



Clean Plant Centers Identify New Ways for Helping Growers to *Start Clean, Stay Clean*

The tag line for The National Clean Plant Network is *Start Clean, Stay Clean*. This is a dynamic mission, requiring the constant vigilance of scientists and growers. In this issue we take a look at some recent developments within the Network, as Centers share new tools in the toolbox for fighting viruses and virus-like pathogens that cause negative impacts to the U.S. agricultural industry. From expanded capabilities at Clean Plant Centers to practical advice for preparing for hurricanes, the toolbox addresses needs across the country and provides solutions applicable to growers, nurseries, and distributors of every size.

NYS launches Grapevine Certification program to protect state's grape industry



Inspection of vines at grape nursery in New York.

Grapevines, like humans, can be infected by multiple viruses. But there are no vaccines (or chemical sprays) for grapevine viruses, and no genes or groups of genes have been found in wild or cultivated grape species that confer stable virus resistance. Unless removed from the vineyard, infected vines spread disease to healthy ones, shortening a vineyard's productive lifespan by up to 75% and causing delayed ripening, poor fruit quality and 30% to 80% reductions in yield.

"The only effective way to deal with viruses in vineyards is prevention," said Marc Fuchs, professor of plant pathology and plant-microbe biology at Cornell AgriTech. "Using clean, virus-tested planting stocks is the key to reducing the presence of

viruses in newly established vineyards and lessening their detrimental impact on New York growers."

To further the NCPN objective of providing growers with clean, virus-tested plant material, the New York State Department of Agriculture and Markets (AGM), in partnership with Cornell AgriTech, has launched a revitalized grapevine certification program.

[Read the entire article here](#)

The relaunched New York Grapevine Certification program provides the most stringent testing protocols in North America for viruses of grapevine plants, greatly reducing introduction of virus-infected vines to new vineyards and increasing the odds that plants being sold will yield a healthy crop. Three New York nurseries are participating in the program and offering New York-certified vines to vineyards across the State, eastern United States, and eastern Canada.

[Read the entire article here](#)

NCPN-Fruit Trees: Clean Rootstocks for Clean Plants



Rootstock being cultivated in greenhouse at the Clean Plant Center Northwest (CPCNW)

A key component of the production of clean plants at NCPN Fruit Tree Clean Plant Centers are rootstocks. Rootstocks of various sizes are used for the initial propagation of budwood of new germplasm received each year. These rootstocks also play a key role for micropropagation of excised shoot tips during virus elimination, and for multiplication of plants to ensure there are enough trees for the Foundation Collection once a plant tests clean and is released. Given the importance of the clean material, and the time and money invested in each accession, rootstock cleanliness and quality are paramount.

Until recently, seedling rootstocks widely were used across clean plant and quarantine programs for ease of propagation, accessibility, and cost. But, with the discovery of seed-transmitted viruses in cherry (cherry virus A), apple and pear (citrus concave gum-associated virus), it was clear that a change was needed because the risk was too great for placing a clean shoot (after heat therapy) onto an infected rootstock. Testing seedlings before use as rootstocks was an interim measure but wasn't cost-effective, and it was discovered that even 'clean' seed sources were, in some cases, still producing infected seed and seedlings. While virus might be hard to find in the fruit-bearing tree, it accumulated in seed and resulting seedlings.

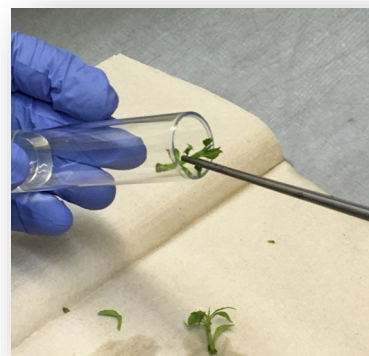
In the quest to tackle the virus issue at the root, CPCNW elected to use non-dwarfing varieties to maximize vigorous growth in pots. Recently released public rootstock lines of apple, pear, and cherry were identified that would be compatible with a wide range of scions. To ensure that they were virus-free, mother plants were isolated and tested by High Throughput Sequencing (HTS) and repeated rounds of PCR testing across 2021 and into early 2022. At the completion of this rigorous testing, selected rootstock lines (M.111 apple, OHxF 97 pear, and F12/1 cherry) were sent as tissue culture plantlets to a commercial tissue propagation facility for expansion. The first batch of these new clonal rootstocks look promising and are being maintained in a controlled environment at CPCNW.

NCPN-Hops Expands Offerings of Clean Planting Material

The NCPN-Hop foundation collection continues to grow! The Winter/Spring sales season at Clean Plant Center Northwest (CPCNW) offers five "new" virus-tested selections (Columbus, Eroica, Northern Brewer, Oregon Cluster, Santiam) in tissue culture and plugs. The sale season will also offer CPCNW's first-ever virus-tested rhizome sale with single units and bulk pricing options, based on the quantity ordered.

For more information on sourcing the latest selections, visit:

[Winter/Spring Hop Availability](#)



NCPN-Citrus: Being Proactive to Mitigate Plant Disease

One of the basic tenets of preventing disease due to pathogens is proactively planting material that has been virus-tested. And one of the strategies for minimizing the devastation of hurricanes and other natural disasters is to proactively prepare to protect people, infrastructure, and—yes—even landscape and agricultural crops.

Research indicates that healthy plants are better able to resist pests and disease. But what may not be obvious is that tender new growth can provide an irresistible attraction for certain pests, leading to the development of insect-vectored diseases. Therefore, when crops are damaged by natural disasters such as hurricanes, the new growth of surviving plants may provide an additional path to destruction. In the case of citrus crops, this is another potential path to the devastation of HLB.

According to University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), in their article *Treatment After Hurricane*, "Tree defoliation also poses the risk of Asian citrus psyllids being attracted to any new flush that the trees will produce." Watch for that article, as Part 2, in the next edition of *NCPN Network News*. Below is Part 1 of the two-part series exploring ideas for proactively preparing for hurricanes that may damage high-value crops.

Part 1 of 2: Preventing Further Hurricane Damage in Groves

Mongi Zekri, Robert E. Rouse, and Jonathan H. Crane

The best way to prepare for a hurricane is to devise a plan and use it far before the hurricane season. A good hurricane plan provides both protection from the storm and recovery afterwards. Strong winds causing tree damage cannot be controlled, but growers can take steps to protect the people, equipment and supplies that will be needed in the recovery process.

Before the Storm

- **Personnel Assignments:** Making a list of all tasks that will need to be done will prevent last-minute and unanticipated issues. Make sure each team member knows their responsibilities and duties, always creating a contact list with names and numbers ready.
- **Safety Training:** Training all team members in safe operation of unfamiliar equipment is important.
- **Liquid Tanks:** Keeping all tanks containing fuel, fertilizer, and other necessary materials, full so they do not move in the wind and rain, and to ensure that those materials are available when needed.
- **Cultural Practices:** Trees should be pruned regularly to reduce broken limbs and minimize toppled or uprooted trees. Windbreaks can also reduce tree damage and the spread of citrus canker bacterium.
- **Emergency Equipment:** Make sure that all emergency equipment is on hand and in good working condition.
- **Communications Equipment:** Have hand-held portable radios with extra charged battery packs and ensure that radios are in good working order.
- **Hazardous Materials:** Hazardous materials should be secured prior to a storm, and gasoline pumps shut down.
- **Emergency Contacts:** Keep a list of important phone numbers, especially electric companies, local emergency operations, sheriff and medical facilities.

Post-Storm Recovery

Activity Check List: An activity check list will help ensure that all essential damage assessment and recovery operations are carried out.

- **Employee Call-In:** Maintain a current list of employee locations and phone numbers.
- **Damage Inspection:** Safely survey lands and assess tree and property damage.
- **Clear Road Access:** Clearing the roads of debris is important so that workers have a clear path, which will aid in a quicker recovery effort.
- **Water Removal:** Within 72 hours after, remove excess water from tree root zones to avoid feeder root damage.
- **Tree Rehabilitation:** Reset any fallen trees to an upright position. This must be done properly. Toppled trees must be pruned back to sound wood. Painting exposed trunks and branches with white latex paint helps prevent sunburn.

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NCPN-Roses: Texas A&M Research may result in furthering the mission to *Stay Clean*

The most important strategy for controlling viruses in roses is planting with stock that is free of targeted pathogens. This is the primary focus of the NCPN mission. That approach is even more effective when using planting stock that has inherent resistance to the pathogens of concern, helping lower the risk of the virus being introduced after planting in the field or landscape. In the case of Rose Rosette Disease (RRD), the researchers at Texas A&M, home of an NCPN-Roses Clean Plant Center, appears to have developed planting material with partial resistance, which may lower virus titer and disease symptoms. [Texas A&M AgriLife](#) is leading a team of researchers to alleviate the estimated \$10 million in annual disease-related loss to the rose industry.

[Read the article in AgriLife Today](#)



David Byrne, Ph.D., the Basye Chair in Rose Genetics, is co-leading the new project with Oscar Riera-Lizarazu, Ph.D., both Texas A&M AgriLife Research rose geneticists in the Texas A&M Department of Horticultural Sciences in the College of Agriculture and Life Sciences.

NCPN-Berries Expands Capabilities With New Home



Research scientist Dan Villamor sets up samples in the centrifuge in the Arkansas Clean Plant Center for Berries.

The Arkansas Clean Plant Center for Berries at the Arkansas Agricultural Experiment Station is moving into a renovated laboratory, expanding its capability to assure that nurseries and growers have plants free of harmful pathogens. Director Ioannis Tzanetakis said the Center provides testing and clean-up necessary for certification of nurseries providing berry planting stock and for export. These are essential services for one of the country's leading agricultural sectors.

[Read more about this important milestone NCPN-Berries](#)



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