MINUTES
Western Clean Plant Network for Grapes & Trees
Grape Section
April 8, 2008

Moderator: Deborah Golino, Foundation Plant Services, UC Davis

Panelists: Ken Eastwell (WSU), Ray Johnson (CFIA), Umesh Kodira (CDFA), Bob Martin (USDA-ARS), Naidu Rayapati (WSU)

Attendees: Maher Al Rwahnih (FPS), Mike Anderson (Napa County), Gary Ballard (NWGFS), Murali Bandla (USDA–APHIS, PPQ), Mike Colvin (CDFA), Cheryl Covert (FPS), Mike Cunningham (FPS), Sam Doane (Oregon), Bev Ferguson (FPS), John Griesbach (Oregon), Lauri Guerra (WDA), Jan Hedberg (ODA), Ed Hellman (Texas), Bill Howell (WSU), Lori Leong (FPS), Dan Martinez (CA), Susan McCarthy (CDFA), Kathy McGahan (FPS), Susan Nelson-Kluk (FPS), Fatima Osman (FPS), Erich Rudyj (USDA-APHIS, PPQ), Tia Russell (CA), Simon Scott (Clemson), Sid Sedegui (ODA), Sue Sim (FPS), Mysore Sudarshana (USDA-ARS), Nancy Sweet (FPS), Athar Tariq (CDFA), Jerry Uyemoto (USDA-ARS), Liz Vavricka (IDA), Thomas Wessels (WDA), Robert Woolley (CA)

The meeting of the Western Clean Plant Network (WCPN) for Grapes & Trees was convened at 8:00 a.m. in the AGR Room of the Buehler Alumni Center on the U.C. Davis campus. Dr. Golino opened the meeting with welcoming remarks, followed by extended introductions. A contact information document will be prepared for meeting attendees.

NCPN Update

Dr. Murali Bandla, Director of the Plant Safeguarding & Pest Identification Unit for APHIS (USDA), presented an update on the National Clean Plant Network (NCPN). The concept of a national clean plant network for grapes originated as a research priority of the National Grape and Wine Initiative (NGWI). A meeting of representatives of the five existing U.S. clean plant programs was held at Foundation Plant Services (FPS) in Davis, California, in 2005, where the group agreed to work towards the formation of the NCPN for all asexually propagated crops with a primary emphasis on fruit crops. Other goals included the establishment of regional centers and securing sustainable funding.

Following the formation of a steering committee in 2006, a draft of initial goals and objectives for the NCPN was created. A report on the history of existing
clean plant programs was created. Those clean plant programs for fruit and nut trees and grapevines were identified as follows: Plant Safeguarding and Pest Identification, Plant Germplasm Unit, APHIS, Beltsville, Maryland; National Research Support Project (NRSP) 5 and Northwest Grape Foundation Services, Prosser Washington; Foundation Plant Services Grapevine Importation Program, UC Davis, California; Missouri Grape Importation and Certification Program, Missouri State University; Quarantine Program and Exclusion of Foreign Pests, Cornell University, New York; Mid-Atlantic Grape Foundation (plans for the future); Peach Tree Germplasm Improvement, Clemson University, South Carolina.

The draft goals and objectives were discussed at an NCPN workshop in Riverdale, Maryland, on May 8-9, 2007. The NCPN goals were redefined, and a draft mission statement and strategic plan were developed. The mission statement states: “The NCPN provides high quality asexually propagated plant material free of targeted plant pathogens and pests that cause economic loss to protect the environment and ensure the global competitiveness of specialty crop producers”.

The strategic plan provides for the interaction of the industry, research and regulatory communities to ensure a viable and fully functioning clean plant system. The proposed NCPN structure is based on commodity (grapevines or fruit trees). Regional commodity networks would operate under a national network for each commodity. All the commodity networks will feed into the National Clean Plant Network.

One of the major issues in the NCPN strategic plan is the structure of the governance group. The industry and research components include private sector stakeholders, such as private universities and colleges and nurseries, growers, and wineries. One obstacle to private sector participation in management of the NCPN is the Federal Advisory Committee Act (FACA), which provides that non-governmental representatives cannot participate in internal regulatory or policy decisions of the Federal government. The proposed NCPN structure was designed to accommodate FACA limitations by way of a multi-tier management structure funded through MOUs (memoranda of understanding) between various federal and state agencies, and including the involvement of other entities, as appropriate, through working groups and by other means.

Dr. Bandla described the proposed network structure for the grapevine commodity. The national grape network will be divided into three regions – West, Central, East. One important quarantine center will be authorized in each region to import foreign grapevine material. At the present time, those centers have been identified as: West – Foundation Plant Services, UC Davis; Central – Missouri State University, Texas A&M (future) or Iowa State University (future); East – Cornell University (future).
Each of the three regions will have its own governance structure made up of three components: the **states within the region** (e.g., CA, OR, WA, ID, AZ for the West); **academic** institutions (UC, WSU, OSU, UI, ASU for the West region); and **industry** (nurseries, growers, wineries in the West region). The states within each region will operate under a memorandum of understanding for grapevine certification programs. Each region will develop its own charter, core operational committees, and operational priorities. In addition to implementing the national standards set by the National Grape Network governing body, each regional entity will develop regional standards, which can be stricter than the minimum national standards. Each region will be represented on the National Grape Network governing board.

The National Grape Network would be a national body charged with developing the minimum clean plant standards that apply to all the regions, with an overriding goal of harmonizing those standards across the nation. The governing body of the National Grape Network is composed of a representative from each of the West, Central and East grape regions; a representative from the NGWI; a nominee from the NCPN; and regional representatives from the National Plant Board. This body would also set priorities for funding in accordance with the NCPN strategic plan and would send a representative to the NCPN Core Working Group.

The NCPN Core Working Group is the national body that would make the final decisions on the priorities and allocate the funding received to support the NCPN from Congress. The funding will be used to assist NCPN stakeholders as determined through the Core Working Group in discussions with various interested parties. The members of the Core Working Group will consist of the USDA partners (see below), the National Plant Board, and other governmental entities. All voting representatives to the Core Working Group must be governmental employees (federal or state). Subject-matter experts from industry will be invited to participate in discussions but will not have voting authority.

A smaller core group embedded within the NCPN Core Working Group is made up of three units within the USDA: APHIS (introductions; quarantine programs); ARS (research activities); CSREES (outreach initiatives). Although each USDA agency will provide its own resources, the three entities will operate under an MOU with one chair person rotating among the Core members. These “USDA partners” will share a common mission with a focus on the stakeholders. This group would have veto power over decisions made by the larger Core Working Group.

For the federal fiscal years 2008-2012, the Farm Bill includes $4 million annually (for a total of $20 million over 5 years) for NCPN activities. That funding would be allocated to by the USDA for the benefit of existing state and federal facilities and to other cooperators that currently ensure clean propagative material and
maintain foundation blocks of pathogen-tested material. The Farm Bill is still pending in Congress.

In addition to the Farm Bill funds, APHIS has secured approximately $750,000 in part from the Agriculture Quarantine Inspection (AQI) Program. That money will be used this year to “jump start” early NCPN program activities, in particular, quarantine activities related to grapevines and stone fruits. The money must be spent only for quarantine inspections or closely associated activities and cannot be used for domestic programs. The $750,000 has been tentatively allocated approximately as follows: NRSP-5 (fruit tree) program in Prosser, WA - $225,000; Grape Quarantine Program, Foundation Plant Services, UC Davis, CA - $350,000; Grape Quarantine Program, Cornell University, NY - $110,000; Peach tree program, Clemson University, SC - $50,000.

NAPPO Standards

Ray Johnson, head of the Grapevine Diagnostic Program for the Canadian Food Inspection Agency (CFIA), discussed relevant international programs dedicated to phytosanitary standards for plant products.

The Food and Agriculture Organization (FAO) of the United Nations provides a forum where nations can negotiate policy related to moving plants throughout the world. The International Plant Protection Convention (IPPC) is an international treaty signed by 107 countries that provides guidelines to the signatories to prevent and control the spread of plant pests. The IPPC has also begun to address such issues as diagnostic tests, lab approvals and standards for international testing of plant material.

The North American Plant Protection Organization (NAPPO) provides regional standards for phytosanitary measures that operate as guidance and clarification for the importation of grapevines into a member country (Canada, United States, Mexico). The standards are negotiated by technical and regulatory experts from the three participating countries. Each signatory country retains sovereign authority to set its own standards under NAPPO.

Dr. Johnson provided copies of the NAPPO Regional Standards for Phytosanitary Measures (RSPM) for Grapevines #15 (Part 1: Viruses and Virus-like Pests, Viroids, Phytoplasmas and Bacteria), a list of diagnostic protocols used by NAPPO member countries for agricultural trade within the region, and Appendix 1 to Grape Standard RSPM #15 (presence or absence of specified grapevine diseases within member countries). The Appendix to Grape Standard RSPM #15 was originally used as a standard for importation of grapevine material into North America. The diagnostic protocol document was designed to specify tests that are used to move plant material within the North American region. Some of the listed diseases are not included in the newly-drafted California Grapevine Program regulations, but those omitted diseases would be
picked up by herbaceous testing that is done in California. Mexico does not yet have a certification program and cannot export plants into Canada and the United States at the present time.

Deborah Golino commented that there is a disconnect between the “elite vision” in the international community as to the extent of phytosanitary testing that is being done and the actual testing requirements in the United States. She provided the group with a brochure entitled “The National Grapevine Importation Program at Foundation Plant Services”. The brochure describes the extensive testing that is actually done on grapevine material at FPS at the current time (page 6). However, the only tests that are required by APHIS and the 1984 CDFA regulations (still in effect) are three woody indicator tests and the herbaceous indexing. The recent revision to the California Grape Program regulations, reflecting current testing protocols, has not yet been officially adopted into law. The revision of Federal Quarantine rule 37 will require extensive technical work to reflect current standards.

The list of diagnostic protocols used by NAPPO member countries was designed to reflect the international standards. The NAPPO documents are reviewed annually and are currently undergoing revision. The goal of the NAPPO regional standards for phytosanitary measures is to harmonize diagnostic testing and treatment protocols so the three member countries know what is needed and countries outside NAPPO know what is expected. Dr. Johnson solicited comments from the participants on the list of diagnostic protocols used by NAPPO member countries for movement of plants within the NAPPO region.

**Western Regional Standards**

The overriding goal within the United States is for programs at all levels (USDA, NAPPO, individual states’ certification programs) to work together through the NCPN structure to arrive at an agreement on the minimum national standards required for domestic certification of U.S. grapevine material. Dr. Bandia commented that the current national testing standards are the APHIS standards. The draft national standards are embodied in a document distributed at the meeting entitled “National Pathogen Testing Standards for Grapevine Foundation Plants” (prepared by Joe Foster, USDA-APHIS).

Regional standards may be stricter than the minimum national standards and could differ among the three regions. However, there was agreement that certification programs at the national and regional levels coordinate efforts so as to work from the same specified diagnostic and testing protocols. Concerns were expressed that climatic differences result in inconsistency in the effectiveness of testing and that mandatory quality assurance procedures could increase the cost of testing.
The discussion then focused on the process to be used for the adoption of pathogen testing standards for the Western region. It will be necessary to separate testing at the foundation plant level from that done at the nursery level. The discussion today relates to testing grapevine material at the foundation level. Deborah Golino presented a spreadsheet on which the group could memorialize its decisions as to which pathogens and tests should be included in the Western region standards for grapevine foundation plants. The information on the spreadsheet includes the name of the pathogen, testing status as delineated in the draft national standards, (proposed) testing status at the Western Region level, and the specific tests (herbaceous indicator, woody index, ELISA, RT-PCR) that should be required in the Western Region. The pathogens listed in the yellow block on the spreadsheet are those for which testing is not required at the national level but which were considered for testing at the Western Regional level. The completed version of the spreadsheet is attached hereto and incorporated by reference into the minutes. Significant highlights of the discussion are presented below.

**Arabis mosaic virus**

The federal quarantine regulations do not include the woody index because it is not effective in detecting nepovirus. FPS does not use the woody index for this virus. Ray Johnson indicated that ArMV is visible on St.George rootstock in Canada due to the cooler climate. The recommendation was not to include the woody index in the Western Regional standards for ArMV.

**Grapevine corky bark virus**

This virus is also known as Grapevine virus B (GVB). Dr. Golino stated that ELISA testing is not effective for this virus.

**Grapevine fleck virus**

Fleck virus is included in the (minimum) national standards for pathogen testing, and therefore must be included on the regional standards. The fleck test “is a byproduct of the St. George test at this time ... the fleck positive material will be eliminated from the foundation blocks [in the Western Region] over time”. The issue addressed at the meeting was the type of tests that should be required.

Dr. Golino explained that, in California, a positive fleck test on St. George rootstock in the woody index requires that the plant material undergo therapy before it can be released from quarantine. The results must show negative on the St. George indicator to qualify for release. Mandatory PCR/ELISA testing for fleck disease would have an impact on the California program. When ELISA/PCR testing was performed on FPS foundation stock that had fleck disease, the results showed the presence of fleck virus plus a group of related viruses. FPS now tests “for disease, not for [a specific] virus”. 
Oregon representatives indicated that ELISA testing is used for fleck. Ray Johnson commented that Canada documents fleck infection but does not exclude from the program any material that has tested positive for fleck.

Johnson observed that the fleck issue focuses the discussion on the purpose of the required tests: should the program test for the disease or for the agent of the disease?

Dr. Golino commented that there is a dilemma on the issue of the purpose of the testing. The goal is to produce grapevine material with as few pathogens as is possible without setting an unrealistically high testing standard. Sensitive tests should ultimately be incorporated into the program when the tests are clearly associated with disease. For instance, grape materials that are positive for fleck using PCR but negative using a St. George field test for fleck are kept in the California R & C program because the two tests often produce different results and the field test indicates the presence of disease. A positive PCR test for GVA, however, is reliably associated with Kober stem grooving disease, according to Kober 5BB field test results. Vines that test GVA positive using PCR are considered defective.

**Leafroll disease (viruses)**

The consensus was that the woody index (Cabernet franc or Pinot noir) is effective for detection of grapevine leafroll disease and should be required. ELISA and/or PCR testing is effective for identification of a particular leafroll virus and will be required for that finding.

A comment will be placed in the Western Region standards about Redglobe virus and GLRaV-2, which are different viruses. In future meetings where the details of specific tests are negotiated, it will be necessary to discuss the requirements for the different strains and viruses and to select the best primers for each virus/strain.

The participants agreed that grapevine leafroll virus 8 does not exist and was removed from the list of Western Regional pathogens. There was no subsequent supporting evidence for the original finding. The group recommended that the subject be addressed again in regard to the national standards at the National Clean Plant Network meeting on July 8 in Davis, CA.

The issue of false test results from certain ELISA testing kits arose. Dr. Bandla stated that properly executed tests that give false results should be removed from the protocols.
Grapevine virus A (asso. with Kober stem grooving)

Ray Johnson commented that Canada uses only the PCR test for detection of GVA, which is a quarantine pest for Canada. The revised grape regulations for the California program require testing for GVA for future imports. Dr. Golino advocated including GVA in the Western Regional standards because grapevine nurseries want to ship material into Canada. The group agreed to add Kober 5BB (woody index) to the list of tests that can be used to detect GVA.

Grapevine virus B (GVB)

Grapevine virus B was merged with grapevine corky bark virus.

Simon Scott proposed that the Western Regional standards contain a list of synonyms.

Pathogens for Regional Consideration

The issue arose as to whether it is necessary to use all four herbaceous indicators (Chenopodium quinoa, Chenopodium amaranticolor, Cucumis sativa, Nicotiana clevelandii). FPS uses and will continue to use all four indicators for imported grapevine material as well as for the certification program. The Chenopodia alone are adequate for the nepoviruses. Naidu Rayapati asked whether N. clevelandii should be added as an herbaceous test for GVA and GVB. Dr. Golino indicated that it is difficult to transfer those viruses onto that indicator plant.

California regulations do not require testing for Asteroid mosaic virus or for decline and degeneration related to nepoviruses.

A comment was made that the Western Regional standards should have an explicit comment that Grapevine virus C and Grapevine leafroll virus 8 are not valid virus species.

Rupestris stem pitting

Ken Eastwell spoke about RSP in Washington State. The grapevine foundation block has been maintained since the 1970’s. The block has undergone woody index (St. George) and PCR testing and is mostly free of RSP. The industry decided to keep RSP testing in the certification program.

Deborah Golino described the history of RSP from the perspective of the California certification program. Dr. Golino first became associated with UC Davis in 1987. Shortly thereafter, representatives from the Oregon grape industry petitioned APHIS to drop RSP from the quarantine requirements of the Oregon
certification program so that Oregon could access various Dijon clones from France. Those Dijon clones later emerged from quarantine with RSP+ status and were brought to California.

In the early 1990’s a major California winemaker asked Dr. Golino to review the literature on RSP. After that review, she was not able to justify the economic effect of keeping RSP testing in the California certification program. APHIS indicated that it would approve deletion of the RSP testing requirement (for federal quarantine purposes) if CDFA approved the deletion. The RSP testing was ultimately deleted from the California Grapevine Registration and Certification Program, and RSP+ plant material was released through the program. At the present time, RSP+ clones are undergoing tissue culture treatment at FPS with the goal of an RSP-free foundation block. A large number of these have been completed. However, 15-20% of the FPS collection, including some very important clones, remain RSP+. Dr. Golino recommended that RSP testing not be required as part of either the National Grape standards or the Western Regional standards.

Dr. Golino indicated that GVA is a different issue. GVA (Kober stem grooving) can kill vines, while RSP appears to have no significant effect on the vines.

**Xylella fastidiosa**

*Xylella fastidiosa* is a problem in Texas, the southeastern U.S. and California. Although there has been no evidence of either Pierce’s Disease or the glassy winged sharpshooter in the FPS foundation vineyard, FPS must test for *Xylella* for plants to be shipped to Oregon. A PCR test is used. Lori Leong (FPS lab manager) commented that for the new introductions, FPS now tests (PCR) all plants for *Xylella* before they are installed in the foundation vineyard.

*Xylella* is a quarantine pest for Canada. Problems with exporting plants may occur if the Western Regional standards do not include *Xylella*.

Dr. Golino indicated that Pierce’s Disease is easily detected with visual symptoms and there is not a significant lag time after infection before the symptoms appear. ELISA tests are also effective for this pathogen, although visual P.D. symptoms are usually evident on the plant by the time an ELISA test gives a positive report.

The group opted to include *Xylella fastidiosa* in the list of pathogens for the Western Regional standards and recommended that the national standards be amended to include it also.
Peach rosette mosaic virus

Peach rosette mosaic virus is a quarantine pest in the Western states. The group recommended that the virus be included in the national standards and that the National Grape Network “consider gradual implementation for testing” by mechanical tests and ELISA.

Grapevine yellows phytoplasmas

Canada does not regulate against U.S. phytoplasmas. FPS is now testing the new grapevine material but older foundation material was not tested for phytoplasmas. The extraction for Xylella could also be used for phytoplasmas. Dr. Golino commented that a finding of phytoplasmas does not impugn plant health and that it is “not a disease issue”. Dr. Bandla explained that including sequencing as part of the test also adds to the cost of the tests.

Grapevine virus D

GVD is in the vitivirus family, can kill a vine and is a quarantine pest. FPS includes the primers for it in the PCR testing. GVD has been found in only one or two vines at FPS.

Agrobacterium species

Agrobacterium species are a problem in colder climates (e.g., Canada, Washington State, northeast U.S.). The new foundation block in Washington State was created by shoot-tip tissue propagation and planted in virgin land (not previously used for grapes). The goal is to maintain a crown-gall free foundation block. The former foundation block was also crown-gall free. Testing in the Washington grape certification program was based only on visual inspection, until this Spring when molecular tests were begun.

Deborah Golino explained that Agrobacterium-infected vines in California fields do not show symptoms. The rootstocks at FPS have undergone microshoot tip tissue culture propagation and are tested for Agrobacterium. Testing the entire FPS collection would be expensive. She concluded that Agrobacterium-free foundation blocks are an important goal to be implemented in the future. The disease is a serious problem but we do not yet have the solution. She stated that including Agrobacterium in the Western standards would create a false expectation that it is now possible to maintain “crown gall free” foundation material and would eliminate 99% of the nursery stock in the country. FPS can work with its nurseries to ensure an Agrobacterium-free environment for grapes going to cold climates.

Ken Eastwell stated that, if Agrobacterium were to be included in the Western Regional standards, buyers in Idaho and Washington would be led to believe that
they could get certified material that is crown-gall free from California. The PCR process for crown gall testing is the same as for the *phytoplasmas* and *Xylela*, but the sap is collected at a different time than with those two pathogens. The bacterium also persists in living roots for a long time.

**Conclusion**

The spreadsheet described in Attachment #1 (below) is submitted as the draft Western Regional standards for pathogen testing for grapevine foundation plants. The meeting of the grape subcommittee of the Western Clean Plant Network was adjourned at noon. Members were invited to the National Clean Plant Meeting to be held at UC Davis on July 8, 2008.

Respectfully submitted,
Nancy Sweet
Foundation Plant Services

**Attachments to the minutes:**

1. Spreadsheet entitled “Pathogen testing standards for grapevine foundation plants” (draft Western Regional standards), April 8, 2008.

2. Strategic Implementation Plan for the National Clean Plant Network (NCPN), April 7, 2008.


4. NAPPO Regional Standards for Phytosanitary Measures (RSPM) for Grapevines #15, Part 1 (Viruses and Virus-Like Pests, Viroids, Phytoplasmas and Bacteria).

5. List of diagnostic protocols used by NAPPO member countries for agricultural trade within the region.


7. The National Grapevine Importation Program at Foundation Plant Services, University of California, Davis.