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Tree Fruit News

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The newsletter this spring will be edited by Steve Hoying until the tree fruit specialists of the ENYCHP team are on board. Questions and comments should be directed to sah19@cornell.edu. Although I welcome phone calls with increased responsibilities I will not be able to answer them in as timely a manner as I want. Messages can be left with Donna Clark at 845-691-6787. I welcome your comments and suggestions although the content is solely the responsibility of the authors. The Tree Fruit News will again be sent to enrolled members of the Eastern NY Commercial Horticulture program every other week throughout the growing season. If you have not yet received enrollment information, don't worry, it is on the way. Thank you for your continued support. We look forward to working with you in 2014. - *Steve Hoying and the ENYCHP*

Where Oh Where is Green Tip?

By Steve Hoying, Cornell University Dept. of Horticulture

This is likely to be the latest bud break in eastern NY ever! A good rule of thumb is green tip occurs about 1 week after Manchurian crabapples began showing green tissue. The forecast for the next 2 weeks is not promising that tree phenology will advance significantly due to the moderate day and low night temperatures even in the warmest areas. The weather forecast indicates we will slowly accumulate growing degree for the next two weeks.

We caution that the estimated dates of green tip are dependent on the accuracy of both the models (which in most cases is quite good) and the weather forecast (which is often not so good). Our prediction as of April 1, 2014 is that green tip on apple in the Mid-Hudson Valley will occur a couple of days either side of April 15 depending on the weather. Just in case, we suggest growers in the Highland area be ready to begin pesticide sprays to control scab, fireblight, scale and mites. Warmer parts of the region will be earlier and the Champlain Valley about May 1. See the current accumulated degree days in the following table and follow progression in your area by accessing the NEWA site.

Station Location	Current Degree Day Accumulation Base 43DD 3/31/14	Current Degree Day Accumulation Base 50DD 3/31/14
Northport LI	30.5	10.8
Riverhead LI	38.3	17.6
Watermill LI	29.6	9.4
Chazy - North	0	0
Peru - North	0	0
Albany - Central	2.1	1.3
Castleton - Central	4.8	3.9
Clifton Park - Central	0	0
Highland - Ulster	8.9	8.4
Modena - Ulster	8.4	7.0
Clintondale - Ulster	12.9	10.5
Hudson - Columbia	6.9	6.1

UPCOMING PEST EVENTS

Phenology/Pest	Degree Day Range Base 43	Degree Day Range Base 50
Pear Psylla Active Adults	30-99	8-34
Pear Psylla Egg Laying	40-126	11-53
Silver Tip McIntosh	60-110	18-42
Green Tip McIntosh	95-147	36-62
Green Fruitworm 1 st Catch	52-154	13-71

Plan for Early Scale Management

By Peter Jentsch, Cornell University Dept. of Entomology

“Despite the forecast, live like it's Spring”. The forecast for this forth week in March is for increasing signs of spring, despite the lingering presence of arctic vortex. We may not be hard pressed into decision-making considerations for pest management but strategies for controlling early season insects, especially San Jose scale *Quadraspidiotus perniciosus* (Comstock) (SJS), should have been a part of your winter musings if pack-out fruit showed signs of SJS infestation. Be mindful that a tree carrying a few SJS damaged fruit last season can become an eruption of fruit injury the following year if left unmanaged. To address a SJS issue seasonal programs will require targeted applications of specific insecticides during three key periods of the season.

Pre-bloom is by far the most opportune time to manage SJS. The overwintering immature stage, protected beneath the waxy covering are least protected from a spray application as developing foliage increase ‘spray shadowing’ as the season progresses. A most effective timing during this period is delayed dormant, from the time silver tip begins to 1/2" green. We are all familiar with the use of horticultural oil, Lorsban, Supracide or Esteem 35WP directed against overwintered "black caps" during this period, as these are long-time standard control measures.

In low to moderate population levels, horticultural oil alone in a 2% dormant application or 1% green tip (GT) application, applied to infested trees with complete coverage, has been shown to control the pest (SJS Management Table 1). In moderate to high populations the oil should be applied in combination with other effective insecticides. Supracide 25WP can only be applied during pre-bloom (delayed dormant) of apple, as stated by the label. Lorsban can be applied once during the pre-bloom season, only as a foliar application through pink OR as a trunk application pre or post bloom to 28 days to harvest. Consider alternating the use of Lorsban between scale and borer management every other year. Dogwood borer (DWB) in M-9 plantings of high-density slender spindle blocks can cause considerable damage to young establishing trees.

Fungicide Considerations for Tree Fruits in 2014

By Dave Rosenberger and Kerik Cox, Cornell University Dept. of Plant Pathology and Plant-Microbe Biology

Designing disease control programs for tree fruits is increasingly complex as we deal with fungicide resistance issues (and the resulting higher inoculum levels in many orchards), while at the same time we are challenged to learn the intricacies of new products and how changing crop

Treatment	Quantity	Timing	% mortality per # of days post application				
			7 d	14 d	21 d	28 d	45 d
1. Damoil	3.0 gal. / 100	GT	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
2. Damoil	2.0 gal. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
3. Lorsban	1.0 pt. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
4. Esteem	1.25 oz./ 100	HIG	48.5 b	41.3 b	37.5 a	51.4 b	59.4 b
5. Assail	1.25 oz./ 100	HIG	51.6 b	44.6 b	78.4 b	94.1 c	99.9 c
9. Untreated	-	-	2.7 a	23.0 a	37.5 a	36.0 a	34.9 a

From our observations, DWB is very prevalent throughout many of the Eastern NY orchards with young plantings.

Remember, the earlier the application against the overwintering black cap phase, the greater the likelihood of success. Coverage is critical in scale management, requiring a slow travel speed (≤ 2.5 MPH), low wind speed (< 5 MPH) and as close to a dilute application as possible. Increased foliage equates to "shadowing" and reduced coverage, which of course is the essential control component against the overwintering life stage. Softer insecticides, such as Esteem 35WP (pyriproxyfen) can be employed with or without oil, acting against the pest as an insect growth regulator (IGR), a unique mode of action for use against the immature scale. As the insect matures, the insecticide acts as a juvenile hormone analog to reduce the insect capacity to molt. Centaur 0.7WDG (buprofezin), also an IGR does require a penetrating non-ionic surfactant such as 0.25% v/v oil to be effective. Be aware that *Movento* (*spirotetramat*), a systemic insecticide, cannot be used pre-bloom as per label restrictions, as there is insufficient foliage for effective uptake. Movento has been found to be most effective after PF in one to two applications, requires a penetrating non-ionic surfactant. Incompatibility concerns over Captan use in early pest management programs for apple scab can be a formidable barrier when considering the use of oil. The possibility of phytotoxicity when using Captan near oil applications should be strongly considered when vying for a weather opportunity for SJS management windows.

management practices affect fungicide use. Following is an overview of our current perspectives.

Fungicides for apples:

Apple orchards with high levels of apple scab last year (i.e., with high inoculum for this spring) should either have received an inoculum reduction treatment last fall or such a

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treatment should be applied as soon as possible this spring. Inoculum reduction can be achieved by leaf shredding with a flail mower set to scalp the sod, but that approach is only effective if leaves beneath trees are raked into the row middles. The sod scalping generated by effective flail mowing of leaf litter can result in a slippery surface for subsequent pesticide applications in a wet spring. Better alternatives would be applications of either urea (40 lb/A in 100 gal of water) or of 2.5 tons/A of dolomitic lime. All inoculum reduction practices should be completed before green tip if possible, but there may still be some benefit even if they are implemented shortly after green tip.

Syllit (dodine) should be applied in combination with mancozeb in two early-season sprays in high-inoculum orchard unless dodine-resistant apple scab is known to be present in the block. If copper is used in the first spray for fire blight suppression, then Syllit plus mancozeb could be used in the second and third applications. Syllit is incompatible with some formulations of copper fungicides and with some formulations of chlorpyrifos insecticide. Combining Syllit and chlorpyrifos has sometimes resulted in buttering out in the sprayer tank. Syllit is less useful after tight cluster because it does not control rust or mildew. Including a mildewcide at tight cluster and pink is becoming increasingly important as mildew populations are becoming increasingly resistant to the DMI fungicides (Rally, Indar, Topguard, Inspire Super). None of the other fungicide groups will effectively control mildew if the first mildewcide application is delayed until petal fall.

Combinations of mancozeb and captan have worked well for many growers in prebloom sprays, but this program of contact fungicides is unforgiving because it provides no post-infection or anti-sporulant activity to suppress scab that may develop as a result of less-than-perfect application timing or fungicide coverage. The latter can result from spraying in the wind and/or from alternate row spraying. Therefore, we strongly recommend that growers include one of the more potent modern fungicide chemistries (i.e., an SDHI, QoI, or DMI, in that order of preference) in either their tight cluster and pink sprays or in their pink and bloom sprays so as to reduce risks of having secondary scab emerge after petal fall. Growers who opt to continue relying on the captan-mancozeb mixture through bloom should at least add several pounds per acre of sulfur to the tank mix at tight cluster and pink to suppress mildew.

The SDHI fungicides Fontelis, Luna Tranquility, Luna Sensation, and Merivon are effective against scab, rust, and mildew, but only Fontelis and Luna Tranquility are currently registered in NY (via special local needs labels), and none of these products are labeled on Long Island due to concerns about the potential for ground water

contamination. Merivon may get a New York label later this spring. For early-season disease control, these products are best used between tight cluster and first cover. Our preference is to use them before petal fall. That is especially true for Luna Tranquility, which is a premix of Luna (the SDHI component) and Scala (pyrimethanil). Scala alone is not effective in protecting fruit from scab or in controlling rust, and the Luna component, like many of the SDHIs, has only moderate activity against rust diseases. Controlling cedar apple rust on leaves is usually most difficult during the period of rapid shoot growth after petal fall, so Luna-T does not fit very well after bloom.

All of these SDHI fungicides should be applied in combination with either mancozeb or captan. This is essential for both fungicide resistance management and because the SDHI fungicide products may not redistribute well enough to protect newly expanding leaves that develop between sprays. In most cases, we prefer to see these products combined with mancozeb rather than captan because of the additional rust control provided by mancozeb and because Fontelis, which is formulated with mineral oil, can enhance uptake of captan into leaves and fruit where captan will cause injury under certain environmental conditions. Merivon has label warnings against tank mixing with oil sprays or other pesticides formulated as emulsifiable concentrates.

The strobilurin or QoI fungicides (Flint and Sovran) also control scab, rust, and mildew in most New York orchards, but they are losing activity against mildew in some orchards and they can fail catastrophically against scab, as has already occurred in many orchards in Michigan. Resistance to QoI fungicides in scab begins as a gradual loss of activity, especially post-infection activity, but can suddenly change to a total loss of activity. In the field, the final loss of activity would mimic the scenario that occurred when apple scab populations became resistant to the benzimidazole fungicides. Because control failures resulting from QoI fungicide resistance can occur quickly and unpredictably, and because we have already used QoIs for many years, we believe it is safer to avoid using them during the prebloom and bloom periods in apples when both scab pressure and the negative consequences of control failures are greatest. Where the QoIs are still working, their best fit may be at petal fall and/or first or second cover sprays.

Both Luna Sensation and Merivon are package mixtures of QoI and SDHI fungicides, so we suspect that using either of these products in prebloom sprays will add to selection pressure for QoI resistance. That selection pressure would certainly be minimized by the presence of the SDHI in those package mixtures, and the recommended inclusion of a contact fungicide (captan or mancozeb) with those

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products would further reduce selection pressure. Nevertheless, a spray program that starts with two sprays of Syllit plus contact fungicide, followed by two sprays of either Fontelis or Luna-T plus contact fungicide, and ending with two sprays of either Flint or Sovran plus contact fungicide at petal fall and first cover should provide excellent resistance management because that program includes back-to-back sprays of at least three different and non-overlapping at-risk fungicide groups (i.e., dodine, SDHI, QoI). Where labeled, Merivon can be used as a substitute for Pristine in preharvest sprays, so excluding it from the scab spray program does not reduce its importance in apple disease control programs.

The DMI fungicides (Rally, Indar, Topguard, Inspire Super) can still be very useful where resistance has not emerged as a problem. However, they are losing activity against both scab and mildew in many orchards in eastern United States. Hence, it may be wise to avoid trusting them for prebloom scab control for the same reasons cited for avoiding Flint and Sovran in prebloom sprays. Where mildew pressure is high and they have been used for many years, they may also fail to provide acceptable control of mildew when used at petal fall and first cover. This is especially true for Inspire Super, which is very weak on mildew if the mildew population has shifted toward DMI resistance. Nevertheless, the DMI fungicides are still the most effective products for

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Tree Planting Tips

By Steve Hoying, ENYCHP

Plant as early as you can prepare the soil. Late planting results in poor first year growth, delayed bearing and reduced profits!

Prepare the site well - as a former colleague of mine used to say "as if you were drilling wheat!" I too have planted into poorly prepared sites. When the site is not well prepared, it is very difficult to pack soil around roots properly and get the planting depth right, weed control is very difficult, and mouse damage is a significant factor the following winter. First year trees will never recover from a dry summer in a poorly prepared site. Spend the extra time and effort to plow and double disk the site. It goes without saying pH, nutritional levels especially Calcium and Phosphorous should be adjusted BEFORE planting. And if the site has drainage problems, install tile. Be sure and have the field marked out for planting and ready when the trees arrive so they can be planted immediately. If not planted immediately, keep them in refrigerated storage suitable for trees without apples or other produce that might give off ethylene gas.

1) Only accept good quality trees. The better the tree quality is the better the success of the new planting. In other words, larger trees equal better growth and more fruit. The minimum quality tree that I like to see would be one with a good fibrous root systems, 5/8 inch diameter, and six feet tall. For the Tall spindle system trees should have as many feathers as possible. Ideally, 15 feathers or dards e unbroken or damaged feathers 12 inches long, well spaced and 1/2 the size of the leader at insertion are acceptable as feathered trees but trees with 5-10 feathers are

much better. More specifically ask for a "Knip" tree, the finest quality tree produced.

- 2) Only buy trees from reputable nurseries with good track records. These nurseries have field representatives that are easily accessible, knowledgeable, and reliable. It is best if you can inspect trees in the nursery, and have the ability to pick them up yourself as early as possible and the day that you are ready. Be sure to call ahead and have them prepare your order so you don't have to wait. There will be no uncertainty when they will arrive or the potential for damage by freezing or drying out on a shipping truck. I know many of you have waited for trees that could have been planted on time if it hadn't been for a shipping glitch.
- 3) As soon as the trees arrive, open the boxes, including the interior plastic wrap, inspect the trees for trueness to order and quality. This process also helps air them out and gives you a chance to water the roots if they appear to be drying out. If they are too moist the mold and fungus that will grow can kill some of the tree's shoots and roots. If you are forced to store trees, keep them in a cooler, completely dormant while you make your last minute preparations. DO NOT STORE THEM IN A COOLER THAT WAS RECENTLY USED FOR APPLES UNLESS IT WAS THOROUGHLY AIRED OUT. Ethylene gas will severely damage or kill nursery stock. If a cooler is not available, find the coolest place you have, keep roots moist and plant ASAP.
- 4) Soak tree roots before planting, the pond works fine, but don't leave them there overnight they will

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- drown. Several water-filled fifty gallon drums on site are an easy alternative.
- 5) I continue to see MANY scion rooted trees. These trees cause all kinds of problems in the orchard managing vigor and fruit quality. Be sure you plant with at least 2-4 inches of rootstock out of the ground. Why incur the expense of a grafted tree if you are not going to let the rootstock work? This is especially important with M.26 which can send a root down even when planted just out of the ground! Adjust graft unions carefully at planting, and pack soil around trees thoroughly. Only peaches should be planted with the graft union buried.
 - 6) Prune trees immediately after planting. Consider the system you are using, but most newly planted trees in WNY require heading. Heading height determines where your first set of branches will occur. On unbranched whips, head about 8 inches above where you want your permanent scaffolds to be. I am heading higher today than we recommended in the past (up to 38 inches). This works well with the strongest trees, poor quality trees do not respond well to high heading and produce only weak feathers. Well branched trees should be headed 12 -18 inches above the top feather and each feather tipped to a side bud.
 - 7) Water trees in with a starter solution. A soluble 20-20-20 fertilizer is available and can be mixed at 6 lbs per 100 gallons with about 3 gallons of solution per tree. I believe the water in this mix is the more valuable component to the trees! It helps settle the soil and keep roots moist.

Berm Stone Fruit. We now recommend that all stone fruit be bermed up no matter the soil. Recent experience in western NY has demonstrated that berming 12 inches has had a positive effect on tree growth and survivability not attributed only to wet feet. I firmly believe it is worth the extra effort if you are serious.

Lime and its Benefits

By W. Stiles and W. Shaw Reid. Reprinted from Orchard Nutrition Management Information Bulletin #19 (click for online version: [Bulletin 219](#))

Thorough incorporation of adequate amounts of lime prior to planting a new orchard is essential. The topsoil (0-8 inch depth) should be adjusted to pH 7 and subsoil (8-16 inch depth) to pH 6.5. An adequate liming program based on soil tests should be the first consideration in developing orchard fertilization plans. Lime is the most economical source of calcium and magnesium. Regulation of soil pH through liming is also necessary to achieve optimal response to other nutrient elements.

Type and fineness of lime. Solubility of lime, and therefore the rate at which it is effective in neutralizing soil acidity, is influenced by the fineness to which it is ground as well as its chemical composition. In general, hydrated (slaked) lime and burnt lime (oxides) are more reactive than ground limestone. Ground limestone is usually suggested for most orchard situations.

Placement of lime. Time required for lime to act is influenced by method of placement (i.e. soil contact) and by fineness of the material. In preparing soil before planting a new orchard, maximum benefit is obtained by thoroughly harrowing or rototilling the lime into the

surface soil, and then plowing to work it as deeply as possible into the soil. If large quantities of lime are required it should be applied in split applications. Working one-half to two-thirds of the total amount of lime into the soil as indicated above, plus thoroughly harrowing the remainder into the topsoil after plowing, is often suggested as an appropriate method for liming during preplant soil preparation. With some fine-textured soils that require large quantities of lime, application of about two-thirds of the total lime required in such a manner, followed by biennial surface applications of additional lime may be necessary to achieve the desired goal.

Surface applications of lime in established orchards move slowly into the soil and must be considered as long term corrective or maintenance programs. Regularly scheduled applications of lime of 2 tons per acre every two years, as predicted by soil and leaf analysis, represent the best available means of maintaining pH values of 6-6.5 and calcium and magnesium supplies in the soil. The type of lime (i.e., calcitic or dolomitic) should be determined by the need for magnesium. In most cases, even if soil magnesium is fairly high, dolomitic lime is suggested for orchards. Dolomitic lime generally has a greater neutralizing value than calcitic lime.

Insecticide Updates

By Art Agnello, Cornell University Dept. of Entomology

Following is a brief (so far) list of changes to the insecticides available for use in NY tree fruit crops for the 2014 growing season; more are sure to follow:

Guthion/Azinphos-methyl - Just to be sure, a reminder that this product and its active ingredient is no longer registered for use in fruit crops.

Thionex - All endosulfan products are currently registered for use in apples only, with an EPA-mandated stop-use date of December 31, 2014.

A new pre-mix insecticide has been registered in NY by FMC; Gladiator, a mixture of avermectin B1 and zeta-cypermethrin, is registered against a wide range of insect pests as well as European red mite in pome fruit and stone fruit.

For best effectiveness and insecticide resistance management, the use of pre-mix products should be reserved for situations when multiple pest species are present and appropriately matched to the combination of active ingredients and modes of action contained in the product.

Weed Control Options for Spring 2014

*By Deborah Breth, Cornell Cooperative Extension
Lake Ontario Fruit Program*

When considering herbicide choices in perennial fruit crops, remember that the soil is a huge seed bank for many weed species. When an herbicide controls some weed species, it removes the competition for others not affected by the herbicide, allowing those weeds to flourish using the water and nutrients in the crop rows. So don't be surprised if something grows through the treatments. There are very few herbicide treatments that are adequate for the entire growing season. Think of weed control like we think of insect control in fruit crops. Is there one insecticide application that will control the long list of insects that attack perennial fruit crops using one treatment per season? NO. So we cannot expect an herbicide treatment to do the same for all the weed species that grow in orchards and fruit plantings. Review the weed problems in your plantings, check the herbicide label for the list of weeds controlled, what growth stage to target the weeds, and find the specific rate required.

Successful herbicide treatments depend on even distribution of the residual herbicide on the soil surface. Most herbicides require water for activation in the top 2 inches of soil which is the weed seed germination zone. Post-emergence herbicides such as glyphosate, 2,4-D, Stinger, paraquat, TreeVix and Venue have an optimal target weed size. But bottom line, rotation of mode of action of herbicides will be the key to preventing buildup of certain weeds and resistance to herbicides.

Early spring options:

Casoron CS can be used in blueberry, brambles, apples, pears, and cherries established for 1 year. Best results are

achieved when this material is applied before weeds emerge or are less than 2 inches tall and temperatures must be below 70F followed by rainfall or irrigation to wash the herbicide into the weed seed germination zone, otherwise it will volatilize before it can be activated. The label only allows the granular form of Casoron to be applied before Feb 15 unless incorporated into the soil. Casoron is effective for many annual broadleaves and grasses (at the lower rate), and some perennials (at the higher rate) but will require a tank mix with a post-emergence herbicide like glyphosate for controlling emerged weeds, especially perennials. Do not apply Casoron to sandy soils since it can go deeper into the root zone and result in crop damage.

Goal or Goaltender (in combination with Prowl or Surflan) needs to be applied before budbreak in pome and stone fruit. These herbicides have performed well in trials giving up to 60 days of control through mid-Jun. Prowl or Surflan used alone provide only 30 days control.

Chateau requires application by pink bud in apples, budbreak in stone fruit and pears. Chateau should be tank mixed with Prowl or Surflan, or another residual to extend the spectrum of weeds controlled. Chateau used at the 12 oz/acre rate will provide longer residual control than the 8 oz/acre rate.

Alion (in pome and stone fruit established for 3 years) or Matrix (in pome and stone fruit established for 1 year) are options than can be applied early spring for extended control. They are both broad spectrum control of annual broadleaves and grasses. In my trials, these herbicides typically required no more than 1 follow-up treatment. In fact, Alion continued to provide some control into the next

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season allowing a cover of moss to develop over the soil.

Of course, there are the old stand-bys including simazine/diuron, or Sinbar (in new plantings at the low rate or in apples and peaches) or Solicam. But if these herbicides are used regularly from season to season, the risk of resistance especially to simazine is likely.

All of these herbicides require a tank mix with post-emergent herbicides such as glyphosate or paraquat. When perennials are actively growing, glyphosate is the most effective herbicide for those plants. A glyphosate application can be safe in spring to kill the perennials when they are smaller rosettes is the best option. But there is always the precaution on the label to not allow glyphosate to contact green bark. Glyphosate should not be used in stone fruit trees established for less than 2 years and there should be no contact with any part of a peach tree with glyphosate.

Stinger is the new option in weed control in apples with a supplemental label for NY (<http://128.253.223.36/ppds/535976.pdf>). It has both post-emergent growth regulator activity and residual activity preventing regrowth from the roots. Stinger is selective for composite family (thistle, horseweed, etc.)

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controlling rust diseases, against which they provide exceptional post-infection activity. If Inspire Super is used for scab control, adding a few pounds per acre of sulfur may compensate for Inspire Super's weakness against mildew. Of course, sulfur cannot be used if oil is included in the tank mix.

Captan issues:

For a variety of reasons, we are suggesting for the first time this year that apple growers avoid captan in their petal fall and first cover sprays. Growers who choose to follow this suggestion will need to avoid any prebloom applications of mancozeb or Polyram that exceed 3.2 lb/A because mancozeb will be needed as a contact fungicide in the petal fall and first cover sprays. If mancozeb is applied at more than 3.2 lb/A in any spray, then the label does not allow for any use of mancozeb after bloom.

Our suggestion for avoiding captan in petal fall and first cover sprays is based on the increasing complexity of tank mixtures applied at those timings. Tank mixes at petal fall frequently include one or two plant growth

and legume family (vetch and clover) and some buckwheat family (curly dock). Dr. Brad Majek, Rutgers, just published an article on Stinger to get the best value, <http://plant-pest-advisory.rutgers.edu/?p=8632>. For perennial weeds like Canada thistle, asters, and goldenrod, the best results are achieved with a split application of 1/3 pint in late April or May when the rosettes emerge. Mark the spot and spray again in 60-70 days after the first application even if there is no visible growth of the problem weed. If you do not do this second application, you will see the weeds reemerge in August and September gaining strength for the root systems for the next spring. The NYS Supplemental label requires the application to be made in a minimum of a 3 foot band on each side of the tree row. There is a 30 day PHI. Consider Stinger when trying to control dandelion before they bloom and clover in row middles to reducing the attraction of bees in the orchard when we are applying insecticides. Stinger can be tank mixed with glyphosate or 2,4-D in the tree row, or with 2,4-D in the sod middles.

The Apple Research and Development program awarded continued funding to study the critical timing of weed control in new high density plantings. Stay tuned for results.

regulators, two or three fungicides, one or two insecticides, foliar nutrients, pH buffers, water conditioners and/or spreader-stickers, and perhaps streptomycin for controlling fire blight on late flowers. These complex mixtures increase the likelihood that something in the mixture will enable the transport of captan across the cuticle into plant cells where it will cause leaf injury and/or fruit russetting. The potential for injury from captan in complex tank mixtures is especially high if the weather between late bloom and first cover is cool, overcast, and wet. We observed or received numerous accounts of fruit and foliar damage throughout northeastern United States in 2013, but the frequency of damage from captan has gradually been increasing over the past decade. Therefore, in the interests of minimizing risks of crop damage, we believe it would be wise to avoid captan in the petal fall and first cover sprays when tank mixes are complex and fruit are most vulnerable to damage.

Bee toxicity issues:

Several reports in the past year have implicated fungicides as potential contributors to widespread

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honeybee mortality that is commonly known as colony collapse disorder (CCD). In particular, chlorothalonil (Bravo and generics) and Indar have been shown to interact synergistically with some insecticides, meaning that some insecticides become more toxic to some bee species when mixed with those fungicides in laboratory tests (Biddinger et al., 2013; Zhu et al., 2014). There is still much that remains unknown about these interactions. Whether these fungicides are having any real impact on bee mortality under field conditions remains unclear. Ultimately, EPA will evaluate all of the data and require label changes if there is solid scientific evidence that these fungicides contribute to bee mortality.

References:

Zhu, W., Schmehl, D.R., Mullin, C.A., Frazier, J.L. 2014. Four common pesticides, their mixtures and a formulation solvent in the hive environment have high oral toxicity to honey bee larvae. *PLoS ONE* 9(1): e77547. doi:10.1371/journal.pone.0077547. Online at <http://www.plosone.org/article/doi/10.1371/journal.pone.0077547>. Online at <http://www.plosone.org/article/doi/10.1371/journal.pone.0077547> [3Adoi%2F10.1371%2Fjournal.pone.0077547&representation=PDF](http://www.plosone.org/article/doi/10.1371/journal.pone.0077547)

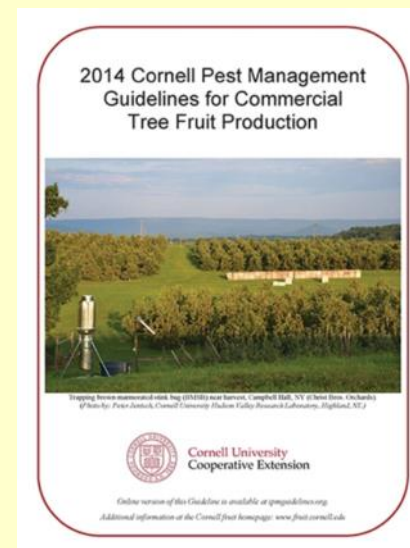
Biddinger, D.J., Robertson, J.L., Mullin, C., Frazier, J., Ashcraft, S.A., Rajotte, E.G., Joshi, N.K., and Vaughn, M. 2013. Comparative toxicities and synergism of apple orchard pesticides to *Apis mellifera* (L.) and *Osmia cornifrons* (Radoszkowski). *PLoS ONE* 8 (9): e72587. doi:10.1371/journal.pone.0072587. Online at <http://www.plosone.org/article/doi/10.1371/journal.pone.0072587> [2Fjournal.pone.0072587](http://www.plosone.org/article/doi/10.1371/journal.pone.0072587)

Cornell Pest Management Guidelines

Please note that the 2014 Cornell Pest Management Guidelines for Commercial Tree Fruit Production is available only as a hard copy this year. A visit to the PMEP website (<http://ipmguidelines.org/treefruits/>) gives the following explanation:

“Due to budgetary constraints, the 2014 Cornell Pest Management Guidelines for Commercial Tree Fruit Production will not be available online. We are currently exploring options that will allow us to recover the costs of posting this publication online. We hope to have the Guidelines back online in 2015.”

Distribution has been taken over by the Cornell Store, and guidelines can be purchased online at <http://store.cornell.edu/c-875-guidelines.aspx> or ordered through your local Cornell Cooperative Extension office.



Disclaimer: 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 possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide. This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension.

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