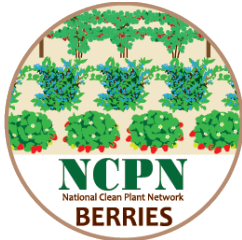




# What is the National Clean Plant Network (NCPN)?

- A national network of clean plant centers, scientists, educators, state and federal regulators, and growers and nurseries.
- Focused on providing healthy planting stock of vegetatively propagated specialty crops to nurseries and growers.





# Participating Crops:

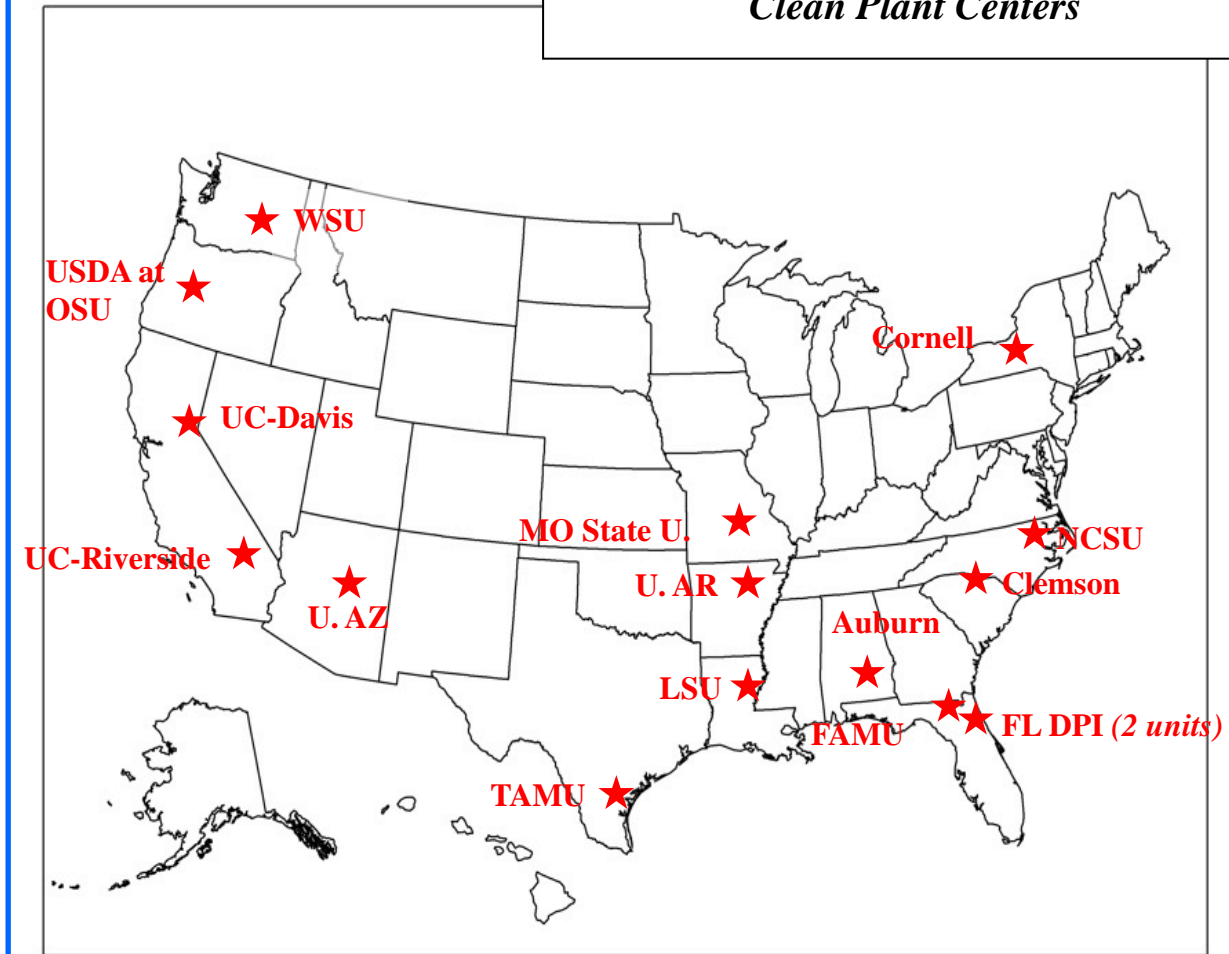
1. Fruit Trees
2. Grapes
3. Berries
4. Hops
5. Citrus

Others interested in joining



# Clean Plant Centers

*NCPN Participating  
Clean Plant Centers*



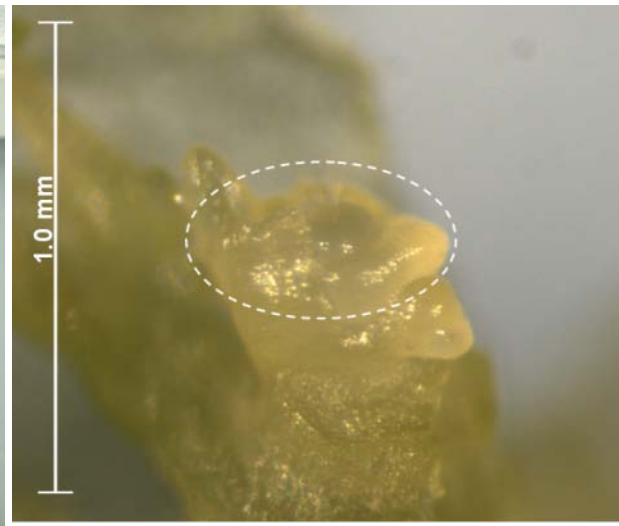


- Clean Plant Centers provide clean, tested propagation stock to nurseries throughout the United States and world.



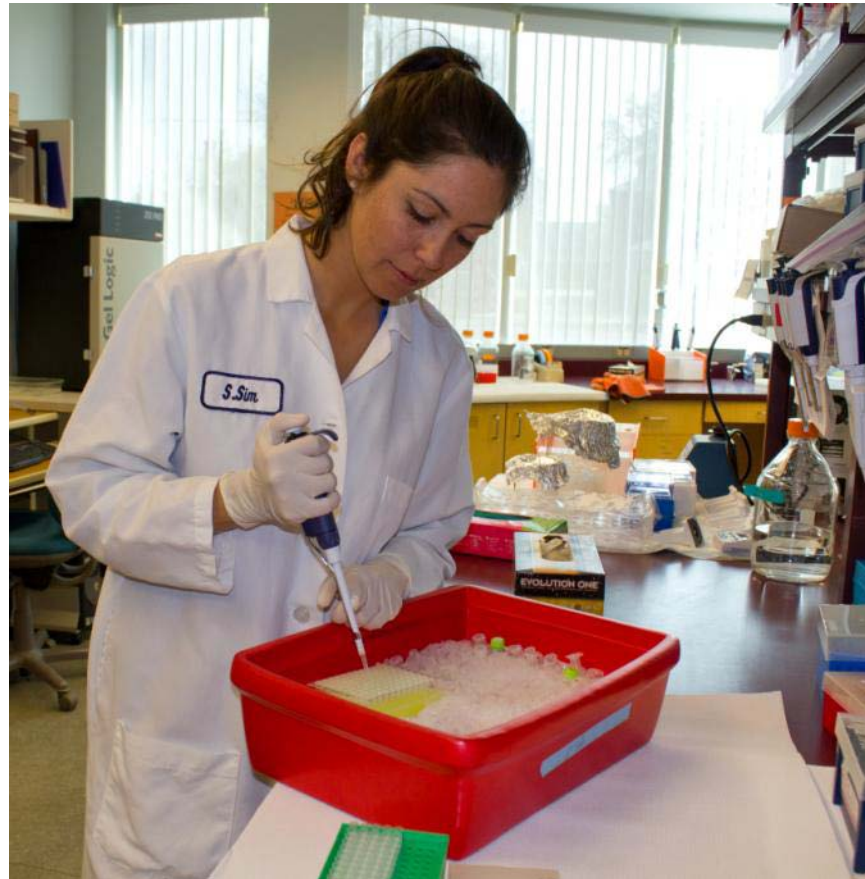


- Clean Plant Centers rigorously test mother plants using standards that are often stricter than state and federal requirements.



- Clean Plant Centers eliminate viruses using heat therapy and/or microshoot tip culture.





- Clean Plant Centers develop state of the art techniques for detecting pathogens.





- Clean Plant Centers import and quarantine new varieties of interest to growers.





- Clean Plant Centers establish and maintain extensive Foundation Mother blocks with regular disease monitoring.



# NCPN Publications



## BERRIES

NATIONAL CLEAN PLANT NETWORK

## FRUIT TREES

NATIONAL CLEAN PLANT NETWORK

**Viruses rob fruit trees of yield, quality and flavor.**

- Some viruses directly damage fruit quality resulting in poor taste and texture while others cause viral symptoms and tree decline.
- Even worse! If it do cause obvious disease symptoms can decrease yield by 10 percent or more.

**Viruses devastate fruit and nut growing regions.**

- In the 1940s, viruses caused crippling diseases of leaflets or diebacks in Walnuts, California and Utah.
- In the 1950s, the cherry disease devastated the sweet cherry industry in British Columbia.
- In the 1990s, plantings lost to the dieback of thousands of peach trees in Pennsylvania.

**Viruses spread.**

- Leafhatched, viruses spread to healthy trees in the orchard.
- Propagating and planting infected trees is one of the most damaging ways viruses spread.
- The only "cure" for the orchard is to remove virus-infected trees and replace with virus-tested planting stock. No chemical spray will eliminate viruses once a tree is infected.

**At National Clean Plant Network- Fruit Trees, we fight viruses.**

- NCPN-Fruit Trees provides commercial nurseries and growers with foundation GTO planting stock that is virus-tested and free (various) of important virus-like agents.
- NCPN-Fruit Trees provides pre-plantations. Planting "clean" trees decreases virus infection rates from orchard to orchard to better plant health with better, more efficient production.
- NCPN-Fruit Trees eliminates viruses from infected plantations. We've raised a global reputation for our ability to eliminate viruses from infected trees.
- NCPN-Fruit Trees keeps U.S. growers and nurseries competitive. Stock you've imported over 100 new varieties from the United States or imported from abroad. These new varieties extend growing seasons and profit margins.

**Our Mission:**

To provide the greater fruit and nut tree community with virus tested propagation material for fruit and nut tree stock production. This side each step of virus tested propagation material protects the fruit and nut industry from disease, improves productivity and opens up new markets to our growers, nurseries and tree growers.

## FACT SHEET

National Clean Plant Network

Start clean, stay clean

### Grapevine Vein Clearing and Vine Decline Disease

## FACT SHEET

National Clean Plant Network

Start clean, stay clean

### Grapevine Red Blotch Disease

**What is red blotch?**  
Grapevine red blotch-associated virus (GRBVA), is the latest addition to the list of more than 75 graft-transmissible agents that have been identified in grapevines. This recently reported virus is associated with the emerging red blotch disease that was described for the first time on Cabernet Sauvignon in Napa Valley in 2008. There is a very good correlation between the presence of GRBVA and red blotch symptoms, but this correlation does not prove causality.

**What are the symptoms of red blotch?**  
Vines with red blotch disease show symptoms much like leafroll disease. Like leafroll, leaves turn red in early fall primarily at the base of the shoots. Unlike leafroll, vines with red blotch disease show pink/red veins on the leaf undersides and no rolling.

**How serious is it?**  
Red blotch disease can result in a significant reduction in sugar accumulation - up to 5% loss. Much is still unknown about effect on yield and possible differences in cultivars and rootstocks.

**Where has it been found?**  
Findings suggest a wide geographic distribution, as well as a widespread occurrence in red and white vinifera cultivars. Infected vines have been identified in California, New York, Virginia, Maryland, Pennsylvania, Texas and Washington. GRBVA was found both in young (first leaf) and mature (5-20 yr old) vineyards. The sequence of a virus nearly identical to GRBVA was also obtained in Canada. GRBVA has been detected in Cabernet Franc, Cabernet Sauvignon, Chardonnay, Malbec, Merlot, Mourvèdre, Petite Syrah, Pinot Noir, Pinot noir, Riesling and Zinfandel.

### Red blotch vs. Leafroll in Cabernet franc.

Red blotch has flat margins.

Leafroll has leaf margins that roll downwards.

Red blotch has pink veins.

Leafroll has green veins.

Photos: M. R. Soderstrom, USDA-ARS Davis, CA





*Thank you*

[www.nationalcleanplantnetwork.org](http://www.nationalcleanplantnetwork.org)



# Foundation Plant Services

## DNA ID Testing & Profiling Services

<http://fps.ucdavis.edu/IDTesting.html>



Foundation Plant Services offers DNA-based varietal identification and profiling on a fee-for-service basis for the fruit and nut tree types listed on the right. The services make “DNA Fingerprinting” technology available to nursery managers, growers, breeders and fruit tree enthusiasts. Varieties are identified by comparing the DNA profile of a sample to DNA Identification Reference Databases, which are specific to each crop. The databases contain DNA profiles of most important varieties of the past and present and includes many rootstocks. FPS offers two different services listed below. Both domestic clients and clients from outside the U.S. may submit samples for analysis. Results are typically ready in three to four weeks.

### Available Tests:

- Grape
- Almond
- Apple
- Apricot
- Cherry
- Peach
- Plum-Walnut
- Strawberry

### Service 1: DNA Identification of Varieties

This service determines or confirms the varietal identity of a particular plant. A sample from the plant in question is typed with microsatellite DNA markers. The resulting DNA profile (the DNA Fingerprint) is compared with Foundation Plant Services’ Databases of Reference Profiles. Leaves are the standard sample, but other tissues including fruit, roots and dormant cuttings can also be fingerprinted. Sample collection materials and instructions are provided as part of the service.

**Price: 1-5 samples \$345 per sample**  
**6 or more samples \$265 per sample**

(There is a \$50 per sample surcharge for all sample types other than leaves.)

### Service 2: DNA Profiling of Varieties (not available for strawberry)

This service provides a unique DNA profile (DNA Fingerprint) of a variety. Two separate samples of the variety are typed at a number of microsatellite DNA markers sufficient to ensure to an extremely high degree of confidence that the profile is unique to the variety. The resulting profile is provided to the client.

**Price: DNA Profiling \$1000 per sample**  
 (Only leaf samples are accepted for the DNA Profiling Service.)