



# GOOD FRUIT

## GROWER

HARVEST / BUYER'S GUIDE

AUGUST 2016

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VOL. 67, NO. 13





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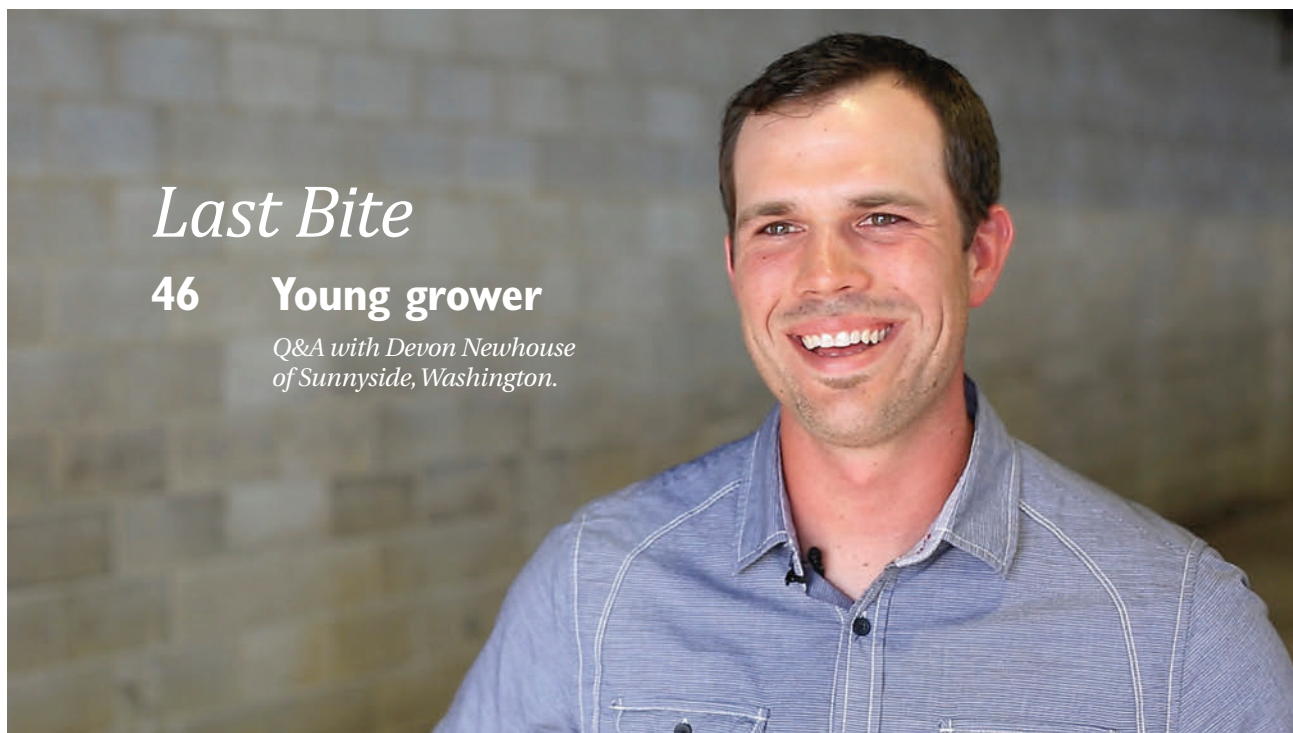
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TJ MULLINAX/GOOD FRUIT GROWER

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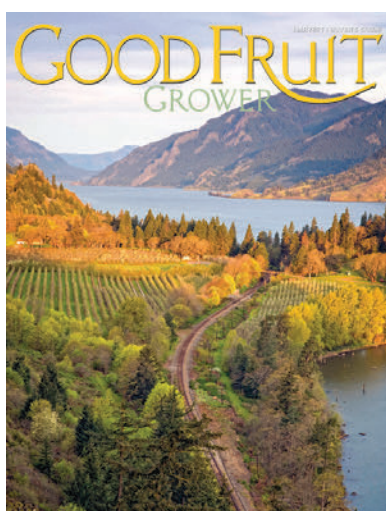
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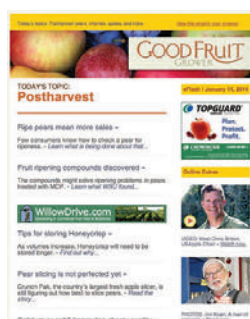
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# QUICK BITES

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## New York Apple CEO retiring

Jim Allen will retire as president and CEO of New York Apple Association Inc., effective Jan. 2, 2017. He has headed the organization since 2000.

Allen joined NYAA in 1996 as retail program director and was named to its top job four years later. Before that, Allen led export sales and procurement for Sun Orchard Fruit Co. of Burt, New York, and worked in procurement and sales for Keystone Fruit Marketing of Greencastle, Pennsylvania.

NYAA represents more than 675 apple growers across New York. As senior executive, Allen oversees all promotional, grower education, communications, market outreach and public and government affairs activities. NYAA Board of Directors outgoing Chairman Will Gunnison said that a search committee has been established to find the association's next president and CEO.



Jim Allen

## Newhouse named chair of national wine grape association

Todd Newhouse of Outlook, Washington, has been elected chairman of the Winegrape Growers of America. The other officers elected were Peter Martini of New York as vice chairman and Dave Barber of the Atlantic Seaboard as secretary/treasurer.

Newhouse, owner of Upland Vineyards, also serves as the board chair for the Washington Association of Wine Grape Growers and is a member of the *Good Fruit Grower* advisory board. Martini is the vineyard manager for Anthony Road Wine Company, and Barber is a wine educator and certified wine judge who serves as the secretary and competition chairman for the Atlantic Seaboard Wine Association.

Since 1978, Winegrape Growers of America has represented the national wine grape growing industry based on the power of unity, cooperation and efficiency. WGA operates as the national lobbying arm of the domestic wine grape industry and provides a forum for communication and exchange of information among member states.



Todd Newhouse

## WSTFA fills two key positions

Jacqui Gordon Nunez has been named director of education and member services at the Washington State Tree Fruit Association, based in Yakima, Washington.

Nunez has a background in food and horticulture, with a degree in Ingeniera Agroindustrial (equivalent to a bachelor's of science in food science) from Escuela Politécnica Nacional in Quito, Ecuador.

Nunez first came to the United States for a one-year internship with the Washington Tree Fruit Research Commission in May 2011. She returned to Ecuador and worked as a food safety leader, before returning to the U.S. in January 2014 to pursue a master's degree in horticulture from Washington State University. She graduated in 2016.

Meanwhile, Tim Kovis has been appointed communications manager at WSTFA. Kovis has more than 10 years' experience in communications, outreach and event planning in Washington state politics and government. His most recent position was as manager of Republican Dan Newhouse's successful congressional campaign in Washington state.

Kovis also has worked for the Washington State Republican Party, Congressman Doc Hastings, R-Wash., and for the U.S. House Natural Resources Committee where he was responsible for organizing committee field hearings around the country.

Kovis also comes from an agricultural and tree fruit background, having grown up on an alfalfa and cherry ranch in Pasco.



Jacqui Gordon Nunez



Tim Kovis

## Correction

A story in the June issue about researchers in Canada working to match apple varieties with consumer preferences noted that Summerland fruit breeder Cheryl Hampson would be collaborating on the project. Hampson retired in April, after the story was written.



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## New cherry breeding manager oversees orchard horticulture

Bernardita Sallato, the new manager for Washington State University's cherry breeding program, wants what everyone else in the industry wants.

"We want the perfect cherry," she said.

WSU has hired Sallato to oversee horticultural practices and information involved with its cherry breeding program. In her role, Sallato will maintain consistent horticultural standards for the trees the program already has at WSU-Prosser's Roza orchard and will evaluate the fruit with the help of Northwest growers and researchers on the Breeding Program Advisory Committee (BPAC).

Sallato, born and raised in Santiago, Chile, calls this cherry season a transition year for the program. In 2017, the university will begin searching for a new breeder to replace Nnadozie Oraguzie, who has switched to full-time genetics research. The new breeder will resume making new crosses.

The cherry industry pays for the breeding program to search for new varieties that are easy to grow and extend the season. The breeding program had its first major release of the popular Rainier blush variety in 1952. Currently, the program has several selections in phase two and phase three trials at sites around Washington and Oregon, while one cross — the dark red R25 — is showing promise.

Sallato's job is a new position. Advisers thought it best to hire a manager with a "green thumb" to keep the trees they already have in healthy, consistent condition.

"We thought it was more important to have a good manager in place before we made any new crosses," said Ines Hanrahan, a project manager for the



ROSS COURTNEY/GOOD FRUIT GROWER

Bernardita Sallato, manager of the Washington State University cherry breeding program, inspects a tree as she leads a tour through the Roza test block at the Irrigated Agriculture Research and Extension Center in Prosser, Washington.

Washington State Tree Fruit Research Commission, which is temporarily helping to steer the breeding program.

Sallato, 36, has a master's degree in fruit production and plant physiology from Pontifical Catholic University of Chile, well-known for its agricultural programs. She spent two years as a laborer in several agricultural venues in New Zealand and then eight years at her alma mater as manager of a service laboratory.

One of the differences she has noticed is that growers in the United States directly fund breeding

programs compared with the university-funded work in Chile. "The good part of the industry being involved is they give you input," she said.

Sallato moved to Prosser in September 2015 before starting at WSU-Prosser. Her goal in the short term is to write and follow a methodology for pruning, fertilizing, irrigating and training the test trees. In the long-term, she would like a set of written goals for each market class.

"There's not just one way to grow a cherry," she said. — **Ross Courtney**



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Tracy Christine Leskey

## West Virginia fruit research station picks acting director

Tracy Christine Leskey has been named acting director of the Appalachian Fruit Research Station in Kearneysville, West Virginia.

Leskey joined the AFRS staff in 2000 as a U.S. Department of Agriculture Agricultural Research Service entomologist. In that capacity, she conducted research on the behavior and chemical ecology of deciduous tree fruit pests.

Much of her most recent work involves research into the brown marmorated stink bug. Leskey's recent published work covers such varied subjects as the insect's overwintering and foraging behavior to its response to various pesticides, as well as evaluations of various traps and baits for the pest.

Built in 1978, the Appalachian Fruit Research Station conducts fundamental, applied and developmental research on critical problems of apples, peaches, pears, plums, strawberries, blueberries, raspberries and blackberries.



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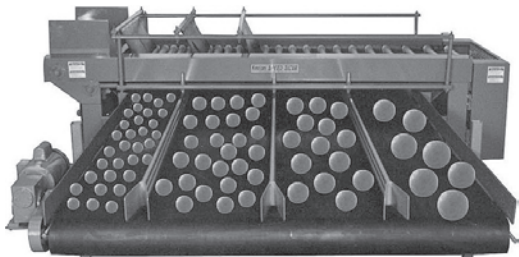
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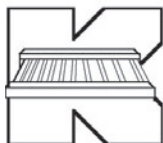
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PHOTOS BY TJ MULLINAX/GOOD FRUIT GROWER

Edgar Salar drops boxes down a chute to workers at the new cherry processing facility operated by Blue Bird Inc. during a mid-June packing run in Wenatchee, Washington. The facility replaces a \$10 million facility destroyed by a 2015 wildfire.

# Bouncing back bigger and better

**Packing house ravaged by wildfire last summer reopens with latest technologies just in time for early cherry harvest.**

*by Shannon Dininny*

Eleven months to the day after a wildfire destroyed a packing house in central Washington, one of the Northwest's oldest grower cooperatives reopened to cherry packing there with a new line that is bigger and more sophisticated than the one it lost.

That speaks to the speed at which new technologies are coming to market on the packing side of the tree fruit industry — the \$10 million line that burned was brand

new — as well as the need to rebuild quickly to meet industry demand.

The new cherry line includes a total of 42 lanes with three parallel sizers and 54 drops, up from the previous line with 28 lanes and 32 drops. In addition, one of the sizers is 12 drops longer than the other two, which enables Blue Bird Inc. to pack organic cherries or Rainiers simultaneously with other varieties. An increased consumer packaging area allows the cooperative to pack





Blue Bird's new facility can accommodate several styles of commercial packaging for cherries, including clamshells.

*"Of course, we're taking all these precautions, and you typically say, 'We'll never have a fire,' but we never thought the Wenatchee facility was susceptible to fire in the past."*



— Ron Gonsalves

greater volumes of clamshells, as well as the new pouch bag style.

The system includes both automated and manual filling stations, and Blue Bird is employing 22 fewer workers — who are running more fruit — than last year. The optical system is processing the digital images from the cameras three times faster than last year as well. "We hope to continue to evaluate our labor and reduce as needed," President Ron Gonsalves said. "Already, though, we're seeing this system is allowing us to diversify in ways we couldn't before."

The capacity of the new line, under optimum conditions: 10 tons per hour on each sizer, for a combined 30 tons per hour if all 42 lanes are in use. Overall, Blue Bird expects to pack 13,000 tons this year.

#### A quick recovery

Last summer, sparks from a nearby wildfire sparked a blaze at a neighboring warehouse in the industrial district of Wenatchee, Washington. The fire, pushed by high winds, quickly spread. By the time firefighters doused it, Blue Bird had lost its new cherry line, as well as a dedicated organic line of 15 years and 75,000 cartons of packed fruit. Firefighters saved the storage warehouses, including rack storage and a 12-room CA storage building.

Blue Bird never questioned rebuilding; the co-op invested \$4.5 million in storage at the Wenatchee site in 2011. Blue Bird has 193 grower members and owns another 750 acres of pears and apples itself, 75 percent of which are certified organic, and another packing house for apples and pears at its corporate headquarters in nearby Peshastin.

The company started packing again in Wenatchee

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on May 27. “Of course, Mother Nature did nothing to help us out this year by being the earliest year ever,” Gonsalves said with a smile. “She had no compassion for us whatsoever, provided us no relief.”

Structurally, the new warehouse underwent significant changes floor to ceiling, from drains that can be easily cleaned and sanitized to a finished drop ceiling through the production area. The facility is larger — 120,000 square feet to 105,000 square feet — with the same footprint but more space in an added mezzanine. Lighting is 100 percent LED, and Blue Bird also installed 72 solar tubes and multiple large windows to bring in supplemental natural light.

The design eliminated forklift traffic in the packing room itself, other than in the dumping area, to improve worker safety and reduce food safety concerns. Elevated catwalks minimize the number of visitors on the packing floor, “which also plays into food safety requirements,” Gonsalves said. The centrally located mezzanine separates the cherry line and a new apple line, scheduled to be completed by mid-August. Shared restrooms, washing stations and a lunchroom sit underneath.

The co-op fully integrated its fire system, with lights, red strobes, sirens and sprinklers, for the entire building, and there is direct access to water on the roof. Blue Bird also installed two-hour rated, fire-resistant board between the building’s insulation and membranes, a step intended to buy additional time if firefighters are delayed in the event of a future fire.

“That board may have protected us from losing the building before had it been up there,” Gonsalves said. “Of course, we’re taking all these precautions, and you



Employee washing stations and restrooms are centrally located between the cherry processing facility and future apple processing facility.

typically say, ‘We’ll never have a fire,’ but we never thought the Wenatchee facility was susceptible to fire in the past. Not located in the middle of town.”

#### Equipment upgrades

Cherries enter the line through twin-feed, robotic submersible dumpers. All of the equipment on the lines is stainless steel or aluminum for sanitary purposes.

Each of the three sizing lanes features three cameras on each side of the lane for optical sizing, defect sorting and measuring internal firmness. Each camera takes 10 pictures, resulting in 60 pictures per cherry in just a fraction of a second. There also are more options for defect and color sorting: dark and light, finding scars, stemless and doubles, sorting for shape and softness, said Ralph

Deleon, who has worked for manufacturer MAF for 17 years and is stationed at Blue Bird as the co-op works with the new equipment.

“The software has more capabilities, higher definition of the photos of the fruit,” he said.

A hydro-cooling unit holds 200 tons of refrigeration, and a smaller, independent unit with a separate water source serves the longer line that can pack organic or conventional fruit. Another tank contains 100 percent ozonized water from an onsite ozone generator for the last fruit treatment before fruit is packed into the different style cartons.

“Typically, the industry is either treating with food grade fungicides of different sorts, but we’ve eliminated all of the fungicides and ozone is working well,” Gonsalves said. “We ship all across the country, all around the world, and residual components, MRLs, are playing into our treatment with ozone. And right now, we’re satisfied with the effectiveness of it.”

A six-lane apple line lost in the fire is being replaced by an eight-lane MAF line, with upgraded defect sorting and sanitation technologies. A robotic stacker grabs each bin, weighs it and then pressure-washes the feet of the bin and the skid before dumping the fruit. The bin then is pressure-washed again, inside and out, and re-nested into a stack of three, all before leaving the warehouse and returning to the field.

“This is a technology that’s used in a lot of facilities in Europe, but this is one of the first installations here that has fully integrated bin washing on the line itself,” Gonsalves said. “We’re pretty excited about getting that online.” ●

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Angel Gallegos scoops out stems and leaves from a robotic cherry submersible dumper.



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# Red tape keeps some workers out



Orchard Homes in Milton-Freewater, Oregon, was built in the 1950s to house workers during fruit harvest. Today, most residents live there year-round.

## Farm labor housing struggles against federal loan stipulation.

by Ross Courtney

**I**n Milton-Freewater, Oregon, many people still call the Orchard Homes farmworker housing facility “the labor camp” after its 1950s origin as quarters for traveling field laborers, who stayed for a month or so before moving on. Obviously, times have changed.

Today, about half of the units in Orchard Homes, an apartment facility built by area farmers specifically to house seasonal laborers, are occupied by year-round residents, but the younger generations of workers are seeking work outside the fields, vineyards and orchards that line the Walla Walla Valley in this corner of northeast



Oregon. As a result, Orchard Homes lacks enough residents, and the nonprofit grower organization that owns it has been dipping into reserves to make its loan payments to the U.S. Department of Agriculture.

The growers would like to house the new wave of



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Beatriz Lara bids farewell to her granddaughter Ana Robledo outside Lara's apartment at the Orchard Homes farmworker housing facility in Milton-Freewater, Oregon, in May. Holding Robledo is Lara's son Javier Lara. The family lives at the complex year-round while working in nearby orchards. The farmers who own the building would like to also use it to house visiting H-2A workers, but their U.S. Department of Agriculture loan requirements restrict the facility to U.S. citizens and permanent residents.

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**PRODUCT REVIEW**



*“We had a perfect housing infrastructure to bring H-2A workers in, but we can’t use that structure, and it’s going broke because we can’t use it.”*

—Tom Waliser

migrant laborers — foreign guest workers on H-2A visas — but can’t because their loan limits them to housing U.S. residents.

Growers considering joining the wave of building apartments for foreign workers should view the Orchard Homes tale as cautionary when they seek funding and steer away from a popular federal program that restricts money to structures for domestic workers only, the same one now tying the hands of the Milton-Freewater facility.

“We had a perfect housing infrastructure to bring H-2A workers in, but we can’t use that structure, and it’s going broke because we can’t use it,” said Tom Waliser, a Milton-Freewater apple and grape grower and member of the housing facility’s board of directors.

The group owes about \$1.4 million on its loan, Waliser said. Vacancies have left it low on short-term cash flow.

Either the farmers must fill more vacant units with seasonal workers or completely renovate the complex into attractive permanent apartments, a multi-million-dollar project they can’t afford. One solution may be to turn over the keys to another organization outside of the agricultural industry.

“If we have to make it more attractive year-round housing, somebody else is going to have to do that,” Waliser said.



ROSS COURTNEY/GOOD FRUIT GROWER

A patchwork of orchards and vineyards line the valley between Walla Walla, Washington, and Milton-Freewater, Oregon.

#### Policy problem

It’s a common quandary throughout the nation, hitting growers in Michigan, New York and other places increasingly relying on H-2A workers.

Diane Kurrle, senior vice president of the U.S. Apple Association, has been lobbying with no success to change the requirements of the loan program, the USDA’s Farm Labor Housing Direct Loans and Grants Program, sometimes called 514 funding.

“Obviously we recognize this as a government policy that doesn’t make sense and we’re trying to fix it,”

said Kurrle, the main lobbyist for the Vienna, Virginia, organization.

The problem requires a legislative fix. In the past, the group and other organizations have pushed for one through the Farm Bill or appropriations bills, but supporters always run up against the same gridlock that has prevented the U.S. Congress from passing immigration reform. They tried again with a round of letters to lawmakers earlier this year. In the meantime, Kurrle advises growers to avoid the 514 program if they ever might consider hiring H-2A workers.

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U.S. Rep. Dan Newhouse, R-Sunnyside, Washington, supports loosening the loan requirements on a priority basis; domestic workers would get first dibs on rooms, and H-2A workers could be housed in them only if there are rooms remaining.

“It’s an inefficient use of taxpayer dollars if farm housing is being underutilized or sitting empty because there are not enough domestic farm workers to fill available housing,” Newhouse’s office said in an email to *Good Fruit Grower*. “It’s in the best interest of taxpayers and farmers to make sure USDA services are being used to their full extent, including allowing H-2A workers access to 514 housing if there are insufficient domestic workers to fill available units.”

The farm labor program is not the only funding source for growers who need labor housing, but others often are intended only for nonprofit organizations, said Jon DeVaney, president of the Washington State Tree Fruit Association in Yakima, Washington. Banks don’t always want to front capital for growers’ worker housing costs because “it’s a big expense that doesn’t necessarily cash flow well.”

### History of Orchard Homes

The Milton-Freewater “camp” started in the 1950s when farmers picked up day laborers — mostly white, male veterans of World War II and Korea, many of them transient, Waliser said. In the 1960s and 1970s, it was families from the south and later Mexican immigrants, as the size and variety of crops increased and the agricultural season stretched from weeks to several months.

In the 1970s, a group of area farmers used a federal loan to rebuild the apartments and another to renovate it in the early 2000s, he said. Since then, migrant labor has been fading. Northwest growers complain of labor shortages of up to 20 percent or more.

“As a result of that, our occupancy in the camp has dwindled down in the last decade,” Waliser said.

Farm laborers save up to buy their own homes more than they did in the 1990s, said Jaime Garcia, a former resident and former chairman of the facility’s board of directors. Also, a newer labor housing facility opened in Walla Walla, just eight miles north in Washington, competing for residents.

Garcia would favor letting H-2A residents live at orchard homes. That would help fill the facility and help growers find workers.

“They are scarce of people,” Garcia said.

Angelica Medina, a former resident and teacher at the preschool next door, has fond memories of playing with friends while her parents worked at the Green Giant asparagus cannery in nearby Dayton, Washington, and paid their rent in cash every week.

“Back then, to me, they were beautiful,” Medina said.

It was also full, with a long waiting list.

For five years straight, her mother drove from Mexico, stopping to use a payphone at the Madras, Oregon, Safeway, to inform the manager the family was on its way.

Medina has noticed the change, too. Green Giant closed in 2015. Other packing houses and processing facilities have followed suit, while migrants have settled, switching to construction or landscaping work.

“A lot of people are buying houses and they are settling here,” Medina said. “They aren’t going back and forth.”

### Life at Orchard Homes

The residents of Orchard Homes pay a sliding scale, live across the street from a Safeway and next door to a preschool where many of their children spend their days.

Beatriz Lara has lived in the apartments year-round with her husband and family for nearly eight years. She carools about 45 miles west each morning to her job at a Broetje Orchards property in Wallula, Washington.

She describes her home the way many families would an apartment complex: decent but not perfect and definitely not temporary. It has a playground and central heat and air, while managers help her keep tabs on her children with the security cameras.

However, sometimes the laundry machines don’t work, vandalism occurs and she wishes the grass was watered more often.

But it’s home.

“I feel comfortable here,” she said. ●


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**G**rowers wanting to offer an early blush cherry usually turn to Early Robin.

Early Robin, the only unrestricted early yellow variety, is one of the most requested varieties at nurseries. Competing varieties are usually associated with a club, but any grower willing to pay the royalties can buy Early Robins.

## Early blush variety comes with growing challenges.

by Ross Courtney

However, the popular variety, which ripens roughly a week ahead of the lucrative Rainier, has some unique growing quirks.

"It's on a real sharp incline," said Matt Whiting, a Washington State University horticulturist, on a May tour of three Early Robin orchards. "And at the same time, I think a lot of you guys know, you're recognizing some challenges with the cultivar."

For one thing, it produces low yields.

Pasco, Washington, grower Denny Hayden anticipated between 5 and 6 tons per acre in his fourth-leaf block, the tour's first stop. By Early Robin accounts, that would be a good year. The Sweetheart variety, on the other hand, routinely produces 10 to 12 tons per acre or even more, Whiting said.



PHOTOS BY ROSS COURTNEY/GOOD FRUIT GROWER

Matt Whiting (right), Washington State University research horticulturist, discusses the intricacies of raising the Early Robin cherry variety with grower Denny Hayden during a May tour in Pasco, Kennewick and Benton City, Washington. The Early Robin is one of the first blush varieties to ripen and is rising in popularity.



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# Early Robin

Early Robins bloom like crazy, but the ovules have a short window of viability that leads to a low rate of fruit set, Whiting warned. All those blooms set growers up for frustration when yields turn out low.

"These things have copious amounts of blooms and they're popping flowers for a week, even on a year like this," Hayden said. He applies ReTain (aminoethoxyvinylglycine) at 10 percent to 20 percent bloom to try to extend the pollination window and augments honeybee pollination with dusters.

Early Robins also struggle with mysterious spots of blind wood, especially close to the trunk on his V-trellis trees, Hayden said. He tried cutting way down on his growth regulator Promalin (gibberellins and benzyladenine) rates to no avail.

"It's an odd phenomenon," he said.

Compared to other varieties, the Early Robin tends to throw a high percent of floral buds at the base of new shoots, Whiting said. The next year, those end up as blind wood.

## Overhead cooling for bloom?

Kennewick grower Tod Wilmoth, the tour's second stop, also struggled with blind wood but was more frustrated with inconsistent fruit set, especially in warm weather during bloom.

"I can't figure out why it doesn't set," Wilmoth said. He said he might try overhead cooling at bloom time.

That could backfire because water on the flowers may reduce the viability of pollen. Whiting also advised against under-canopy cooling because increasing the humidity around the tree will reduce its natural cooling through transpiration, Whiting said.

"This is a serious issue," Whiting said of fruit set problems due to heat during bloom.

Whiting warned growers pollinating with dusters to use fully compatible pollen in which both alleles of the flowers on the pollinizer and crop plant match, not just semi-compatible pollen, in which only one allele works.

## Avoid competing with Rainiers

Former nursery owner Dena Perleberg Ybarra recommended growing Early Robin trees in areas where they won't compete directly with Rainiers. The idea, after all, behind the Early Robin is to extend the blush season.

Perleberg Ybarra formerly owned Willow Drive Nursery, the first nursery to have a license to sell Early Robin.

She warned growers that Early Robin has problems. The trees are not very productive, though they perform better on Gisela rootstocks over Mazzard. The fruit is prone to heat-induced doubling and rain cracking.

"Early Robins are definitely farmed differently," she said.

Gary Snyder, co-owner of C&O Nursery in Wenatchee, warned growers and shippers to make sure they are connected to a sales team that knows how to sell Early Robins and move fruit during the early market. "As an industry overall,

if you are going to be in the market for a blonde that is early, then you want that in your portfolio," Snyder said. ●



Some Early Robin growers have noticed spots of blind wood, such as here at Denny Hayden's orchard in Pasco, Washington.

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# Trellis fails

**A**s the tree fruit industry grows increasingly more progressive with high-density plantings, growers are left wondering how to design the perfect trellis that won't fail under heavier crop loads.

There's no engineering guidebook that answers all of their potential questions — and there are many. What incline is recommended for an angled trellis system in my growing conditions? What system and materials are best suited for my soil type? How much distance should I leave between posts?

**Researchers  
aim to produce  
trellis guide for  
high-density  
plantings.**

by Shannon Dininny

A new research project supported by the Washington Tree Fruit Research Commission aims to answer some of those questions, with a goal of producing an engineering guide for trellis installation that takes into account fruit loads in high-density plantings and fixed and variable loads on a system.

"The reality is that if you were going to put up a laundry line and you were just going to hang your clothes, your needs are very different than if you were going to hang your clothes and your neighbor's clothes and rugs," said Mark De Kleine of De Kleine Machine Co., lead researcher on the study.

"The trellis system is the foundation of the orchard," he said. "When you lose a trellis system, it can be devastating. In some cases, you can salvage trees, and in some cases, it's a complete failure and you have to start over. You don't ever want to be in that situation."

Too many growers have looked to a neighbor for ideas, he said, "but you don't really have an idea what that system looks like if you're going to grow 80 bins to the acre, 150 bins to the acre or 200 bins to the acre. And there's no real sense, as a grower who's going to put in a trellis system, how to design a system for my conditions, my soil type, my horticultural practices."

## Preliminary results

For the first phase of the project, researchers surveyed growers about trellis failures in Washington. Thirteen failures were reported. Crop loads ranged from 40 bins per acre to 130 bins per acre. Half of all failures occurred

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GERALDINE WARNER/GOOD FRUIT GROWER FILE PHOTO

An example of a trellis system that failed to support an organic apple orchard row in central Washington.

*“When you lose a trellis system, it can be devastating. In some cases, you can salvage trees, and in some cases, it’s a complete failure and you have to start over. You don’t ever want to be in that situation.”*

—Mark De Kleine

in September and October, when crop loads were heaviest, and in some cases, several feet of crop was growing above the top wire of the trellis. Failures were evenly split between angled and vertical systems.

What most stood out in the responses — and what was most surprising — was that 90 percent of the failures occurred within the first 10 years, De Kleine said. “You can look back and say, in the last decade, there’s been lots of changes in trellising, and crop loads are increasing, but to have a failure in the first 10 years is surprising,” he said.

Sixty percent were related to in-row posts snapping or being upended. In-row post spacing ranged from 40 feet to 55 feet, but in more than half, spacing was greater than 40 feet.

Roughly 40 percent of the failures were related to anchor or anchor-wire failures, including loose anchors and rusted anchor wires. High wind events were reported in 40 percent. One failure occurred after a 20-hour watering interval in sandy to sandy-loam soil.

#### Final project

The researchers aim to build a user interface in which growers could enter variables from their orchard, such as soil type, trellis type and projected crop load, to determine the type of installation needed to support that crop load.

In building the interface, they are taking into account various loads applied to the system, including wind, installation of any additional superstructure such as netting, and any loads that could come from automation, such as machine pruning or harvest. The final interface should enable growers to add variables as necessary to determine the ideal trellis for their orchard system, De Kleine said.

Other researchers on the project: Karen Lewis, Washington State University tree fruit regional extension specialist, Paul Booker of Century Steep in Othello, Washington, and Chuck Pezeshki of WSU’s Mechanical Engineering Department. ●

## Trellis inspecting tips

Researchers offered a few tips for inspecting trellises for security:

- In-row wires should not have kinks, and breaks need to be repaired.
- Look for in-row posts that have become loose or are leaning beyond the intended angle, as well as bowing wood posts or, if applicable, bending at wire notches on metal posts.
- Check anchor wires for rust and breaks. Is the eyelet below ground, exposed to the soil environment?
- Ensure that anchors have not become loose.

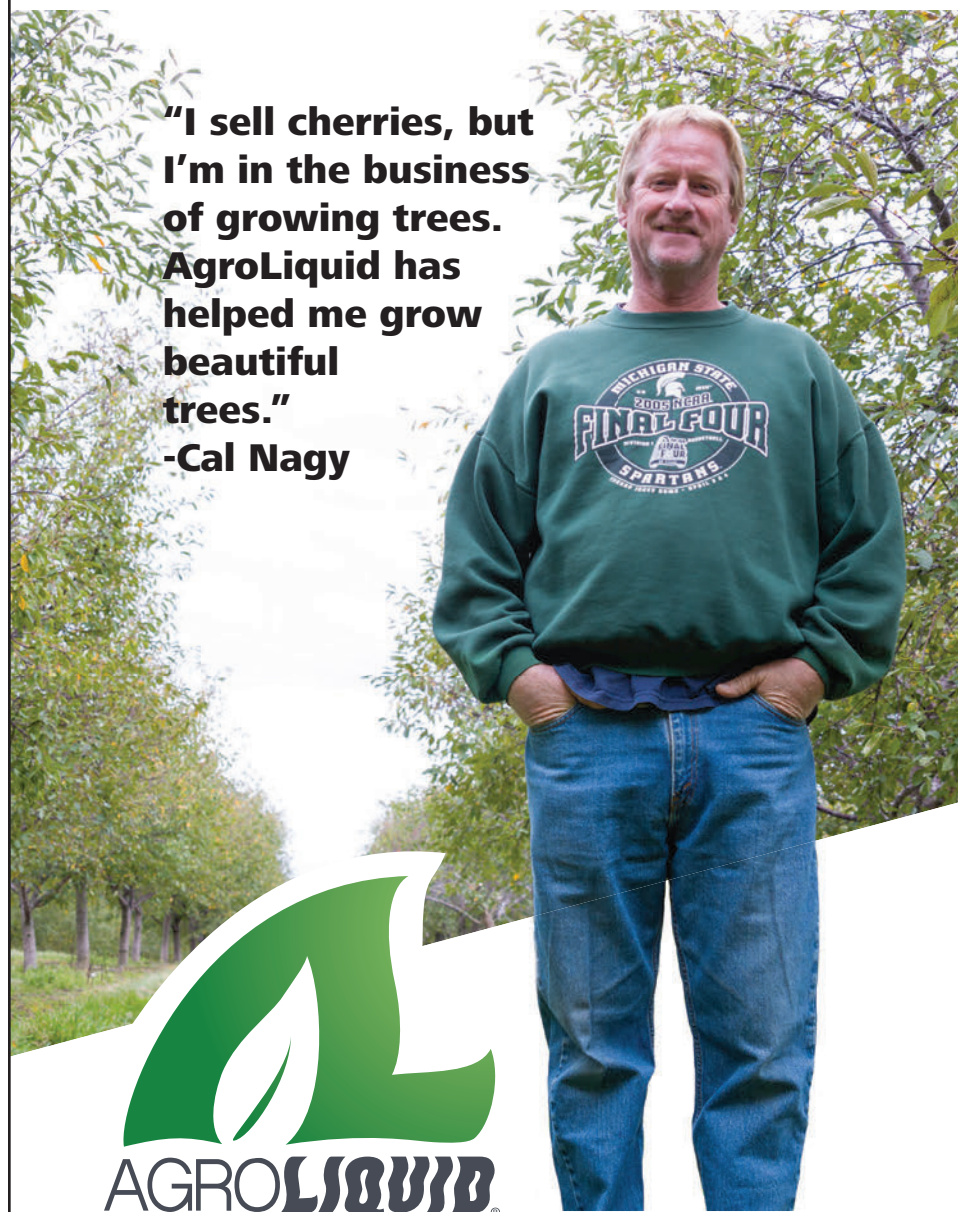
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## How to convince employees to switch from ladders to platforms.

by Ross Courtney

**W**hen it comes to platforms, crew supervisor Ismael Torres deals with two types of workers: Those who climb aboard and those who don't.

In spite of the Stemilt foreman's preaching that the tools will make everybody safer, faster and richer, some employees simply want no part. They prefer working on the ground and using ladders.

"I was just motivating them to try to see if it was going to work or not," Torres said through an interpreter.

Platforms, mechanical thinners, hedgers and other tools of orchard efficiency make a lot of sense for growers and managers, but employees aren't always as excited. Many of them have spent a lifetime developing lightning quick skills that pay off under piece-rate wages, and they don't want to change.

Multiple speakers discussed the issue at the February conference of the International Fruit Tree Association (IFTA) in Grand Rapids, Michigan. They all stressed communication and training with employees during the transition.

"Make sure that you spend and invest time in these people as well," said Rod Farrow, a New York grower and IFTA board member. "Working with them and machinery is often difficult, getting them to accept it and work with it. They're so used to what they are doing and so good at what they're doing, it is difficult to get the efficiency gains. It's easy to do in Europe, not so easy here when guys are already picking 10 bins a day of good fruit."

Miranda Sazo, a cultural practices specialist with the Cornell University Cooperative Extension's Lake Ontario Fruit Program in Newark, New York, encouraged growers and managers to bring Spanish-speaking employees with them to conferences to help win over employees back home.

### Reasons to hesitate

Several skeptical workers declined interviews with *Good Fruit Grower*, but Torres, 49, shared the concerns he's heard for the past several years as Stemilt has introduced self-driving platforms in its Quincy, Washington, orchards.

Some reasons:

On a platform, workers in crews of two, four or six all pick to fill the same bin, splitting the per-bin rate evenly come payday. After decades of working solo



Crews of thinners atop three self-driven platforms work in June in a Stemilt Gala apple block in Quincy, Washington. Fostering



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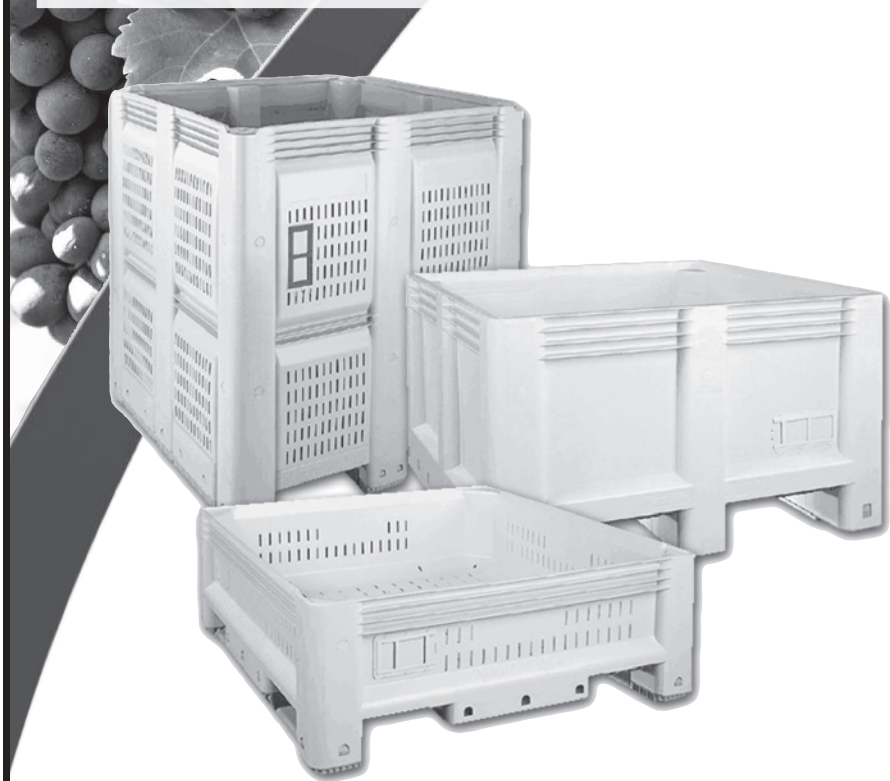
ROSS COURTNEY/GOOD FRUIT GROWER

teamwork is key to convincing reluctant employees to work on platforms.



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From left, Alejandro Salcido, Jesus Ventura and Anael Ruiz carefully place ripe Sweetango apples into a bin on top of an automated platform in a Stemilt orchard in Quincy, Washington, in 2014. Harvesting on platforms requires employees to pool their earnings and split them evenly, which some are reluctant to do.

with ladders, some are reluctant to hitch their fortunes to a group.

Also, Stemilt deploys the platforms at night, when workers would rather spend time with their families.

Still, some employees simply don't believe they will make as much money on a platform than with ladders, a concern that grows smaller each season as more workers prove otherwise.

A few fear falling from the machines, but not many.

### Local, H-2A worker differences

Bernardo Reyes, Stemilt's Quincy orchard manager, understands the reluctance to rely on a team, especially if workers are really fast on their own. He grew up picking fruit at piece rate, starting at age 14. He recalls jockeying for position in a row neighboring another fast picker to push himself, almost as if they were racing.

"If they work picking, it's because they're really good," Reyes said.

Reyes and Torres notice a big difference between the attitudes of the local employees and the H-2A guest workers. The H-2A workers adapt pretty quickly; the locals are the reluctant ones.

"They don't want to give it a chance, to try it," said Reyes, 32, who lives on the farm with his family.

### Tips to help convince workers

Growers, orchard employees and experts offered a few tips for how to convince workers to use platforms:

—Pay extra. Stemilt has offered bonuses to convince workers to work from platforms and even larger bonuses to use them at night.

—Recruit workers who have made more money using platforms to tell their story to the reluctant ones.

—Invite seasoned workers and crew supervisors to conferences.

—Stress safety. Platforms reduce falls.

—Give the platform crews some level of autonomy. Stemilt lets the workers form their own platform crews and occasionally allows them to vote off a team member they don't believe is pulling his or her own weight.

Reyes and Torres suspect that H-2A workers travel and live as a unit and psychologically adjust to teamwork more easily.





TJ MULLINAX/GOOD FRUIT GROWER



ROSS COURTNEY/GOOD FRUIT GROWER

Jessica Medina of Columbia Fruit Packers prunes Kanza apples in February from atop a self-driving orchard platform while another passes in the background in Ephrata, Washington.

Luiz Perez Cerna, a guest worker from Michoacán, Mexico, started at Stemilt a year ago. At first he was skeptical of blending into a platform team, but a veteran H-2A employee convinced him to try. Now, he feels safer on platforms and believes he is making more money.

"The whole time you're using your hands to pick, not to move the ladder and climb the ladder," said Perez Cerna, a 24-year-old father of two.

In early June, Perez Cerna and three

H-2A crewmates stood high atop a bright orange platform, strapped with harnesses, thinning Gala apples. Two men worked each side, each at different heights. Because they were being paid collectively per tree, Perez Cerna, charged with thinning the very tops, hopped over to the other side to help during the occasional break in action on his own side. Two other platform teams crawled through the orchard following the same routine.

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Reyes estimated each man would make about \$17 per hour that day on the platforms but would have made only \$13-\$14 per hour on the ground.

That doesn't mean all domestic workers will resist mechanization. Some take no convincing at all.

Nearby in Ephrata, Columbia Fruit Packers also has introduced self-steering platforms at its Winchester Ranches orchard. Candy Giron, a four-year supervisor, could think of no employees unwilling to work from a platform while pruning Kanza apples in February.

Giron, a mother of two from Moses Lake, cited safety as one her favorite benefits.

"Sometimes when there was too much snow, you were more scared of falling or when the floor was too wet, the ladder dips in," Giron said.

Giron's platform partner Jessica Medina, born and raised in California, also warmed to the idea of working from a platform right away.

"You get tired of carrying the ladder all day," said Medina, also a mother of two. "You still get tired on here, but it's not the same as when you're carrying the ladder all day and you're bruised up from your ankles or from the front of your legs from banging on the ladder." ●

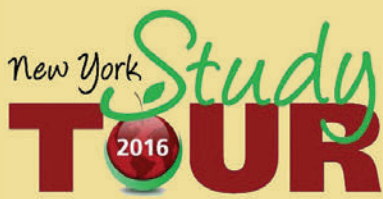


ROSS COURTNEY/GOOD FRUIT GROWER

Ismael Torres, center, a Stemilt supervisor, oversees a crew of H-2A laborers thinning Gala apples in June in Quincy, Washington. Torres has noticed H-2A workers more easily adjust to the teamwork required by platforms than local workers, who prefer to work solo on ladders. "If the group works together, they can make more money," Torres said.

## IFTA COVERAGE

*Mechanization is a key topic of the International Fruit Tree Association's summer tour in New York. Watch for coverage in forthcoming issues of Good Fruit Grower.*



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# GOOD FRUIT GROWER



The essential resource

TJ MULLINAX/GOOD FRUIT GROWER

## 2016-2017 Buyer's Guide

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# CA & COLD STORAGE

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FAX (757) 855-4155  
[sales@QAsupplies.com](mailto:sales@QAsupplies.com)  
[www.QAsupplies.com](http://www.QAsupplies.com)  
RUSS HOLT

*Hundreds of products designed for professionals in the perishable foods industry and those wanting to monitor or control environmental conditions.*

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[shiflettsinc@shiflettsinc.com](mailto:shiflettsinc@shiflettsinc.com)  
ROB MATSON / ED KRUEGER

*Shiflett's Inc. (established in 1975) is the Northwest leader in controlled atmosphere applications from system design through on-site training, including sales and service.*

## GAS ANALYSIS

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Union Gap, WA 98903  
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FAX (509) 576-8633  
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[www.pacificca.com](http://www.pacificca.com)

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*Nutri-Cal®, an organically complex calcium solution for fruits, vegetables and turf.*

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FAX (509) 882-3681

[tmcentire@bleyhl.com](mailto:tmcentire@bleyhl.com)

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[midvalecattleco@gmail.us](mailto:midvalecattleco@gmail.us)

*Manure compost and screened manure certified for use on organic crops.*

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[www.naturesintent.com](http://www.naturesintent.com)

*Nature's Intent, by Pacific Calcium Inc., is a line of soil amendments and fertilizers suitable for organic and conventional applications.*

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(503) 867-4849  
[www.pacificgro.com](http://www.pacificgro.com)

*Liquid Oceanic "Seafood for the Soil," from fish and micronized shrimp and crab. Provides NPK, calcium and chitin for drip or fertigation use.*

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[www.superiorpeat.com](http://www.superiorpeat.com)

*Over 20 years of experience by leading orchardists and vineyardists, and confirmed by the Summerland Agriculture Research Centre, has proven that Superior Peat, when used in replanting, reduces the effect of replant disease without fumigating. Significant increase in first-year root and leaf growth is achieved using Superior Peat, whether it be apples, peaches, pears, cherries or grapes. It is a natural way to adjust soil pH and add moisture-holding organic material at the root level. Available in Canada and the United States. Bulk suppliers of organic soil amend-ments and conditioners.*

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FAX (760) 599-6965  
[wrg@westbridge.com](mailto:wrg@westbridge.com)  
[www.westbridge.com](http://www.westbridge.com)

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8992 New Castle Drive,  
Middleton, ID 83644  
(208) 995-6459  
[heath@diamondkgypsum.com](mailto:heath@diamondkgypsum.com)  
[www.diamondkgypsum.com](http://www.diamondkgypsum.com)  
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Sunnyside, WA 98944  
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1700 Carmi Ave., Penticton, BC  
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[info@superiorpeat.com](mailto:info@superiorpeat.com)  
[www.superiorpeat.com](http://www.superiorpeat.com)

*Over 20 years of experience by leading orchardists and vineyardists, and confirmed by the Summerland Agriculture Research Centre, has proven that Superior Peat, when used in replanting, reduces the effect of replant disease without fumigating. Significant increase in first-year root and leaf growth is achieved using Superior Peat, whether it be apples, peaches, pears, cherries, or grapes. It is a natural way to adjust soil pH and add moisture holding organic material at the root level. Available in Canada and the United States. Bulk suppliers of organic soil amend-ments and conditioners. OMRI listed.*

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[tyler@brandtsfruittrees.com](mailto:tyler@brandtsfruittrees.com)

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[kevin@brandtsfruittrees.com](mailto:kevin@brandtsfruittrees.com)

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[www.pacificbiocontrol.com](http://www.pacificbiocontrol.com)

*Suppliers of insect sex pheromone systems. Mating disruption products for codling moth, leafrollers, oriental fruit moth, peachtree borers.*

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*Manufacturing and sales of automated fruit packing and bagging equipment, including cherries, apples, and stone fruit.*

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[www.kapstonepaper.com](http://www.kapstonepaper.com)

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[info@volmcompanies.com](mailto:info@volmcompanies.com)  
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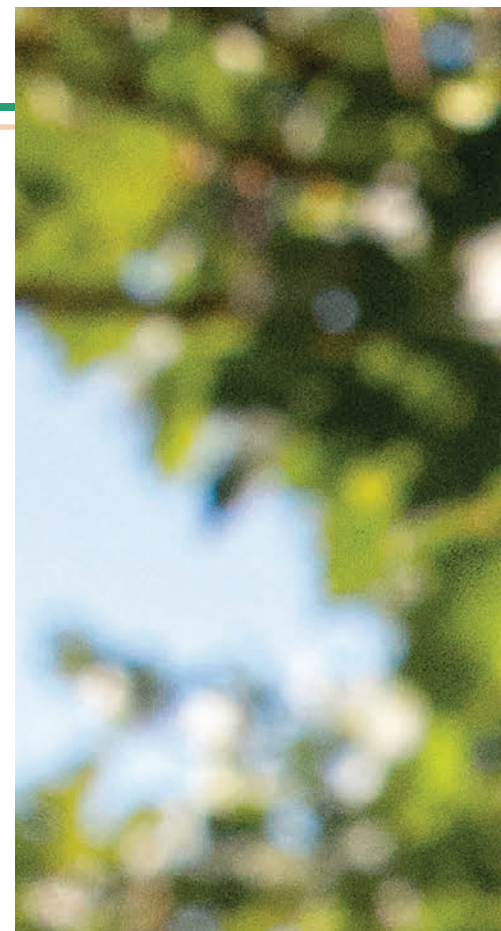
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[www.alliedgrapegrowers.org](http://www.alliedgrapegrowers.org)

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[www.cce.cornell.edu/columbia](http://www.cce.cornell.edu/columbia)  
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Quebec H9X 3V9 Canada  
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[www.mcgill.ca/plant](http://www.mcgill.ca/plant)

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6686 S. Center Hwy.,  
Traverse City, MI 49684  
231-946-1510  
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Benton Harbor, MI 49022  
269-944-1477  
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Trevor Nichols Research Complex  
6237 124th Avenue, Fennville, MI 49408  
269-561-5040  
[agbioresearch/msu.edu/tmrc](http://agbioresearch/msu.edu/tmrc)  
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Flint, MI 48502  
810-244-8500  
[msue.anr.msu.edu/county/info/genesee](http://msue.anr.msu.edu/county/info/genesee)  
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Traverse City, MI 49684-2208  
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## NATIONAL VIRUS TESTED

### FRUIT TREE PROGRAM

National Clean Plant Network - Fruit  
Trees  
24106 North Bunn Road,  
Prosser, WA 99350  
[cpcnw@wsu.edu](mailto:cpcnw@wsu.edu)  
[www.ncpn-ft.org](http://www.ncpn-ft.org)

## NEW MEXICO STATE

### UNIVERSITY

Plant and Environmental Sciences  
Las Cruces, NM 88003-8003  
575-646-3405, FAX 575-646-6041  
[cahe.nmsu.edu/pes](http://cahe.nmsu.edu/pes)

## NEW YORK APPLE ASSOCIATION, INC.

7645 Main Street, P.O. Box 350,  
Fishers, NY 14453-0350  
585-924-2171  
[www.nyapplecountry.com](http://www.nyapplecountry.com)

## NORTH CAROLINA APPLE GROWERS ASSOCIATION

P.O. Box 58, Edneyville, NC 28727-0058  
828-989-1969, FAX 828-685-3726  
[www.ncapplegrowers.com](http://www.ncapplegrowers.com)

## NORTH CAROLINA

### STATE UNIVERSITY

College of Agriculture & Life Sciences  
Department of Horticultural Science  
Raleigh, NC 27695-7609  
919-515-3131  
[www.cals.ncsu.edu/hort\\_sci](http://www.cals.ncsu.edu/hort_sci)

## NORTH CENTRAL WASHINGTON FIELDMEN'S ASSOCIATION

P.O. Box 2365,  
Wenatchee, WA 98807-2365  
509-784-0357

## NORTHWEST CHERRY GROWERS

105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509-453-4837, FAX 509-453-4880  
[stonefruit@wastatefruit.com](mailto:stonefruit@wastatefruit.com)  
[www.nwcherries.com](http://www.nwcherries.com)

## NORTHWEST FRUIT EXPORTERS

105 S. 18th Street, Suite 227, Yakima, WA  
98901  
509-576-8004, FAX 509-576-3646  
[nfe@goodfruit.com](mailto:nfe@goodfruit.com)

## NORTHWEST HORTICULTURAL COUNCIL

105 S. 18th Street, Suite 105,  
Yakima, WA 98901  
509-453-3193, FAX 509-457-7615  
[www.nwhort.org](http://www.nwhort.org)

## NORTHWEST MICHIGAN HORTICULTURAL RESEARCH STATION

6686 S. Center Highway,  
Traverse City, MI 49684  
231-946-1510, FAX 231-946-1404  
[nwmihort@msu.edu](mailto:nwmihort@msu.edu)  
[nwmihort.agbioresearch.msu.edu](http://nwmihort.agbioresearch.msu.edu)

## OHIO STATE UNIVERSITY

Horticulture and Crop Science  
Columbus, OH 43210  
614-292-6891  
[cfaes.osu.edu](http://cfaes.osu.edu)

## OKANOGAN HORTICULTURAL ASSOCIATION

50 Sylvester Road, Tonasket, WA 98855  
Dan McCarthy, cell: 322-1286

## OREGON HORTICULTURAL SOCIETY

4991 Drift Creek Road SE, Sublimity, OR  
97385  
503-769-8940  
[info@oregonhorticulturalsociety.org](mailto:info@oregonhorticulturalsociety.org)  
[www.oregonhorticulturalsociety.org](http://www.oregonhorticulturalsociety.org)

## OREGON STATE UNIVERSITY

College of Agricultural Sciences  
Corvallis, OR 97331-2212  
[agsci.oregonstate.edu](http://agsci.oregonstate.edu)  
Department of Horticulture  
[horticulture.oregonstate.edu](http://horticulture.oregonstate.edu)  
Cooperative Extension  
4017 Agricultural and Life Sciences  
Building, Corvallis, OR 97331-7304  
541-737-3464, FAX 541-737-3479  
[www.oregonstate.edu/dept/mcarec](http://www.oregonstate.edu/dept/mcarec)  
Mid-Columbia Agricultural Research  
And Extension Center  
3005 Experiment Station Drive,  
Hood River, OR 97031-9512  
541-386-2030, FAX 541-386-1905  
Douglas County  
1134 SE Douglas Avenue,  
Roseburg, OR 97470  
541-672-4461, FAX 541-672-4453  
[extension.oregonstate.edu/douglas](http://extension.oregonstate.edu/douglas)

Hood River County  
2990 Experiment Station Drive,  
Hood River, OR 97031  
541-386-3343, FAX 541-386-3684  
[extension.oregonstate.edu/hoodriver](http://extension.oregonstate.edu/hoodriver)  
Jackson County / Southern Oregon  
Research & Extesion  
569 Hanley Road,  
Central Point, OR 97502  
541-772-5165, FAX 541-772-5110  
[extension.oregonstate.edu/sorec](http://extension.oregonstate.edu/sorec)  
Lane County  
996 Jefferson, Eugene, OR 97402  
541-344-5859  
[extension.oregonstate.edu/lane](http://extension.oregonstate.edu/lane)  
Umatilla County  
2411 NW Carden Avenue,  
Pendleton, OR 97801  
541-278-5403  
[extension.oregonstate.edu/umatilla](http://extension.oregonstate.edu/umatilla)  
Wasco County  
400 E. Scenic Drive, Suite 2.278,  
The Dalles, OR 97058  
541-296-5494, FAX 541-298-3574  
[extension.oregonstate.edu/wasco](http://extension.oregonstate.edu/wasco)  
Yamhill, Polk, Marion, Washington,  
Clackamas, and Multnomah Counties  
2050 NE Lafayette Avenue,  
McMinnville, OR 97128-9333  
503-434-7517, FAX 503-472-3054  
[extension.oregonstate.edu/yamhill](http://extension.oregonstate.edu/yamhill)

## OREGON SWEET CHERRY COMMISSION

2667 Reed Rd.,  
Hood River, OR 97031-9609  
541-386-5761, FAX 541-386-3191  
[www.osweetcherry.org](http://www.osweetcherry.org)

## PACIFIC AGRI-FOOD RESEARCH CENTRE

Agriculture and Agri-Food Canada/  
Agriculture et Agroalimentaire Canada  
Box 5000, 4200 Highway 97,  
Summerland, BC V0H 1Z0 Canada  
FAX 250-494-7711,  
[www4.agr.gc.ca](http://www4.agr.gc.ca)  
6947 No. 7 Highway, P.O. Box 1000,  
Agassiz, BC V0M 1A0 Canada  
604-796-2221, FAX 604-796-0359  
[www.agr.gc.ca](http://www.agr.gc.ca)

## PACIFIC NORTHWEST CANNED PEAR SERVICE

c/o Washington State Fruit Commission  
105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509-453-4837, FAX 509-453-4880  
[www.eatcannedpears.com](http://www.eatcannedpears.com)

## PEAR BUREAU NORTHWEST

4382 SE International Way, Suite A,  
Milwaukie, OR 97222-4635  
503-652-9720, FAX 503-652-9721  
[info@usapears.com](mailto:info@usapears.com)  
[www.usapears.com](http://www.usapears.com)

## PENNSYLVANIA STATE UNIVERSITY

Department of Horticulture  
University Park, PA 16802  
814-865-2571  
[horticulture.psu.edu](http://horticulture.psu.edu)

## PROCESSED PEAR COMMITTEE

c/o Washington State Fruit  
Commission Administers  
Federal Marketing Order #927  
105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509 453-4837, FAX 509 453-4880  
[www.ams.usda.gov](http://www.ams.usda.gov)

## PRODUCE FOR BETTER HEALTH FOUNDATION

7465 Lancaster Pike, Suite J,  
Second Floor, Hockessin, DE 19707  
302-235-2329, FAX 302-235-5555  
[www.pbhfoundation.org](http://www.pbhfoundation.org)

## PRODUCE MARKETING ASSOCIATION

1500 Casho Mill Road,  
Newark, DE 19714-6036  
302-738-7100  
[www.pma.com](http://www.pma.com)

## RUTGERS UNIVERSITY

Department of Agricultural, Food &  
Resource Economics  
New Brunswick, NJ 08901  
848-932-9155  
[www.dafre.rutgers.edu](http://www.dafre.rutgers.edu)



# INDUSTRY ORGANIZATIONS

## SONOMA COUNTY WINEGRAPE COMMISSION

400 Aviation Blvd, Suite 500,  
Santa Rosa, CA 95403  
707-522-5860  
[info@sonomawinegrape.org](mailto:info@sonomawinegrape.org)  
[www.sonomawinegrape.org](http://www.sonomawinegrape.org)

## UNITED FRESH PRODUCE ASSOCIATION

1901 Pennsylvania Avenue NW, Suite  
1100, Washington, DC 20006  
202-303-3400, FAX 202-303-3433  
[www.unitedfresh.org](http://www.unitedfresh.org)

## UNIVERSITY OF ARKANSAS

Department of Horticulture  
Fayetteville, AR 72701  
479-575-2603, FAX 479-575-8219  
[hort.uark.edu](http://hort.uark.edu)

## UNIVERSITY OF CALIFORNIA DAVIS

Department of Plant Science  
530-752-0122, FAX 530-752-8502  
[plantsciences.ucdavis.edu](http://plantsciences.ucdavis.edu)  
UC Fruit & Nut Research & Information  
Center  
530-754-9708, FAX 530-754-8523  
[fruitsandnuts.ucdavis.edu](http://fruitsandnuts.ucdavis.edu)  
UC Postharvest Technology Research  
and Information Center  
530-752-6941, FAX 530-752-8502  
[postharvest.ucdavis.edu](http://postharvest.ucdavis.edu)  
Department of Viticulture and Enology  
Davis, CA 95616-8749  
530-752-0380, FAX 530-752-0382  
[wineserver.ucdavis.edu](http://wineserver.ucdavis.edu)

## UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

One Shields Avenue, Davis, CA 95616  
Kearney Agricultural Center  
9240 S. Riverbend Avenue, Parlier, CA  
93648  
559-646-6500, FAX 559-646-6593  
[www.kare.ucanr.edu](http://www.kare.ucanr.edu)  
Amador County  
12200-B Airport Rd, Jackson, CA 95642  
209-223-6482, FAX 209-223-3279  
[cecentralsierra.ucanr.edu](http://cecentralsierra.ucanr.edu)  
Fresno County  
550 E. Shaw Avenue, Suite 210B  
(559) 241-7515 FAX(559) 241-75391  
[cefresno.ucanr.edu](http://cefresno.ucanr.edu)  
Kern County  
1031 S. Mount Vernon Avenue,  
Bakersfield, CA 93307  
661-868-6200, FAX 661-868-6208  
[cekern.ucanr.edu](http://cekern.ucanr.edu)  
Kings County  
680 Campus Drive, Suite A,  
Hanford, CA 93230  
559-852-2730, FAX 559-582-5166  
[cekings.ucanr.edu](http://cekings.ucanr.edu)  
Lake County  
883 Lakeport Blvd., Lakeport, CA 95453  
707-263-6838, FAX 707-263-3963  
[celake.ucanr.edu](http://celake.ucanr.edu)  
Madera County  
328 S. Madera Avenue, Madera, CA 93637  
559-675-7879, FAX 559-675-0639  
[cemadera.ucanr.edu](http://cemadera.ucanr.edu)  
Marin County  
1682 Novato Blvd., Suite 150-B,  
Novato, CA 94947  
415-473-4204, FAX 415-473-4209  
[cemarín.ucanr.edu](http://cemarín.ucanr.edu)  
Merced County  
2145 Wardrobe Avenue,  
Merced, CA 95341  
209-385-7403, FAX 209-722-8856  
[cemerced.ucanr.edu](http://cemerced.ucanr.edu)  
Monterey County  
1432 Abbott Street, Salinas, CA 93901  
831-759-7350, FAX 831-758-3018  
[cemonterey.ucanr.edu](http://cemonterey.ucanr.edu)  
Napa County  
1710 Soscol Avenue, Suite 4,  
Napa, CA 94559  
707-253-4221, FAX 707-253-4434  
[cenapa.ucanr.edu](http://cenapa.ucanr.edu)  
Sacramento County  
4145 Branch Center Road, Sacramento,  
CA 95827  
916-875-6913, FAX 916-875-6233  
[cesacramento.ucanr.edu](http://cesacramento.ucanr.edu)  
San Benito County  
3228 Southside Road, Hollister, CA 95024  
831-637-5346, FAX 831-637-7111  
[cesanbenito.ucanr.edu](http://cesanbenito.ucanr.edu)

San Joaquin County  
2101 E. Earhart Avenue, Suite 200,  
Stockton, CA 95206  
209-953-6100, FAX 209-953-6128  
[cesanjoaquin.ucanr.edu](http://cesanjoaquin.ucanr.edu)  
San Luis Obispo County  
2156 Sierra Way, Suite C, San Luis  
Obispo, CA 93401  
805-781-5940, FAX 805-781-4316  
[cesanluisobispo.ucanr.edu](http://cesanluisobispo.ucanr.edu)  
Santa Clara County  
1553 Berger Drive, Bldg. 1,  
San Jose, CA 95112  
408-282-3110, FAX 408-298-5160  
[cesantaclara.ucanr.edu](http://cesantaclara.ucanr.edu)  
Solano County  
501 Texas Street, First Floor, Fairfield,  
CA 94533  
707-784-1317, FAX 707-429-5532  
[cesolano.ucanr.edu](http://cesolano.ucanr.edu)  
Sonoma County  
133 Aviation Blvd., Suite 109,  
Santa Rosa, CA 95403  
707-565-2621, FAX 707-565-2623  
[cesonoma.ucanr.edu](http://cesonoma.ucanr.edu)  
Stanislaus County  
3800 Cornucopia Way, Suite A,  
Modesto, CA 95358  
209-525-6800, FAX 209-525-6840  
[cestanislaus.ucanr.edu](http://cestanislaus.ucanr.edu)  
Sutter-Yuba Counties  
142 Garden Hwy, Suite A,  
Yuba City, CA 95991  
530-822-7515, FAX 530-673-5368  
[cesutter.ucanr.edu](http://cesutter.ucanr.edu)  
Tulare County  
4437-B S. Laspina Street,  
Tulare, CA 93274  
559-684-3300, FAX 559-685-3319  
[cetulare.ucanr.edu](http://cetulare.ucanr.edu)

## UNIVERSITY OF CALIFORNIA KEARNEY AGRICULTURAL CENTER

9240 South Riverbend Ave.,  
Parlier, CA 93648  
559-646-6500  
[kare.ucanr.edu](http://kare.ucanr.edu)

## UNIVERSITY OF CONNECTICUT

Department of Plant Science  
Storrs, CT 06269-4067  
860-486-2924, FAX 860-486-0682  
[www.uconn.edu](http://www.uconn.edu)

## UNIVERSITY OF FLORIDA

Horticultural Sciences Department  
Gainesville, FL 32611-0690  
352-392-1928, FAX 352-392-5653  
[www.hos.ufl.edu](http://www.hos.ufl.edu)

## UNIVERSITY OF IDAHO PARMA RESEARCH AND EXTENSION CENTER

29603 U of I Lane, Parma, ID 83660  
208-722-6701, FAX 208-722-6708  
[parma@uidaho.edu](mailto:parma@uidaho.edu)  
[extension.uidaho.edu/parma](http://extension.uidaho.edu/parma)

## UNIVERSITY OF ILLINOIS

Department of Crop Science  
Urbana, IL 61801, 217-333-3420  
[CropSci@illinois.edu](http://CropSci@illinois.edu)  
[www.cropsci.illinois.edu](http://www.cropsci.illinois.edu)  
Research and Education Centers  
217-333-4424, FAX 217-333-5299  
[ednaf@uiuc.edu](mailto:ednaf@uiuc.edu)  
[www.cropsci.illinois.edu](http://www.cropsci.illinois.edu)

## UNIVERSITY OF

## MASSACHUSETTS

Department of Plant, Soil,  
and Insect Sciences  
Amherst, MA 01003  
413-545-2222, FAX 413-545-2115  
[umass.edu/plsoils/contact.html](http://umass.edu/plsoils/contact.html)  
[stockbridge.cns.umass.edu](http://stockbridge.cns.umass.edu)

## UNIVERSITY OF MINNESOTA

Department of Horticultural Science  
305 Alderman Hall, St. Paul, MN 55108  
612-624-4742  
[www.horticulture.umn.edu](http://www.horticulture.umn.edu)

## UNIVERSITY OF TENNESSEE

College of Agricultural Sciences and  
Natural Resources  
Knoxville, TN 37996-4500  
865-974-7303, FAX 865-974-9329  
[casnr@utk.edu](mailto:casnr@utk.edu)  
[ag.tennessee.edu/](http://ag.tennessee.edu/)

## UNIVERSITY OF VERMONT

College of Agriculture and Life Sciences  
Burlington, VT 05405-0106  
802-656-2980, FAX 802-656-0290  
[www.uvm.edu/cals](http://www.uvm.edu/cals)

## UNIVERSITY OF WISCONSIN

Department of Horticulture  
Madison, WI 53706  
608-262-1490  
[www.horticulture.wisc.edu](http://www.horticulture.wisc.edu)

## UNIVERSITY OF WYOMING

Department of Plant Sciences  
College of Agriculture  
Laramie, WY 82071  
307-766-3103, FAX 307-766-5549  
[www.uwyo.edu/plantsciences/](http://www.uwyo.edu/plantsciences/)

## U.S. APPLE ASSOCIATION

8233 Old Courthouse Road, Suite 200,  
Vienna, VA 22182-3816  
703-442-8850, FAX 703-790-0845  
[www.usapple.org](http://www.usapple.org)

## USDA-ARS APPALACHIAN FRUIT RESEARCH STATION

2217 Wiltshire Road,  
Kearneysville, WV 25430  
304-725-3451, FAX 304-728-2340  
[www.ars.usda.gov/naa/afrs](http://www.ars.usda.gov/naa/afrs)

## USDA-ARS TREE FRUIT RESEARCH LABORATORY

1104 North Western Avenue,  
Wenatchee, WA 98801  
509-664-2280, FAX 509-664-2287

## USDA-ARS YAKIMA RESEARCH LABORATORY

USDA Agricultural Research Service  
5230 Konnowac Pass Road,  
Wapato, WA 98951  
509-454-6550

## UTAH SWEET CHERRY MARKETING BOARD

2070 South Main Street,  
Orem, Utah 84058  
801-225-3459, FAX 801-225-7395

## VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Department of Horticulture  
Blacksburg, VA 24061  
540-231-5451, FAX 540-231-3083  
[www.hort.vt.edu](http://www.hort.vt.edu)

## VIRGINIA STATE

## HORTICULTURAL SOCIETY

P.O. Box 2445, Winchester, VA 22604  
540-667-9101

## WASHINGTON AGRICULTURE & FORESTRY EDUCATION FOUNDATION

9211 E. Mission, Suite J,  
Spokane, WA 99206-4096  
509-926-9113  
[www.agforestry.org](http://www.agforestry.org)

## WASHINGTON APPLE COMMISSION

2900 Euclid Avenue,  
Wenatchee, WA 98801  
509-663-9600, Ext. 234, AX 509-662-5824  
[www.bestapples.com](http://www.bestapples.com)

## WASHINGTON APRICOT MARKETING COMMISSION

c/o Washington State Fruit Commission  
Administers Federal  
Marketing Order #922  
105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509-453-4837, FAX 509-453-4880  
[www.ams.usda.gov](http://www.ams.usda.gov)

## WASHINGTON APPLE EDUCATION FOUNDATION

2900 Euclid Avenue,  
Wenatchee, WA 98801  
509-663-7713, FAX 509-663-7469  
[www.waef.org](http://www.waef.org)

## WASHINGTON ASSOCIATION OF WINE GRAPE GROWERS

P.O. Box 716 Cashmere, WA 98815  
509-782-8234  
[www.waugg.org](http://www.waugg.org)

## WASHINGTON CHERRY MARKETING COMMITTEE

c/o Washington State Fruit Commission  
Administers Federal  
Marketing Order #923  
105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509-453-4837, FAX 509-453-4880  
[www.ams.usda.gov](http://www.ams.usda.gov)

## wafila

8830 Tallon Lane NE, Suite C,  
Lacey, WA 98516  
(360) 455-8084, FAX (360) 538-7378  
[wafila.org](http://wafila.org)

## WASHINGTON GROWERS LEAGUE

406 West Chestnut Avenue,  
Yakima, WA 98902  
509-575-6315, FAX 509-452-4834  
[www.growersleague.org](http://www.growersleague.org)

## WASHINGTON-OREGON CANNING PEAR ASSOCIATION

105 S. 18th Street, Suite 218,  
Yakima, WA 98901  
509-853-3525, FAX 509-453-4880  
[www.wastatefruit.com](http://www.wastatefruit.com)

## WASHINGTON STATE FARM BUREAU

975 Carpenter Road NE, Suite 301,  
Lacey, WA 98516  
360-357-9975, 800-331-3276  
[www.wsfb.com](http://www.wsfb.com)

## WASHINGTON STATE FRUIT COMMISSION

105 S. 18th Street, Suite 205,  
Yakima, WA 98901  
509-453-4837, FAX 509-453-4880  
[stonefruit@wastatefruit.com](mailto:stonefruit@wastatefruit.com)  
[www.wastatefruit.com](http://www.wastatefruit.com)

## WASHINGTON STATE GRAPE SOCIETY

100 N. Fruitland St., Suite B  
Kennewick, WA 99336  
509-585-5460; FAX 509-585-2671  
[www.grapesociety.org](http://www.grapesociety.org)

## WASHINGTON STATE TREE FRUIT ASSOCIATION

105 S. 18th Street, Suite 116,  
Yakima, WA 98901  
509-452-8555, FAX 509-452-8754  
2900 Euclid Avenue,  
Wenatchee, WA 98801  
509-665-9641, FAX 509-665-8541  
[www.wstfa.org](http://www.wstfa.org)

## WASHINGTON STATE UNIVERSITY

Pullman, WA 99164-6230  
509-335-2933, FAX 509-335-2926  
[ext.wsu.edu](http://ext.wsu.edu)  
Area Tree Fruit Extension Educators  
Benton-Franklin Counties  
1121 Dudley Avenue, Prosser, WA 99350  
509-786-5609, FAX 509-786-5525  
[benton-franklin.wsu.edu](http://benton-franklin.wsu.edu)  
Chelan-Douglas-Okanogan Counties  
400 Washington Street,  
Wenatchee, WA 98801-2670  
509-667-6540, FAX 509-667-6561  
[wsu.edu/chelan-douglas](http://wsu.edu/chelan-douglas)  
Grant-Adams Counties  
1525 East Wheeler Road,  
Moses Lake, WA 98837  
509-754-2011, FAX 509-754-0163  
[grant-adams.wsu.edu](http://grant-adams.wsu.edu)  
Skagit County  
11768 Westar Lane, Suite A,  
Burlington, WA 98223  
360-428-4270, FAX 360-428-4263  
[skagit.wsu.edu](http://skagit.wsu.edu)  
Whatcom County  
1000 N. Forest Street, Suite 201,  
Bellingham, WA 98225-5594  
360-778-5800, FAX 360-738-2458  
[whatcom.wsu.edu](http://whatcom.wsu.edu)  
Yakima County  
2403 South 18th Street, Suite 100,  
Union Gap, WA 98903  
509-574-1600, FAX 509-574-1601  
[yakima.wsu.edu](http://yakima.wsu.edu)

Mt. Vernon Northwestern Washington  
Research and Extension Center  
16650 State Route 536,  
Mount Vernon, WA 98273  
360-848-6120, FAX 360-848-6159  
[maritimefruit.wsu.edu](http://maritimefruit.wsu.edu)  
Puyallup Research & Extension Center  
2606 West Pioneer,  
Puyallup, WA 98371-4998  
253-445-4582  
[www.puyallup.wsu.edu/plantclinic](http://www.puyallup.wsu.edu/plantclinic)  
Tree Fruit Research & Extension Center  
1100 North Western Avenue,  
Wenatchee, WA 98801  
509-663-8181, FAX 509-662-8714  
[www.tfrec.wsu.edu](http://www.tfrec.wsu.edu)  
Irrigated Agriculture Research &  
Extension Center  
24106 North Bunn Road,  
Prosser, WA 99350-8694  
509-786-2226, FAX 509-786-9370  
[www.prosser.wsu.edu](http://www.prosser.wsu.edu)

## WASHINGTON TREE FRUIT RESEARCH COMMISSION

1719 Springwater Avenue,  
Wenatchee, WA 98801  
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# Promising progress for solid-set delivery

**MSU research team improves system to reduce chemical waste.**

by Leslie Mertz

**A** Michigan State University research team demonstrated new progress on an innovative solid-set canopy delivery system (SSCDS) that the team believes could drastically cut the volume of pesticides and other sprays needed for orchards, vineyards and other crops.

This research builds on earlier SSCDS work that shows such a system increases the speed of application, distances workers from the application, and keeps tractors or other rolling spray-applying equipment out of tree and vine rows. The demonstration was part of the MSU Clarksville Research Center Field Day held in southern Michigan on June 22.

Basically, the system consists of tubing running between and connecting to a series of microsprayers. A hydraulic pump and an air compressor are used to supply agrichemicals to the microsprayers and discharge the agrichemicals as a mist.

The research team developed and then tested the feasibility of the system from 2012-2014 and showed that the SSCDS got similar pest management results to those yielded by a traditional air-blast system (see "A new way to apply chemicals" in the June issue of *Good Fruit Grower*).

"The basic concept for the delivery of agrichemicals is that, instead of using a tractor-based sprayer that you have to pull through the orchard, we distribute microsprayers throughout the canopy, and those microsprayers are fed by a pumping station that combines both a hydraulic and a pneumatic delivery system," said Matthew Grieshop, the project director and associate professor at the MSU Entomology Department.

One major challenge remained: chemical waste. The chemicals cleared from the 500-foot-long tube system after spraying amounted to about 2 gallons, and the team wanted to reduce that amount. With critical input from irrigation expert John Nye at Trickle-eez Irrigation, the team began considering the benefits of a canister-vent system, and last fall, it invited a group of five mechanical engineering students from Michigan State to make a run at the problem. Within five short weeks, the students had a working prototype. Grieshop reported, "With the testing we did this winter, we had only about a cup and a half of residual fluid that came out of the bottom line, so we had about an 80 percent reduction in volume."

At the center of the students' prototype is a reservoir designed to release a fixed amount of liquid chemical. (A video of the SSCDS prototype in action is available at [www.canopydelivery.msu.edu/](http://www.canopydelivery.msu.edu/).) Each reservoir is a small canister with a carburetor float-type mechanism. The reservoir connects to a feed line on the bottom and an air line on the top. When the pump is on and liquid chemical begins coursing along the lower feed line, it enters the



PHOTO BY LESLIE MERTZ

A Michigan State University research team is working on an improvement to its solid-set canopy delivery system (SSCDS), which will not only spray crops quickly, but may cut back on pesticide and other spray volumes.

first reservoir in the series. As liquid fills from the bottom, a pingpong ball in the reservoir rises with the liquid, and when it reaches the top, it seals the reservoir. The liquid continues along the tube to fill the next reservoir, and so on, until all reservoirs are filled. The air compressor then

takes over and provides sufficient pressure to force the liquid from the canisters and through spaghetti tubing to microsprayers placed throughout the canopy.

"Our initial SSCDS design meant that you ended up having to pump many hundreds of gallons of liquid into

your feeder lines to get the liquid where it needed to be to spray, but this new design does away with that essentially," Grieshop said.

Grieshop and the SSCDS team are now working with AgroLiquid of St. Johns, Michigan, to test the system for foliar application of pesticides and nutrients, as well as other researchers who are evaluating it for distributing pheromones or other sprays. They also are hoping to fine-tune the system, including the nozzles in the microsprayers, and look into commercialization.

"We're really excited and we've got our fingers crossed that we'll get some funding and move this project into more of a production phase," he said. "There are just so many possibilities." ●

Leslie Mertz, Ph.D., is a freelance writer based in Gaylord, Michigan.

*"With the testing we did this winter, we had only about a cup and a half of residual fluid that came out of the bottom line, so we had about an 80 percent reduction in volume."*

—Matthew Grieshop

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# Troublesome pest makes a comeback

**Thought to be eradicated years ago, grape rootworm has returned to New York and Pennsylvania vineyards.**

*by Dave Weinstock*

**C**oncord grape growers in western New York and Pennsylvania are dealing with a pest they thought they had rid themselves of 25 years ago. But grape rootworm is back, and its adult beetle seems to be emerging a bit earlier.

Tim Weigle, New York state integrated pest management specialist and team leader of Cornell Cooperative

Extension's Lake Erie Regional Grape Program, said the insect was rediscovered on grapes being grown near Westfield, New York. Most have been reported in Concord grapes since the vast majority of the region's acreage is planted to that variety.

More recently, the pests are moving into other regions. "Now we're seeing some in the Finger Lakes, primarily on native varieties, though we've had some reports of them on hybrids," he said.

## Biology

Females produce eggs three to seven days after mating, from early June through late July. Egg-laying peaks late from June through late July, but can continue into September.



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Although previously thought to emerge around July 4, adult rootworm beetles are emerging as early as June 21. One explanation may be Concord grapes bloom earlier than they did 20 years ago, and the insects have simply adapted to their food sources' availability.

COURTESY OF TIM WEIGLE

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COURTESY OF TIM WEIGLE

Telltale chain patterns like these on Concord leaves are one of the ways scouts identify grape rootworm infestations. This kind of damage is minimal compared to the damage larvae do to roots.

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Eggs are laid between cane and stem bark layers. Creamy yellow to white-colored eggs are oblong and found in clusters numbering from 20 to 100, hatching within 10 to 15 days.

Though they typically produce one generation a year, late-season hatches will result in larvae overwintering and emerging as adults the following year. As their name implies, the insects do most of their damage as larvae.

For the first nine to 10 months of their existence, the immature grubs will live in the soil, feeding on grapevine roots — eating smaller roots and boring into larger ones — then emerge as adults and feed on grape leaves. In heavy infestations, the bugs also have fed on immature grapes.

Damage to vines can result in loss of vigor and production in as few as three years.

During feeding, most larvae can be found in the top 12 inches of soil. In late fall, they move deeper into the soil to form cells in which they overwinter.

Traditional wisdom puts the best time to scout for adult rootworms' emergence to be around July 4. In recent years, however, Weigle and his team have found them earlier; this year, they saw the first emergents on June 21, which has them asking why.

One explanation is the region has seen earlier bloom dates, which could explain the earlier emergence. "I wasn't around then, but the scouts then may have just waited to look for them when feeding was obvious," said Weigle.

They are still working on when first and peak emergence occurs and what factors influence it. "We're fine-tuning how we scout for them so we can manage them more effectively," he said.

#### Traditional controls

Once the pest emerges, adults can be found in the sucker growth, and then they'll move up into the canopy.

That's when control methods are most effective. "It's the only way to go after them," said Weigle.

Carbaryl is the only pesticide labeled for the pest. Last year, Weigle and Cornell University entomology professor Greg Loeb field-tested a number of other pesticides labeled for grapes to see if they, too, might be useful against the pest.

They identified four effective chemicals already labeled for use in grape production in New York: Admire Pro (imidacloprid), Leverage 360 (beta-cyfluthrin), Sniper (bifenthrin) and Danitol (fenpropathrin). Admire Pro and Sniper are not labeled for use in Alaska; Leverage 360 is not labeled for use in California; Danitol is registered for use in all 50 states.

None are labeled for grape rootworm, but Loeb applied to the U.S. Environmental Protection Agency to allow growers to use the products. The agency approved the applications, but usage requirements vary by state. "By law, New York growers must have a copy of the FIFRA 2(ee) in their possession to use the pesticides, but Pennsylvania growers do not, as long as the product is labeled for grapes," Weigle said.

#### Biocontrol research

Weigle is just starting a biocontrol investigation with Elson Shields, a Cornell University entomology professor. Shields has developed an entomopathogenic protocol — using insect-attacking, native nematodes.

Farmers raise and spray the nematodes onto their crops, then stand back and let them reproduce. So far, the protocol has picked off three pests — alfalfa snout

beetles and two weevils preying on strawberries.

The alfalfa snout beetle's feeding pattern is similar to that of the grape rootworm. Larvae burrow down into the soil to feed on alfalfa roots.

Though nematode application costs are well documented for forage crops, Weigle said researchers have yet to develop similar information for grapes. "Dr. Shields has documented that since the nematodes we are using are native to New York, they can become established in the soil and do not require numerous reapplications," he said.

For the last few weeks in June, Weigle was in western New York Concord vineyards collecting beetles, placing 2-by-2-foot catching frames with muslin stretched over them under the vines and shaking the top wire to catch adults.

He plans to release the captured adults onto caged potted vines. Then, he'll apply three native New York nematodes to the vines in an attempt to gauge how effective they will be in eliminating grape rootworm larvae.

The three nematode species he will apply are all native to New York and supplied by Shields. The three nematode species are *Steinernema carpocapsae*, *S. feltiae* and *Heterorhabditis bacteriophora* and will be applied in three combinations, along with a control with no nematodes.

In a previous experiment in Japanese beetle control, Weigle, Loeb and Shields dribbled nematodes out through a boom sprayer with no pressure, using non-chlorinated water. This time, since the vines are in pots, they'll seed them with the wax-worm larvae used as nurseries to produce the nematodes.

Weigle said it would be two to three years before he has any reportable results. ●

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# Certified plants are only the first step

**Growers need to monitor for virus in early years of a “clean” vineyard.**

*by Melissa Hansen*

**P**lanting with certified, “clean” plant material is the first line of defense against grapevine viruses. But research funded by the Washington wine industry shows that growers need more than just “clean” for vineyard health, longevity and profitability.

Washington wine industry’s rapid expansion during the past 15 years, combined with a shortage of certified grape plant material and limited diagnostic technology, has resulted in disease creep throughout the state. Grapevine leafroll disease, the most prevalent of grapevine viruses in the world, is also the most prevalent viral disease in Washington. Of nearly 1,500 samples collected throughout the state during the last two years from red and white wine grape varieties, around 70 percent tested positive for grapevine leafroll associated

virus 3. (See “Grape viruses in Washington,” May 14, 2014, *Good Fruit Grower*). Close to 6 percent were positive for grapevine red blotch associated virus, 8 percent had a combination of leafroll and red blotch viruses and 16 percent were negative for leafroll and red blotch, but positive for other viruses. Samples were taken based on visual virus symptoms for red varieties, but random samples were taken for whites because whites don’t show symptoms.

Grapevine viral diseases are especially challenging. Visual symptoms that show in the leaves can be confused with other factors (mechanical injury, nutritional imbalance, heat or environment stress), and different vectors are involved in virus spread. Mealybug insects and scale are known vectors of leafroll disease, while the three cornered alfalfa treehopper was recently identified



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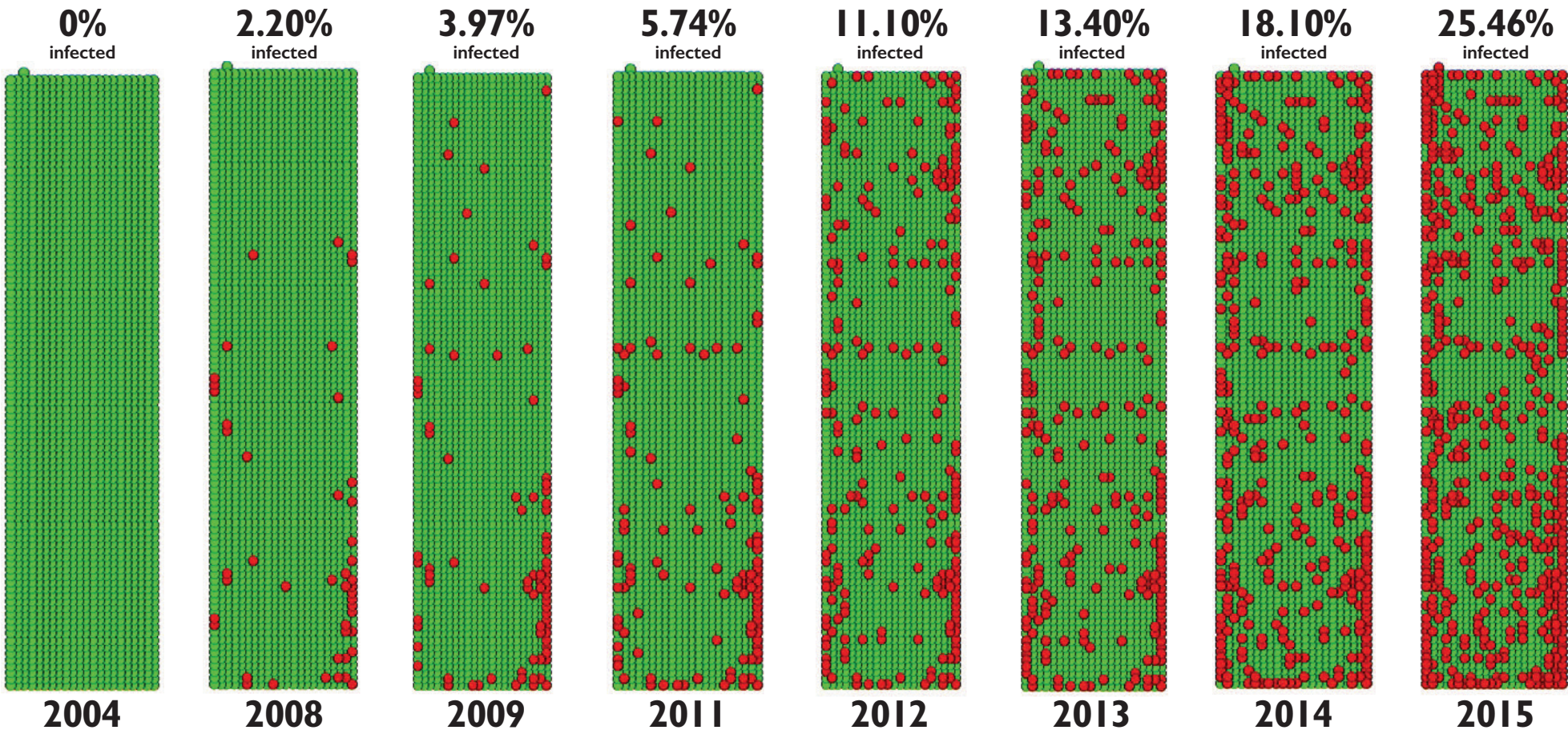
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# How a grape leafroll virus infection spreads

A block of Syrah grapes planted with certified material in 2004 shows the spread of grape leafroll virus between 2008 and 2015 and the corresponding percent of infection.



SOURCE: WASHINGTON STATE UNIVERSITY

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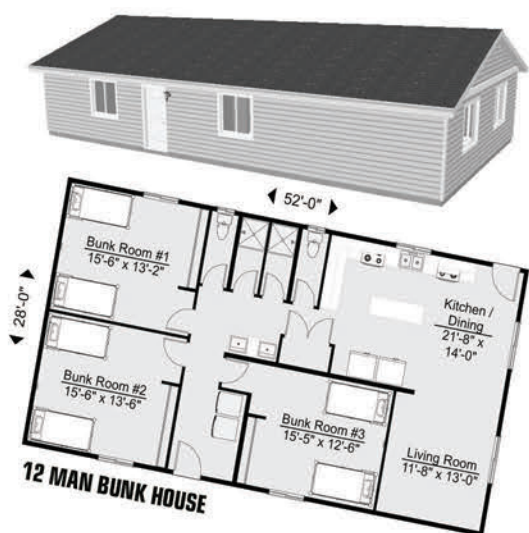
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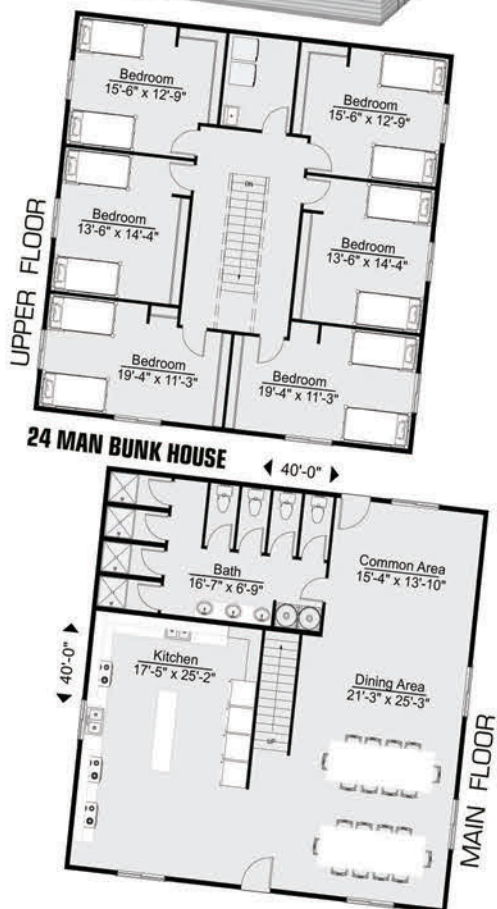


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as another possible vector of red blotch disease. Viruses can also be spread through propagation.

A universal issue among grape viruses is that there's no existing cure for what can result in significantly reduced yields, fruit quality and vineyard longevity. A published Washington State University study on the impacts of leafroll disease on fruit yield and grape and wine chemistry found that wines from leafroll-affected, own-rooted Merlot grapes had significantly lower alcohol, tannins and anthocyanins compared with unaffected, own-rooted Merlot grapes made into wine from the same vineyard. It was previously reported in *Good Fruit Grower* (March 15, 2015) that a grower can lose up to \$20,000 per acre over a 20-year period depending on the extent of crop loss and level of decline in fruit quality, according to a WSU economic study.

Recent research funded by the Washington State Wine Commission shows how quickly a young, clean vineyard can become infected from nearby diseased vines. Further, the study highlights the importance — especially in the early years of a vineyard — of constant vigilance and rapid response.

### High priority

For more than a decade, Washington's wine industry has supported the work of Naidu Rayapati, Ph.D., WSU plant pathologist and interim director of the Clean Plant Center-Northwest. Rayapati has worked with growers and state agricultural officials to survey vineyards and grape nurseries in the state for diseases that include leafroll, the recently discovered red blotch and others, and to develop strategies to strengthen the state's certified grape plant program. As a result, mother blocks are now inspected three times per year by the Washington State Agriculture Department. Also, because visual inspection is not always reliable, diagnostic testing of mother blocks has been adopted as an assurance for maintaining clean plants in nurseries.

Rayapati's team of six WSU graduate students and post-doctorates are working to reduce the costs of diagnostic testing by developing a single test that detects both leafroll and red blotch and develop post management strategies to help growers manage viral diseases.

Rayapati's research is primarily funded by the Washington wine industry, but his program has been greatly leveraged with supplemental funding from a variety of resources, including the Washington State Commission on Pesticide Registration, the Northwest Center for Small Fruits Research, and state and federal specialty crop grants. This leverage allows Washington's wine industry to receive the greatest bang for its research investment.

Of late, Rayapati is studying the pathways of virus spread into newly planted, clean vineyards as well as cultivar and site-specific impacts of viruses on vine performance.

### Spread in young vineyards

The industry mantra is still to use certified plant material or to test bud wood before planting, Rayapati said. "But this strategy alone is not good enough because there is always the risk of viruses spreading into young vineyards from infected neighboring vineyards," he said. Rayapati's team has compiled a detailed picture of how leafroll disease spreads in young vineyards planted with clean plant material.

They studied three vineyards in different locations that were planted with certified plant material of Cabernet Sauvignon, Syrah and Petite Syrah in 2004, 2007 and 2009, respectively. All three blocks were in close proximity to old blocks that were heavily infected with leafroll disease. Vines in the new vineyards were monitored for disease up to the 2015 season. Symptomatic vines of the three vineyards were tested for leafroll disease, along with immediately adjacent vines, even those not showing symptoms. The locations of infected vines were plotted on a matrix and a map of the spatial data was evaluated for disease spread.

## Soil-borne viruses

Two soil-borne viruses affecting grapevines were recently confirmed in Washington wine grape vineyards, reported Naidu Rayapati, Washington State University plant pathologist.

Tobacco ringspot virus has been confirmed in Grenache and Tempranillo vineyards in Washington's Yakima Valley, and grapevine fanleaf virus was found in Cabernet Franc, Chardonnay and Pinot Noir blocks in Yakima Valley and in Cabernet Franc blocks in Walla Walla Valley.

Fortunately, the dagger nematode species (*Xiphinema index*) that transmits grapevine fanleaf virus is not currently present in Washington soils, therefore removing infected vines would eliminate the risk of fanleaf, according to Rayapati. However, tobacco ringspot, another soil-borne virus, is spread by the dagger nematode species found in Washington soils, and management of

### ONLINE

Rayapati's recently published research on the impacts of leafroll disease on fruit yield and grape and wine chemistry is archived on the

Washington State Wine Commission's website at [washingtonwine.org/research/reports](http://washingtonwine.org/research/reports)

Not surprisingly, vines showing symptoms in the early years of the three vineyards initially occurred in rows closest to the heavily infected blocks and declined as distance from the infected blocks increased. This "edge effect" indicates that leafroll spread is occurring from the infected blocks into the newly planted vineyards, explained Rayapati.

"But in subsequent years, the spatial distribution of symptomatic vines showed aggregation or clustering," he said. "This clustering indicates a secondary spread of virus between adjacent vines within a row and across adjacent rows as a consequence of vine-to-vine movement of vectors around the primary site of infection established in young blocks."

Rayapati also found site-specific factors are involved in spread of disease. In one location, wind led to an increased dispersal of vectors and an increase in the rate of disease spread in the young vineyard.

### Management strategies

"Planting clean material is only the beginning step in managing diseases," he said.

"Never assume that cuttings used in propagation are clean from disease — unless they are from a certified source," said Rayapati, who added that more than 25 percent of cuttings and bud wood samples brought to his lab by growers for testing were infected with viral diseases.

Once vines are planted, it's critical to monitor them closely the first few years.

"And, if symptomatic vines are noticed, quick action is needed," he said.

That includes testing symptomatic and nearby asymptomatic vines, and if virus is present, removing (rogueing) the infected vines quickly to prevent further, secondary spread. Growers can bring samples for testing to Rayapati's lab at WSU's Irrigated Agriculture Research and Extension Center in Prosser, Washington. ●

Melissa Hansen is research program manager for the Washington State Wine Commission.



# confirmed in vineyards

## GRAPE VIRUSES IN WASHINGTON

1,500 samples collected from 2014 to 2015

VIRUS	PERCENT TESTING POSITIVE
Grapevine leafroll associated virus 3	70
Grapevine red blotch associated virus	6
Grapevine leafroll and red blotch combined	8
Other viruses	16

Samples include red and white wine grape varieties collected from throughout eastern Washington. Samples for red varieties were taken based on visual virus symptoms, but samples were randomly collected for white varieties.

SOURCE: WASHINGTON STATE UNIVERSITY

tobacco ringspot will involve clean plants and nematode suppression strategies.

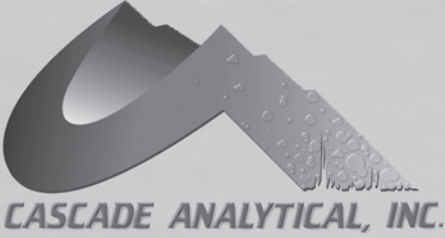
The symptomatic Grenache vines showed severe stunting and decline symptoms and poor fruit set, he said. The pathogen resides in the soil and can be a problem when grapes follow tree fruit crops like apples and pears. In this case, the virus did not have any impact on pears that were planted before the vineyard, but caused devastation in the wine grapes.

Sampling of soil near the symptomatic Grenache vines showed dagger nematode (*Xiphinema rivesi*) was


the predominant nematode species. Further experiments using virus-free Cabernet Franc vines and cucumber seedlings planted near the symptomatic Grenache vines as bait showed that the dagger nematode can transmit tobacco ringspot virus.

“This is a classic example of a virus ‘jumping’ from one crop to another and serves as a learning experience for growers to keep in mind the crop history before planting wine grapes because some viruses may be a more serious problem to grapevines than to other crops,” Rayapati said.

—M. Hansen



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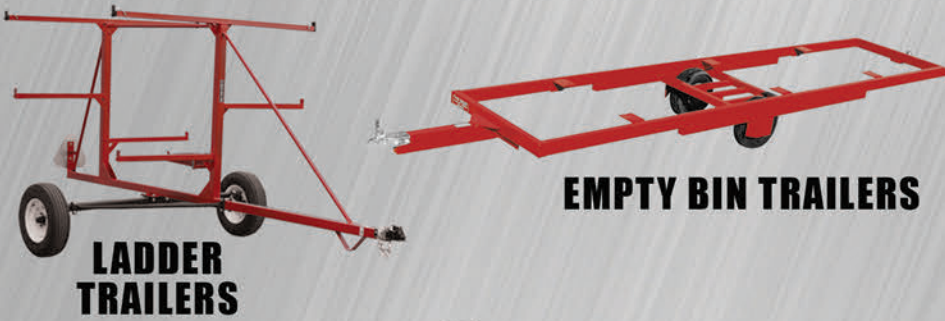
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# Bearing down on black stem borers



COURTESY OF USDA-ARS

Black stem borer females excavate galleries in apple tree trunks to lay eggs and hatch larvae. Later in the season, they move deeper into the trunk to overwinter.

**New York researchers  
working to stop one of the  
newest apple pests.**

by Dave Weinstock



Art Agnello

Control is so difficult for the black stem borer, researchers have been recommending that growers remove infested trees and burn them. Now, efforts are afoot in New York — again — to find a way to stop the borer.

Researchers are making strides to better understand the beetle, and several biopesticides under review are showing promise. The bad news: Field trials run last year using Lorsban (chlorpyrifos) and a number of trunk sprays produced disappointing results. “None of the treatments were tremendously effective,” said Art Agnello, a Cornell University Extension entomologist.

Agnello is continuing to research effective controls, baiting borers with ethanol and testing, among other things, verbenone — currently used as an organic insect repellent in pine forests — in wooded areas just outside orchards. Meanwhile, Ithaca, New York-based USDA-ARS research entomologist John Vandenberg is investigating organic controls, and Kerik Cox, an associate professor in Cornell University’s plant pathology and plant-microbe biology section, examined a possible connection to fire blight and blister bark.

The insect, which hails from Asia, has been in this country since the 1930s. In the not-too-distant past, the black stem borer — a type of ambrosia beetle — limited its activities to forest hardwood and ornamental species like ash, black cherry, black walnut, cedar, dogwood, oak, pine, poplar, rhododendron and willow.

Recently, it developed a taste for apple trees. “We’re seeing them in all varieties of apples, although we see them more in young plantings, which tend to be newer varieties,” Agnello said.

The insects tend to attack smaller caliper trees suffering from flood or cold injury, severe pruning or disease, which may be why they moved into orchards and nurseries. “There were enough stress-producing events to get them moving into nurseries and orchards,” he said.

Vandenberg suggests nearly all modern apple trees may be stressed to some extent, raising the stakes against the pest. “Pruning, the cutting, the shaping, it all causes trees some stress and may make them more vulnerable to insect attack,” he said.



TJ MULLINAX/GOOD FRUIT GROWER

Art Agnello adjusts five potted apple trees in the middle of a hardwood forest that borders an apple orchard near Huron, New York, in early July. The young trees are part of a pest control trial to combat the spread of black stem borers. This location has 20 sets of five stressed trees each; 10 sets use ethanol lures, 10 use ethanol and the repellent verbenone.

Last month, the research was part of a scheduled field day held at the New York State Agricultural Experiment Station in Geneva, New York, which coincided with the International Fruit Tree Association’s summer tour.

## Fungal solutions?

Vandenberg and Louela Castrillo, a research scientist in Cornell University’s entomology department, are evaluating biocontrols that may provide an alternative to uprooting and destroying infested trees. Working in concert with scientists in Tennessee, they have identified three biopesticides capable of either killing the insects or limiting their ability to reproduce. (Female borers hollow out galleries in the sapwood or heartwood of the tree in which to lay eggs.)

The active ingredients in each of the products — Botanigard, Met52 and RootShield — are fungi.

*Beauveria bassiana* is Botanigard’s active ingredient. It is a fungal pathogen of insects occurring naturally in soils throughout the world and is not harmful to humans. The fungus requires contact to kill beetles, though it will not kill them when they ingest it. *B. bassiana* attacks both adults and larvae, producing spores called conidia, which produce enzymes that attack the beetle’s cuticle, then later its organs, killing it within three to seven days.

Met52’s active ingredient is *Metarhizium brunneum*, and its action is similar to that of *B. bassiana*. “We found it killed about half the females and significantly reduced the remaining females’ abilities to reproduce,” Vandenberg said.

Adults soon become infected, which, in turn, leads to infected larvae. “It creates an epidemic in the galleries,” he said.

The downside to this is that the female walks through





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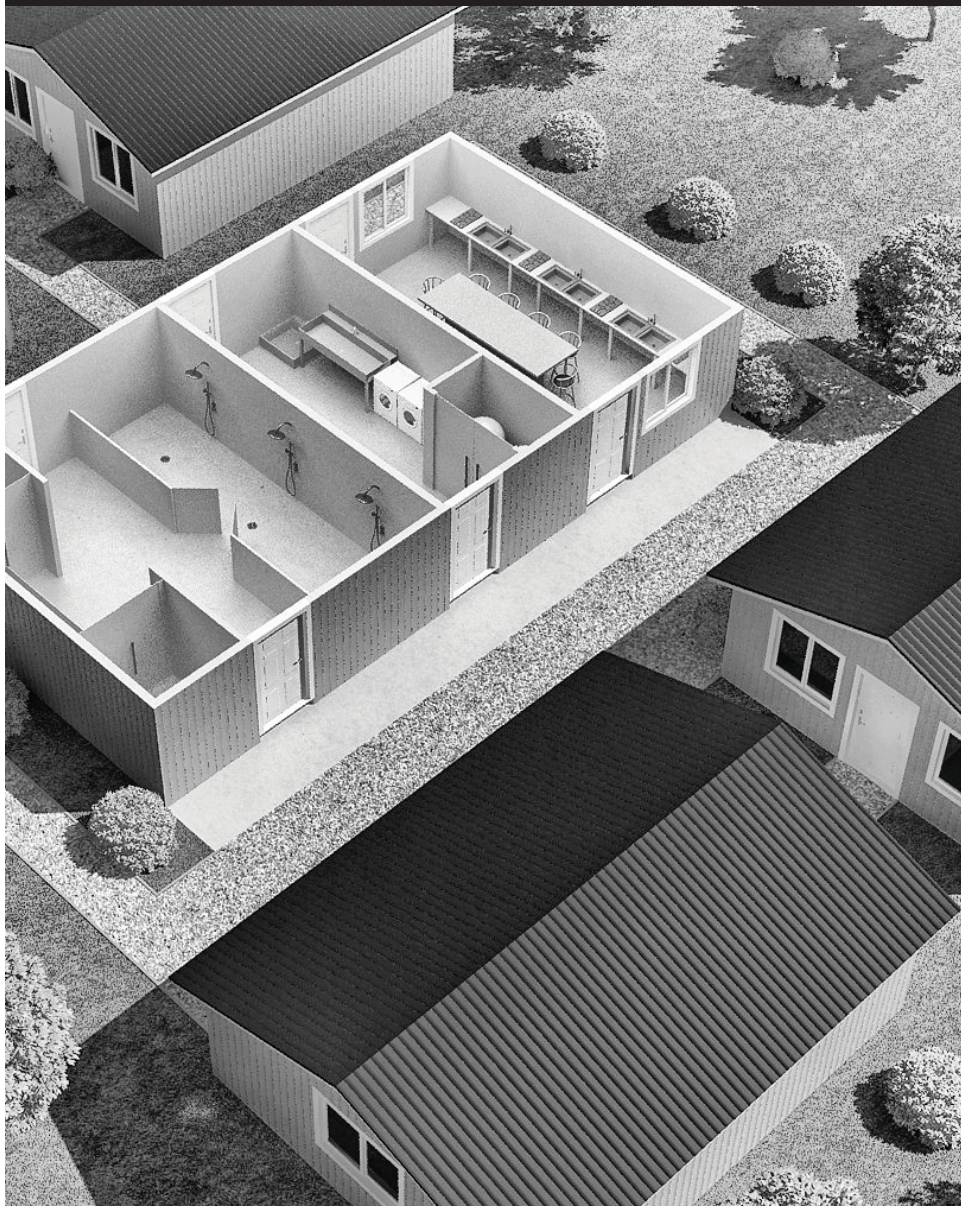
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## PLAY

Learn more about the black stem borer trials from Art Agnello at [goodfruit.com/media](http://goodfruit.com/media)



Packets of commercially available verbenone, left, and ethanol, right, hang from stressed apple trees several hundred feet into a wooded area bordering an apple orchard near Huron, New York. Verbenone is an organic insect repellent used against pine beetles in the western U.S., and the ethanol packets are used as a lure for black stem borers.

the compound sprayed onto the tree but it doesn't kill her on contact. "She will still invade, and still create her gallery, which is both a good and bad outcome for the tree."

RootShield's active ingredient is a mycoparasite (*Trichoderma harzianum*). Mycoparasites kill other fungi; in this case, *T. harzianum* targets the fungus that female borers produce and deposit onto the walls of the galleries. The borers somehow recognize that their own fungus (*Ambrosiella grosmaniae*) has taken hold in the gallery and begin to lay eggs, but *T. harzianum* will stop the production of *A. grosmaniae* before it gets started.

"If we can interrupt the symbiont (the ambrosia fungus), then it can't get established in the gallery walls," Vandenberg said.

However, that's not a final solution. When females don't detect their own fungus, they keep drilling, expanding the wound inside the tree as they continue to excavate. "This product will require more testing to determine if it can be a useful tool for apple growers," he said.

## Fire blight, no ... blister bark, maybe

The good news: Where researchers once believed there was a connection between black stem borers and fire blight, now they don't. "We originally thought there was one," Cox said, "but we have no solid link between the two."

In 2013, when Cornell Cooperative Extension personnel found black stem borer in western New York orchards, they found trees showing oozing holes in scions and rootstock. Six of the sites featured borers and fire blight.

So they took some borers from the site, put them





PHOTOS BY TJ MULLINAX/GOOD FRUIT GROWER

Art Agnello shows a handmade trap set to capture black stem borer next to an apple orchard near Huron, New York. Agnello, Cornell University Extension entomologist, set up traps with commercially available ethanol lures inside plastic containers, which hold soapy water in the bottom to capture beetles.

into petri dishes, examined some and put others in petri dishes with bleach and ethanol and ground them up to see what was inside.

They found no evidence of fire blight. What they did find were a number of fungi and two in large supply — *A. grosmanii* and *Nectria haematococca*. “Both can be cultivated by BSB; they farm it and eat it,” Cox said.

According to information filed in the U.S. Department of Energy’s Joint Genome Institute, *N. haematococca* is actually the reproductive stage of *Fusarium solani*, the fungus identified as the causal agent for a number of vegetable diseases as well as sudden death syndrome in soybeans. *N. haematococca* occurs in several forms, among them as a fungus that feeds on soil organic matter and as a plant pathogen.

It has an extensive range of metabolic capabilities, including the ability to degrade lignin — the organic polymer that makes many plants rigid and woody — and pesticides. It is also tolerant to more than a few compounds that are toxic to other fungi, such as antibiotics, heavy metals and metabolic poisons.

One of more curious symptoms not explained by the beetle or the fungi is bark blistering around the sites where the bugs tunnel. When researchers scraped the bark away, they found a white, chalky material, something they later identified as callus cells that appear in injured wood.

Curiously, however, they did not find any fungi usually associated with black stem borers in blistered bark samples they examined. Instead, they found lots of fluorescent *Pseudomonas* bacteria, which have been associated with symptoms like this in apples in Europe.

“The overall wilting symptoms observed on infested apples trees are most likely the result of tunneling,” Cox said. It also is likely to be weakening the wood and making it susceptible to things like blister bark. For this reason, Cox said, researchers have not yet ruled out a link between black stem borers and blister bark. ●

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# Organic Pearxit

An organic pear orchard near Mesa, Washington.

Pear Bureau Northwest is out of the organic pear promotions business, after nearly all of the region's organic pear packing companies opted out of their promotion assessments.

Meanwhile, a proposal for a national check-off program has organic producers across the entire country considering unifying under a wide umbrella of products.

Under a provision of the 2014 Farm Bill that took effect this year, organic growers were allowed to opt out of promotion assessments that previously had been required. The so-called "opt-out" or "exemption" clause applies to all 30 marketing orders but affects pears most among Northwest fresh fruits.

## Northwest organic pear growers opt out of assessments.

by Ross Courtney

In June, packers representing 93 percent of the Northwest's organic pear production chose to cease paying organic promotion assessments to Pear Bureau Northwest, which generically promotes Northwest pears under a federal marketing order through advertisements, in-store samples and other marketing activities.

That would leave the Pear Bureau with less than \$3,000 for organic promotions next year.

As a result, the bureau's board of directors has decided to scrap organic promotions activities in the coming season and ask the remaining six packing companies to leave, too. Those that didn't get their paperwork in on time will receive a refund at the end of the season, said Kevin Moffitt, president of Pear Bureau Northwest, in an email to *Good Fruit Grower*.

"This is all uncharted territory," he said.

The Northwest produces roughly 1 million 44-pound box equivalents of organic pears, about 6 percent of the Northwest's total volume. Shippers pay an assessment of 38.5 cents per box for both.

The exemptions will not affect assessments and promotions of conventionally grown pears. The opt-outs also do not apply to a 3.1-cent per box research

assessment and 3.3-cent administrative assessment. All producers, organic or conventional, will continue to pay those.

## Organic vs. conventional

Early in the process, several large organic shippers had considered remaining in the marketing order under the banner of teamwork. But over time, the "opt out" issue began to unveil a growing wedge between producers of organic and conventional agricultural products.

Discussion grew heated at times during the pear industry's annual meetings in Portland, Oregon, in June.

"We disagree with the concept that pears are pears," Ken Hembry, general manager of Peshastin Hi-Up, said in the meetings. "We feel there's more in common between organic pears and organic apples than between organic pears and conventional pears."

The Wenatchee Valley company was one of the first two companies to opt out. Stemilt was the other. The two shippers account for roughly 26 percent of all organic pear volume in the Northwest. The Chelan Fruit Growers Cooperative was among the remaining 7 percent that originally chose to pay the assessment.

Consumers don't shop for pears by brand, said Mac Riggans, director of marketing for Chelan Fresh, the sales arm for Chelan Fruit Growers. "The rugged individualism of this industry is what makes it so great, but the cohesiveness that you get by cooperation is what gives you the united face to the consumer," Riggans said.



*"This is all uncharted territory."*

—Kevin Moffitt





TJ MULLINAX/GOOD FRUIT GROWER

### The organic checkoff proposal

Organic producers may separate even more in the coming years.

The national advocacy group Organic Trade Association has applied with the U.S. Department of Agriculture for a promotional checkoff program to create a marketing and consumer education campaign for all organic commodities, including grains, vegetables and other crops, as well as fruit.

Promotional checkoffs in the past have spawned the well-known advertising tag lines, "Beef. It's what's for dinner," and "Got milk?"

The organic checkoff proposal calls for an assessment of one-tenth of 1 percent of net organic sales to raise more than \$30 million a year for promotion and research related to organic commodities.

The Organic Trade Association was one of the primary authors of the "opt-out" clause so many pear shippers used this spring.

The association argues in promotional material and their USDA application that organic producers need their own identity and consumer education campaign. An example: telling people the difference between organic and natural labels.

Organic Trade Association officials did not respond to interview requests.

The proposed checkoff is months, if not years, down the road. The U.S. Department of Agriculture first must approve it, then a majority of organic stakeholders must vote in favor.

Fruit industry leaders are uncertain of their position. Several years ago, an effort to combine fruit and vegetable growers in a national campaign to promote them as part of a healthy diet didn't even make it to an official application with the USDA.

"When you start bringing in so many different categories and commodities and everybody's self-interests and strategies, it becomes very difficult to unify a group of that size all putting their oars in the water the same way," said Howard Nager, vice president of marketing for Domex Superfresh Growers, a Yakima, Washington, fruit sales company that represents about 25 percent of the Northwest's organic pear volume. ●

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## GOOD POINT

Kate Woods, Northwest Horticultural Council

# Getting ready for FSMA

**E**ven as retailers continue to up the ante by adding more restrictive food safety requirements for produce suppliers, tree fruit growers and packers will soon be faced with yet another layer of complex requirements to meet — this time to comply with federal law.

The seven regulations that implement the Food Safety Modernization Act (FSMA) are now final, with staggered implementation dates over the next few months and years based on the rule and size of operation.

Those who sell culls as animal feed will need to monitor the Preventive Controls for Animal Food rule. Packers who import fruit will need to understand the Foreign Supplier Verification rule, and fork lift drivers on the loading dock will be required under the Sanitary Transportation rule to inspect each truck for cleanliness. However, the two rules that will most heavily impact our industry are the Produce Safety rule and the Preventive Controls for Human Food (PCHF) rule.

The 801-page Produce Safety rule with explanatory text represents the first time the U.S. Food and Drug Administration (FDA) will regulate on-farm practices — a daunting prospect. The rule, which will impact all commercial orchards and many packing houses, sets specific standards and requirements to prevent or mitigate six potential routes of contamination for produce:

- Agricultural water.
- Biological soil amendments of animal origin (i.e., manure used as fertilizer — primarily impacting organic growers).
- Worker hygiene and health.
- Equipment, tools and sanitation.
- Domesticated and wild animals.
- Growing, harvesting, packing and holding activities.

The rule will be enforced through inspections by FDA, or state officials on behalf of FDA, and includes comprehensive paperwork requirements to prove that growers are in compliance with each provision.

Growers and packers must adhere to this rule by Jan. 26, 2018, with an additional two years provided to comply with the water standards. Those with under \$500,000 in annual sales will have more time. Exemptions apply for fruit that is sent to a processor with a kill step, such as for apple juice or canned pears.

Much of the rule dictates practices that are already widespread within our industry due to existing audit requirements. The water provisions are the biggest departure from current industry practice, and likely the most costly. Specifically, the rule sets water quality standards

*Be aware of the compliance dates for the rules that will affect you and start thinking about what changes you may need to make at your operation to become compliant.*

for any water that touches the “harvestable portion of the fruit” or a fruit contact surface.

To prove they are meeting this standard, growers who use surface water have two to four years before water provisions go into effect to conduct 20 tests on each water source. To take advantage of the full four years the rule provides, that means sampling needs to begin this year for most growers.

After these initial 20 samples, growers will be required to conduct five tests annually on each surface water source. Options are provided in the event that a test comes in above the stated threshold, including a die-off period between the last day of irrigation and harvest.

The training requirements included in the rule should also be given special attention. Much like existing audit requirements, the rule requires employees who handle fruit or a food contact surface be trained in hygiene. This training must occur annually and must be documented with the date of the training included, something that will be a challenge with a seasonal workforce.

Also new is a requirement that each orchardist have at least one staff member who has received specialized food safety training with curriculum that is equivalent to what has been approved by FDA. Unfortunately, the release of this curriculum has been delayed until at least September, making it more difficult for growers to prepare for implementation.

The second rule that will have a significant impact on the tree fruit industry is the PCHF rule, which will go into effect Sept. 19 for larger packing houses that do not fall under the Produce Safety rule. Smaller facilities will have an additional one to two years to comply.

This 930-page rule with explanatory text, which was written for large food processors like Kraft Foods but will impact some tree fruit packing houses and storage facilities because of a wonky farm definition, requires facilities

to develop and implement a food safety plan that:

- Analyzes the hazards that may exist.
- Identifies preventive controls to reduce these hazards.
- Identifies techniques to monitor whether these preventive controls are working.
- Identifies corrective actions to be taken if the preventive control fails.
- Identifies methods to verify that the preventive control is working.
- Identifies methods to verify that orchardists are complying with the Produce Safety rule.

The PCHF rule also requires that each facility have a person on staff who has taken the equivalent of FDA-approved training. While the curriculum for this training has been released and trainings made available, the Northwest Horticultural Council (NHC) has expressed concerns to the FDA and policymakers that it does not adequately address how fresh produce packing houses are expected to comply with this processor-oriented rule.

So what is the next step for growers and packers who will need to be in compliance with these massive, confusing regulations? First, be aware of the compliance dates for the rules that will affect you and start thinking about what changes you may need to make at your operation to become compliant. Second, don’t assume that you have as much time as FDA is giving you; private audit schemes that your customers require are already beginning to incorporate FSMA into their program requirements.

We know there are a lot of questions about how to implement these policies on the farm. For example, how does FDA define “each water source” when a grower obtains his or her water from an open-ditch canal? What preventive controls are acceptable for tree fruit packing houses where there is no “kill” step to eliminate pathogens?

The NHC and other produce groups are pushing FDA to release guidance for industry that addresses these types of questions. We will also continue to push FDA to make the Preventive Controls curriculum more applicable for tree fruit packing houses, and to release the Produce Safety curriculum as soon as possible so that growers have adequate time to prepare. In addition, the Washington Tree Fruit Research Commission continues to support research into the most critical food safety questions for the industry, while the Washington State Tree Fruit Association will continue to provide FSMA training as additional curriculum and guidance become available. ●

*Kate Woods is vice president of the Northwest Horticultural Council.*

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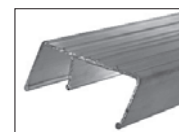


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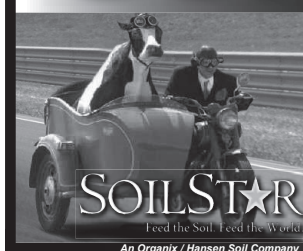
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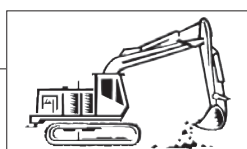
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**August 26-28:** Festival of Fruit 2016 — The Year of Edible Landscaping, California Rare Fruit Growers, San Luis Obispo, California, [festivaloffruit.org](http://festivaloffruit.org).

## SEPTEMBER

**September 13-15:** Fresh-cut Produce: Maintaining Quality & Safety Workshop, Davis, California, UC Davis Campus, [postharvest.ucdavis.edu/Education/FreshCut](http://postharvest.ucdavis.edu/Education/FreshCut).

For a complete listing of upcoming events, check the Calendar at [www.goodfruit.com](http://www.goodfruit.com)

**September 14-16:** Macfrut 2016, Italian Fruit & Vegetable Trade Fair, Rimini Fiera, Italy, [macfrut.com](http://macfrut.com).

## NOVEMBER

**November 9-10:** Northwest Cherry Research Review, Wenatchee, Washington, [www.treefruitresearch.com](http://www.treefruitresearch.com). For more information, contact Kathy Coffey, (509) 665-8271, ext. 2.

**November 11-13:** Tilth Annual Conference, Wenatchee, Washington, [seattletilth.org/special\\_events](http://seattletilth.org/special_events).

**November 22:** Stone Fruit Research Review, CPAAS, Prosser, Washington, [www.treefruitresearch.com](http://www.treefruitresearch.com). For more information, contact Kathy Coffey, (509) 665-8271, ext. 2.

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**THE NORTHWEST HORTICULTURAL COUNCIL** ([www.nwhort.org](http://www.nwhort.org)) located in Yakima, Washington, is seeking a regulatory information specialist. The successful candidate will be primarily responsible for USDA organic laws and regulations and assist on a range of other policy matters related to agricultural chemicals, food safety, export market access, and other issues of importance to our tree-fruit members. Key focus will be on monitoring and analysis of domestic and international regulatory changes in areas of concern and helping communicate commercially relevant changes to our industry. Position requires occasional travel. Qualifications include: University degree with strong academic performance; excellent writing skills; careful attention to detail; comfort in public speaking opportunities; familiarity with office data and word processing programs (including experience with web-based communication); and a valid driver's license. A competitive wage package, including medical insurance, will be offered. Applications with a letter detailing interest and qualifications for the position to be submitted to the Northwest Horticultural Council, 105 S. 18th Street, Suite 105, Yakima, WA 98901 or to: [general@nwhort.org](mailto:general@nwhort.org). An Equal Opportunity Employer.

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# LAST BITE

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## Devon Newhouse

grower / Sunnyside, Washington

age / 28

crops / Wine and juice grapes, cherries, nectarines and hops

business / Vice president of Newhouse Farms Inc.

family background / Devon's family started out raising cattle in the Yakima Valley, then moved into hops, tree fruit and grapes. He and his wife Halley operate the family farm. Devon is grandson to Irving Newhouse and son to Dan and Carol.

### How did you get your start?

“When I first came back, I did what I knew. Every farm needs a fabricator or a welder, and that's what I did for the first year and that slowly changed to where I was getting called to help with other tasks. It finally came to a point where now, I do just about every job imaginable.

### What challenges do you face?

“A challenge for me is trying to treat the farm like a business. For most cases, you're out in the middle of nowhere, being your own boss. You have to get yourself up in the morning, go out to make impactful decisions, while staying out until the sun goes down. No one's going to hold you accountable — except your own finances. If you try to focus solely on the business side of the farm, there's a risk that your whole day will be consumed, seven days a week, and you'll never get out in the field. Some people choose that, but that's not really me. Having people around that I trust with the business side of the farm really helps. I work with my wife who works in the office as well as out in the field. To have a partner like that, where we can rely on each other and share the burden, is important.

### What does future farming mean to you?

“With many of the current technological advances, you just have to be open to change and the latest discoveries. An example would be with orchards. Every orchard I know of that's getting pulled out is being replaced with trellis and high density. It's the same way with grapes. They are planting them tighter to make up for weather changes — and growing is totally open to anything you want to do.

### What would you tell younger growers?

“I'd say that farming is a lot harder than many of the jobs you can have in this world, but it'll get better, easier and more rewarding. It's a long-term business. You aren't going to see the fruits of your labor in the next quarter. Maybe in the next three or five years. When that does happen, you'll never stop trying because you'll want that reward again.

“The best thing now is that everything in farming is changing.”

by TJ Mullinax

More from this interview and other Young Growers at [goodfruit.com/yg](http://goodfruit.com/yg).



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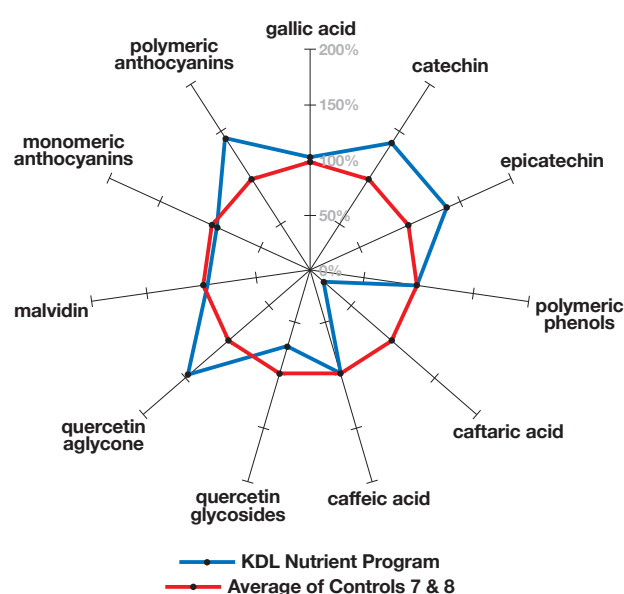
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