



The Community Orchardist

October 2012

Michael Phillips, Editor

How's the "new normal" on the climate front treating everybody? Many growers in the East and across the Midwest and up into Ontario saw a very limited crop due to buds freezing this spring. My two plus acres of orchard yielded about three bushels total, with maggot fly getting dibs in every variety across the ripening spectrum. Nothing was done to alter that onslaught but boy, does it show what a pest can do when very few fruit are to be found! Growers further south suffered near-total crop losses as record heat literally baked mid-season apples on the tree. Guy Ames in Arkansas reports forty days with temps above 100°F, with the hottest day at 118°F. Drought was another factor, particularly for folks nursing new plantings toward production. And now we are deep into fall with nary a night touched by frost. Peach growers have reason to worry that sudden cold will find trunk cambium not quite hardened, resulting in potential tree death if a first cold night sees temps plummet into the high teens.

Little can be done about all this, of course. Nature offers up what comes. We're left with grower tenacity and the ever-present hope that next year will be better. Diversity is good on the livelihood front as well as out in the orchard.

The Fall Holistic Spray

The very first step in growing next year's crop begins in these weeks following the harvest. Disease inoculum digs in for the winter ahead on fallen leaf litter, on the bark, and even deep down in the bud crevices. The specifics of the assorted fungal and bacterial pathogens for the particular fruit crops we're each growing sets this stage. The fall holistic spray(s) plays a big role in shifting the odds back to our favor.

Enhancing leaf decomposition right where the leaves fall makes sense in holistic disease management. Often we refer to reducing overwintering disease inoculum on the orchard floor as good hygiene practice. This involves a combination of leaf liming, aggressive mowing, spreading woody compost, and spraying fatty acid compounds to facilitate leaf decomposition. All important and useful techniques. I just prefer calling this “stirring the biological stew” in order to keep the concept of fungal duff support up front in my conscious efforts to always build biological connection.

Choose any three, but under no circumstances skip these steps!

- **Leaf liming.** Sprinkling a quart container (or so) of calcitic lime per bearing tree atop fallen leaves interrupts an essential reproductive act of fungal scab in late fall necessary to form pseudothecia spore sacs. Time this when a third to half of the leaves have fallen off the tree. Take advantage of this extra attribute of lime in those years when soil tests indicate a need to apply a maintenance rate of 200-400# per acre of lime to boost calcium levels while slightly raising pH back into the 6.3 to 6.7 range.
- **Aggressive mowing.** Chopping leaves up into smaller bits by mowing the orchard area ensures that a far greater percentage will be decomposed by spring. The mere act of flipping a leaf puts potential pseudothecia in a downward-pointing direction . . . a scab bummer if ever there was one. Just as importantly, complete mowing of the orchard in fall takes away vole cover. (Some growers deliberately wait to mow aisle ways; voles move into place away from the trunks of the trees; the mowing of this final swath at high speed takes care of more than a few voles as well as leaves.)
- **Spreading compost.** Compost spread atop such a leafy grass mix hastens the decomposition of any remaining fungal inoculum on the ground. Earthworms and microorganisms carry out the work from this point on until the earth freezes solid. The trees should be fully dormant at the time of spreading compost. I do rake leaves out from the trunk to clear the immediate trunk zone as well as rake leaves that the mower may have missed inward from pathways back within the dripline. Orchard compost then anchors this “fungal cake” in place beneath each tree.
- **Fall holistic spray.** The biology awards triple value for this particular effort when approximately 40–60 percent of the leaves have fallen off the trees. Pure neem oil and liquid fish increase the decomposition to a crescendo on the ground with fatty acid compounds. I spray the entire tree and remaining leaves up top as well to facilitate microbe diversity (be it with effective microbes or compost tea) in the bud crevices and on potential twig lesions for the dormant months ahead. The fall root flush has hit full stride in the gathering of nutrients—like the nitrogen in that fish—to store in cambium tissues that will launch spring growth. This spray is the most essential step of all.

Growers dealing with peach leaf curl, bacterial spot, and even apple scab in warmer zones should understand that these diseases maintain geographical advantage in the dormant buds. A lipid coating typically protects dormant spores and scab conidia and opportunistic bacterium from other hungry microbes. Applying the fall holistic spray in two separate rounds leads to what I have deemed the **fatty acid knockdown** when dealing with such diseases. High rates of fatty acid compounds – and here we're talking experimenting with doubling normal ground rates to as much as 6 to 8 gallons of liquid fish and 2 gallons of pure neem oil per 100 gallons per acre – will strongly impact that lipid coating. Apply effective microbes at 3 to 4 gallons per acre (along with compost tea, if you wish) twenty-four hours later leads to a feeding frenzy in the grower's favor. Research into augmenting biological control of disease from around the world supports this nuanced approach.



Lost Nation Orchard tucked away for a winter of sweet fungal dreams. Snow can come now ...

We are emulating forest-edge ecology by building up humus and increasing biological activity in all these ways. Wrapping up the orchard year with what amounts to a celebration of earthy promise always feels good.

Pear Leaf Blister Mite

Another season-end problem that deserves consideration now is pear leaf blister mite, a sporadic pest of pears that can show up in orchards favoring organic and holistic methods. The adults are very small and cannot be seen without a hand lens; the body is white and elongate oval in shape, like a tiny sausage. The mite causes three distinct types of damage. The blistering of leaves will likely be how you catch onto the presence of this mite. Blisters are 1/8–1/4 inch across and, if numerous, can blacken most of the leaf surface. Leaf function can be seriously

impaired by a heavy infestation. During winter, the feeding of the mites under the bud scales is believed to cause the bud to dry and fail to develop. This type of damage is readily confused with bud injury from insufficient winter chilling. Fruit damage is the most serious aspect of blister mite attack. It occurs as a result of mites feeding on the developing pears, from the green-tip stage through bloom, causing russet spots. These spots, which are often oval in shape, are usually depressed with a surrounding halo of clear tissue. They are 1/4–1/2 inch in diameter and frequently run together.



Remember to take action in fall to deal with pear blister mites.

Once leaves are off the pear tree, the bud scales are fully revealed where blister mites will overwinter. One effective approach on young (and thus small) trees is to pick off infested leaves in early September. The mites will still be in the vibrant green leaves at this point but this plucking will not be so soon as to initiate new growth from secondary buds. Fussy, I know, but if you get the timing right it does eliminate the problem for next spring. Spray options go in two directions. One is to use lime sulfur to saturate bud crevices on infested trees; the other is to choose horticultural oil instead. Some growers mix the two. Micronized sulfur can be substituted, noting that garlic extracts added to such a spray can help in getting toxic effects into bud tissues where the mites are feeding. Organosulfur compounds in garlic are noted for this ability to deliver nutrients through a membrane.

Now for the Rest of the Story

An established relationship between blueberries and apples planted in the same vicinity is that a certain braconid wasp parasitizes both blueberry maggot fly and apple maggot fly. Multiple food hosts in turn increase such beneficial populations. Knowing a little more about the wee ones involved here helps us appreciate great marvels.

Diachasma alloeum is a small wasp in the family Braconidae. The adult female lays its eggs into third instar larvae of the maggot fly, which then develop after the larvae have pupated. The maggot fly larvae emerge from the fallen fruit and then wriggle their way an inch or two into the soil to pupate, all the while hosting

an unavoidable end. The immature wasps then eat the fly larvae and overwinter inside the fly puparia. This picture shows the next season's wasp emerging from an AMF pupal case, an astounding view, brought to us by Andrew Forbes of the University of California at Davis.

The story does not end there. These parasitoid wasps use volatile compounds that the fruits emit in response to pest intrusion and then they probe the fruit to find the maggot fly larvae within. The female wasp lays her eggs into the maggots by means of a lengthy ovipositor. Insect parasitoids are known to deposit chemical signals on utilized hosts following egg laying. Each female essentially leaves her scent on the surface of infested fruit by dragging her ovipositor across the fruit surface, depositing a clear liquid to tell other females to direct their attentions elsewhere. This has been termed 'excreting behavior' by entomologists.

This particular parasite has long been known to be active in the East where apple maggot flies first made the move from native hawthorn to the domesticated apple. The wasp followed and somewhere along the way developed a similar affinity for blueberry maggot fly larvae. The good news for growers across North America is that this mutual attraction seems to follow



Absolutely amazing, Andrew!



A male braconid wasp alights on an apple. He has no ovipositor, of course, but can tell that *she's been there* in search of maggot larvae.

wherever maggot flies lead. From Connecticut to Missouri, out in California and up to Washington, from Michigan to Florida, back up to Ontario and New Brunswick and down to Maine, researchers have found *Diachasma alloeum* at work. Our role in this is to simply further fruiting biodiversity in our plantings. Pretty cool, eh?

Question of the Month

Should I expect to see some signs of rust and other disease spotting on the leaves or expect that all will be eliminated when using the holistic approach?

Your question goes right to the heart of a fruit eater's expectations. I actually want to see the slightest presence of "dis-ease" because it tells me the plant is thwarting infection pressure and standing up to environmental stress. The immune function of a plant is all about producing certain phytochemicals like terpenoids and flavonoids in response to pathogens at work. The production of these secondary plant metabolites is triggered by the presence of a disease organism, which we in turn can further stimulate with foliar application of neem and other nutritional approaches. Of course we don't want to see tons of rust or scab or what have you. A light touch, on the other hand, indicates healthy reality. Fruit grown more naturally are going to have more of the antioxidant constituents that make sayings like *an apple a day* meaningful. How we grow our *gardens of eden* is about so much more than the outer appearance of the fruit. Learn to promote a little spotting here and there with your customers, knowing how that ties to keeping us well.

Only those who will risk going too far can possibly find out how far one can go.

--T.S. Eliot

Network Support

Hearty thanks to the growers -- and those friends who want more good fruit grown -- listed here. These are the folks who have stepped to the plate with financial support for this network since the last newsletter.

The amount of fiscal support you choose to provide for these efforts can be any amount. It's the fact that you participate and support this effort [[click here](#)] that makes the Holistic Orchard Network able to put forth the portal site for growers to dialogue and to initiate worthwhile systems research.

Kalya Olson - NEW MEMBER
 Paul Loftness - RENEWAL
 Tom Rosenfeld - NEW MEMBER
 Eden Ice Cider - SPONSOR
 North Country Organics
 - SPONSOR
 Nathaniel Brock - RENEWAL
 Dan Bussey - NEW MEMBER
 Mark Gemmill
 Don Jantzi - NEW MEMBER
 Wayne Branham - NEW MEMBER
 David Maxwell
 Andy Brennan - NEW MEMBER
 Kathy MacKay
 William Gunn - NEW MEMBER

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

Michael Phillips