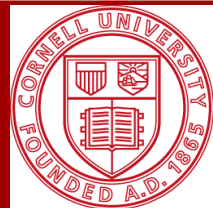




FRUIT NOTES

Lake Ontario Fruit Program



Volume 14 Issue 7

April 10, 2014

Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide.

Forecasting Bud Break in the Spring of 2014

Terence Robinson and Mario Miranda Sazo

Calculations of growing degree hours in Western NY (Williamson) since early January show that trees have accumulated only 658 growing degree hours by April 7th of the 2500 hours needed for green tip this year. Recall that in 2012 we reached the 2500 hour level by March 22 and in 2013 we reached that level on April 18. This year we currently have **only about 26%** of the 2500 total hours needed to reach green tip. This indicates we need significantly more heat units before we reach green tip of apple.

Using forecasts for the next 10 days (until April 17) it appears we will rapidly accumulate growing degree hours (820 new growing degree hours between April 7 and April 17) for a total of 1478 GDH by April 17. This will still be 1000 GDH short of what we need to reach green tip. We can accumulate that amount in a warm week however; the forecast is for continued cool weather. However we don't have confidence in weather forecasts longer than 10 days thus we have not calculated a predicted date to reach 2500 GDH. However it is **likely to be 7-10 days after April 17**. If green tip in WNY is around April 24 or later this will allow growers about 3 more weeks to finish up winter pruning and get spraying equipment ready. For much more detail, see the full article in the most recent *Scaffolds Fruit Journal*:

<http://www.scaffolds.entomology.cornell.edu/2014/SCAFFOLDS%204-7-14.pdf>

Considerations for Copper Sprays in Tree Fruits

Dave Rosenberger

Copper fungicide/bactericide sprays have proven useful for managing fire blight of apples and pears, peach leaf curl and bacterial spot on peaches and nectarines, and bacterial canker on cherries and apricots. When a fixed copper is applied to apples at green tip to suppress fire blight, the copper in that spray will also provide protection against apple scab equivalent to that provided by mancozeb applied at 3 lb/A. Copper is no longer presumed to provide reliable suppression of scab ascospores even though copper sprays will protect green tissue from infection when applied before spores are released. Several lines of evidence suggest that the annual use of copper at green tip may also help to suppress DMI-resistant apple scab. However, more work is needed to verify if and why a single copper spray in spring might impact resistance to DMI fungicides.

Many different copper products are registered for these uses, and it is difficult to know which product to select for any given application. Factors that impact activity of copper were discussed in an article published in *Scaffolds Fruit Journal* of March 12, 2012, linked here: <http://www.scaffolds.entomology.cornell.edu/2012/SCAFFOLDS%203-12-12.pdf>. In this article, we revisit a few key issues related to the effectiveness of copper.



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Building Strong and Vibrant New York Communities

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.

In the past, copper products applied to tree fruits at or near bud-break were almost all "fixed coppers" that had low solubility in water. When fixed copper products are mixed with water. The spray solution is actually a suspension of copper particles, and those particles persist on plant surfaces after the spray dries. Copper ions are gradually released from these copper deposits each time the plant surface becomes wet. The gradual release of copper ions from the copper deposits provides residual protection against plant pathogens. At the same time, the slow release of copper ions from these relatively insoluble copper deposits reduces risks of phytotoxicity to plant tissues.

Fixed coppers include basic copper sulfate (e.g., Cuprofix Ultra Disperss, Basic Copper Sulfate), copper oxide (e.g., Nordox), copper hydroxide (e.g., Kocide, Champ), copper oxychloride sulfate (e.g., COCS), and copper ions linked to fatty acids or other organic molecules (e.g., Cueva). Note that basic copper sulfate behaves differently than the non-basic form of copper sulfate, also known as copper sulfate pentahydrate or bluestone. The addition of hydroxyl ions changes copper sulfate into a relatively non-soluble fixed copper. With traditional Bordeaux mix, which is a mixture of copper sulfate plus lime, the chemical change occurs in the spray tank as the hydroxyl ions from the lime complex with the copper sulfate to form a fixed copper.

Efficacy of fixed coppers is dependent on both the amount of elemental copper applied and on how finely the copper has been ground. The impact of particle size becomes obvious when one realizes that a spherical particle with a diameter of 2.8 microns, common in older copper formulations, contains 64 times more volume than a sphere with a diameter of 0.7 microns. Therefore, copper products with a median 0.7-micron particle size theoretically have 64 times more copper particles distributed across and adhering to treated plant surfaces than would occur following application of a copper product with a 2.8-micron particle size if rates of both products were adjusted so as to generate the same rate of metallic copper per acre. Furthermore, research has shown that the larger copper particles are more subject to

removal by wind or rain acting on the leaf surfaces after sprays has dried. Thus, one can achieve both better coverage and better residual activity with a finely ground copper compared to a coarsely ground copper. That fact has allowed manufacturers to gradually reduce the labeled rates for actual amounts of copper applied per acre in new products.

Reducing the total amount of copper applied in each spray is desirable so long as efficacy is maintained because copper can accumulate in soils. High levels of copper in soil have negative impacts on both plant growth and on earthworms and other non-target organisms. However, even with the best formulations, there will be an end-point where the amount of elemental copper applied in bud-break sprays will no longer provide enough residual activity to suppress fire blight and bacterial canker. That low-rate end-point has not been defined for tree fruit applications, but it undoubtedly varies both with the product used and with the post-application weather in any given year. Copper applied to suppress fire blight may have little impact on disease development if all of the copper residues are removed by heavy rains before trees reach the tight cluster or pink stage of bud development.

Over the last several years, a number of new copper formulations have appeared on the market with labels that allow for only very low rates of elemental copper in each application. Some of these products (MasterCop, MagnaBon, Phytan 27AG) contain copper sulfate pentahydrate rather than a fixed copper, and they therefore are more soluble in water. Manufacturers are claiming "systemic activity" for some of these products, and the higher solubility of these products may in fact allow more uptake into plant tissue. However, efficacy of these "low-rate" copper products in bud-break sprays is questionable because we lack convincing evidence that the low rates of copper that can be applied with these products will provide the residual activity that we believe is needed to suppress bacterial diseases in deciduous tree fruits. These low-rate copper products may work very well where repeated applications are made at regular intervals as occurs with citrus and some vegetable crops, but

more research is needed before they can be recommended for sprays at bud-break on apples and stone fruits.

Most copper labels list a broad range of rates for bud-break sprays. In general, the upper end of labeled rates are suggested for applications that are made at silver tip or green tip on pome fruits, especially when those bud stages occur early and one can therefore expect a long, drawn-out timeframe for bud development. The lower ends of labeled rates are suggested for applications at green tip (or even at half-inch green, in an emergency) if one expects trees to advance rapidly from bud break to bloom. Using excessive rates of copper, especially finely ground coppers that have good residual properties, could result in fruit russetting on some apple cultivars if copper ions are splash-dispersed to developing fruit tissue after flowers reach pink or bloom.

With the fixed copper products, there is no published evidence that adding spray lime for tree fruit applications will either reduce phytotoxicity

or extend the residual activity of the copper. However, some sweet cherry growers have reported that they achieve better control of bacterial canker when they add spray lime to copper sprays even if they are using a fixed copper that theoretically does not need any additional lime. Lab evaluations of seven different fixed copper formulations revealed that, when mixed at rates commonly used for dilute applications, the copper solutions in the spray tank will have a pH near 8 whereas adding spray lime at 2 lb/100 gal raises the pH to 11.0-11.5. (The old traditional Bordeaux mix formulation of 8-8-100 that was recommended for bud-break sprays also as a pH near 11, whereas a Bordeaux mix with 8 lb of copper sulfate and only two lb of spray lime has a pH near 8.) Thus, it may be that the high pH of both the old 8-8-100 Bordeaux mix and of the fixed copper-plus-lime solutions used by some cherry growers can reduce populations of the bacterial canker pathogen in ways that exceed the capabilities of a fixed copper applied alone.

Spring? It will come sooner than later! D. Breth

Many of us would prefer a few more weeks of winter. But the Canada geese, swans, blooming crocus, and even the turkey buzzards say that spring is coming soon. It is time to start planning for pest management activities that need to be done in the early spring.

1. Fungicide applications for peach leaf curl are necessary if not done in the fall, before the budscales crack (usually mid-late March). In peach orchards with few fungicide applications last season due to reduced crop, leaf curl pressure could be high. Fungicides such as Ziram (4 lb. per acre if light disease pressure or 6-8 lb. per acre for heavy disease pressure), Ferbam, or chlorothalonil (Bravo, Echo) are more effective than copper for leaf curl. But if leaf curl pressure is not so bad, a copper application will be effective and also provide some benefit for bacterial spot control. Dormant applications of copper are also labeled for bacterial canker in apricots, and bacterial blast in plums and prunes. Copper can be applied late dormant in sweet cherries for bacterial canker.

2. Take steps to reduce overwintering scab inoculum, apple scab ascospores, in orchards that were scabby last year. Apply urea to the orchard floor this spring to help the infected leaves decay. Apply 40 lb. of urea per 100 gallons water per acre and apply uniformly to the orchard floor including the sod row middles. Dissolve the urea in warm water before putting it in the tank. David Rosenberger has addressed other possibilities including lime, lime sulfur, and leaf shredding, but none are as effective as urea in the spring. You will reduce your spring N applications based on the percentage of the 40 lb. of urea that was applied to the tree rows. The portion that treated the sod row middles will just be taken up by the sod.

3. In orchards with a history of phytophthora root rot (all but plums except those planted on peach or apricot rootstocks), brambles, and strawberry plantings that have some drainage problems and heavy soils, consider an application of Ridomil. See label for rates and how to apply it in various crops.

Merivon is also registered in NY as SLN label

New York has received Special Local Needs (SLN) registrations for Merivon Xemium Brand Fungicide (SLN NY-140004, EPA Reg. No. 7969-310 and Priaxor Xemium Brand Fungicide (SLN NY-140005, EPA Reg. No. 7969-311). Both products contain the active ingredients fluxapyroxad and pyraclostrobin. Merivon is registered for use on pome and stone fruits against several diseases, in particular apple scab and powdery mildew. Priaxor is registered for use on several crops including corn, dried and succulent shelled peas and beans, edible-podded legume vegetables, fruiting vegetables, oats, rye, wheat soybean, and potatoes against several diseases. Note the following restrictions for both Merivon and Priaxor:

- Restricted-use pesticide in New York State.
- Not for use in Nassau and Suffolk Counties.

- No aerial application within 100 feet of aquatic habitats.

Users must have a copy of the SLN label and the primary product label in their possession at the time of pesticide application. All precautionary statements, applicable use directions, and use precautions and limitations on the label affixed to the product container must be followed. Copies of the approved SLN label will be available shortly at the PIMS website (<http://pims.psur.cornell.edu>) under the "Special Registrations" link. Until then you can access the labels for all the new fungicides at our website:

<http://lof.cce.cornell.edu/submission.php?id=215&crumb=pests|pests>. See Issue 5 for "Fungicide Considerations".

Early Management of Pear Psylla

Peter Jentsch, Hudson Valley Lab
Edited by D. Breth & C. Kahlke

According to Terence and Mario in the "*Forecasting Bud Break in the Spring of 2014*" in this issue, we are at least 2 weeks from green tip, giving the current forecast. So what's the rush? Seasoned pear growers know the damage this pest can do if left unchecked. For many more details, see the recent full article in Scaffolds here: <http://www.scaffolds.entomology.cornell.edu/2014/SCAFFOLDS%204-7-14.pdf>

The next couple of days with temperatures in the mid-50s' will get pear psylla actively laying eggs.

In the overwintering stage, the adult lingers about the orchard and woodland edge from fall, through the winter into spring. Adults are often seen in flight during the warm hours of the day, with increasing movement of woodland adults into the orchard over the next few weeks. After mating, females begin to produce the first of three to four generations, beginning with egg laying and nymph hatch from late March through June. When scouting for early egg laying, focus on the terminal

end of the fruiting branches using magnification along the basal plates of buds.

Strategies to manage pear psylla include prebloom applications of ovipositional deterrents, along with ovicides and insecticides aimed at the adult and nymph populations. Early management should begin upon the first appearance of the eggs, which will likely occur around green tip. To delay the insect from laying eggs, Surround WP or oil, both acting as a barrier film, can be used. Either of these products will reduce egg laying by adult pear psylla. Delaying oviposition of the adults buys time for a greater number of overwintering psylla to enter the orchard from the hedgerows and woodland for a later adulticide application.

The advantages of using oil to control this insect are many. Oil is still a relatively inexpensive material for which no mechanism has been found for the insect to develop resistance. It provides a degree of egg laying deterrence to treated buds

and wood lasting a week or two, depending on rates and weathering. Higher rates would be applied at the dormant stage this week, using one spray of 3% oil, or two of 2% to green cluster. This rate will also reduce overwintering populations of San Jose scale, European red mite, pear leaf blister mite, and Comstock mealybug. If you begin at swollen bud, one spray at 2% or two at 1% up to white bud would suffice. Contacting the adult with oil droplets will cause mortality, while applications over the top of the egg will reduce adhesion, often causing them to dislodge from the tree. Oil applied prior to oviposition acts to delay and synchronize egg laying later in the season, producing a more concentrated nymphal emergence period that enables management using a single insecticide application. One negative observable impact of oil applications has been enlarged lenticels on developing stems, which may have an impact on plant respiration.

Ovicides can also be employed to kill the eggs prior to hatch. The use of Esteem and Centaur work as insect growth regulators (IGRs) to inhibit development of various life stages. Esteem 35WP, used prebloom to kill the egg stage of

psylla and reduce the viability of eggs laid by a treated adult, should be applied prior to sustained egg laying, together with 0.25% v/v horticultural spray oil. Esteem may be applied once at prebloom at 16 fl oz/A, or once at prebloom and once at petal fall at 13–16 fl oz/A, as a tactic for both psylla reduction and as a resistance management strategy. Remember, its mode of action is as an ovicide, so it will not reduce the adult or nymph population directly. It is most effective if the material is on the wood or foliage prior to the eggs being deposited.

Stay tuned for follow up treatments. Using an ovipositional deterrent is a prerequisite for at least two follow-up strategies. One option, after oil, is an adulticide to kill the adults after they have completed migration into pear orchards, and before significant eggs have been laid. Adulticides would be employed this season from mid- to late April to significantly reduce the adult population. The choices for managing adult psylla include older chemistries such as the neonicotinoids Actara 25WDG at 5.5 oz/A and Assail 30SG at 4.0–8.0 oz/A. Pyrethroids are no longer believed to be effective at reducing adults due to insecticide resistance (note from D. Breth).

Pollination Survey for Apple Growers

Aaron Hoshide, University of Maine

A Northeast project team is researching ways growers can enhance pollination security for apples in New York, squash in Connecticut, cranberry in Massachusetts, and wild blueberries in Maine. In order to do this, we need a better idea of the current pollination practices of apple growers in New York State. If you are interested in helping with this, please fill out a brief anonymous online survey at the following web link

(<https://www.surveymonkey.com/s/NKT2Z6G>).

This research team is also interested in on-farm interviews to get a better understanding of the economics of adopting these pollination practices in apples. If you are interested in this, please contact Aaron Hoshide at aaron.hoshide@umit.maine.edu or at (207) 659-4808.

Taking Care of Trees while Waiting for Better Orchard Planting Conditions

Mario Miranda Sazo

We are approaching the early (ideal!) planting season in Western NY. Hopefully your soils will dry out and you will be able to plant this coming

weekend or sometime in the next few weeks. Some of you already got the new trees to be planted in 2014. It is now extremely important to

keep your trees in good condition while waiting to plant. Don't let them dry out; keep them in cold storage **away from ethylene sources** with plastic wraps loosened to prevent fungal development on the trees. Do everything you can to prevent nursery trees from breaking dormancy before planting. Trees already growing in the box will have to use limited reserves to re-grow those shoots in the field. Here are the basics for tree storage as recommended by Steve Hoying in the last few years: (1) when you receive trees open the boxes, open the plastics to allow trees to breathe, inspect trees for quality and condition, contact nursery immediately if anything is wrong, (2) check to see that roots are moist and covered, if not water well, (3) store in a cooler or cold room at 34°F. The room should have been well aired to remove any ethylene remaining from stored

apples, (4) if a cold room is not available, find a root cellar or common storage that stays as cold as possible. Steve mentioned that he has even buried a limited number of trees for a short period of time on the north side of building, (5) never store nursery stock with apples. The ethylene gas will severely damage trees, (6) plant as soon as possible if the soil conditions warrant, and (7) do not plant if the soil is still too wet.

If the soil has dried out sufficiently and you are able to plant during or after this coming weekend (hopefully!), keep your trees out of the sun and protected from drying winds (never allow the roots of the tree to dry out). If possible, soak roots for a couple of hours before planting using a pond, tub or barrel.

Evaluating the Soil in the Potential Orchard

Carol MacNeil, Cornell Vegetable Program (this information was presented at the 2014 LOF Winter Schools and was modified by M. Miranda Sazo)

Fields with heavier soils need to have tile drainage installed at 30-40 feet intervals. Almost every site will require spot drainage somewhere in the field. Field notes on wet spots will be very helpful. Many Western NY orchards have hard fragipans which prevent drainage and root penetration. They can be ripped through but will reform. In addition, almost all agricultural soils have compaction layers which greatly reduce drainage and root penetration. Wet soils for 2-4 days during active growth will suffocate and kill roots, effectively pruning them off. Such conditions also promote infection and spread of Phytophthora.

A penetrometer measures the depth and severity of soil compaction when it is pushed into soil that has just fully drained. **Spring is the best time to check** (wetter soil appears less compact while drier soil appears more compact). A reading over 300 lbs. /sq. in. (psi) indicates that plant roots will not penetrate and excess water will not promptly drain away. A number of vegetable growers have made their own, uncalibrated penetrometers and use them for determining the depth of compaction, so they will know how deep to rip.

Sometimes soils appear to have compaction, but they may function well, and ponding and plant stress do not occur. This can be clarified by digging a soil pit. If there are ample plant roots all the way down to 18 inches then those root channels will allow deeper root growth and adequate drainage. If you see gray sub-soil it is a good indication of water saturation at some time of the year. Are there earthworms or their channels in the soil? If so, it is a sign of good soil health. In addition to cycling organic matter their channels can be used for root growth and for drainage.

Spring work in the field for the new orchard: Do a soil ball test from a sample as deep as you will rip, plow, till, or plant. Make a soil ball by rolling the soil in the palms of your hands. Press your thumb into the soil ball. If the print of your thumb remains it is too wet. If the soil ball crumbles it is dry enough to work the soil. If needed, deep rip again, plow deep and fit the soil. Add lime and fertilizer as needed and till into the soil. Plant the orchard.

Last Reminders for Grafting in 2014

Mario Miranda Sazo

Are you doing any grafting in 2014? Collect bud wood while it is still dormant! You can also start checking the 14 minute video where Steve Hoying shows how to top work trees to another variety using bark grafts. Please check: <http://hudsonvf.cce.cornell.edu/photogallery.html> and then click the bark grafting of apple trees video.

Fruit FAX, Subscribe Now!

**Horticultural and Pest Management Notes,
produced by Lake Ontario Fruit Program, CCE**

Fruit Fax includes updates and reminders of necessary horticultural practices, pest management activities, disease and pest development status, meeting notices, and important business management reminders. They include information relating to tree fruit crops and berries. **Fruit Fax** subscriptions begin April 8, 2 issues per week during primary scab season, 4-6 times per week during bloom for fire blight warnings, and 1 issue per week unless otherwise needed through September.

Fruit FAX is more time sensitive than newsletters but with less detail. For the complete LOF program, you need both. To receive the **FRUIT FAX** this season, complete the tear slip registration form above and return to: Cornell Cooperative Extension, Attn: Kim Hazel, 12690 Rt. 31, Albion, NY 14411

Include a check payable to "Cornell Cooperative Extension" for \$60, if farming in Wayne, Monroe, Orleans, Niagara, and Oswego counties. If farming outside those counties, please include a check for \$100.

If you already subscribed through enrollment you do not need to return this form. **See the registration form above.**

Fruit Fax Subscription - 2014

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**Lake Ontario Fruit Program
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REISSIG RETIREMENT PARTY - MAY 17

Harvey Reissig has recently retired after 40 years as a Fruit Entomologist at Cornell's NYS Agricultural Experiment Station in Geneva. Those of us who work with tree fruit insects have come to regard Harvey as one of the gurus of the field, someone who is not only aware of all of the complex interactions taking place in the orchard, but who can keep a handle on the practical aspects of what the insects are doing out there. During his time at Cornell, Harvey mentored and collaborated with a long line of colleagues, students, visiting scientists, fruit industry leaders & insiders and the general public. We cordially invite you to join us in celebrating his retirement, along with that of his wife, Nancy, who has been an Administrative Assistant in the Entomology Dept. for 23 years, by attending a dinner at Geneva Country Club on Saturday, May 17, 2014.

The buffet menu includes Pasta with Tomato Sauce, Mixed Vegetable Medley, Eggplant Parmesan, Rice Pilaf, Broiled Haddock with Butter Crumb Topping, and Baked Chicken; Finger Lakes wines will be donated by area wineries; cash bar available. Cost per person: \$30.00 (checks only, payable to "Cornell University"). For registration and payment, please respond to Kate VanHouter (kev35@cornell.edu; tel: 315-787-2331), NYSAES, Dept. of PPPMB, 630 W. North Street, Geneva, NY 14456. Registration & payment deadline: May 2.