



the BeeLine



Summer 2019

Newsletter of the Western Cascade Fruit Society

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2019 Washington State Fair

Coming sooner than you realize to Puyallup

Come to Puyallup between Friday, August 30, 2019 and Sunday, September 22, 2019 to see, smell, & taste The Fair and help staff the Western Cascade Fruit Society booth at the Washington State Fair.

Shifts average 4 hours each & there are 3 shifts a day.

9:30 or 10:30 to 2,

2 to 6,

6 to 9:30 or 10:30 depending on the day.

The Fair will be dark (closed) all Tuesdays – Sept. 3, 10, & 17 as well as the first Wednesday – Sept. 4, 2019.

In return for your help, we offer a free entry ticket, access to free parking and shuttle service from at least one of the parking lots. Tickets should be available by mid-August. Come help staff the booth & see The Fair!

Check your calendars, then contact Bill Horn at hornbill66@msn.com (best) or 253-770-0485. The Tahoma Chapter appreciates your help.

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Note to WCFS Chapter Presidents—Please encourage your Members to Volunteer for a Fair shift. WCFS Board meets Saturday, September 14, 10:00am at Summit United Methodist Church, 5316 104th Street E., Tacoma. Board Members should consider working a shift on day of the Board meeting.

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The BeeLine is a quarterly publication of Western Cascade Fruit Society, a non-profit 501(c)3 corporation in the State of Washington.

Good Enough to Eat:

With proper care, peaches can thrive

By CHRIS SMITH, SPECIAL TO THE Seattle POST-INTELLIGENCER | May 16, 2001

A tree-ripened peach surely ranks among the finest fruits we can eat. Years ago when I discouraged Kitsap County Master Gardeners from growing peaches, one of them invited me to visit her orchard to see the crop her trees had set. I went and was impressed. The arrival a week later of a basket of perfectly ripened peaches from her orchard made an even bigger impression. Since the mid-1980s, I've visited other local orchards which regularly produce high-quality peaches. So after my non-recommendation, I wasn't surprised to receive a good-humored response from R.R. of Clyde Hill. She wrote, "I have had peach trees for 29 years and very successfully. The trees are sprayed the last time around the first week in February. With these sprayings, I do not have any leaf curl. The trees are well loaded and this is after hours of thinning them for the larger fruit."

So why can't I be more enthusiastic about peach culture in Western Washington? In short, it's our climate. The cool, moist weather we enjoy in such abundance favors diseases, saps tree vigor and some years doesn't provide sufficient heat to ripen the fruit.

However, home orchardists lucky enough to have warm microclimates and committed enough to spray for several diseases can beat the odds.

If you dare to grow a peach, first search your grounds for a spot with western or southwestern exposure. That's where to plant a tree to catch the most sunlight in summer, when our mornings are frequently cloudy and our afternoons clear.

Next, resolve to spray the tree in winter for peach leaf curl, the most destructive of the several diseases that attack the trees in our area. Apply the first spray of lime sulfur or fixed copper in late December and second and third sprays at three-week intervals. Try to time the applications so the tree will be dry for at least several hours after you've sprayed. And be sure to spray curl-resistant varieties; typically they're susceptible to the disease for the first three or four years of their lives.

Brown rot, the other common disease of peaches, attacks during bloom. To prevent it, apply sulfur at weekly intervals between pink bud and petal fall.

If you hate to spray, choose a curl-resistant variety like Frost, Q 1-8, Avalon Pride or Mary Jane. After four years, you can stop spraying these for curl.

If flavor is paramount, plant Harken, New Haven, Red Haven or Harrow Diamond. You'll have to spray these varieties annually for curl, and all but Harrow Diamond for brown rot.

Train a peach tree to an open center with three or four main branches. Spread those branches early in the tree's life to form strong crotch angles (60 degrees or more) with the trunk. Every spring, thin the new shoots, targeting the strongest and weakest and leaving those of moderate vigor. Then head the longer of the remaining shoots. Heavy annual pruning encourages the formation of new fruiting wood. Keep the ground under the tree free of weeds to maximize the tree's vigor, and practice orchard sanitation by promptly removing infected leaves and fruits. These attentions will improve the odds of your growing a productive tree.

A genetic dwarf peach such as Eldorado offers an alternative to a full-size tree planted outdoors. Typically 3 to 5 feet tall, a genetic dwarf grows easily in a large pot. It won't produce much fruit but it's portable. Keep it dry under cover from mid-December through February and the leaf curl fungus won't have access to the moisture it needs to initiate infection.

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Douglas Bullock's recommendations for peach trees in Seattle: Frost, Avalon Pride, Q18, Oregon Curl Free.

Short-lived

Peach trees have a productive life of only about 20 years. Not much, compared to the over 100 years you can get from an apple tree. On the plus side, they grow fast and are precocious, bearing fruit earlier than many other fruit trees.

Chilling requirements

Seattle doesn't get very cold, but since "chill hours" only require temperatures under 45°F, we actually get a surprisingly high average of 3000 chill hours. That's more than enough for peaches.

Pollination

This is a serious issue. Peach trees flower early, when the weather is often too cold and wet to allow for successful insect-pollination. Fortunately, since peach trees usually require heavy thinning of fruit set, a sub-par fruit set may not actually be such a bad thing.

Disease

Peach trees are disease-prone. In particular, they are susceptible to peach leaf curl, a fungal disease promoted by cool wet winter weather, *i.e.* Seattle conditions.

Options assuming you don't want to spray chemicals:

- Plant a leaf curl resistant variety, such as Oregon Curl Free, Avalon Pride, or Indian Free Peach
- Protect your tree from winter rains by planting it against a house wall, under the roof overhang
- Spray natural anti-fungals in early Spring, such as *Trichoderma mix* or *Effective Microbes*

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Groundcover and leafhopper management for X disease

WSU Extension, Aug. 13, 2019

Last week, WSU invited Professor Emeritus Alexander Purcell from UC Berkeley, an entomologist who was a key component for the California X disease abatement program in the 1980's, to tour orchards in Wenatchee and Yakima and meet with researchers and representatives of the Washington cherry industry. After joint discussions, we think leafhoppers are moving into orchards while feeding on orchard broadleaf weeds in the groundcover before moving onto cherry or stone fruit trees. Indeed, last week we did find leafhopper vectors while sweep net sampling orchard groundcover weeds. Therefore, groundcover is likely an important part of X disease transmission. There is a wide range of potential methods to combat this problem, and we encourage you to treat the problem of the groundcover as a source of leafhoppers within the philosophy of your orchard management program. Any herbicide treatments to remove ground cover weeds should be paired with insecticide treatments to kill leafhoppers that are stimulated to move from the groundcover to trees. X disease infects trees for the life of the tree, so all orchard blocks should be treated for leafhoppers, including non-bearing blocks. Sampling can be conducted with yellow sticky cards to monitor effectiveness of treatments.

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3 Signs of a sweet juicy ready to eat peach:

Frog Hollow Farm, May 21, 2014

There are three main characteristics that would help you identify a sweet, juicy, ready-to-eat peach:

1. Color: This is important because you ought to know what you're looking for! According to Farmer Al, "the real color you want to look for is the background color of the fruit and not the red, highlight." The red color is deceptive because our brain is genetically evolved to think that the color red is delicious and sweet. He says, "Plant breeders have bred the color red into a lot of peaches grown around the world nowadays because it helps sell the fruit." The real color you want to look for is yellow and it should be deep golden, not pale.

2. Touch: You can tell if a peach is ripe or not by a gentle, yet firm squeeze (not hard enough to bruise it) with your fingers. If there's a little bit of a give there, then it means that the fruit is almost ripe but not quite. I would still leave such a peach on the kitchen counter for another 2-3 days till it is actually soft to very soft.

3. Appearance/Texture of Skin: This is the most telling of all three characteristics. You can tell that a peach is ready to eat by looking for signs of shriveled skin around the stem. When you see wrinkles, that's the sign of a really excellent peach. Wrinkles develop on the skin when water starts to leave the fruit. Water evaporates from fruit once it has been picked because the skin is very porous. It will shrivel and dry up and that will intensify the flavors and give you the best peach flavor.

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Recent Research on the Use of Apogee and Early Calcium Sprays to Suppress Bitter Pit in Honeycrisp

Daniel J. Donahue, Eastern New York Commercial
Horticulture, Cornell Cooperative Extension

Fruit Tree News, June 14, 2019

Dan Donahue and colleagues with Cornell Cooperative Extension in eastern New York State began studying the Honeycrisp bitter pit issue in 2016. Their objectives were very practical, looking to identify producer practices that would significantly reduce Bitter pit incidence, and also develop a method of bitter pit (BP) incidence prediction in stored apples that was reasonable economical and accurate. They are evaluating early season PGR and foliar calcium strategies, as well as conducting a 36-site survey study. To date, they have learned that Prohexadione-Calcium (ApogeeR, BASF) applied at pink can suppress BP 50%, Prohexadione-Calcium applied later for vegetative growth management as commonly practiced can aggravate bitter pit, at least one formulation of foliar calcium, POMA (6% calcium chelate), can suppress bitter pit when applied during the cell mitosis phase of fruit development. For 2019, Dan is leading a statewide bitter pit prediction implementation project, evaluating the 2nd generation of his peel mineral model as well as the "passive" prediction protocol developed by Dr. Chris Watkins at Cornell.

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Alert to WCFS Chapters

Have you ordered your rootstock?

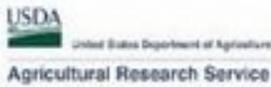
Check out the Nursery list in
Summer BeeLine,
Page 11.

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Using Cover Crops to improve soil health

Test Your Soil, Nicki Youngsma, HOS editor, July 2019

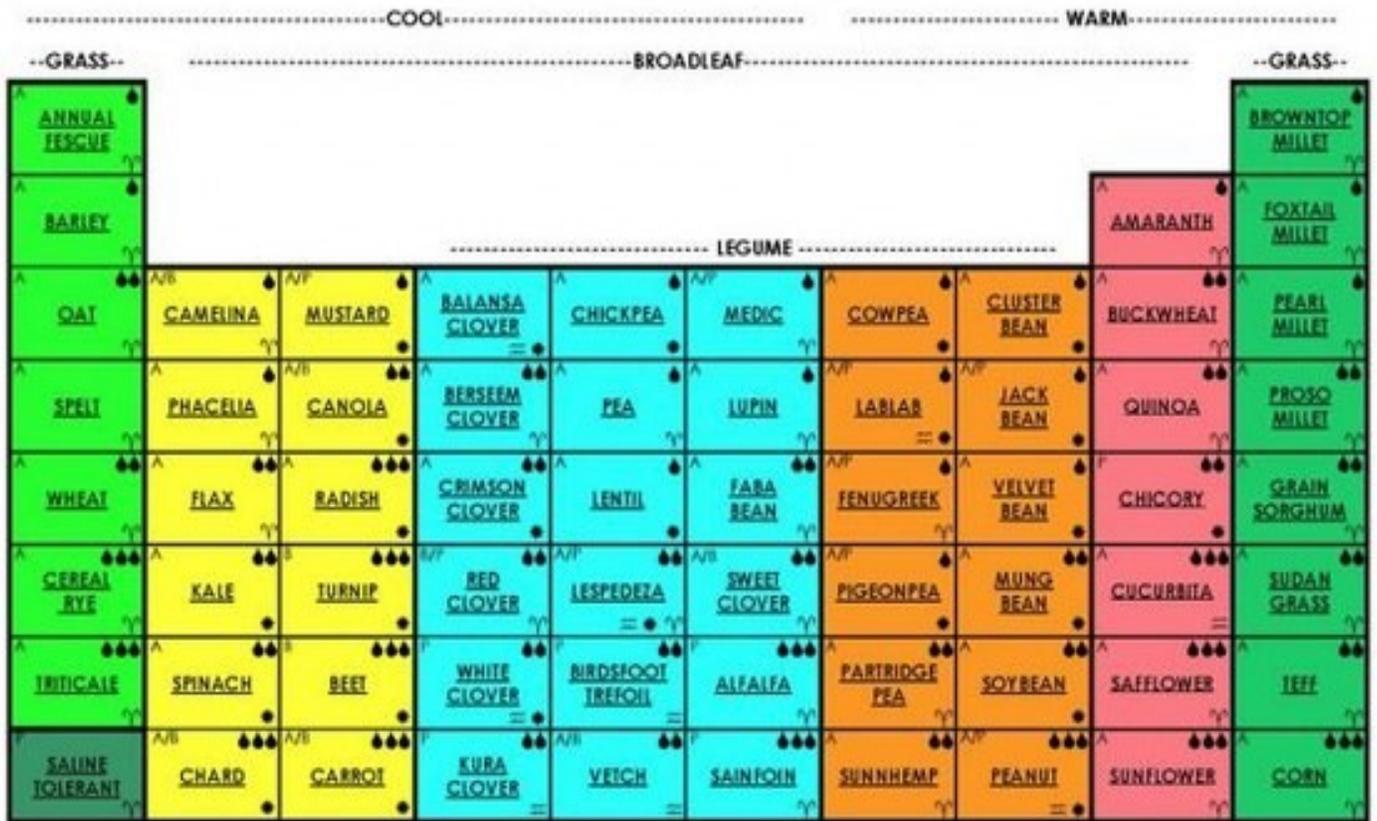
Soil is complex and soil science is multifaceted. The study of soil benefits from knowledge of chemistry, biology, physics, geology, and hydrology. It is more than knowing if your soil is sandy loam or loamy sand or clay-ey loam. Soil has its own taxonomical classification system of which there are 12 orders. You can look up the soil classification of a region—or soil survey—on the USDA Natural Resources Conservation Service website. Cover crops can improve soil health. The “Cover Crop Chart” displays, in a style similar to the periodic table of elements, different plants to use as cover crops. The columns and rows are organized in groups of plant types (legumes, grasses, broadleaves, etc.), water use, growth cycle, among other categories. Another tool suggested for cover crop selection was the “Pacific Northwest Cover Crop Selection Tool,” by the USDA Department of Agriculture Natural Resources Conservation Service (NRCS). It is a free Microsoft Access document that you can download and use on a PC desktop.



Cover Crop Chart



GROWTH CYCLE	PLANT ARCHITECTURE	RELATIVE WATER USE
A = Annual	γ = Upright	● = Low
B = Biennial	● = Upright-Spreading	●● = Medium
P = Perennial	≡ = Prostrate	●●● = High



V 3.0 February 2018

◆ [Additional Information](#)



Soil Your Briefs

Clackamas County Soil & Water Conservation District

There is a different way to test soil health. Instead of using a conventional soil test kit to measure pH or specific minerals, you can assess the strength of the soil's digestive powers by burying pairs of 100% cotton briefs in various locations on your property. This could result in a memorable and compelling visual.

Healthy soil is full of bacteria, fungi, arthropods, protozoa, and earthworms. The cotton in the briefs is a food source for the microbes and other organisms in the soil. This is why after two months in the ground, the worse looking the briefs, the more biological activity you have in your soil. Biologically active soil is healthy soil.

Want to test your own soil?

- Find a pair of 100% cotton underwear (undyed). Take a photo of your briefs for future comparison.
- Dig a hole 4 to 6 inches deep. This is the root zone where much of the soil biological activity occurs.
- Lay your briefs flat in the hole and cover with soil. Watch for soil moisture. If your soil dries out you will need to water periodically unless the area is irrigated.
- After two months, dig up your briefs and compare them to the photo you took in the beginning.



After you visually test your soil, be sure and get a scientific soil test. Cameron Denning, Orchard Manager of Finnriver Farm and Cidery in Chimacum, recommends A and L Western Agricultural Laboratories in Portland, Oregon. The labs perform custom soil testing for pH, organic matter, nutrients, minerals, salts, and texture.

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When Should You Harvest Pears?

Pears need to be harvested at the right time to get the best flavor. These pomes are one of the few fruits that are best when picked under ripe. Pear tree harvest time will vary according to variety. The early varieties are ready up to a month sooner than late-blooming types. Either way, it is best to pick them firm.

According to professional growers, pears should be allowed to ripen off the tree rather than on the stem. This is because pears will overdevelop on the plant, resulting in soft texture and overly sugared flesh. If you pick your pears when they have sweetly blushed skin but are still firm and slightly under ripe, you can ripen them on the counter or in a paper bag.

Each fruit will come into its best maturity at slightly different times due to environmental factors, so when harvesting a pear tree, each pome will need to be individually considered before picking.

The optimum time for picking pear fruit will vary depending on your zone. Begin by checking a few fruits to see if they are mature enough. Extremely young pears won't be developed enough to produce the necessary sugars after leaving the branch.

Take a pear gently in your hand and lightly tip it away from the branch. If the fruit comes off easily, it is ready to take. Those that resist should be left on the tree to mature a bit more. This handpicking test is the best way to decide when to start picking since texture and color will vary by variety and are not a good indicator of maturity.

Once you have easily separated the pear fruit that is mature, bring it indoors to ripen. You can keep the pears longer by storing them at 30 degrees. This cooling period enhances the ripening process.

Bartlett pears only need a day or two of chilling, but many of the other varieties benefit from two to six weeks of cooling. Then it is time to force ripening. Simply leave the pears on the counter in an area with 65- to 75-degree temperatures.

Chris Rusch, OSU Extension Master Gardener

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WSU Extension on Cherry

New high quality cherry varieties, particularly the self-fruitful introductions, combined with the availability of dwarfing rootstocks such as Gisela 5, and innovations in training systems, have led to great advances in cherry culture for both home growers and orchardists in recent years. White Gold, recently introduced from Cornell, is a self-fertile variety that needs no pollinator.

Certain varieties have less genetic tendency to crack – usually those with somewhat softer flesh. Smaller trees can be netted for bird protection and are more easily accessible for pest management. New training systems combined with high tunnel technology are being developed to extend growing seasons and provide rain protection. Later ripening varieties (late July to August) may take advantage of the better weather and late market opportunities for on-farm sales.

The main problems with growing cherries in western Washington are fruit cracking, bacterial canker, and damage to the crop by birds. Cherry bark tortrix, an insect that bores holes in tree trunks, can damage sweet, tart, and ornamental cherry trees. Now the arrival of a new insect pest, Spotted Wing Drosophila (*D. suzukii*) has added another threat; it attacks and damages the cherry fruit before and during ripening. Bacterial canker often attacks sweet cherry trees in western Washington, and over time it is probably the most serious threat to tree health. Tart (pie) cherries such as Montmorency are usually much less susceptible to canker, show little damage from rain, and because they are often later blooming, the weather conditions at bloom time make good pollination more likely.

In 2012 the cherry orchard block at WSU Mount Vernon NWREC was used as the site for the annual cherry field day co-sponsored by the Western Washington Fruit Research Foundation and WSU. See “Resources” below for presentations at the workshop.

Future plantings are targeted to new cherry introductions and advanced selections from breeding programs at WSU, Cornell (Geneva, NY), BC Summerland, and the University of Michigan.



Cherry: Bacterial canker

WSU Extension on Cherry

Use IPM (Integrated Pest Management) for successful plant problem management. Bacterial canker is favored by cool, wet weather and is common in western Washington. The bacteria overwinter in cankers, buds and other host tissues. Dark cankered areas on trunks and branches may develop and expand in early spring. The infected tissues may produce gum. The cankers often girdle twigs and branches, causing dieback above the lesion. Leaves on girdled twigs often yellow and fall by late summer. Infected buds may be killed or leaf infections may occur as the new growth emerges resulting in collapse of leaves. Infection can be spread by wind, rain, insects, pruning tools, or by planting or grafting with infected stock. The disease may spread throughout the entire tree (systemic infection) with or without visible symptoms.

Management Options

- Avoid injury.
- Burn or cut out cankers on branches or trunks. Cauterizing should be done in the spring prior to bloom. Check cauterized areas for continued bacterial activity 15-20 days later.
- Control weeds, which may serve as a source of bacteria.
- Prune out and destroy infected tissues during dry weather. Make cuts well below visible canker and sterilize tools frequently. Do not remove cankers at the same time as regular pruning.
- Remove severely infected trees.

Focus on cultural management first. If you supplement with chemical control, make one application in October during leaf fall prior to fall rains. Then make a second application in early January. Products containing copper may have limited efficacy due to resistance.

If you choose to use a pesticide, some examples of products that are legal in Washington are listed below. Always read and follow all label directions. This list may not include all products registered for this use.

- Bonide Liquid Copper Fungicide Conc/Organic Gardening
- Lilly Miller Kop-R-Spray Concentrate
- Monterey Liqui-Cop Copper Fungicidal Garden Spray
- Soap-Shield Flowable Liquid Copper Fungicide

Revision Date:4/24/2012

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OSU leading way on hazelnut “tidal wave” Oregonian July 21, 2019

Shawn Mehlenbacher is on an endless search for the perfect nut. He and his team at Oregon State University oversee 50 acres of land dedicated to hazelnut breeding. He creates new hazelnut types resistant to disease that threatens the future of one of Oregon’s most important crops. The new hazelnuts could be crucial to Oregon’s plan to supply a growing domestic market.

“This program at OSU is bigger than all the other programs in the world—and the world knows it,” said Mehlenbacher, who teaches horticulture and genetics courses at OSU.

Oregon harvests 99.9% of the country’s hazelnuts. Half of these are sold to China, where they are a popular snack food. The annual crop makes up less than 7% of the world’s hazelnut output.

In the early 1970s scientists in the Pacific Northwest noticed Eastern Filbert Blight, a fungal disease. The disease spreads through hazelnut tree bark like poison. It does not affect the safety or health of the crop, but it kills trees and diminishes the hazelnut harvest for the next season.

In dealing with this disease, scientists have worked tirelessly to cure the crop and help grow the Oregon hazelnut industry.

Mehlenbacher started researching how to grow disease-resistant hazelnut varieties at OSU in 1986. The first was released to the public in 2005. Since then, Mehlenbacher has released seven more varieties of hazelnuts resistant to Eastern Filbert Blight.

He cross-pollinates two different hazelnut plants to create new kinds. The process takes 17 years—much of that time spent evaluating the progress of the nuts.

“As a scientist,” he said, “there’s kind of an obligation to share my research.”

Walking into Oregon State’s hazelnut breeding labn, visitors see a poster with a smiling squirrel and the message they are entering the “Nut House.”

Mehlenbacher believes the hazelnuts he breeds are more uniform than others grown overseas. Between 60% and 70% of the world’s hazelnuts are from Turkey.

“We can deliver a consistent high-quality product,” he said.

The demand for hazelnuts is primarily overseas, but local hazelnut organizations hope to grow the domestic industry through marketing. Part of the plan includes educating local



Chefs on Oregon hazelnuts and encouraging them to use the nuts in their dishes.

According to the Oregon Hazelnut Marketing Board, the industry is growing exponentially, with 8,000 new acres being planted each year in the state.

Todd Smith, manager of O.O. Agriculture, is betting on the demand that may come with greater investment. This company has invested 1,000 acres and millions of dollars in hazelnuts. They use OSU hazelnut varieties and pay royalties for them.

The company spent about \$6 million on hazelnut varieties and technology to support the crops. By fall, they will have planted six of Mehlenbacher’s creations.

This may be a risky enterprize as one of the nut types was planted on “mediocre” land, and so far, the results are less fruitful than expected.

Smith is counting on the long term health of his plants. He remains optimistic and cvertain the company will break even within the next decade. “There’s this tidal wave of nuts coming.”

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WCFS Board meets Saturday, September 14, 10:00am
Summit United Methodist Church,
5316 104th Street E., Tacoma.

Plan Bee

Rebecca Phillips, WSM, 2-11-18

For thousands of years, humans have relied on the European honey bee to pollinate agricultural crops. Now, wild North American bees are getting a second look.

WEST OF THE CASCADES, WSU entomologist Dave Crowder and doctoral student Elias Bloom are investigating the role of native pollinators in Seattle's urban environment. Their [Citizen Science Initiative for Bees](#) (CSI Bees) includes the first comprehensive survey of wild bee diversity in the Puget Sound region. In fact, all across the Pacific Northwest, WSU researchers lead the way in pollination ecology and efforts to conserve threatened populations.

By some estimates, pollinators like bees and butterflies produce up to a third of the world's food supply. Recent studies, however, have shown dramatic declines in many of these species, with some nearing extinction. Once common and widespread, the western bumble bee (*Bombus occidentalis*) has disappeared from large parts of its former range and other species are following suit.

"Wild bees are affected by the same pesticides, fertilizers, and herbicides that harm honey bees," says associate professor Crowder. "But most important, they are impacted by the loss of habitat.

"As we convert natural landscapes into agriculture or housing developments, we destroy some of the normal nesting sites," he says. "Plowing up ground and planting huge monocultures may deplete nesting options for ground-dwelling bees. Clearing forests and other vegetation decreases options for cavity nesters."

And, although there is scientific value to preserving species, Crowder says on a practical level, we need them to pollinate our food crops and native plants. In fact, for certain crops, wild bees are more effective pollinators than commercial honey bees.

Take the fuzzy bumble bee which has developed the clever trick of "buzz pollination" to release tightly-held pollen grains in cranberries and blueberries. They do this by unhinging their wings from the wing muscles, grabbing onto the pollen-filled anthers, and rapidly vibrating their bodies, something honey bees can't do.

Studies also suggest that crop yields are improved when both wild and honey bees are present in the same field. Like an insurance policy, the biodiversity provides farmers with more reliable pollination.

Tim Lawrence, associate professor and Island County Extension director in Coupeville, has been keeping bees for 56 years, including a stint as a professional bee wrangler. He shares an inside look at the mysterious ways these insects accomplish their mission.

"Bees are covered with fine feathery hairs that develop a positive electrical charge as the bee flies," he says. "When they land on a negatively-charged flower, pollen grains will literally jump onto those hairs. The bees then groom their legs and pack the pollen into little baskets on their hind legs called

corbiculae and fly back to their nest. During this process, some of the pollen falls off and fertilizes the plant."

Lawrence says it was recently discovered that when a bee lands on a flower, it reduces the negative charge of that flower, leaving an electrostatic signature that other bees can sense. "So, you'll see a bee hovering over a flower and then land on one that indicates it hasn't recently been visited by other bees and is more likely to offer a pollen or nectar reward."

Bees also have the help of a floral ultraviolet guidance system. "If you look at a flower under a black light, it shows ultraviolet radiation coming off like landing strips at an airport," he says. "These lines guide the bee to the nectar and pollen."

Despite their natural abilities, wild pollinators face an uphill battle against the challenges of climate change, widespread chemical use, and ongoing habitat destruction.

Crowder says the American public is stepping up to help. Citizen scientist groups across the nation have joined forces with federal and academic researchers to gather data and help restore pollinator habitat.

On a local level, he and Bloom launched the [Northwest Pollinator Initiative](#) in 2015 to study habitat conservation on small farms in western Washington. The initiative includes CSI Bees, a community information-sharing network where volunteers learn to observe, monitor, and catalog wild bee diversity throughout the region.

"The level of enthusiasm has been through the roof," Crowder says. "Well over 100 citizen scientists are participating in some of our different projects."

Crowder and Bloom began their efforts in 2013 when they reached out to Bob Redmond, founder of Seattle nonprofit [The Common Acre](#), who helped locate urban gardens for study and introduced them to local farmers.

Unlike the east side, western Washington farms are typically smaller and more diverse with a mixture of fruits and vegetables that require pollination, such as tomatoes, peppers, squash, strawberries, and apples.

"There is a lot of organic agriculture there—CSAs and farmers markets," says Crowder. "Farms with diverse crops have plants blooming throughout the whole season which, in turn, helps keep wild bee communities healthy year round."

Crowder and Bloom have since established a network of about 36 sites for sampling bees—everywhere from downtown Seattle, Tacoma, and Olympia to outlying rural areas.

As a result, they've made significant progress in documenting the types of pollinators living around Puget Sound, and are now using the data to develop long-term conservation plans.

Their first step was to team up with P-Patch, a group of Seattle community gardens, where they recently installed a number of "habitat augmentation treatments."

Each treatment area consists of a patch of bare soil for ground-nesting bees, a section of lavender, lupine, or other flowers, and a bee hotel for cavity-nesters—often, incidentally, painted in bee-attracting bright blue.

CSI Bees volunteers observe these treatments and meticulously record the types of bees, wasps, flies, spiders, butterflies, and other insects that visit. In time, Crowder and Bloom will

Cont. on page 9



From page 8 Plan Bee

compare their results to observations made on farms without augmentation. The goal is to try to increase pollination and crop production.

They also hope to verify that the bees will continue flying out to the crops.

“Ultimately, we want bees to increase our food supply. If we provide too nice of a habitat for them, there is the risk that they will have no need to search for pollen and nectar in the fields,” Crowder says. “These enhancements take time, labor, and money, so we have to know if the effort pays off for farmers to invest in it.”

If nothing else, Crowder and Bloom’s efforts have paid off in motivating people.

“Eli is probably asked to give up to 20 presentations per year to everyone from 4-H groups, schools, Master Gardeners, and Girl and Boy Scout troops, to farmers and home gardeners,” says Crowder. “Every year, we put on multiple field days and workshops where we teach people to monitor bees and provide them the tools to augment habitat in their own gardens.

“We’re now starting similar pollinator surveys in the Palouse area of eastern Washington.”

There, among the vast monocultures of wheat, peas, and lentils—which don’t require insects for pollination—Crowder and Bloom have discovered an unexpected flurry of diversity in the canola fields.

Crowder says canola is one of the few flowering crops in the area that benefits from the service of bees, but they expected most to be honey bees from local beekeepers.

Instead, net samples revealed over 100 different pollinator species including bumble bees, sweat bees, honey bees, mining bees, butterflies, flies—and even a variety of leafcutter bees.

“I was surprised at the diversity,” he says. “There are very few patches of natural Palouse prairie habitat left to support bees, and those that are there must often travel long distances to find a canola field.”

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Attention WCFS Members

Want to know instantly what’s happening in the organization? Subscribe to the WCFS Forum.

It’s a benefit of membership.

The Forum is private and closed to the public. It keeps us together and on top of what’s happening in our chapters.

The Forum’s host has changed to **Groups.io**.

Contact: Mike Geiser, Forum Administrator,
email: oldfaithfulgeiser@gmail.com

Plum problems and Cherry canker Harley Oien, OOS, 2019

I have plum problems and canker on a sour cherry tree. If you let it go it will definitely spread everywhere.

I found, after many other tries, that the cherry canker dies quickly when you put 91% isopropyl alcohol on the affected areas. My tree also has brown blossom rot. The WSDA organic inspector did NOT approve of using isopropyl alcohol as it is not a certified Organic material and I had to withdraw the tree from production. The alcohol did get rid of the glop from canker.

I continued in the Fall to prune the tree heavily, get all affected areas cut off. In my case that made the tree look like a trunk with few branches. I wondered if it would even emerge next Spring. Important to note is the fact that branches will have lesions which are open areas through the bark of elliptical shape. These have to be cut off well below the lesion and burned.

Then, I removed all brown blossom rot debris still clinging to the branches. That is where the fungus hides for return next year. I clean up the ground around all fruit trees very carefully each Fall and dispose of the down fruit, branches and debris.

Then I had the good fortune of attending an Olympic Orchard Society meeting with Dr. Lee, well known to all, who said that he used lime sulfur spray and AgraLife Megamend for his healthy trees.

I applied both to my trees together with compost (I have lots of compost from 300 chickens and their straw bedding) starting two years ago and the transformation has been dramatic. The tree came back the following Spring and leaves were picture perfect. The brown blossom rot still remained, but the glop and canker lesions were gone. As an aside, the WSDA inspector made me hang a sign on the tree to designate that it was withdrawn from Certified Organic production. As of now, the tree foliage looks bright and healthy, A few cherries and a few brown blossom affected spurs. I will continue but the tree responded to good nutrition, drastic pruning, 91% Isopropyl alcohol (Walmart). lime sulfur, AgraLife Megamend and regular watering.

I can now feel that it will survive and return to great production.

Our orchard has been under attack from a plethora of fungus and bacteria the past few years and I was too slow to start the good practices.

Harley Oien, Port Angeles

* * * * *



Bright and flavorful, Washington State University's new red raspberry variety, 'Cascade Premier,' is more than a decade in the making.

The first full harvest is expected in 2021. Of the 10 raspberry varieties that Puyallup-based small fruit breeder Patrick Moore has released in his 31 years at WSU, "this is one of the best," he said. "It's unusual to get something that's this flavorful, firm, colorful, easy releasing, and resistant to disease," Moore added. "This one hits all the sweet spots." Rich in fiber and vitamin C, raspberries are a "superfood," offering folate, magnesium, potassium, calcium, niacin, vitamin B6, phosphorus, and zinc.

The No. 2 state for raspberry production, Washington grows about 80% of the nation's processed red raspberries.

The berries of 'Cascade Premier' release easily at the right time, allowing growers to harvest firm berries. The new variety also grows its fruit-bearing branches to a uniform length, reducing damage to the canes from harvest and ensuring better yields.

'Cascade Premier' also ripens earlier in the berry season, which allows growers to lengthen their season. 'Cascade Premier' is lighter and brighter than 'Meeker,' and its chemistry is similar to 'Willamette.'

"It's a little bit tart, with good sugar levels and well-balanced flavors," Moore said. "It's a good-looking, good-tasting berry. 'Cascade Premier' has characteristics that allow it to be used for processing or fresh - large firm fruit with excellent flavor that picks easily either by machine or hand."

The Northwest crop has been dominated by 'Meeker,' a 1967 WSU variety. Moore has been working to give farmers updated varieties that can resist root rot. Once you've got root rot in your soil, it stays there.

Root rot wilts and eventually kills all of your canes and there are no effective treatments beyond seeking virgin soil, or breeding canes that can resist the rot.

Grown at fields in Puyallup known to harbor the root rot pathogen, 'Cascade Premier' held up well to the disease. Tested in Washington, Oregon, and British Columbia, this new berry grows well throughout the Pacific Northwest. It came out in the top 10% of tested varieties for yields several years running.

For years, Moore has followed a two-word convention when it comes to naming his berries. The first name is always "Puget" for strawberries, "Cascade" for raspberries. "That helps people know they're from WSU," he said.

Since these berries stood out so strongly from the pack, he dubbed them "Premier."

"There aren't a lot of cultivars that are early fruiting with good yield and flavor, firm fruit, good root rot tolerance, and are machine harvestable," Moore said.

"With all that it brings to the table, I believe this berry will do very well in the Pacific Northwest."

A plant patent application for 'Cascade Premier' is currently pending.

by Christina Herrick, *Growing Produce*

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Olympic Orchard Society loses one of its own.....

Joyce Provost Wheeler (1941-2019)

Joyce Wheeler, a Baltimore school teacher, retired on the Wheeler family farm, in Sequim, in 2007, passed away peacefully at home the night of March 21. She was 78. The cause of death was Alzheimer's disease.

She loved to garden in her front yard with the sweeping view of the Olympics. She and her husband, Tim Wheeler, also enjoyed dancing to rock music.

She celebrated when the North Olympic Land Trust saved the Wheeler farm (Historic Ward Farm) two years ago ensuring that it remains farmland forever.

Joyce is survived by her husband, Tim; sons, Morgan of Sequim, and Donald Nicholas, of Bainbridge Island; and daughter, Susan, of Baltimore. They have seven grandchildren and three great-grandchildren.

Our sincere sympathy to Steve Vause and Carlyn Syvanen, relatives of Joyce.

* * * * *



Tree Fruit Nurseries

Biringer Nursery
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Willamette Nurseries Website: willamettenurseries.com
Phone: (503) 263-6405
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info@copenhagenfarms.com (503)-985-7161
Rootstock

Sierra Gold
5320 Garden Highway
Yuba City, CA 95991 (530) 674-1145
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(360) 985-2873
A family owned farm specializing in unusual fruiting plants, trees and shrubs.

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Apple Custard Pie Makes 8 servings

Ingredients:

1 pie crust
2 sticks butter
1 tsp. vanilla
4 eggs
1 cup granulated sugar
1/2 cup all-purpose flour
1/2 tsp. salt
3 semi-tart apples, such as Granny Smith, Baldwin, Cortland or Idared

Steps:

Heat oven to 350 degrees. Pierce inside of pie crust all over with a fork, line with foil and weigh down with dry beans. Bake until crust is light golden brown, 12 to 15 minutes. Remove beans and foil. Keep the oven on.

Melt butter in a small saucepan over medium heat, swirl the pan often until the butter foam subsides and it becomes golden brown, 2 to 3 minutes. Remove from heat and cool for 10 minutes.

Whisk together eggs, sugar and vanilla extract. Slowly add all the butter to the egg-sugar mixture, whisking constantly. Add the flour and salt and whisk until smooth.

Peel and core the apples; slice into 1/4-inch slices. Arrange them in a slightly overlapping circle around the edge of the pie crust. Slowly pour the filling over the apples. Add enough filling to come within 1/4 inch of the top of the crust.

Bake until the apples are a deep golden brown and the filling is set in the center, about 50 min. to 1 hour. Transfer pie to a wire rack and cool for 2 hours. Serve warm or at room temperature.

Per serving: 518 calories; 32 g at; 17 g saturated fat; 79 mg cholesterol; 6 g protein; 55 g carbohydrate; 34 g sugar; 3 g fiber; 441 mg sodium; 32 mg calcium.

*Adapted from "Tasting Table"
By Mika Paredes*

* * * * *

Why You Should Consider Whole Tree Renewal Pruning for Cherries

by Gregory Lang

Renewal pruning usually is imposed selectively to remove a small portion of secondary (non-permanent), structural fruit-bearing growth so that the regrowth creates new, young, strong fruit-bearing sites.

In many high-density orchards, this would remove one to three of the largest branches, mini-leaders, or upright offshoots on a spindle (TSA=Tall Spindle Axe), multiple leader bush (KGB=Kym Green Bush), or multiple leader planar (UFO=Upright Fruiting Offshoot) tree. These refer to Gisela rootstocks utilizing three training systems. Therefore, this percentage of the canopy that is removed to be re-grown tends to be around one out of every eight or so major fruit-bearing structures or 12.5% more or less, depending on the orchard, orchard manager and canopy architecture.

Let's consider that concept of annual renewal from a somewhat radical point of view, Whole Tree Renewal (WTR), which is the removal of every major fruit-bearing portion of the canopy such that the entire secondary structure of the canopy is re-grown. In sweet cherries, this idea germinated in 2013 when Washington State University (WSU) Professor Matthew Whiting and I visited the sweet cherry germplasm collection of a breeding program in Spain.

There, decades-old trees on seedling rootstocks had been chain-sawed back to stumps and were vigorously re-growing, giving the impression of a KGB orchard in its development years but taller and with massive trunks. In 2014, Matt imposed WTR on some UFO trees at WSU's Roza research orchards and in 2015 I imposed WTR on some very small, very productive UFO-trained 'Rainier'/Gi.3 trees that had been suffering from poor selective renewal due to the dwarfing rootstock and competitive crop load.

Both preliminary trials gave remarkable results. The well-established root systems of the trees and the removal of the competitive crop load, promoted extensive and vigorous replacement of the canopy. In the 'Rainier'/Gi.3 trial, timing of WTR was examined, from dormant to green-tip, to full bloom, to petal fall. All timings resulted in full canopy renewal, although the greatest number of new shoots resulted from imposing WTR at bloom.

The regrowth of WTR trees resulted in a relatively uniform canopy compared to that of standard selectively-renewed trees, which have branches of many different ages, since WTR synchronizes the age of the regrowth, though some new shoots are more vigorous than others. This led to expanded studies in the coordinated NC-140 cherry training systems/rootstocks trial across North America. Excellent canopy replacement occurred across training systems and rootstocks of varying vigor.

The rapid canopy replacement for the KGB and UFO canopies was expected since WTR removes apical dominance and the fruiting canopy re-grows vertically from a relatively low trunk or cordon. However, even regrowth of the TSA

canopies was relatively uniform and complete along the central leader although apical dominance became re-established the following year. Nevertheless, WTR re-invigorated lower portions of the central leader canopy which can be difficult to achieve in selectively renewed trees though growth in the upper canopy reverted to its previous vigor.

Nuts and Bolts of WTR

So, the next question is, how often might WTR be imposed to synchronize renewal growth? Considering the relatively standard 12.5% renewal rate across entire orchards, one can envision imposing WTR annually to one tree in the row, skipping 7 trees and repeating, thereby achieving a 12.5% renewal of fruiting wood across the orchard. Even better, an entire row of trees can be subjected to WTR; the next seven rows should be skipped that year and thus is repeated.

Again, 12.5% of the orchard is being renewed annually, but the renewed rows can be managed differently from the rest of the orchard, improving management efficiency for spraying, harvesting, etc., while improving individual tree uniformity. Each renewed row would require two years for spurs to form, then would be fruited for six years before again being renewed (an eight-year rotation).

Research in the NC-140 trial has shown that WTR-pruned canopies in high-density orchard systems can refill their orchard space within two years and depending on cultivar productivity, return to "full" yields in the third year.

Too Much Vigor?

An unexpected consequence of WTR was that some of the regrowth was so vigorous that sylleptic (secondary) shoots formed on the primary shoots during the year of renewal. This can be an advantage for the branching canopy of TSA trees but is a disadvantage for the development of spur-bearing, narrow upright leaders in KGB and UFO canopies. Not only must labor be expended to remove sylleptic shoots in these training systems, but their formation precludes development of a fruiting spur at the node where the sylleptic arose.

Consequently, future research must determine how to modulate the vigor of the WTR response, perhaps by using specifically-timed growth inhibitors like prohexadione-Ca (e.g., Apogee, BASF) or imposing a late spring heading cut to the more vigorous WTR shoots to diffuse their vigor into two to three new primary shoots (which can be thinned out as necessary during the dormant season).

Also, yet to be determined is the potential bacterial canker infection risk of large WTR cuts imposed at bud break vs. perhaps in late summer when warmer temperatures and drier conditions reduce susceptibility to canker.

Note: Judi Stewart I did this to a 20-year-old Stella cherry that had grown too tall to manage and had non-bearing lower limbs. I cut the tree back to a height of three feet and pruned the new shoots that would eventually form the new canopy. After three years, the tree is now bearing a crop.

* * * * *



Should we bring back the American Chestnut tree?

Julia Rosen, Los Angeles Times, The Oregonian,
July 28, 2019

The wild chestnuts around the leafy college town of Syracuse, New York, used to grow in such great numbers that locals collected the nuts by the bushel and shipped them off to New York City for a small fortune.

These days, though, it can be hard to find a single tree thanks to a devastating blight imported from Asia in the late 1800s.

“Every fall, I look for the burs,” said Neil Patterson of the Tuscarora Nation, a Native American tribe that has lived in the region for centuries. His ancestors depended on the trees for food and medicine. But in 10 years of searching, he’s never found the spiny pods that hold the chestnut’s prized fruit. Knowledge of the chestnut has been lost. Soon, scientists at the SUNY College of Environmental Science and Forestry could change that.

They say they’ve found a way to resurrect the chestnut by giving it a gene from wheat that shields it from the blight’s poison. If the federal government approves, these genetically engineered trees could be ready to plant in a few short years.

It would mark the first use of the technology for ecological restoration, and probably not the last. Across the country, forests face growing threats from invasive pests, diseases and climate change. Elm, ash, oak, hemlock and whitebark pine are all dying in huge numbers.

But genetic engineering raises a host of difficult questions. Like how much humans should intervene in nature in the name of conservation. And whether saving a tree through genetic engineering makes a forest more wild, or less so.

These are issues the Tuscarora and the five other nations of the Haudenosaunee Confederacy are grappling with as they confront the prospect of the GE chestnut. Some see the tree as a way to restore an important piece of the ecosystem and their culture. Others question whether an engineered tree can do either. “We just don’t know about this next version 2.0 of chestnuts,” said Patterson.

Once upon a time, American chestnuts (*Castanea dentate*) spread their leafy boughs from Maine to Mississippi, accounting for a quarter of the trees in some forests. More than 100 feet tall and 10 feet around, they earned the nickname Redwood of the East. For thousands of years, Haudenosaunee people collected the fallen nuts and mashed them into a rich paste, or dried them and ground them into flour. They used the sawtoothed leaves as medicine; and, chestnuts are mentioned in many versions of their creation stories.

The fungus that did the trees in was discovered in 1904, having hitched a ride across the Pacific on imported Japanese chestnuts. Within a few decades, the deadly blight felled nearly 4 billion trees. Aside for a few aging relics, all that’s left are slender saplings and unruly shrubs that sprouted from the seeds of other sickly chestnuts. They, too, will eventually fall victim to the blight’s cankers, which kill the

trunk and strangle everything about it. Losing a tree species rips a hole in an ecosystem. Researchers say the chestnut’s disappearance changed fundamental forest processes, like the way nutrients cycle through the soil. Its absence made room for competitors like hemlock, and it deprived bears, rodents and birds of a staple food source. At least 5 species of insects went extinct.

The impetus to resurrect the tree came from a group of chestnut enthusiasts – of European descent – who saw it as an important piece of U.S. heritage. They formed The American Chestnut Foundation in 1983. For decades, the foundation poured resources into a program to breed blight resistance genes from the Chinese chestnut into American trees. But progress has been slower than anticipated.

The foundation’s New York chapter supported a parallel effort to develop a genetically modified chestnut. It turned to scientists at SUNY ESF, including Bill Powell, a plant biotechnologist who has studied chestnuts for most of his career. It took 16 years for Powell and his colleague Charles Maynard to create a blight-tolerant tree using a gene found in wheat and many other plants. The gene causes the chestnut to produce oxalate oxidase, an enzyme that detoxifies the blight’s acid.

It’s an elegant solution, Powell said. The enzyme doesn’t kill the fungus, so it’s less likely that the blight will evolve ways to defeat it. And unlike the crossbred trees, the genetically engineered ones preserve nearly all of the native chestnut’s genome.

The chestnuts are born in Powell’s labs, where a veritable forest of miniature trees grow inside clear plastic containers stacked on metal shelves. A few graduate to carefully controlled field sites where they can stretch their limbs.

Every year, Powell and his staff cut or bag every flower to keep the pollen from spreading. That’s to comply with federal regulations, and because they need the pollen for breeding. To restore the species, scientists must introduce the blight-fighting gene into wild trees from across the chestnut’s range – a project Steiner says will take decades. But is this a problem science should try to solve?

A report from the National Academies of Sciences, Engineering and Medicine flagged the social and philosophical issues at stake. Among them: Would genetically modified trees degrade the wildness of natural ecosystems, or would they bolster it by preserving species that we would otherwise drive to extinction? And who stands to benefit – or be harmed – by their release?

Powell’s group is trying to get answers. His team has studied whether the pollen is safe for bees (it is) and whether the leaf litter harms native frogs (they seem to thrive on it). He’s confident there won’t be issues, “Even if problems come up, there’s always a solution,” he said.

* * * * *

Soil (health) evaluation begins by asking “What’s the problem with my soil?”

Andrew McGuire | July 9, 2019, WSU College of Agricultural, human, and natural resource sciences

When evaluating your soil, start with the problems..

Soil health—the pursuit that launched a thousand soil tests. Many people are looking at indicators of soil biology status, others at the soil’s physical state, many at various measurements of soil organic matter. There are lists of tiers of tests: the USDA’s [Natural Resource Conservation Service has a list](#), the [Soil Health Institute has a list](#), with tiers, and [the soils lab at Oregon State University has a list](#). The lists are similar, but not identical. Commercial labs are joining the effort offering various tests: Solvia, the Haney test, fungal:bacterial ratios, and more. The lists will get pared down and labs will figure out the most relevant tests for their clientele, but before you take any soil samples, before you have any samples analyzed, before you start worrying about your soil biology, ask yourself, “what’s the problem with my soil?”

The problem with lab-based soil health evaluation is that it is not focused on one problem, on your problem. Often it is assumed that you don’t have soil health and that you need to get it, but the lack of soil health is not a real problem. Nor is your problem low active carbon, soil respiration, or microbial biomass. Those soil health *indicators* may or may not correlate with the actual problems you have with your soil...if you have a problem. And that is the place to start, determining if you have a real problem with your soil, and if you do, what exactly is it? Start by asking: what is your soil doing that you don’t want it to do, or what should it be doing that it’s not?

Problem-based soil evaluation

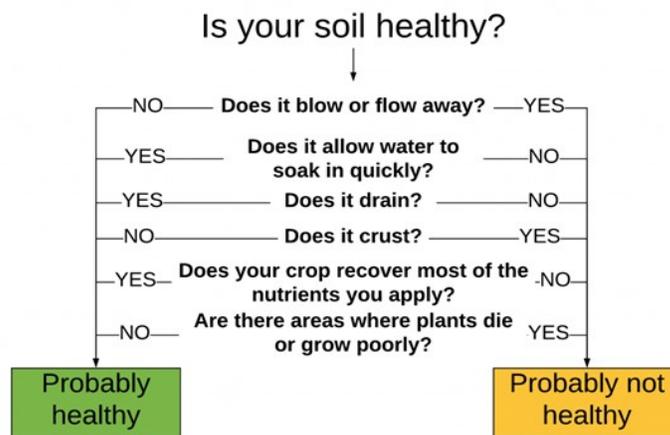
Here is a series of questions to start your problem-based soil evaluation. Originally from Caley Gasch, soil scientist with North Dakota State University, I have modified them a bit, putting the problems in order from higher to lower in terms of the problem’s long-term consequences, harmful effects, and responsiveness to management.

What we want is for the soil to function in a way that enhances the main goal of agriculture: to produce food, and to keep on producing food. Function here has to do with air, water, and nutrients.

Erosion is first. If you have erosion, water or wind, fix it first. It makes no sense to be worried about soil biology, mycorrhizae, soil regeneration, or the soil food web if your soil is leaving your farm. The good news is that many of the fixes for soil erosion – increased residues on the soil surface, reduced tillage, cover crops – also benefit other aspects of soil health.

Next is how your soil handles water at the surface, infiltration, and below the surface, drainage. Then surface crusting, nutrient cycling and finally soilborne pests and diseases.

If you go down the list and answer the last question “yes” then you must determine the most likely reason for your



crop’s problems. This is where a shovel can help and a diagnostic lab. Is it soilborne disease, insects, salinity, etc.?

This list covers the most common problems but not all of them. Some of the problems may be related to each other. If they are, determine what they have in common. For instance, poor infiltration and wind erosion may be related to the lack of soil structure which is related to the low amount of soil organic matter. Why is there low soil organic matter? Low residue crops, too much tillage, plowing the surface organic matter into deeper layers? Keep asking why until you come to the root problem. This often comes back to soil organic matter and its management, but not always. Even if you have figured out that higher organic matter is the solution, you know WHY this is the problem and what other problems are related to it. This is an improvement on just building soil organic matter for the nebulous goals of soil health or soil biology.

Now that you have identified the root problem you can attack the problem directly rather than through “soil biology” or some similarly vague tool. This problem-based soil evaluation will quickly focus your attention on the actual functions of your soil. It bypasses the fuzzy idea of achieving “soil health” and identifies something to guide your management decisions. It grounds your actions on solving a problem. Then it is much easier to decide what to do first and how to evaluate your progress.

What about soil health testing?

Having identified your problems, you can proceed with management and with soil health testing. “Test your soil” is a long-time mantra of Agricultural Extension, because, as the saying goes, you cannot manage what you don’t measure. But like testing your soil’s nutrient levels and then making decisions based on your planned crop, you can conduct soil health testing with a certain problem in mind. Perhaps there are tests that are associated with your problem more than others. Use those to evaluate your plan to address the problem.

This method is specific, practical, and immediately useful. It drives solutions that solve the problem in a way that soil testing by itself cannot. What if you don’t identify any problems or if you solve them? Do you then have a healthy soil? Overall a healthy soil will have fewer problems than an unhealthy one, and be able to overcome those problems that do occur.

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Managing earwigs: how and why to conserve in pome fruits and suppress in stone fruits

By Robert Orpet, WSU Entomology, robert.orpet@wsu.edu, June 2019, WSU Tree Fruit Research and Extension Center

Earwigs are omnivores capable of damaging fruits, but they can also suppress pests such as woolly apple aphid and pear psylla. So, are earwigs pests or beneficials? Ongoing research in Washington and around the world suggests that earwigs are beneficial in pome fruits but pests in stone fruits. Earwigs rarely attack apples or pears except where there is existing damage like splits or mechanical injuries. However, earwigs clearly initiate damage to soft fruits like peaches. To manage earwigs, a variety of options are available for conservation or suppression.

Herbivore and predator behavior

Earwigs can make shallow or tunnel-like holes in fruit flesh. A distinctive feature of earwig feeding is its rounded edges, whereas wounds with jagged or straight edges may be from mechanical or bird damage. This type of damage is common on stone fruits like peaches. This following linked Utah State University fact sheet has useful pictures of earwig damage: <https://utahpests.usu.edu/upddl/files-ou/factsheet/European%20Earwig.pdf>.

When earwigs are seen on damaged apples, they are usually feeding or merely sheltering in existing wounds, which are attractive day-time hiding spots for these nocturnal insects. I released thousands of earwigs into research plots and occasionally found earwigs in stem-bowl splits, but the incidence of stem-bowl splitting was similar between earwig release plots and control plots with lower earwig populations. This is evidence that earwigs didn't cause any new damage, but merely exploited existing damage.

As a predator, earwigs will eat almost anything small or soft. Several experiments from around the world have shown earwigs suppress woolly apple aphid and pear psylla, and video footage is available of earwigs consuming woolly apple aphids in the field (<https://www.youtube.com/watch?v=sSFakIgfMI>).

How to suppress or conserve earwigs

Whether you want to suppress them or conserve them, it is important to time management tactics based on whether earwigs are in their underground nesting phase (winter and early spring), ground phase (spring), or canopy phase (summer to fall). Females overwinter in underground nests and produce one to two broods in Spring. There is only one generation of earwigs per year. Young immature earwigs eventually abandon nests and forage on the ground. Older immatures and adults spend most of their time in plant canopies instead of the ground.

Nesting phase (Tillage)

Tillage can destroy earwig nests. However, the nests usually occur >10 cm underground, so heavy disturbance of the soil

is required to harm populations. To harm earwig populations, tillage would need to occur after October, when earwigs first beginning nesting, and before May, when the new generation starts to abandon nests.

Ground phase (insecticidal baits)

Spinosad is highly toxic to earwigs and is available as a soil-applied insecticidal bait formulation (Seduce) labeled for earwig suppression. To be effective against earwigs, this should be applied before May. Otherwise, canopy-foraging earwigs will not encounter these baits on the orchard floor. Note: the label of Seduce restricts application to 0.45 lb active ingredient spinosad/A/year, including foliar uses.

Canopy phase (insecticide sprays)

From late May to early October, earwigs are vulnerable to canopy sprays. However, earwigs sheltered in their daytime hiding spots can avoid direct contact with insecticides, lowering their efficacy. The best time of the day to spray to suppress earwigs would be during the first half of the night after sunset. The following insecticides have been implicated in suppressing earwigs in the field: carbaryl, diazinon, beta-cyfluthrin, imidacloprid, thiacloprid, spinosad, novaluron, diflubenzuron (note: not labeled for use in cherry), indoxacarb, and flonicamid. Kaolin clay can also suppress earwigs, but is not known whether residues from early-season applications can harm earwigs later in season, and this is a topic of investigation this year at WSU.

How big is my earwig population?

How large your current population is. Earwigs only have one generation per year, and disperse very slowly (they have wings but rarely use them), so conservation will have little immediate effect if there is no existing population. Also, if there is already a large earwig population, there is little benefit in increasing it further, and changes to management would be unnecessary.

To monitor, place rolled strips of corrugated cardboard in tree canopies in contact with trunks near any major limb. Place them during late June and a week later, around July 1, shake earwigs out of the tubes and count them. Studies conducted around the world with ca. 10 × 35 cm cardboard strips suggest that the pest control benefits of earwigs level off at around 5 to 15 per shelter. If you find no earwigs, the population is either very sparse or there isn't one.

Conclusion

Earwigs are often seen sheltering in previously damaged fruit during the day, but are underappreciated predators that attack pests at night when you aren't watching them. In particular, earwigs can increase the consistency of biological control against woolly apple aphids and pear psylla. Whether you are aiming to conserve them or suppress them, it's key to know where earwigs are at what time of year to use appropriate tactics. To develop more recommendations to improve biocontrol, research is ongoing at WSU on how to avoid non-target effects of pesticides on earwigs, and how to efficiently inoculate apple and pear orchards lacking earwigs with a new population.

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WCFS Chapter News**Vashon Island Fruit Club**

Charon Scott-Goldman, Chapter President

Ciderfest 2019 happens Oct 5th. Festivities start at 10 am, and continue until 4 pm. Check out WCFS chapter webpage for location and to verify date.

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Peninsula Fruit Club**Kitsap County****Fall Fruit Show, October 26,**

Sat., Oct. 26 from 10 am to 4 pm at the West Side Improvement Club, 4109 West E Street, Bremerton 98312. Take the Loxie Eagans Blvd. exit off Hwy 3 and follow the signs.

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South Sound Fruit Society

An Introduction to Blueberries by Gary Gorremans

Tues., Sept. 3rd, 7pm at the Grub Farmhouse, 2016 Elliot Ave., Olympia.

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Olympic Orchard Society is hosting David Granatstein on September 11, Wednesday, 7:00pm, at Clallam County Courthouse, Port Angeles.

Topic will be **Apple Replant Disease.**

Prior to joining WSU, David Granatstein managed an organic farm for seven years, worked in forest management, and spent a year in southern Africa with an agricultural development project. He served as on-farm research director for the Land Stewardship Project in Minnesota, where he wrote Reshaping the Bottom Line, an early sustainable ag book for farmers. He has been invited to Russia, Argentina, Chile, and Canada to conduct training in sustainable agriculture, and gives presentations on the topic across the US and beyond.

The organic agriculture community celebrated the career of WSU sustainable agriculture specialist David Granatstein during the National Organic Standards Board meeting in Seattle in April.

Granatstein retired from WSU late last year after 30 years with the university, but his work with sustainable agriculture started with working on a small organic farm in Washington's Okanogan County in the 1970s and the alternative agriculture community that would create the Tilth Assn,

"He's always focused his research, training and advocacy work on what's best for organic farmers," said Miles McEvoy, former deputy administrator for the U.S.D.A. National Organic Program. "His research into soil amendments helps growers spend money where it actually helps."

Granatstein's wife, Elizabeth Kirby, compiled the statistics on organic acreage and production trends the now-booming tree fruit sector has come to depend on. And, reflecting on his careers, he said it's clear that organic and sustainable agriculture is a process of continuous improvement in food production. "I still don't know what the best way to farm is, I think organic is a point on a journey to figure out the best way to farm."

K. Pregelman, Good Fruit Grower, Vol 70, No. 11.

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OOS Fall Fruit Show

Saturday, Nov. 2, 10:00-3:00

Trinity United Methodist Church, 100 Blake Ave., Sequim

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This issue of BeeLine was produced by
Gathering Editor Marilyn Couture,
with input from membership.
Please contribute your articles for our next
Summer issue!

Issue Deadlines:
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Fall August 30

Email your articles to: **couture222@msn.com**
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Links

Here is a list of sites on the web that may be of interest to you.

Related Organizations

- Backyard Fruit Growers
www.sas.upenn.edu/~dailey/byfg.html
- California Rare Fruit Growers
www.crfg.org
- East of England Apples and Orchards Project
www.applesandorchards.org.uk
- Indiana Nut Growers Association
www.nutgrowers.org
- Midwest Fruit Explorers
www.midfex.org
- North American Fruit Explorers
www.nafex.org
- Northern Nut Growers Association
www.northernnutgrowers.org
- Oregon Sustainable Agriculture Land Trust
www.osalt.org
- Western Cascade Fruit Society
www.wcfs.org
- Western Washington Fruit Research Foundation
www.wwfrf.org
- Home Orchard Society
www.homeorchardsociety.org/
- Seattle Tree Fruit Society
www.seattletreefruitsociety.com/
- Seattle Tree Fruit Society—Apple ID program
www.seattletreefruitsociety.com/appleid.php

Fruit Research

- National Clonal Germplasm Repository
www.ars-grin.gov/cor
- Tree Fruit Research and Extension Center, Washington State.
www.tfrec.wsu.edu
- Northwest Berry and Grape Infonet.
berrygrape.oregonstate.edu
- Pedigree: A Genetic Resource Inventory System
www.pgris.com
- Oregon Department of Agriculture
www.oda.state.or.us

Government Sites

- US Dept. of Agriculture
www.usda.gov
- USDA Agricultural Research Service
www.ars.usda.gov

Helpful Sites

- Orange Pippin
www.orangepippin.com
- Kiyokawa Family Orchards
www.mthoodfruit.com
- Red Pig Tools
www.redpigtools.com
- Friends of Trees
www.friendsoftrees.org
- Cornell Gardening Resources
www.gardening.cornell.edu
http://www.fruit.cornell.edu/tree_fruit/GPGeneral.html
- The National Arbor Day Foundation
www.arborday.org
- UBC Botanical Garden
www.ubcbotanicalgarden.org
- The Reckless Gardener
www.recklessgardener.co.uk
- Farm & Garden
www.farm-garden.com
- SeeMeGarden.com
www.seemegarden.com
- GardenGuides.com
www.gardenguides.com
- VitiSearch: Helpful Resources about Grapes
www.vitisearch.com
- Avant-Gardening: Creative Organic Gardening
www.avant-gardening.com
- The Hardy Plant Society of Oregon
www.hardyplantsociety.org
- Ask the Berry Man
www.asktheberryman.com
- BackyardGardener.com
www.backyardgardener.com
- Tom Brown's website
www.applesearch.org

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