



The Community Orchardist

February 2014

Michael Phillips, Editor

A year passes since the last newsletter. Our apple crop here in New Hampshire was decent in 2013, and much happened on the personal front. Yet mostly ... I simply didn't buckle down to complete new articles despite bringing pen to hand more than once. Certainly the trees keep me going as does in-depth discussion whenever I meet up with other growers. This coming year will be good too, I just know it. Many are experiencing greater cold this winter than has been seen for a while. Keep in mind this will impact insect pests - it's said brown marmorated stinkbug numbers will be drastically reduced, for one - and that ought to keep you in good cheer to *Grow Healthy!* once again.

An Extremely Wet Year, An Extremely Dry Year

Looking back helps us learn essential insights in becoming more adaptive growers. The weather in any given season determines the possibilities as we dance to fungal rhythms and the drumming beat of certain pests. Those in the East had a deluge season+of too much rain whereas I know folks out West dealt with extreme drought. I share two of my lessons in encouraging you to do similar analysis.

Last May found me on a Mid-Atlantic teaching tour during the week my orchard came into pink. This moment before bloom demands attention but nevertheless I missed the timing for the second holistic spray. Bloom had begun by the time I returned, and now I would not use neem oil in the mix. (The concern being pollinators working fruit blossoms.) One can just skip stimulating immune function in the holistic approach, of course, and within a week six inches of rain sealed the deal for primary scab on susceptible varieties. The lesson here lies in preparing ahead for Plan B. This year I will trial **Karanja Oil** both in bloom time sprays and as a synergist with neem oil (using karanja as a third of the fatty acid rate+in the holistic core recipe). This other seed kernel oil lacks the azadiractin compounds of neem that potentially could impact pollinators.

Which brings me to complete photosynthesis shutdown and philosophical dogma. Trees in this part of the world literally shut down shoot growth through June and for the first half of July. It rained and rained and rained again. The sun was not to be seen. Photosynthesis was little more than a theory, and for a guy seeking to boost immune phytochemistry, there was simply no internal oomph to check the spread of secondary scab.

Such extreme conditions warranted stronger medicine. I thought long and hard about applying micronized sulfur one or two times to alter the acidity on the leaf surface and fruitlets to combat scab. A comparison trial of one block *with*, the other block *without*, would have been particularly brilliant. Yet I kept my intention to no longer rely on mineral fungicides, thinking this essential to the holistic learning curve. That was too rigid a position in 2013 given the unforeseen lack of sweet sunshine. Sticking to one's dogma in challenging circumstance isn't necessarily the best call—and frankly, I could have done better. Both scab-immune varieties and scab-tolerant varieties were fantastic; varieties like Gala simply needed an allopathic touch.

Getting a Handle on Spotted Wing Drosophila



Since landing on the West Coast in 2009, spotted wing drosophila (*Drosophila suzukii*) has set its eyes on many soft fruits. These small flies are very much like the native fruit flies flitting around a bowl of overripe fruit or the compost pile. Only now everything gets compounded as this immigrant species attacks immature fruits as well. Eggs are laid in ripening fruit; maggots hatch out en masse by harvest time; a gooey mess falls to the ground to start the cycle anew. SWD have up to thirteen generations per season, with a single female laying as many as 375 eggs. The life cycle from egg to sexual maturity takes a mere eight days. SWD found its way across the North American continent in three years, undoubtedly propelled by wind. These flies overwinter

surprisingly well. The action starts by midsummer. **No grower can be smug.**

Highest risk crops seem to be late summer blueberries and fall ripening raspberries, followed by the autumn picking of everlasting strawberries. White-fleshed peaches seem more heavily attacked than standard peaches. Colored grapes seem to be more heavily hit than green colored varieties. Warmer zones will experience all this accelerated forward, putting elderberries and possibly even currants and gooseberries at risk.

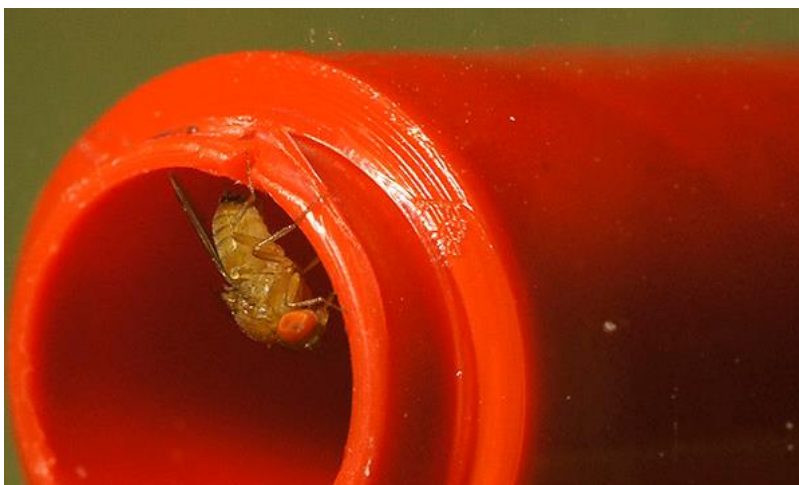
Monitoring SWD

Trapping so-called vinegar flies at emergence allows growers to precisely time when to address the first surge. Traps for SWD are readily made from red 18-ounce plastic cups with lids. Apply a black band with electrician's tape an inch or so below the rim. Use a heated nail to make holes in the cup, through the black band, to allow the insects to get in, and the odor to escape. Leave one quadrant of the cup without holes, to make it easy to pour out and examine the liquid bait.

The bait of choice is good old apple cider vinegar, with a bit of soapy water added to make sure the surface tension is broken so that drowning insects sink. Two plus inches of liquid will suffice. Some people stand a yellow sticky card on edge inside the cup as a convenient means of assessing that the right culprit has indeed been snagged.



Set out traps prior to at-risk fruit starting to ripen. Mid June would be appropriate across Zones 5 and 6. Two is plenty for monitoring purpose, perhaps go with three in a quarter acre planting or larger. This next bit is critical: Place the traps within the crop plant, in the shade, slightly beneath foliage yet in the zone near fruit. Placing it in the shade is hard to do for strawberries, but hopefully the early summer harvest will be done before SWD arrives. Check traps every week at



Female SWD entering trap, courtesy of **Good Fruit Grower** magazine

first, moving to every few days by August. Keep checking as long as ripe fruit crops need protecting.

Nature's Edge

A winter of deep cold sets back this menace but we don't yet have a handle on absolute kill. Two Septembers ago I experienced SWD for the first time,

on fall ripening raspberries, but last year not a peep. Zone 4 may well keep this edge, especially given limited snow cover and significantly below zero temps early on. In warmer places, SWD has been found in infested cherries still hanging on the trees as late as November. Both male and female flies were found at the end of January in Hood River, Oregon, in traps where the vinegar bait had actually frozen.

The upshot? Spotted wing drosophila may take a longer time to rebuild numbers following a true winter, thereby letting earlier varieties squeak by the finish line before overwhelming maggoty mess takes the next variety on deck. A cool, wet summer seems to have a similar effect, further delaying peak activity. But by August and September – look out! In certain SWD will return here when warm summer winds blow those first mated females up from the south.

One parasitic wasp so far has been identified that attacks this vinegar fly. This particular pteromalid wasp's life cycle, however, takes about three times as long as that of the drosophila. This is not unusual, as many wasp species have a longer developmental time than their hosts. But keeping up with the frenzied pace of SWD may be another matter entirely.

Organic Sprays for SWD

Drosophila are not controlled by the GF-120 bait commonly used to control cherry fruit flies (which are more akin to apple maggot fly than fruit flies). Organic growers have primarily been using a spinosad formulation to prevent fruit damage. Entrust (and more dilute products like Monterey Spray for home orchardists) gives 5 to 7 days of effective knockdown – but ideally is not the only part of a spray plan. Early morning applications of PyGanic are rotated in on the second and third beat to lessen the odds of SWD developing resistance to spinosad. Note the emphasis on dawn timing as this is a pest species with a predilection towards vulnerability as the sun rises. (Circadian rhythms for insects involve a cycling of enzymes that could potentially detoxify insecticides. This peaks at one time during the day and wanes at another. This is when the insect's detoxification system is at its weakest.) Apply spray materials on the undersides of the foliage, and the interior part of the canopy, as the flies spend little time on upper surfaces of exposed leaves.

Lest We Forget

Every insect challenge correlates back to healthy plant metabolism. Proteins result when photosynthates (carbohydrate sugars) get combined with nitrogen in the plant cell. Breakdown in protein synthesis attracts insect pests. Grower investment in trace minerals, fatty acids, fungal diversity, and taproot fertility in the vicinity of fruit plantings are the building blocks of healthy plant metabolism. Bob Wilt of [Sunset Valley Organics](http://www.sunsetvalleyorganics.com), chief crop blueberries, does not have a SWD problem although his neighbors' plantings are overwhelmed. Ideally we reach for health before we reach for compensating medicines.

The Proper Pruning Cut

Tree response to a pruning cut has best been unveiled through the work of Alex Shigo. Here was a guy ready and willing to take on tree assumptions. Beginning in the late 1950s, Dr. Shigo led a pioneering project on the discoloration and decay of trees for the USDA Forest Service. He and his co-workers would go on to dissect over 15,000 trees, mostly with a chainsaw. The patterns found within revealed new ways of looking at trees and how they function.



This photo of a dissected stem shows the place to make a correct pruning cut (the black line to the right) and a poor one (the black line below the other line). Take note of the *branch protection zone*, being the discolored portion below the rotted branch stub. Trees compartmentalize in response to injury in order to prevent further spread of rot organisms and decay. This is why, properly speaking, according to the ever-observant Bill MacKentley of **St.**

Lawrence Nurseries, we never should say trees %heal+a pruning cut. The callus that forms along the edges of that cut begins to close the wound but never is the tissue within regenerated. Compartmentalization is a brilliant strategy on the tree's part.

These vertical dissections show the internal results of a correct cut (left) and a poor cut (right). The latter is called a *flush cut* because the branch collar has been removed and thus the plane of the shear dissects the *branch bark ridge* (the ridge of bark in a branch crotch that marks where branch and trunk tissues meet, often extending down the trunk.) It takes a keen eye to note the internal differences here. The dead zone resulting from a poor cut extends both up and down the immediate annual growth rings. Cambium tissues are very unlikely to ever close such a wound. A proper pruning cut, however, leaves the branch collar and thereby the wound eventually does close to the outside. The beauty of this years down the road makes me marvel how a tree can work with the travails of life and still prevail. We have something to learn from this ourselves.



All of which brings up the concept of **rip and tear pruning**. This European practice involves literally tearing shoots off by hand instead of cutting away with a pruner. The thinking behind this is to lessen aggressive vegetative response, especially in dwarf plantings, especially in the first part of summer, especially in varieties with a strong vertical growth habit. Individual cells are not cut when tearing off a branch . the tear line basically negotiates its way between cells . resulting in a wound that supposedly closes faster and produces fewer suckers. Fire blight conditions are quite favorable at this point in the growing season yet those using this technique claim fewer bacterial strikes ensue. The resulting wounds to the tree are not for the faint of heart by any means. High-density growers will take out branches as big as $\frac{3}{4}$ inch in diameter. Typically, this is considered to be the diameter limit for laterals in making way for new stubby growth on trees planted as little as two feet apart.

I admit to tearing out developing watersprouts in the weeks following petal fall when handthinning crop load. Removing supple and green growth like this comes easy, with relatively little damage to the branch. Ripping off bigger laterals seems outright disrespectful, however, to our tree friends. Surely, Alex Shigo would have felt much the same about *rip and tear*, eh?

Competitive Colonization for Skeptics

Growers rightfully want ~~proof~~ that holistic methods work. That requires trail breakers willing to trial biological concepts and further tweak recipes to foster both health and nutrient-dense productivity. Far more will sit on the sidelines, ever familiar with continuous fungicides, skeptics to the end.

The thinking behind competitive colonization is that *ruffians don't like a crowd*. Fungal pathogens and opportunistic bacteria alike require a relatively open stratum to get a foothold, be that the leaf surface or the delicate nature of an open blossom. Elaine Ingham (of compost tea fame) teaches that a colonization rate of 70% is more than adequate to outcompete invaders. Yet conditions don't always favor a crescendo of benign organisms. Acid rain, heat and drought, even food resources running low will whittle away the necessary microbe edge to stop disease. Biological reinforcement in the form of compost tea, effective microbes, and fermented brews . coupled with fatty acid nutrition . is designed to maintain the right sort of crowd.

Do we know what happens when we supplement organisms? Not particularly. Natural microbes surviving on the fruit or leaf surface may eat the new guys in reestablishing their niche. Maybe the new guys inspire a biological defense, kicking who knows who into antibiotic gear to produce substances that kill or damage pathogen cells. Maybe the new guys become the requisite crowd in their own right. All the while amino acids, vitamins, and antioxidants are being produced to feed other microbes and the tree itself. These are the ways of arboreal diversity.

More and more products come to market each year targeting specific pest and insect challenges by means of biology. Efficacy trials provide a trademarked proof+for particular allies on the competitive front:

BlightBan uses the beneficial bacterium, *Pseudomonas fluorescens* A506, for the suppression or control of fire blight on pome fruits. A506 basically outcompetes fire blight bacterium for nutrients in apple and pear tree blossoms.

Blossom Protect consists of two strains of *Aureobasidium pullulans* in a citric acid base that outcompete fire blight for space and nutrients on open blossoms. Other formulations of these same fungal yeasts are targeted for gray mold on grapes, botrytis on tomato, and so forth.

Zen-O-Spore is a live spore preparation of a non-pathogenic saprophytic fungus, *Ultocladium oudemansii*. This biological control agent outcompetes brown rot on stone fruits and gray mold on strawberries, among others.

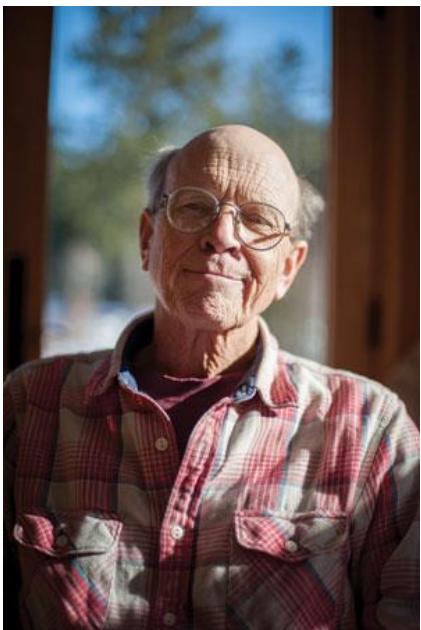
Beneficial species like these are part of the overall diversity we're encouraging with holistic methods. Sit on the fence no longer, my skeptical friends.

Question of the Month

You speak about treatments for fruit trees that could be sourced from your own farm. Yet it seemed to me that very few of the ingredients you mention for use in the holistic sprays are indeed sourced on your farm. I too am interested in sourcing what is needful from my own homestead, for both economic and carbon footprint reasons. I am concerned with sustainability over the long term, and I suspect that neem oil, seaweed, and fish products are going to be less and less affordable to me as we travel down the energy descent.

Holistic sprays are about deep nutrition and competitive colonization, all aimed at building orchard health. I constantly suggest alternatives to what makes up that ðcore recipeö so people can indeed start to source the ingredients that make the most sense. And to do that you need to think about certain constituents in herbs, unsaturated fats available in basic foods, brews to enhance microbe diversity, and mineral balance in the soil. The underlying principles of nutrient density do not change.

Brewing aerobic compost tea certainly is on par with using effective microbe cultures. The terpenoids and flavonoids in plants like wintergreen and giant knotweed (to name just two) can be used to induce systemic resistance in our fruit trees. Similarly, fatty acids can be found in raw milk, coconut oil, and perhaps even plant-generated oils you press out at home. Fermented nettle tea certainly boosts trace mineral levels though maybe not quite as widely as seaweed and crystallized sea minerals. What we don't have is another plant source with the same azadirachtin impact as pure neem oil. (But then I'm inclined to be okay with occasional fair trade around the globe, *he says as he sips his coffee.*) I laughed at first when a lady once asked me about using ðliquid chickenö instead of liquid fish í but she had a very good point. All of this is open to the wiles of a good cook. Understand the principles and you'll find indigenous ways to promote outrageous plant health.



The Tale of Johnny Bunker

Were Johnny Applesed alive today, he would certainly get on well with our tree brother in Maine, John Bunker of **Fedco Trees**. Talk about a promoter of heirloom varieties and fermented possibility! What's fun is sharing good press for a good friend. Rowan Jacobsen wrote an exquisite article about John in the **March 2013 issue** of *Mother Jones* magazine last year. Here's a taste:

Everywhere he travels in Maine, from the Common Ground Country Fair to the many Rotary Clubs and historical societies where he speaks, Bunk is presented with a series of mystery apples to identify. He's happy to oblige, but what he's really looking for are the ones he can't identify. It's all part of being an apple detective.

When a decision is made to cope with the symptoms of a problem, it is generally assumed that the corrective measures will solve the problem itself. They seldom do. These countermeasures are all based on too narrow a definition of what is wrong. Human measures and countermeasures proceed from a limited scientific truth and judgment. A true solution can never come about in this way.

Masanobu Fukuoka

Network Support

Hearty thanks to the growers -- and those in our communities wanting more good fruit being grown -- listed here. These are the folks who have stepped to the plate with **financial support for this network** since the last newsletter.

Stay in touch, think deeply,
and treasure those
venerable trees!

Michael Phillips

Lawrence Sewall
Roger Zinn
David Hirsch
Leroy White - NEW MEMBER
Richard Rutschman
Tim Bates - RENEWAL
Jassy Bratko - RENEWAL
Anthony Kline - NEW MEMBER
Eliza Greenman
Ben Applegate
Susan Snipes-Wells
West County Cider - RENEWAL
Maury Wills
Steve Lisbin
Jeff Corbet - RENEWAL
Fedco Trees - RENEWAL
Jon Place - RENEWAL
Don Kretschman - RENEWAL
Mike Biltonen - NEW MEMBER
Robbie Anderman - NEW MEMBER
Tom Moore - RENEWAL
Jamie Ager - NEW MEMBER
John Snowdon - NEW MEMBER
Edgar Foudray
AlblemarleCiderworks - RENEWAL
Chris & Michelle McColl - RENEWAL
Stephanie Victor - NEW MEMBER
Jamie Renshaw
Tooley's Trees - RENEWAL
Schafer Fisheries
Brian Caldwell - RENEWAL