



Our most recent issue of *NCPN Network News* (August 2021) focused on a number of people coming into or transitioning out of the Network. As the year winds to a close, we have a couple more changes to share with you. Sue Sim, arguably one of the longest-serving members of NCPN, has really, truly retired this time! After her first retirement from Foundation Plant Services while also serving as the NCPN-Grapes Coordinator, Sue continued to support NCPN as a co-chair of the Education & Outreach Committee (E&O). E&O is largely comprised of people with other full-time responsibilities who also help get our products and services (like this newsletter, the NCPN website, factsheets, etc.) out the door. Sue has worked tirelessly behind the scenes serving E&O and she will be greatly missed. Thank you, Sue, for all you have done—now go act retired, already!

And with a drum roll please...we are delighted to introduce Dr. Jennifer Nicholson, who replaces recently retired Erich Rudyj, as the APHIS NCPN Coordinator. Read more about Jennifer below. Welcome aboard Dr. Nicholson—we know the Network is in good hands!

APHIS Announces New NCPN Coordinator



**Dr. Jennifer Nicholson is the new
National Clean Plant Network
Coordinator for APHIS**

APHIS has announced Dr. Jennifer Nicholson as the National Clean Plant Network Coordinator, since the retirement of the previous coordinator, Erich Rudyj. Jennifer has been working closely with Erich for the last several months on knowledge transfer and succession planning for this position to ensure a smooth transition.

Prior to joining PPQ, Jennifer Nicholson was an Assistant Professor at North Carolina State University in the Department of Crop Science conducting research in plant breeding, biotechnology, and genetics. She was also the curator of the U.S. Nicotiana Germplasm Collection. Jennifer joined APHIS in 2007, working with PPQ's National Science Advisor to evaluate science and technology issues, coordinate international scientific collaborations, and promote plant biosecurity education. For the last several years, she has served as the PPQ Science and Technology Critical Issues Specialist, leading communications, coordination, project management, and planning for a variety of issues.

Jennifer is excited for the opportunity to return to a plant germplasm-related field and work with the National Clean Plant Network to support specialty crops with access to clean plant material. She looks forward to working with centers, regulators, stakeholders, and industry to build on to the Network's accomplishments to date and continue to strengthen network collaborations and clean plant center operations.

Dr. Jennifer Nicholson is based in Raleigh, North Carolina and can be reached at:
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Testing Once, Testing Twice... Keeping Berry Plants Clean from Viruses

Viruses can be a menace to berry crops. A single breeding selection can easily be propagated to millions of plants and if the mother plant is infected, all daughter plants will also be infected. An infected plant could translate to poor establishment, loss of yield, and could possibly result in the need to replant. For these reasons, virologists put a lot of effort into virus testing and elimination.

A project conducted by Agricultural Experiment Station in Fayetteville, Arkansas, in collaboration with the Oregon Clean Plant Center in Corvallis, Oregon, yielded some surprising results. The study compared new high-throughput sequencing (HTS) detection technologies with the current standards to decide whether they could improve the process. Instead of the two RT-PCR testing regimes, which is currently the standard, researchers opted for four, as the new technologies were untested in the task in hand. The great news is that the new HTS technologies provide better detection and have the capacity to detect new viruses. In addition, the new technologies could eliminate a major bottleneck of the propagation pipeline, grafting onto indicator plants, a tedious, expensive, and time-consuming exercise.

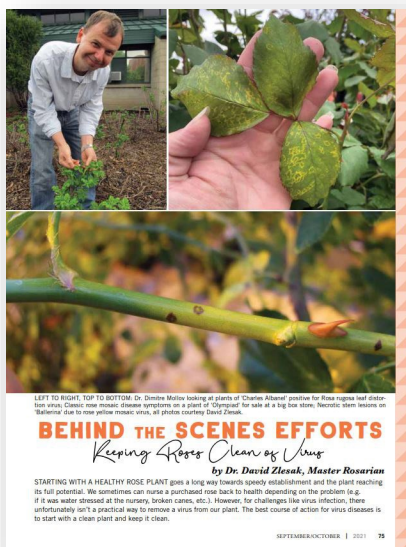
The unexpected finding was how well viruses hide. Researchers noticed that, independent of the technologies used, detection could be unreliable with some viruses being undetectable in three of the four sampling times. Those findings will change the approach to testing so NCPN-Berries Centers can provide nurseries and producers the cleanest berry plants possible.

[Read the article here](#)



Dan Villamor prepares plant tissue samples for virus testing. He and Division of Agriculture plant pathologist Ioannis Tzanetakis say their research shows that standard testing for viruses in new berry plants should be increased from two tests to four tests over two years to make certain new plants are free from disease-causing viruses. (UA System Division of Agriculture photo by Fred Miller)

Behind the Scenes Efforts: Keeping Roses Clean of Virus



Starting with a healthy rose plant goes a long way towards speedy establishment and the plant reaching its full potential. We sometimes can nurse a purchased rose back to health depending on the problem. However, for challenges like virus infection, there unfortunately isn't a practical way to remove a virus from our plant. The best course of action for virus diseases is to start with a clean plant and keep it clean. For more information on this process, read the article 'Behind the Scenes Efforts: Keeping Roses Clean of Virus' by Dr. David Zlesak published in the September/October issue of *American Rose Magazine*. David is a Professor of Horticulture at University of Wisconsin-River Falls and a Master Rosarian. We are also delighted to have him serve as an NCPN-Roses board member!

[Read the article here](#)

USDA and CDFA Approve Use of HTS- and PCR-Based Diagnostic Protocols for Quarantine Release and Certification of Grapevine, Prunus and Roses

The US Department of Agriculture-Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ) and California Department of Food and Agriculture (CDFA) have approved the use of Foundation Plant Services' (FPS) revised diagnostic testing protocol that replaces biological indexing with a combination of high throughput sequencing (HTS) and polymerase chain reaction (PCR) testing for release of plant material. This represents a tremendous advancement based on years of research at FPS and other clean plant centers indicating HTS and PCR used in combination result in more accurate test results compared to biological indexing using woody and herbaceous indicators for virus detection. Plant selections tested for the CDFA Fruit & Nut Tree and Grapevine R&C Programs and grape, Prunus and rose accessions sourced under a USDA-APHIS-PPQ 588 Controlled Import Permit are covered by the approved protocol. These approvals pave the way for other clean plant centers to use similar protocols with a combination of HTS and PCR testing in lieu of biological indexing.

Adoption of the streamlined testing methods will safeguard imported plant material ensuring detection of quarantine pathogens and potential unknown pathogens, yield the most accurate information about the disease status of incoming material, reduce potential risks from the transmission of vector-mediated viruses in the field and expedite release times. This expedited timeline with quick access to clean plant material is critical for certification programs and enables the US industry to remain competitive and responsive to consumer needs.

[Read the full press release here](#)



Clean Plant Center Northwest Approved as Post-Entry Quarantine Facility for Hop Imports



In response to the addition of Hop stunt viroid in hops (*Humulus lupulus*) being added to the NAPPRA (Not authorized Pending Pest Risk Analysis) list by USDA-APHIS earlier this year, the CPCNW has requested and received approval to act as a post-entry quarantine facility for the importation of hop propagative material. This allows U.S. stakeholders, working with the CPCNW, to have continued access to desirable germplasm from around the world.

As the sole NCPN hop center, and with long-established relationships with hop industry bodies, the CPCNW is uniquely situated to provide this essential service to U.S. hop growers, breeders, and intellectual property managers.

Interested stakeholders should contact the CPCNW (cpcnw@wsu.edu) for further information.

Fruit Trees: Staying 'Clean' With X-disease in the Neighborhood

The NCPN motto is 'Start Clean, Stay Clean' and the first part is self-evident: purchase and propagate clean G1 plants if you are a nursery or propagator. But what about the *stay clean* part? The key is assessing and managing risk.

For example, X-disease phytoplasma (*Candidatus Phytoplasma pruni*) has become an increasing threat to stone fruit production across much of the western U.S. It is readily transmitted and can be lethal to peach and nectarine trees.

Where is it? It is present across North America and is currently at epidemic levels in the Pacific Northwest, with low incidence in the other states.

What are the vectors? It is transmitted by at least seven different leafhopper species that are present across much of the western U.S., including *Colladonus montanus*, and *Fiebriella florii*.

What's the host range? Nearly all commercial and wild *Prunus* spp., sagebrush, broadleaf weeds (like dandelions), and other commercial crops. Worse, many of the leafhopper vectors also readily feed on these hosts, creating potential reservoirs for further spread.

How do I manage it? It's a three-step process:

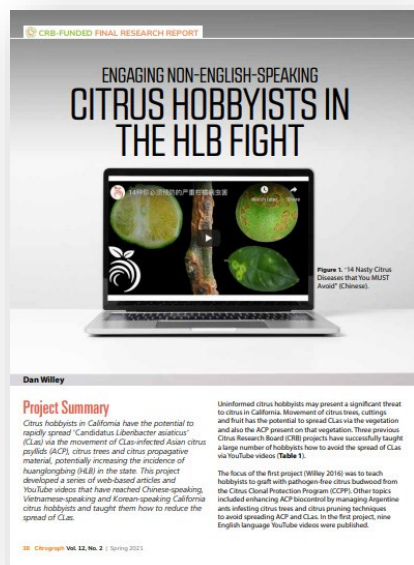
1. Scout/test for X-disease phytoplasma in nursery blocks and surrounding area. A systematic testing program is critical as it can take several seasons to produce symptoms in susceptible *Prunus* species.
2. An effective vector management program. Many of the leafhopper vectors are found in the undergrowth so yellow sticky cards should be placed low (<3 feet), and spray programs should cover potential vectors and vector activity periods.
3. Identify and remove potential alternative hosts, such as broadleaf weeds, from nursery blocks and borders.

As always, propagators should only use G1 material from an NCPN clean plant center and should consult with their county extension agents for up-to-date pest management information.



X-disease is transmitted by at least seven different leafhopper species present across North America

Engaging Non-English-speaking Citrus Hobbyists in the HLB Fight



A series of videos and other publications, sponsored by the Citrus Research Board (CRB) is helping reduce the spread of huanglongbing (HLB) in citrus trees and citrus propagative material. The videos, available on YouTube, are now available in English, Spanish, Chinese (Mandarin), Vietnamese and Korean, are expected to help slow the spread of HLB to hobbyists and commercial citrus growers alike in California. The Citrus Clonal Protection Program (CCPP) reports that a large number of California citrus hobbyists are ordering pathogen-free budwood as a result of this outreach effort.

[Read more](#)

Virus-Tested Sweetpotato Seed Shines in Recent California Trial

Sweetpotato “seed” is not true seed. Rather, it is the term given to the smaller harvested roots from the previous crop. Sweetpotato growers must save a portion of their crop each year to replant the following spring. Plant cuttings are then transplanted into commercial fields. A consequence of this type of propagation is that the plants become infected with viruses over time by aphids and whiteflies.

In sweetpotatoes, virus exposure occurs rapidly under field conditions, but the impact is cumulative – the more years a plant is grown, replanted, and grown again, the greater the virus titer, and the greater number of different viruses, accumulate in the tissue. Depending on the variety, the age of the seed can have a significant impact on yield and quality of the harvested crop.

In 2021, Scott Stoddard, of the UC Cooperative Extension for Merced County, CA, evaluated three varieties for the impact of new compared to old seed. *New* seed was from virus-tested plants that were grown for one year in the field (G1 seed). *Old* seed was seed that Stoddard had been using in variety trials for several years in a row, and was at least 5 years old (G5+). Plants were grown under hotbed conditions typical for California, then transplanted May 24 into a grower’s field. Plots were 1-row by 50 feet, and were replicated 4 times using a RCB design. Harvest took place on Oct 13, 2021, using the grower’s harvester and harvest crew.

Roots were tested by Dr. Chris Clark at Louisiana State University. All roots, including G1 seed, were infected with viruses, but the old seed had greater number of infected roots as well as a much higher incidence of 2 potyviruses: 20% for G1 seed, 66% for G5+ seed. Preliminary field trial harvest results are shown in Table 1. The benefit of using virus tested seed for the cultivars ‘Beauregard’ and ‘Vermillion’ is clear: a remarkable 100% increase in yield for both, and a reduction in culls of 68% for Beauregard and 81% for Vermillion.

Stoddard explained that in California, it would be very rare for growers to use seed that is 5 years old. Nonetheless, this trial does show the tremendous improvement in yield and quality that can occur with the use of clean seed, and why the work of the various Clean Plant Centers is so important for the sweetpotato industry. Further work is planned.



Old Bx roots were characterized by poor color, shape, and severe cracking.



New Vermillion coming up the harvest belt.

Table 1. Virus-tested seed trial harvest results 2021, Merced CA.

Cultivar	TMY, bins/A	Culls, %
Beauregard, G5	19.4	52%
Beauregard, G1	42.5	16.5%
Vermillion, G5+	29.0	21%
Vermillion, G1	61.0	4%

TMY = total marketable yield

Bins = ~ 1000 lbs

Culls: unmarketable roots due to cosmetic blemishes (cracks, rough skin, off-color, etc.)