Spring 2018

the BeeLine

Spring 2018

Newsletter of the Western Cascade Fruit Society

Inside:

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

BIFC Ongoing Activities at Johnson Farm Orchard 2014-2018

Bainbridge Island Fruit Club's (BIFC) involvement with the Johnson Farm and Friends of the Farm (FOF) has been ongoing since 2014.

BIFC was successful in establishing an inventory of Johnson Farm Fruit Trees; Restoring the Johnson Farm Orchard through selective pruning, grafting, and introduction of new fruit trees; creating new varieties through grafting of older trees; educating the public about growing fruit; and, assessing fruit production.

Starting in 2016 and continuing into 2017, the BIFC has identified about 75 percent of the 66 fruit trees adjacent to the Johnson Farm Pea Patch. These include: apple (45), pear (10), plum (9), and walnut (2). Of the apple varieties, nearly half are Red Delicious. As for those varieties that couldn't be identified, they will continue their quest to identify them from local experts. Their pruning events were significant as was their successful grafting program. In 2018 they will continue pruning, grafting, and planting pregrafted trees where trees have died.

Report submitted by
Darren Murphy BIFC

Orchard Spraying and Following Label Requirements on Common Tree Fruit Pesticides

Written by Carol Black, WSU, Jason Deveau, Ontario Ministry of Agriculture, Food & Rural Affairs Compliance with pesticide labels requires managers and applicators to follow pesticide label directions. The "Directions for Use" section has mandatory language, noted in **bold type** below, that must be followed to be in compliance with federal and state laws. Mandatory label language is stated in this fact sheet for three common pesticides; these statements come directly from the label.

Chlorpyrifos* language excerpt from the label
Orchard Airblast Application
The following **mandatory** spray drift best management practices **are required** to reduce the likelihood of off-target drift movement from airblast applications.
Direct nozzles so spray is not projected above the canopies.
Apply only when wind speed is 3 to 10 mph at the application site as measured by an anemometer outside of the orchard/vineyard on the upwind side.
(WSU recommends applications be made in 3-7 mph winds to increase deposition on the canopy)
Outward pointing nozzles **must be** shut off when turning corners at row ends.

Lime Sulfur* language excerpt from the label
For airblast applications:
Sprays must be directed into the crop canopy, rather than above the canopy. Outward pointing nozzles should be turned off at row ends and when spraying outer rows.
TEMPERATURE INVERSION:
If applying at wind speeds less than 3 mph, **the applicator must** determine if a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. **Do not** make applications into areas of temperature inversions or stable atmospheric conditions.

Mineral Oil* (dormant oil) excerpt from the label
SPRAY DRIFT MANAGEMENT
A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, and relative humidity) and method of application (e.g., ground, aerial, or airblast) can influence pesticide drift.
The **applicator and grower must** evaluate all factors and make appropriate adjustments when applying this product.
The restrictions pertaining to wind speed, temperature inversions, and droplet size **apply to all the methods of application permitted for this product.**
WIND SPEED
Do not apply at wind speeds greater than 15 mph at the application site. *(WSU recommends 3-7 mph winds)*
TEMPERATURE INVERSIONS
If applying at wind speeds less than 3 mph, **the applicator must determine** if a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. **Do not** make applications into areas of temperature inversions or stable atmospheric conditions.
AIRBLAST APPLICATIONS
Turn off outward pointing nozzles at row ends and when spraying outer row. To minimize spray loss over the top in orchard applications, **spray must be directed into the canopy**.

Don't Assume Your Sprayer is Adjusted Properly
Learn About Sprayer Set Up and Operation with Airblast 101—A handbook for best practices in Airblast Spraying. It describes best practices in airblast spraying in clear, conversational language.
A FREE downloadable version of Airblast101 is available at http://sprayers101.com/articles/multimedia/airblast101/ This friendly handbook is aimed at airblast sprayer calibration and configuration.
*Active ingredients were used for review. Consult WSU Pesticide Information Center Online (PICOL) Database http://cru66.cahe.wsu.edu/LabelTolerance.html for product names and links to labels.
Contacts: Carol Black, WSU, ramsay@wsu.edu, 509-335-9222
Jason Deveau, Ontario Ministry of Agriculture, Food & Rural Affairs

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Codling Moth (Cydia Pomonella) and Management Using CYD-X[1]

Sue Ryburn, Cooperative Workstudy Student,
Clackamas Community College, Molalla, Oregon

Codling moth (*Cydia pomonella*) is the most serious pest of apples in the Pacific Northwest, especially in warmer and drier areas. Larvae feed directly on the fruit, either by "stinging" it or boring into it and feeding from within. Stings are shallow depressions where feeding occurred and then stopped. Larvae that bore into the fruit leave characteristic bore holes on the exterior, which fill with frass that extrudes from the hole.

Biology and Life History

Codling moths overwinter as mature larvae in silken cocoons spun under loose bark, in the soil, or in debris at the base of a tree. Pupation is in the spring around the time the first blossoms show pink Adults emerge around bloom, are active only at dusk and dawn, and lay eggs on leaves and sometimes on fruit.

Larvae emerge, begin feeding on fruit, and may bore to the center of developing fruit to feed on the flesh and seeds. As larvae mature, they push frass out the entry hole. After 3 to 4 weeks, the larvae leave the fruit and seek a sheltered spot on the tree to spin cocoons.

The larvae may overwinter in the cocoon, or they may emerge in 2 to 3 weeks as a new flight of adults. These adults are active in July and August. In warm areas, there may even be a third generation. Larvae of the third generation often penetrate fruit but do not complete development before harvest or winter.

Monitoring

During spring, when blossoms are present, monitor with pheromone traps for the presence of codling moth.

In July and August monitor the fruit weekly for new waves of adults. Evaluate 5% of randomly selected trees for appearance of codling moth present on developing fruit.

Cultural Control

Remove fallen fruit and organic debris from around the base of the tree and do not put into compost.

As a preventative measure, spray with kaolin or place kaolin -soaked socks (on smaller trees) on fruit after thinning.

Install bat boxes to attract bats to prey upon codling moths.

According to the PNW Handbook, mating disruption pheromones can be used but are not effective for orchards less than 10 acres.

Management Using CYD-X

Codling moth granulosis virus CYD-X contains a naturally occurring virus that infects and kills codling moth larvae. This virus is host specific. It does not infect beneficial insects, fish, wildlife, livestock or humans.

Granulosis virus is a selective biological insecticide that must be ingested to be effective. Each particle containing the virus is naturally micro-encapsulated within a protein occlusion body (OB) that protects it to some degree from degradation.

Thorough coverage is important. The virus degrades when exposed to UV light. Frequent applications (every 7 to 10 days) are necessary if a grower relies only on granulosis virus for codling moth control especially when codling moth pressure is high. The virus controls larvae, but some fruit damage stings may be evident.

How CYD-X Works

The larval digestive tract of the codling moth is at a pH of 10, a high alkaline environment which dissolves the OB and releases the virus to penetrate the cells lining the gut. The viral DNA then "hijacks" the nucleus of the cell, directing it to replicate many copies of the virus, which rapidly spreads the infection to other organs. Within a few days the infected larva stops feeding and its melting organs fill with virus. Upon death the larva "melts," its fragile outer skin disintegrating to release the liquefied remains of its internal organs, which contain billions of new virus OBs, each capable of initiating a new infection if ingested by another codling moth larva feeding at that site or wherever OBs have been deposited by raindrops, gravity, or by spraying CYD-X. Laboratory studies have determined that a dose of 1 or 2 OBs is all that is required to cause a lethal infection in half of the codling moth larvae tested. A single ounce of CYD-X biological insecticide contains nearly one trillion OBs. The virulent nature of CYD-X toward its host means it is effective at very low usage rates.

Resources

Pacific Northwest Insect Management Handbook, "Apple-Codling Moth." https://pnwhandbooks.org/insect/tree-fruit/apple/apple-codling-moth

Brunner, Jay F. "Codling Moth," WSU Tree Fruit Research and Extension Center, Orchard Pest Management Online. http://jenny.tfree.wsu.edu/opm/displaySpecies.php?pn=5

Cyd-X Technical Memo, http://www.certisusa.com/pdf-technical/cyd-x-technical-2009.pdf

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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. Click on this link and follow the prompts:
http://lists.ibiblio.org/mailman/listinfo/wcfs
Judi Stewart, Forum Administrator

Beating bitter pit in Honeycrisp

by Dave Weinstock
Good Fruit Grower, Oct. 19, 2016

The key lies in combining foliar calcium sprays with reduced potassium fertilization. Growers have long believed full-season foliar calcium sprays will reduce bitter pit, but two Cornell University horticulture researchers, Lailang Cheng and Mario Miranda Sazo have discovered it's only half the solution: Reduced potassium fertilization fills out the rest of the equation.

Bitter pit reduction begins at ground level
Preventing or mitigating bitter pit in Honeycrisp begins before trees are planted, especially in regions like western New York, where soils tend toward acidity.

Applying lime to bring soil pH up to optimal levels — 6 to 6.5 — followed by the right rootstock are the very first steps growers can take to reduce bitter pit incidence.

Liming sites before planting is just one more way to increase calcium availability. "I've known growers whose orchards get very acidic by the second or third leaf. Under those conditions, calcium is not fully available to the roots," said Sazo, Cornell Cooperative Extension fruit specialist.

Sample soil from both the topsoil layer — zero to 8 inches — and the subsoil layer, from 8 to 12 inches. "Do it before planting, and that will tell you how much lime you have to apply," he said.

Cornell Cooperative Extension personnel also recommend three to four foliar sprays of 1.5 to 2 pounds of 78 percent calcium chloride per 100 gallons, at two-week intervals beginning seven to 10 days after petal fall. Follow this with two additional sprays at 3 to 4 pounds of calcium chloride per 100 gallons at four weeks and two weeks prior to harvest.

Rootstock plays an important role in bitter pit susceptibility as well. "Based on data I've seen in the NC-140 trials, Honeycrisp trees on Bud 9 seem to have less bitter pit than those on M.9 or M.26," said Lailiang Cheng, Cornell University horticulture associate professor.

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Ten Antique Apples I Have Grown and Loved

Carl Nollen Runnells, Winter 2018, NAFEX Pomona

I have a special liking for "soft" apples which I prefer to call "mellow." Because they are "soft," rather than firm and crisp, you won't see them at farmers' markets and certainly never in the grocery store. Here are ten antique apple varieties I have grown for over 40 years and recommend:

<u>Ashmead Kernel.</u> A small, greenish yellow apple with the most intense flavor of any. It will pucker your mouth. Not attractive, but it tastes so good!

<u>Chenango Strawberry.</u> A beautiful shiny early August apple with light yellow background and rosy stripes. My semi-dwarf tree died last year and I have already planted a new tree. I miss it!

<u>Duchess of Oldenburg.</u> Medium to large light yellow with light red striping ready late July. The first of all my early varieties. All early apples are "mellow."

<u>Kandil Sinap.</u> A tall skinny tree with small, skinny apples. Beautiful light yellow skin with rosy blushes and a "porcelain" finish.

<u>Mother.</u> A very late tree - noticeably later than all the others to leaf out and bloom. But it catches up. A smallish, mellow apple with orangey flesh.

<u>Opalescent.</u> A large, deep red, late apple that is sweet, crunchy, juicy, hint of strawberries - a well-flavored apple.

<u>Oriole.</u> An early August apple which tree needs plenty of room and as much sun as possible. The one apple I will plant this spring in a better place to replace the present.

<u>Snow.</u> This famous apple with its snow-white flesh and distinctive spicy flavor is not like any other apple variety. A mellow apple that is a poor keeper.

<u>Swaar.</u> The word is Dutch for "heavy." A very late apple that hangs on after frost.

<u>Zabergau Reinette.</u> Large, rough-skinned, russeted, golden brown apple. Many grow as large as a small grapefruit.

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Cordon Fruit Trees: How to Get the Best Harvest From a Small Garden

by Benedict Vanheems, GroVeg, Aug., 2014

Modern dwarfing and semi-dwarfing rootstocks have helped to limit the final size of fruit trees, and when these rootstocks are combined with training the trees as cordons the outcome is an impeccably behaved orchard that packs flavorsome variety into a remarkably tight space.

Cordon fruit trees are simply trees grown as a single stem, with all the fruit swelling on short laterals immediately off this central stem. Cordons are normally grown at a 45-degree angle for the simple reason that this increases the length of the stem, and hence fruits, at picking height.

Because of their compact size a cordon's final yield will never be as weighty as that of a traditional tree. However, the fact they can be planted just 2-3ft apart more than makes up for this and an established tree should still produce up to 22lbs of fruit. Now let's assume that the average small garden is a very modest 17ft long and that cordons are planted along just one side of the garden boundary. Crunch the numbers on this and you'll find a row this long works out to 176lbs of home-grown goodness per season – and all within a strip of ground no more than a couple of feet wide.

Apples and pears make the most successful cordons, although cherries and plums can also be grown like this. Select spur-fruiting varieties over tip-bearers to guarantee plenty of fruits along the entire length of the stem, and make sure you plant varieties that flower at the same time for successful initiation of fruit on those trees that require a pollination partner and heavier yields from those that don't.

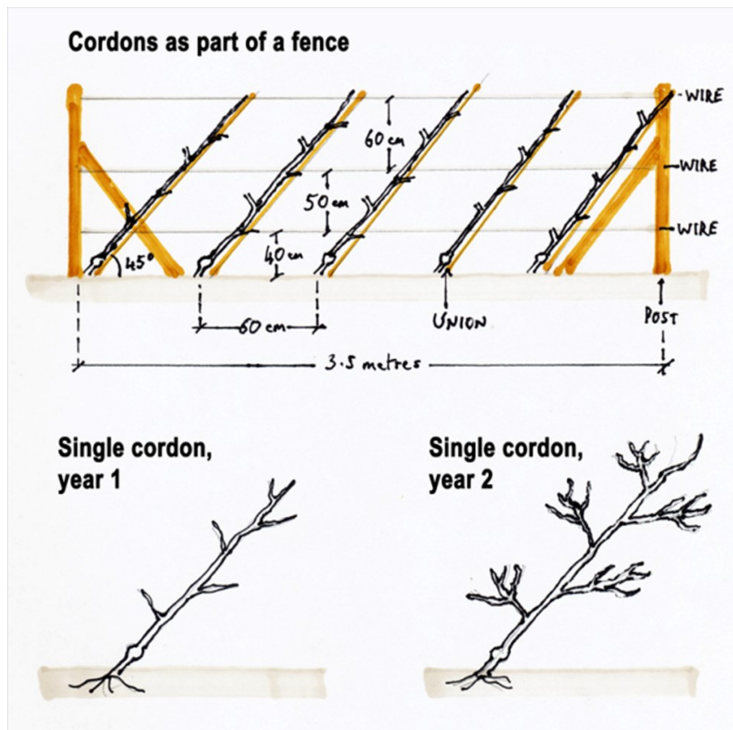
The real beauty of growing cordon fruit trees is their easy-care, easy-access habit. All cordons trained against a wall or within a free-standing row will need a system of taut, horizontal wires into which the stems can be tied. Three wires spaced about 2ft apart will do the trick. Opt for quality wire of a decent thickness that will last as long as the trees. Use thick vine eyes to strain the wires into the upright posts or your wall.

Prepare the ground for each tree by removing all weeds then digging in at least a bucket full (preferably two) of well-rotted manure or compost into the immediate area. Add a handful of bonemeal to help the root system find its feet. Tie a tall bamboo cane into the wire supports where each tree's stem will eventually grow, angling the cane as appropriate. The cane offers the stem further support and gives you something to tie the growing point of the stem to as it reaches out.

Plant each cordon 2-3ft apart, angling the tree at a 45-degrees to meet its cane. Make sure that the union, where the stem meets the rootstock, sits above ground level. The union is identifiable as a bulge at the base of the stem. The scion usually emerges from one side of the rootstock. If this is the case, position the tree so that the scion is uppermost as this will dramatically reduce the chances of it snapping at the point of the union in the future.

A cordon fruit tree won't remain a cordon if it isn't pruned correctly. The crucial prune comes in late summer, when new sideshoots emerging from the main stem are cut back to three leaves. Shoots produced from the laterals – those existing short stems on which the fruit is carried – are cut back to one leaf beyond the basal cluster. This pruning is often carried out with fruits still on the tree, and will force the tree to concentrate on producing flower buds the following spring, which is obviously good news come picking time.

Winter pruning when the tree is dormant involves thinning out congested laterals and cutting out any really old ones that are failing to produce fruit. This will allow more air to circulate, thereby improving the general health of the tree, and encourage new, productive growth to pick up where old growth has left off. The only other pruning to consider is when the main stem has reached the desired height. At this point the new growth at the end of the stem is cut back to just one leaf each spring. Cordons are pretty forgiving fruit trees and are the very best way of enjoying a wide variety of fruits without giving over your entire garden to an orchard.



Cordons diagram by realenglishfruit on November 9, 2011

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Best Pears for the Western Pacific Northwest

Joseph Postman, USDA-ARS National Clonal Germplasm Repository, Corvallis, Oregon; with Bob Norton, Jacky King, Gary Moulton, Sam Benowitz, and Bill Davis

In March 2017, a "favorite pears" panel was held at the Northwest Washington Research and Extension Center in Mount Vernon, Washington.

Kristan Johnson compiled the original list, which was later revised and expanded by Joseph Postman in January 2018.

The number following the pear name indicates the number of panelist votes.

EUROPEAN PEARS

Comice (Doyenne du Comice) (5) - midseason: The queen of dessert pears. Fruit large, often with red blush; flesh sweet, melting, very juicy, aromatic, quite free of grit. A temperamental variety to grow, slow in coming into bearing and reaches perfection only under limited soil and climate conditions. Ripens best if given 3 weeks in storage after harvest. Stores well until Dec. Originated in France in 1849.

Conference (4) - mid to late September: A quality standard for mid-season pears in Western Europe. Fruit medium to large, long pyriform shape; skin smooth, green, partially russeted; flesh pale, tender, melting, very juicy, and sweet. Reliable production, good storage, keeps until January or February. Some scab resistance. Originated in England in 1846.

Orcas (4) - late August: Fruit large, attractive, uniform, slightly lumpy, yellow with red-orange blush. Mild, sweet flavor, excellent for canning or drying. Tree is vigorous and resistant to scab. Discovered on Orcas Island, Washington, in 1966.

Rescue (4) - August: Fruit large, yellow with an attractive reddish blush. Has a mild sweet flavor with melting flesh. Good for fresh use or canning. Good production with little scab. Trees bear well, though not highly vigorous. Rescued near Vancouver, B.C., in 1976 before the original tree was destroyed.

Seckel (4) - mid September: Small fruit with excellent, spicy flavor and dull red color. Not for long storage. Tree moderately vigorous and productive. Susceptible to scab but somewhat resistant to fire blight. A historic American variety discovered near Philadelphia, Pennsylvania, in 1760.

Barlett (3) - late August: The most widely grown pear in the world. Very good fruit quality with typical "pear" shape. Tree is productive and begins bearing at a young age. Susceptible to scab. Originated in England in 1765.

Stuttgarter-Geishirtle (=Zuckerbirne) (3) - early August: Fruit small with red blush. Can be eaten ripe from the tree. Highly productive, excellent crunchy flavor. Tree not highly vigorous. Will fit in smaller yards.

Blake's Pride (2) - late August: Fruit of moderate size with attractive russeted skin; flesh firm and flavorful. Stores until early November. Tree healthy, vigorous, flire blight resistant. Introduced by USDA Agricultural Research Service in 2002.

Bosc (2) - late September to October: Good late-season dessert pear. Fruit elongated, usually russeted; flesh firm and crisp with rich buttery flavor and pleasant aroma. Good for baking or poaching. Needs a few weeks of cold storage for best ripening. Can be stored until January. Tree is productive; somewhat susceptible to scab.

Harrow Delight (2) - early September: Fruit medium size, with light red blush; flesh flavorful, smooth texture similar to Bartlett. Tree is productive; resistant to fire blight and scab. Developed in Ontario, Canado.

Kalle (=Red Clapp Favorite) (2) - August: Red sport of Clapp Favorite. Fruit uniform in size with attractive even red skin color, mild sweet flavor. Tree is vigorous and productive. Nice in a market display with green pears. Very susceptible to scab.

Sirrine (2) - mid September: Excellent fruit quality, but tree can be sprawling, difficult to manage, and not very productive.

Atlantic Queen (2) - mid September: Very large, yellow-green fruit up to 1.5 pounds each. Fruit is aromatic with good flavor and buttery texdture. Tree is productive even under adverse growing conditions, and is generally disease resistant.

Abate Fetel (1) - mid season: Excellent fruit quality, long banana-shaped fruit, yellowish-green with slight russet; flesh white, slightly crisp, honey-like flavor. Favorite pear in Italy. Susceptible to scab and fire blight.

Bella di Giugno (=Mirandino Rosso) (1) - late June: Very early, small Italian pear with rich, buttery flavor. Sturdy, easy to grow tree, susceptible to scab.

Concorde (1) - September: Good keeper; firm yet juicy texture, sweet and aromatic, vanilla-like flavor. A cross of Conference x Comice from England. Precocious and high yielding.

Gem (1) - late August—September. A recent USDA Agricultural Research Service introduction. Attractive, uniform-shaped fruit that hang well on tree; nice balanced flavor. High yielding, good storage, fire blight resistant.

Cont. on page 7

Cont. from page 6 Best Pears PNW

Highland (1) - late September—October: Fruit yellow with light russet; flesh melting, juicy, sweet, fruity flavor. Ripens several weeks after Bartlett and keeps well in storage; susceptible to fire blight.

White Doyenne (1) - September: Fruit of medium size with smooth, waxy skin. Flesh buttery, moderately juicy, aromatic "like a fine, rich, buttery chardonnay," sweet yet tart, with musky undertones and a strong perfume.

PERRY PEAR

Hendre Huffcap (1) late September: Consistent bearing, makes a very good hard cider. Fruit is small and yellow/ green; high in acids and low in tannins.

ASIAN PEARS

Hosui (1) mid-season, ripens with Chojuro: Large, golden russeted fruit is sweet, crisp and juicy. Russeted skin resists blemishes. Tree is rather vigorous and willowy. Sister varieties 'Kosui' and 'Shinsui' are also excellent.

Kikusui (1) early September: Round, yellow pears are sweet and juicy. Trees are productive even when young. Resitant to fire blight.

Kosui (1) August: Yellow-bronze russet, fruit is similar to but smaller than Hosui. One of the best flavored Asian pears; fruit must be thinned for good size.

Mishirasu (1) late September: HUGE fruit! Rough, brown russet; crisp and crunchy; good flavor.

Shinsui (1) mid-August: Fruit of medium size, yellow-brown russet; flesh crisp, juicy, very sweet, fine texture. Excellent eating quality.

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The Spring 2018 BeeLine was produced by
Gathering Editor Marilyn Couture,
with input from membership.
Please contribute your articles for our next
Summer issue!

Issue Deadlines:
Winter December 15;
Spring February 15;
Summer May 15;
Fall August 30

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

WCFS News

WCFS Spring Board and General Membership Meeting met on Vashon Island, April 7, 2018.

Highlights included: Darren Murphy, BIFC, was elected Vice President and Heide Madden, BIFC, was elected Director.

Seattle City Fruit research grant of $1980 was continued.

Temperate Orchard Conservancy was awarded $5000 gift. This will enable TOC to go forward with their irrigation plan for the 4900 apple varieties they have grafted. In 2015 WCFS gave TOC $2500 to assist with fencing. We will all benefit from TOC mission to establish a science research center for the genetic testing of temperate tree fruits, the I.D. of varieties and the preservation of heirloom specimens.

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2018 NAFEX Annual Meeting

Call For Presentations and Papers Jerry Lehman, Meeting Chair, 7780 Persimmon St. Terre Haute, IN 47802 Plans for the 2018 annual North American Fruit Explorers (NAFEX) meeting are advancing. This meeting and conference will begin Thursday, July 26, 2018 and continue through Saturday, July 28 with possible extension of tours on Sunday, July 29. The meeting facility is the conference center at the Danville Area Community College (DACC) in Danville Illinois which is 2.5 hours south of Chicago. Mark your calendars now and schedule your vacation such that you can attend this educational and fun meeting.

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The Good and Bad of Different Rootstocks

Jared Johnson, Ross Courtney, TJ Mullinax
Good Fruit Grower, Feb. 12, 2018

Nursery owner warns growers it's not as simple as asking which one is the best. A young Geneva 41 rootstock grows in September at Helios Nursery in McMinnville, Oregon. Nursery owner Tye Fleming tells growers the G.41 is productive and resistant to fire blight but can struggle with transplant.

Nurseries don't have a single, best rootstock for all orchards any more than a mechanic has a single, best tool for all repairs. The tree fruit industry needs to stop thinking that way, said Tye Fleming, owner of Helios Nursery. "It's about matching the rootstock to the need that we have at that particular time," he told growers at December's Washington State Tree Fruit Association Annual Meeting in Kennewick.

With that, Fleming ran down a list of good and bad qualities of eight different rootstocks. The overall gist is that genetics from the relatively new Geneva rootstock collection give growers more choices, the way cultivar genetics have opened the door to a new array of varieties for the marketplace. Gone are the days of using Malling 9 rootstocks as the crescent wrench of the fruit industry.

"We've been using M.9 successfully, but we need to do better," he said. M.9 rootstocks produce well in layer bed production, grow well in nurseries and transplant well into orchards, he said. But they are susceptible to replant disease, woolly aphids, fire blight and winter injury — problems the industry used to just accept.

"Well, we don't have to accept those because we have new genetics coming down the road," he said.

Enter the Geneva rootstocks — G.11, G.41, G.214, G.935, G.210, G.969 and G.890 — released by Cornell University breeders, which give growers a colorful, if confusing at times, palette of choices.

"It has taken 15 years to get to this point, and 10 years to commercialize the few of the 28 Geneva (roots) that have been evaluated by the industry," said Tom Auvil of North American Plants and a former program manager for the Washington Tree Fruit Research Commission. "The next five years will see even more focus and perhaps five more new Geneva rootstocks released."

Each of the seven commercially available Geneva rootstocks have their own list of pros and cons, which Fleming detailed in his speech.

Here are a few highlights:

—G.11 is productive and somewhat resistant to fire blight, but is susceptible to woolly aphids and runts out in poor soils.

—G.41 is productive and resistant to fire blight, woolly aphid and replant disease with good cold tolerance but does not put out new roots, breaks roots easily, can have brittle graft unions with certain varieties and can struggle with transplant.

—G.935 propagates well, produces good crops and resists fire blight. It can feasibly be cropped in its second leaf, too. One grower made $900 per bin on a second leaf Honeycrisp, Fleming said. But the root has been sensitive to a mysterious condition that may be a combination of viruses when paired with certain cultivars. Research into that problem is underway.

—G.969 and G.890 seem like a silver bullets at first glance. They're easy to propagate, productive and resistant to fire blight, replant problems and woolly aphids. However, G.890 may be too vigorous for some situations, and nurseries have little data about the G.969's vigor and cold hardiness.

The challenge for nurseries is to improve on the quality of all the rootstocks to give growers the right tools even if some of them are hard to work with, Fleming said. The nurseries only have trees two years; growers have them 20.

"It's not about being easy," Fleming said. "We've got to get the right genetics to the grower so the grower can be successful."

In the meantime, he encourages growers to consult with their nurseries to make the best rootstock choices and to even run a few of their own trials.

"They also need to be at least playing with the different rootstocks to see how they perform in their location and with their farming style," Fleming said in a follow-up interview with *Good Fruit Grower.*

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WCFS Tahoma Booth — Washington State Fair

August 31 - September 23, *2018* Get on Tahoma's List to help out at the Fall 2018 Washington State Fair.

Please let Bill Horn know if you can help.
Bill Horn, Tahoma Chapter Treasurer, 253-770-0485

Legal battle over Cosmic Crisp unlikely to affect availability of new trees

Kate Prengaman, Ross Courtney, Good Fruit Grower, Mar 16, 2018

Sources describe how dispute began

Washington State University has spent two decades developing WA 38, now known as Cosmic Crisp. (TJ Mullinax/Good Fruit Grower)
Industry leaders suspect that dueling lawsuits between Washington State University and one of its own start-ups over the rights to sell Cosmic Crisp apple trees will not impact the overall supply as the state's fruit industry ramps up production of the much-anticipated variety.

"There's a lot of trees out there," said Dave Allan of Allan Bros., in Yakima, Washington, and part of a committee formed to steer the Cosmic Crisp's commercial introduction. "We've got more than enough."

Ultimately, market forces — not lawsuits — will determine the success of the WA 38, which was developed over the course of 20 years for Washington growers and will be sold under the trade name Cosmic Crisp, Allan said. Some estimates put the industry's investment in the apple at nearly $500 million. Growers began planting in 2017 with more coming this year.

However, suits, filed in both state and federal court, illustrate the high value and high stakes for access to Cosmic Crisp.

In February, Phytelligence sued the university in King County Superior Court for breach of contract after WSU terminated the Seattle tissue culture company's propagation agreement and instructed it to destroy all the trees they have grown so far, complaining that WSU is not honoring Phytelligence's option to pursue a commercial license.

"Honestly, it's all pretty simple," said Ken Hunt, Phytelligence CEO. "We had an option. We exercised it. We're not asking for anything special."

In March, WSU filed a counterclaim in Superior Court and a lawsuit of its own in U.S. District Court in Seattle for trademark infringement.

It claims Phytelligence allegedly sold trees to a Yakima producer, which Phytelligence denies. "We ultimately felt like we had no choice," said Phil Weiler, WSU vice president of marketing and communications.

Timeline leading up to Cosmic Crisp litigation

1998 *– WSU professor and breeder Bruce Barritt begins work on the apple variety WA 38..*
2011 *– WSU professor Amit Dhingra founds Phytelligence to commercialize micro-propagation technology with university support.*
February 2012 *– Barritt files for patent for WA 38 with U.S. Patent and Trademark Office.*
November 2012 *– Phytelligence and the WSU Research Foundation, a now-extinct entity for commercializing WSU technology, enter into an agreement to propagate WA 38 that contains an "option to participate as a provider and/or seller" if the cultivar is released by WSU.*
February 2014 *– WSU receives patent for WA 38.*
2014 *– WSU enters into an exclusive commercialization agreement with Proprietary Variety Management, PVM, for WA 38. PVM then sub-contracts with the Northwest Nursery Improvement Institute, NNII.*
2016 *– Phytelligence tries to seek a license to sell WA 38 through WSU and PVM, but was told to work through NNII to obtain a license like every other participant.*
December 2017 *— WSU alleges that Phytelligence sold 135,000 WA 38 trees without a license in April 2016, but the company and alleged buyer say the order was cancelled when Phytelligence could not get a license.*
January 2018 *– WSU notifies Phytelligence that it was terminating the Propagation Agreement and ordered it to destroy all the plant material in its possession.*
February 2018 *– Phytelligence sues WSU in King County Superior Court alleging WSU broke the Propagation Agreement.*
March 2018 *– WSU files suit against Phytelligence in U.S. District Court in Western Washington for patent infringement and breach of contract.*
Compiled from legal filings and interviews

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More Lost Apple Varieties Found in Eastern Washington

Joanie Cooper, TOC, in correspondence with
Marilyn Couture, OOS, April, 2018

The *Shackleford, McAfee, Surprise #1*, and *Saxon Priest*, four apple varieties thought to be extinct, have been rediscovered still growing in eastern Washington. In addition, eight other rare or lost apples were also found in the region. The trees, located by David Benscoter of Chattaroy, WA, and confirmed as rediscovered by apple experts, Joanie Cooper and Shaun Shepherd of Oregon, have links to eastern Washington in the late 1800's and early 1900's. The *Shackleford* was found growing ten miles north of Spokane, the *McAfee* was located near Steptoe Butte, forty miles south of Spokane, the *Surprise #1* was located near Waitsburg, WA and the *Saxon Priest* was found growing near Ellensburg, Washington.

The other rare apples found in old orchards in the area include the *Autumn Gray, Ewalt, Flushing Spitzenburg, Republican Pippin, Bogdonoff Glass, Flory, Kittageskee,* and *Early Colton*.

Between 2014 and 2016 three other apples believed to be lost, the *Nero, Dickinson*, and *Arkansas Beauty* were located in eastern Washington.

In October and November of 2017, Benscoter sent apples from the previously lost trees to apple identification experts Shepherd and Cooper of the Temperate Orchard Conservancy in Oregon. They confirmed the identity of the apples by comparing the apples to detailed written descriptions and antique watercolor paintings. Another apple identification expert, John Bunker of Fedco Seeds in Maine, joined in the identification of the Shackleford.

It is estimated that of the 17,000 named apple varieties originating in North America, only around 4,000 still exist today. Some of the lost varieties are truly extinct, having been chopped down for firewood or ripped out to make room for more profitable crops or buildings. Others, like the *Shackleford, McAfee, Surprise #1*, and *Saxon Priest,* have been forgotten and abandoned.

Research indicates over 220 apple varieties were grown in eastern Washington and at least 25 lost apple varieties could still be growing here. Several trees are currently undergoing a vetting process to determine if they are matches with lost varieties.

The *Shackleford* is a large, purple-red apple that keeps well in storage. Records indicate both the Shackleford and the McAfee were sold at the Hanford Nursery in Oakesdale, Washington. The McAfee was found about 8 miles from the nursery. According to a magazine article from 1906, the nursery later opened a branch in the Spokane valley, about 15 miles from where the Shackleford was found.

The *Saxon Priest,* also known as the *Hungarian Saxon Priest*, was one of 20 Hungarian apple varieties sent to the Washington State Experiment Station. Samples were sent from Pullman, Washington to the USDA in 1896. In turn, George Ruedy, a nurseryman in Colfax, WA, participated in testing of the apples. The apple is small, yellow skin with fine red stripes and light red blush. It is a tasty dessert apple.

The *McAfee* apple is believed to have been planted by a homesteader, Robert Burns. Burns and his wife Mecie moved onto their homestead on the north side of Steptoe Butte in 1888 and started growing wheat. However, in 1893 an unusually wet fall caused Burns to lose his entire crop of wheat. The following spring he decided to diversify his farming by planting apple trees and other fruit to sell. However, fruit trees planted in the 1800's were grafted onto standard rootstock that takes anywhere from 6 to 10 years before they begin producing fruit. A lack of time and planting mistakes led to him losing his homestead in 1899. The *McAfee,* also known as *McAfee's Nonsuch*, was a yellow apple splashed with red. It is described as a winter apple with very good taste.

Surprise #1 (also known as *Blood Apple* and *Success*) is said to have originated in Colorado. Specimens were sent to the U.S.D.A. in 1898 for evaluation. It is medium sized, the skin is brownish yellow with slight red coloring under the skin. The flesh is deep pinkish red and has an excellent flavor.

The *Shackleford, McAfee, Surprise #1*, and *Saxon Priest* were discovered with help from many individuals and groups. Shepherd and Cooper, in addition to identifying apple varieties, run the Temperate Orchard Conservancy (TOC). The TOC, located in Molalla, OR, is one of the largest repositories of individual apple trees in the world. With an inventory of over 4,000 different apple varieties, TOC ensures that more varieties will not become extinct. Another contributor to the search for lost varieties is the Lost Apple Project (LAP) under the Whitman County Historical Society (WCHS).

The following are summaries of the other apple finds:

Autumn Gray: First recorded in 1869. A small yellow apple, nearly covered with thin nettings of russet. Tender, rich, aromatic, very good for dessert. (also known as *Autumn Pomme Gris*).

Ewalt: This apple was grown by John Ewalt at Bedford City, PA before 1800. A large yellow apple with a crimson bnlush; tender, juicy, brisk sub-acid flavor. Very good quality winter apple.

Flushing Spitzenburg: Named by William Prince of Prince Nursery in Flushing, N.Y. prior to 1820. Medium to large in size, with deep orange-red skin. The flesh is white; juicy and sweet, sometimes stained red, ripe in October.

Republican Pippin: Found by George Webber in Lycoming County, PA., growing in a woods, prior to 1800. A large apple with yellow skin, striped with bright red. It is tender, juicy and good quality for kitchen use.

Bogdanoff Glass: This was one of several varieties imported by J. L. Budd at Iowa State Agricultural College in 1880. They came from the Bogdanoff Estates in Russia. The apple is large, smooth, glossy green becoming bright pale yellow. It has crisp flesh, good quality for eating.

Flory: This seedling was grown by Mr. Flory in Montgomery County, Ohio, introduced in 1867. A beautiful yellow apple of very good quality for kitchen or market use.

Cont. on page 11

Cont. from page 10 More Lost Apples

Kittaeskee: Probably originated with the Cherokee Indians in North Carolina, introduced in 1851. It was sent to France by P. J. Berckmans Nursery, Augusta, Georgia, in 1860. It was sold in Europe until at least 1905. The apple has yellow skin flushed with bronze. It is small to medium in size, the flesh is nearly sweet and aromatic. A very good winter apple. Considered Extinct.
Early Colton: Tom Brown, an apple "detective" in North Carolina, found an *Early Colton* (*Colton*) Several years ago. The tree found in Washington is only the second known heirloom aged apple of this variety. The apple originated before 1840 and ripens very early. It is medium sized, round, with greenish yellow skin.

All of these apples were considered lost. There is no known source for scions or trees, so you can imagine our feeling of success to have identified so many. Shaun and I were very glad to see the last of those red-geen striped apples. But next year, we'll be excited to start again.

Joanie Cooper, TOC

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Home-Made Aphid Trap

From Printerist

Just use an upside down yellow Solo Cup pinned to a wood stake and cover the yellow cup with a thin layer of Vaseline. Aphids are drawn to the yellow color thinking it is food, stick to the cup and die. It takes very little time to make but will save your plants from Aphid damage.

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Vermiculture—cast iron claw foot bathtub

Interview with George Will, Sequim, in which he demonstrated his organic fertilizer system using red wigglers.

M. Couture photos

Fine mesh is placed in bottom of tub over the drain to prevent worms from falling into the sump. Liquid drains into bucket. Dilute 50/50 with water and use as plant feed.
Tub has removable lid (¾"plywood). Layer cardboard, newspapers as worm bedding. Add decomposing kitchen waste, peelings, leaves, old bread, banana peels, soft fruit, etc. to one end of the tub where it will be moist. After eating, worms will move into the dry bedding to nest. Their waste is an excellent, nutrient-rich organic fertilizer and soil conditioner.

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WCFS NEW MEMBERS

OOS	BIFC
Kathy and Harry Cook	Joe Alonzo
Johanna Striar	Sheri Goade

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Chapter News

OOS elected a new President, **Paul Gotz.** Paul is an expert cidermaker, having gained knowledge and information from a weeklong workshop with The Northwest Cider Society, The Western Washington Fruit Research Foundation, Mt. Vernon, WA.

Paul is also President of Seattle Soccer Referee Association.

Paul will present “All Things Cider” to OOS Members May 8, 7pm, Clallam Courthouse.

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WCFS OFFICERS AND BOARD MEMBERS

President	Ron Weston ronweston09@comcast.net
Vice President	Darren Murphy GardendadBI@gmail.com
Secretary	Carlyn Syvanen syvanenx@teleport.com
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Tahoma	Paul Mallary paulmallary@gmail.com
Vashon Island	Charon Scott-Goldman Charon@centurytel.net

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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

Goverment 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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