotal works. FPS has initiated contacts with both private and University sources, searching for individuals willing to share their experience and their plant material.

There appear to be some unique challenges to the propagation of chestnuts, the main one being varying degrees of rootstock-scion incompatibility. If the scion material is not very closely related to the rootstock, the bud or graft will heal in and grow, only to die from incompatibility problems in the third or fourth leaf. Because chestnut imports to California will arrive in the form of budsticks, it is imperative that FPS have on hand a crosssection of rootstock seedling selections, at least one of which will be closely enough related to the imported variety to facilitate a successful graft or bud union.

Though such delayed incompatibility is not conducive to the production of trees for commercial use, it has been suggested that it is possible to propagate a cultivar to an incompatible seedling rootstock, harvest nuts from this early fruiting crop as early as its second leaf, germinate the nuts, and bud the resulting seedlings with wood from the mother tree itself. This technique may prove useful if appropriate rootstock seedlings are unavailable.

A variety of rootstock seedlings have been secured and are currently being held in the FPS greenhouses and screenhouses. In August 2002, FPS staff visited the chestnut orchards of Lucienne Grunder in Waterford, California, returning with a wealth of information gleaned

from both Ms. Grunder and her propagation manager. Ms. Grunder donated more than thirty seedlings of the variety 'Colossal' and trees of various Chinese species to help with the program startup. The majority of these seedlings are currently available for use as understock for any imported material that may arrive to UC Davis in the near future.

Another immediate goal for FPS is to propagate trees from the chestnut variety collection growing in the fields of the UC Davis Department of Pomology. This small orchard contains many cultivars and seedlings that were of interest to Dr. Kay Ryugo, UC Davis emeritus professor of pomology, during his career. The trees need to be moved because there is currently no focus on the collection from within the pomology department, and the orchard is in the pathway of the campus expansion plans for new housing and facilities.

When grafting chestnuts, it is considered safest to bud each cultivar to a rootstock seedling that has originated from that cultivar itself. During the fall of 2002, FPS staff harvested seeds from 18 chestnut varieties that were singled out by Dr. Ryugo as being of sufficient importance and uniqueness to deserve a place in a future collection. The seeds were labeled, germinated after a period of stratification and have been planted into pots. It is our intent to cut budwood from the trees that were the sources for the seed, and to either fall or spring bud the UC Davis pomology collection onto its own seedling plants. This effort will provide an opportunity to learn about the peculiarities of propagating chestnuts

and, at the same time, will produce trees for the Davis National Clonal Germplasm Repository, the new home department for the chestnut collection. ∞

Chestnut seedlings in various stages of germination and growth in the FPS shadehouse nursery. Seeds from 18 varieties have been collected from the UCD pomology orchard for use as rootstock for future imports.



Pollination Structure Built for Production of UCB#1 Pistachio Rootstock Seed

UCB#1 is the short name for University of California, Berkeley #1 hybrid pistachio rootstock seed, invented by Dr. Lee Ashworth of the UCB Department of Plant Pathology. It is a hybrid of *Pistacia atlantica* X *P. integerrima*. Both parents are homozygous and produce hybrid seedlings with a minimum of variability. UCB#1 has demonstrated better cold tolerance than *P. integerrima* and a tolerance to *Verticillium* fungal infections.

Seed production was at first limited to the harvests obtained from a single *P. atlantica* (female) tree located at the Kearney Agricultural Center in Fresno County. In 1996, FPS propagated thirteen *P. atlantica* and four *P. integerrima* (male) trees for planting at UC Davis. The seed obtained from this cross is distributed as UCB#1. Special hand-pollination procedures are required to produce this seed because the parents do not bloom simultaneously, and to prevent wind-borne pollination by undesirable males. The pollen is collected in early March and stored dry under refrigeration until needed. One week before bloom in mid-March, the female rachii are bagged and observed daily for bloom. When the females are receptive, pollen is injected into the bags. The bags are removed once bloom is complete.

The seed is harvested by clipping the lateral rachii in mid-November. The seed is hulled to remove the seed coat, floated to remove non-viable floating seed, and dried at room temperature. The seed is stored dry under refrigeration, and a sample is stratified and germinated to determine the viability. Germination rates are normally in the range of 95-98%. The resulting seedlings are potted to larger containers and observed for off-type variations, indicative of the presence of foreign pollen.

In recent years, the staff at Kearney has altered the pollination procedures by building a structure to house



To protect against the intrusion of unwanted pollen, five female *Pistacia atlantica* trees are enclosed in a greenhouse structure during pollination for production of UCB#1 hybrid seed. Built in spring 2003, the greenhouse boasts a removable plastic covering and fan and pad cooling system for moderating the temperature. This fall, harvest data will be compared to the adjacent uncovered trees.

its *P. atlantica* tree rather than bagging individual female flower clusters. A permanent wood framework was erected and the thirty-foot tall female tree is enclosed entirely in polyethylene plastic for the 10–14 days during which the flowers are receptive. Cool air is pumped in through two swamp coolers. Several times each day, pollen is released in front of the fans and is effectively dispersed throughout the structure. This technique has resulted in higher seed production numbers with fewer hours of labor.

Bagging and hand pollinating the trees at FPS has been a workable endeavor for the early years when the trees were small. The staff has used the time to become familiar with the seed production process. As the trees have begun to flower more heavily, the labor involved in this hand work has become excessive, and FPS has researched and built an enclosure for a portion of the trees at Davis. A “cold frame” with fan and pad cooling was constructed to provide the needed protection for half of the female trees planted in the pistachio block. The plastic covering is removed once pollination is complete. Before investing in enclosing the remainder of the female trees, FPS staff will take a season to compare labor and yield data for the enclosed and unenclosed trees.

The 2002 season was the first for sale of UCB #1 seed from FPS source trees. Just under 27,000 seeds were distributed, with a germination rate of 99%. ∞

Hand pollination of hybrid pistachio trees is accomplished by bagging each female cluster and dusting with pollen several times per day during the receptive period.





▲ Winter rains made for muddy conditions when the holes were augered for the pistachio pollination structure on January 9, 2003. Field manager Matt Gallagher (left) and Tom Pinkston kept the alignment on target.



◀ As the pollen begins to ripen and shed, catkins are collected from the male pistachio trees (*Pistacia integerrima*) daily. Nursery technician Judy Lee carefully selects mature catkins.



◀ By May, the pistachio seeds have set and begun to swell, although the quality and viability won't be determined until after harvest. Mike Cunningham keeps a close watch on the developing crop.



▼ Overnight drying releases the pollen from the clusters. It is then sifted to remove foreign particles and stored in tubes under cold, dry conditions.



◀ Justin Jacobs uses an atomizer to disperse the pollen around receptive catkins of the female pistachio trees (*Pistacia atlantica*) inside the pollination structure. This process was conducted once or twice daily for nearly three weeks to maximize pollination.

▼ Strong winds made conditions difficult for the crew to fasten the plastic to the framework. Fan and pad cooling was effective in keeping temperatures from overheating inside. Once pollination terminated, the plastic was removed.



New Accessions — From Acquisition to Release

Sources of new selections

THERE ARE GENERALLY TWO SOURCES from which a candidate fruit or nut tree selection is obtained for planting in the FPS Foundation Orchard.

Selections from the National Research Support Project #5 (NRSP-5, formerly known as IR-2) in Prosser, Washington that have successfully tested negative for disease on the accepted panel of indicators can be sent to FPS upon request. The initial disease testing to qualify these selections for planting in the Foundation Orchard is done at Prosser, Washington; thereafter, the annual ELISA and Shirofugen cherry tests for continued foundation status are performed by FPS. Propagation wood of the tested selections from NRSP-5 is budded to foundation-level rootstock in the FPS nursery, and subsequently planted in the Foundation Orchard. Upon verification of trueness to variety, these trees will qualify for the California Registration and Certification (R & C) Program. Many of the fruit and nut tree varieties acquired from NRSP-5 have originated from California plant breeding programs of either USDA or private enterprises.

The breeding programs associated with the UC Davis Department of Pomology are another important source of new introductions for the Foundation Orchard. Advanced breeder selections are submitted to FPS for initial disease testing for the R & C Program, even as the final field trials are conducted by the plant breeders.

Because a minimum of two years is needed to complete the FPS field indexing, it is advantageous to begin this testing even before a selection is named and released by the breeder. When these candidate selections have tested healthy on the panel of indicator varieties that comprises the FPS field index, trees are propagated to plant in the Foundation Orchard. Testing and propagation in the early stages helps ensure that ample propagation material is available if and when the accession is released for public distribution.

Non-registered vs. provisional status

As each new selection is planted in the FPS Foundation Orchard, it is designated either “non-registered” or “provisional.” Non-registered selections have passed all of the required disease tests and have been planted in the Foundation Orchard, but have not yet been slated for release to the public. Most of these are unnamed UC breeder selections that are undergoing field trials to establish their characteristics and niche for growers.

Propagation material of non-registered UC selections is distributed only at the discretion of the breeder under test agreement with the University of California. Selections are also sometimes non-registered if questions remain about their disease status or identity; if such problems are confirmed, the trees are removed from the Foundation block and customers who have received material are informed of the problem.



Dr. Tom Gradziel, far left, discusses almond varietal characteristics during a biannual inspection of the FPS Foundation Orchard. From right: **Clay Weeks**, USDA Germplasm Horticulturist; **Mike Cunningham**, FPS Fruit and Nut Tree Program Manager; **Dr. Adib Rowhani**, FPS Plant Pathologist; visitor; and **Dr. Jerry Uyemoto**, USDA Plant Pathologist.

Trees of provisional selections have passed all required disease tests and have been planted in the FPS Foundation Orchard, but have not yet flowered and fruited—crucial stages for varietal identification, which is the final step before registration. Periodically throughout the growing season, UC staff and faculty visually inspect their new selections in the FPS Foundation Orchard to verify trueness-to-variety. Industry representatives are also invited to inspect the Foundation Orchard for trueness-to-variety, including new tree accessions that did not originate from UC breeders. When an individual tree checks out as true to variety for two consecutive seasons, the California Department of Food and Agriculture is notified and the tree is included in the California Registration and Certification Program.

California Foundation Stock tags can be retroactively issued to nurseries that purchased propagating stock from provisional selections that later became registered. The provisional category provides the option for an earlier release of propagating material of new UC cultivars to nurseries willing to take the risk of buying material whose trueness-to-type is yet to be verified.

Release for distribution

When FPS receives authorization for the release of new selections, distribution information is sent to interested individuals and production nurseries. The packet includes a brief description of the selection, licensing information, prices, ordering deadlines and forms. Plant material is cut at the appropriate time, allocated and distributed to customers who have completed signed licensing agreements with the UCD Technology Transfer Center. FPS allocation policy promotes equitable distribution of propagation material of new releases.

New selections currently being tested by FPS from UC breeding programs include: apricots from Dr. Fred Bliss, mahaleb cherries being tested by Dr. Steve Southwick, size-controlling and root-knot nematode resistant peach rootstock selections from Dr. Ted DeJong, several cling peach selections from Dr. Tom Gradziel, and dried plum and sweet cherry selections from Carolyn DeBuse and Jim Doyle. ∞

Pollination Update for Tulare Giant Plum and Sutter Prune

by Dr. Ted DeJong, professor; Carolyn DeBuse, plant breeder; and Jim Doyle, retired plant breeder, UC Davis Department of Pomology

The following is an update on the pollination requirements for the *Prunus domestica* plum cultivars Tulare Giant and Sutter. The information has been derived from several sources, including controlled cross-pollinations and screened isolation cages as well as from observations in test plots and commercial plantings of the subject cultivars.

Tulare Giant

Initially, flowers of the Tulare Giant plum were considered to be at least partially self-fruitful. Sections of limbs that were bagged to exclude pollinating insects set a moderate amount of fruit in a test conducted in spring of 2000 at the Wolfskill Experimental Orchard near Winters, Solano County, CA. Continued testing of Tulare Giant at Winters in 2003 using large full-tree cages, however, has so far indicated that although the cultivar is partially fruitful, it does not set fruit in high enough numbers to develop a commercial crop load without cross-pollination. Field observations in test plots and young commercial blocks of Tulare Giant also seem to indicate the need for cross-pollination. Where pollinizer cultivars are present in the Tulare Giant planting or where the Tulare Giant trees are planted near another *Prunus domestica* cultivar such as French Prune or Sutter Prune, normal fruit sets usually develop. Where Tulare Giant is planted in a block without a pollinizer and isolated from other *Prunus domestica* trees, uneconomical, light sets occur.

The early blooming characteristic of Tulare Giant needs to be considered within the pollination scheme. Tulare Giant trees adjoining both French Prune and Sutter Prune trees have produced improved sets of fruit. Both of these prune cultivars, however, bloom near the end of the Tulare Giant bloom period with less than desirable bloom overlap. What seems to be happening is that with the great abundance of flowers produced on the Tulare Giant tree, a reasonable crop of fruit is being produced with only a minimum of bloom overlap. There is a risk

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The 2003 pollen isolation caged test of a 'Tulare Giant' plum tree at the U.C. Wolfskill Research Station.

Photo courtesy of Carolyn DeBuse

Pollination Update...*Continued from page 9*

of light sets, however, when unfavorable weather occurs in this narrow window of opportunity.

Controlled crosses of Tulare Giant with the old cultivar Sugar prune have produced very good sets. The Sugar cultivar blooms a few days earlier than French or Sutter, providing a longer window of opportunity for fruit set. The Sugar cultivar used as a pollinizer would need to be closely managed. Sugar is a notorious alternate bearing cultivar with both crop and bloom very heavy in the "on" year and very light in the "off" year. Unless heavily pruned in the "on" year there would be inadequate bloom present to set a Tulare Giant crop in the "off" year. Virus-tested propagation material of this old cultivar would currently be hard to find.

A new dried plum selection from the UC Davis cultivar development program is currently undergoing testing in grower plots both in the Sacramento and San Joaquin Valleys. The selection, D6N-72, is a dual-purpose plum and is an early bloomer, almost perfectly overlapping the Tulare Giant cultivar. In limited field observations where D6N-72 is planted adjoining Tulare Giant trees, good fruit set is present on both the Tulare Giant and the D6N-72. This selection is close to a general release to California growers, but propagation material is limited and currently could only be propagated under controlled non-propagation agreement from UC Davis.

It is suggested that probably the most practical pollination strategy would be to plant either French or Sutter pollinizers in Tulare Giant blocks to obtain the maximum benefit possible from these cultivars. A system with a pollinizer tree at every third tree in every third row should be considered. When the D6N-72 is released for commercial use, the French or Sutter trees could be progressively grafted to improve the bloom overlap and presumably improve fruit set if necessary or desirable.

Sutter

Caged tree tests at Wolfskill in 2003 resulted in a range of fruit sets with Tulare Giant producing the least fruit, French Prune producing the heaviest set and Sutter Prune fruit set intermediate. Based upon limited information, it would appear that the Sutter cultivar benefits from cross-pollination, producing a heavier crop load when planted in association with French Prune. Depending upon the crop load and the resultant individual fruit size desired by the grower, the grower may be able to manipulate the crop up or down by mixing the two cultivars in rows or blocks. The bloom period of both French and Sutter overlap well.

Carolyn DeBuse can be contacted by email at cjdebuse@ucdavis.edu for further information. ☞

NEWS & NOTES FROM THE NATIONAL AND INTERNATIONAL REGULATORY SCENE

Recent Developments at NAPPO, APHIS and the National Plant Board



by Robert Woolley, Chairman, California Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board

THE NORTH AMERICAN PLANT PROTECTION ORGANIZATION (NAPPO) Fruit Tree Panel (FTP) met at Foundation Plant Services on April 3, 2002 to work on a proposed new NAPPO standard – *Guidelines for Regulatory Action Following Detection of Plum Pox Virus in NAPPO Member Countries*.

The FTP had met previously in Richland, WA, and Mexico City to develop the standard. Some progress was made toward completion of the standard in the Davis session. Subsequent to the meeting, however, CDFA and APHIS officials raised questions about the format of the standard in light of the fact the disease is not known to occur outside of limited quarantine zones in Ontario and Pennsylvania. APHIS consequently submitted a revision to the FTP at the September 24, 2002 meeting of the committee. The Panel accepted the revision with slight modifications. The standard will now go to the NAPPO Standards Committee for review and then to the NAPPO Executive Committee for approval.

The lengthy process of developing the PPV standard illustrates the difficulty of resolving the concerns of scientists and regulators and of harmonizing national, regional and international standards. Hopefully, in future efforts technical details will be worked out in advance in order to streamline the process.

On another front, NAPPO efforts ultimately may be overshadowed by developments in yet another international trade treaty development. If adopted and ratified, a Free Trade Area of the Americas Treaty (comprised of North & South America) would ultimately supersede NAFTA. In any case, plant health standards developed

by regional plant protection organizations such as NAPPO need to conform to standards developed under the International Plant Protection Convention (IPPC).

On a more positive note, the new facilities at the expanded APHIS National Plant Germplasm Quarantine Center (NPGQC) in Beltsville, Maryland, are very near completion after 4 years in construction and \$18 million spent on the 43,000 square foot expansion project. I visited the facility last August and received a tour by Dr. Laurene Levy, Director of the Center. The state-of-the-art facility includes new screen and green house, laboratories, growth chambers, office space and an APHIS BSL-3Ag greenhouse/laboratory complex designed to safely contain and analyze exotic plant disease. The new facility will be occupied following completion of a checkoff list of items to meet quarantine standards.

Construction of the project was seriously delayed over the years due to the very demanding technical requirements of the project, which could not be compromised, and the bankruptcy of the project's general contractor two and a half years into construction. The newly expanded NPGQC will provide adequate space for ARS and APHIS to conduct programs to detect and exclude foreign pathogens, delimit their spread if introduced, and aid in their eradication.

In yet another development, in response to an Eastern Plant Board request, National Plant Board President Bill Callison has formed a committee to investigate the feasibility of a national mandatory certification program for fruit tree nursery stock. The committee met once in early November, 2002, and a second conference call was set for March, 2003. The committee's deadline to report to the NPB is June of 2003. Anyone interested in the topic is invited to contact Robert Woolley by email robert@davewilson.com, or Chairman Ruth Welliver at the PA Dept of Agriculture for additional information. ☞

New PCR Disease Testing Service Offered for Fruit and Nut Trees

by Lenka Biardi, FPS Staff Research Associate

IN SUMMER 2003, FPS expects to launch its new custom PCR disease testing service for fruit and nut trees. This service is being offered in response to the growing demand by nurseries and growers for rapid and accurate assays for the presence of disease in their nursery blocks and orchards.

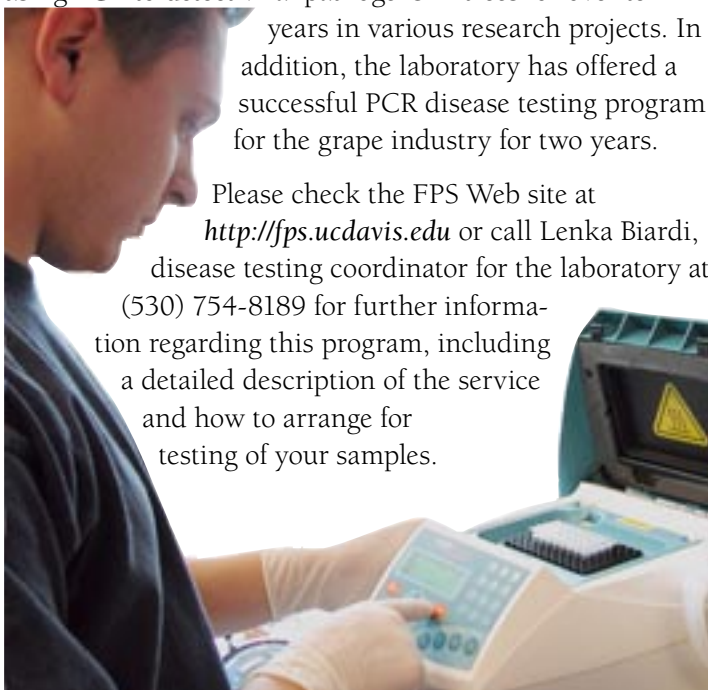
Polymerase Chain Reaction (PCR) is currently one of the most sensitive methods for disease detection available. PCR refers to the process of amplification of a small, select part of the genetic code of a particular organism. PCR can be used for the detection of viral pathogens in fruit and nut trees because each virus has its own unique genetic code. In the past decade, molecular scientists have been identifying the genetic codes of various plant viruses. Once the genetic code of a virus is known, PCR detection of that virus in plant tissue is possible.

Currently, FPS has developed PCR testing for Prune dwarf virus (PDV), Prunus necrotic ringspot virus (PNRSV), Cherry leafroll virus–walnut isolate (CLRV-W), Tomato ringspot virus (ToRSV) and phytoplasmas.

The new PCR disease testing program will be overseen by Dr. Adib Rowhani, FPS plant pathologist and a leading expert in this field. Dr. Rowhani’s laboratory staff has been using PCR to detect viral pathogens in trees for over ten

years in various research projects. In addition, the laboratory has offered a successful PCR disease testing program for the grape industry for two years.

Please check the FPS Web site at <http://fps.ucdavis.edu> or call Lenka Biardi, disease testing coordinator for the laboratory at (530) 754-8189 for further information regarding this program, including a detailed description of the service and how to arrange for testing of your samples.



Upcoming Meetings

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.

2003 FPS Annual Meeting will be held November 6, 2003 at the University Club, UC Davis. Contact the FPS office at (530) 752-3590 for information or to register.

The Joint Meeting of the NE 1006 Multistate Program “Eradication, Containment and/or Management of Plum Pox Disease (Sharka)” and **WCC-20** “Virus and Virus-like Diseases of Fruit Trees, Small Fruits and Grapevines” will be held November 16–19, 2003 at the U.S. Fish and Wildlife Service National Conservation Training Center, Shepherdstown, West Virginia. Contact Ralph Scorza at rscorza@afis.ars.usda.gov for details.



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