

SCAFFOLDS Fruit Journal, Geneva, NY

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Update on Pest Management and Crop Development

March 21, 2016

COMING EVENTS

	43°F	50°F
Current DD* accumulations		
(Geneva 1/1-3/21):	92.4	34.4
(Geneva 1/1-3/21/2015):	5.1	1.0
(Geneva "Normal"):	46.8	16.6
(Geneva 1/1-3/28, predicted):	116.2	42.3
(Highland 1/1-3/21):	189.9	81.6

Upcoming Pest Events – Ranges (Normal +/- Std Dev):

Green fruitworm 1st catch.....	47-149	11-69
Pear psylla adults active	31-99	8-34
Pear psylla 1st oviposition	40-126	11-53
Redbanded leafroller 1st catch...	113-177	41-83
Spotted tentiform leafminer		
1st catch	115-215	44-102
McIntosh silver tip	61-107	20-42
McIntosh green tip	97-145	37-63

*[all DDs Baskerville-Emin, B.E.]

Phenologies

Geneva:	<u>Current</u>	<u>3/28, Predicted</u>
Apple (McIntosh, Empire):	silver tip	green tip
Apple (Red Delicious):	silver tip	green tip
Pear (Bartlett):	swollen bud	swollen bud- bud burst
Pear (Bosc):	dormant	

Highland:

Apple (McIntosh): green tip (as of 3/17)
 (Red Delicious, Ginger Gold, Empire): silver tip
 Pear (Bartlett, Bosc): swollen bud
 Plum (Stanley): swollen bud

Pest Focus

Highland: 1st Redbanded Leafroller trap catch 3/14.
 1st Green Fruitworm trap catch today, 3/21.
 Pear Psylla egg laying has begun.

[Section: GENERAL INFO]

RUNNING HOT AND COLD

(Art Agnello, Entomology, Geneva; ama4@cornell.edu)

[Box text: MERCURIAL]

"Everybody talks about the weather, but nobody does anything about it." (Charles Dudley Warner, American journalist, 1829-1900).

I'll admit to being guilty of the above behavior—both parts—but I don't feel particularly bad about this, since my workday (and -week, -month, etc.) is actually driven pretty directly by the weather, unlike someone who flips burgers or trades stocks for a living. The problem is that this doesn't help any when it comes to predicting the result of whatever weather blips do come our way. It's easy enough to find out that this winter was the warmest nationwide in 121 years, with regional temperatures running 5–10 degrees warmer than the 30-year average, and precipitation levels at the 3rd highest (although 3rd lowest in snowfall) in the last 25 years. These stats don't reveal much, though, about what the coming spring looks like from a bugs-eye view. For one thing, they gloss over the really cold and even snowy extremes, of which there were actually several.

Christmas may have been quite warm — some neighbors were seen having a cookout on their front porch on Christmas Eve — but lows got into the single digits during the first week of January, and again later in the month (corresponding with the NY Expo, of course). Lows around Valentine's Day (which had a high of zero

in Geneva) were down to 15 below, followed by a healthy storm that featured 18 inches of snow. These brief polar plunges can actually have an impact on some insects, such as the non-native brown marmorated stink bug, which have been found to die off at 5°F; our home-grown pests, though, will probably be more impacted by the record average high temps and early warm-up. These facts aside, the spring sequence always sets the master clock for pest emergence, and cold temperatures in April (if we get them) won't put them back to sleep once they start their engines, but cool, rainy and generally crummy weather before bloom does slow things down pretty well. Like fruit growers, I guess I tend to be more at ease when our spring weather can't be mistaken for whatever is going on in Virginia, or even Pennsylvania. But it's impossible to ignore one of the surest signs of spring known to all Geneva residents: Mr. Twistee's, our local ice cream drive-in, opened last Friday.

We Never Claimed to be #Trendy

Scaffolds will continue to be available via email and online this year. As always, we ask subscribers to inform us of any address changes, so that there are no surprise nasty messages from list servers or mail bots.

Scaffolds is sent as a pdf file via email each Monday afternoon. For those desiring a more screen-friendly format than the double column we currently use, I can send an unformatted plain text version to anyone who requests it, in addition to (or in place of) the pdf. There is also a web version available, which should be up and ready for viewing at the same time as the emailed pdf is sent. ***Scaffolds*** can be found online at: <http://www.scaffolds.entomology.cornell.edu/>. Please make a note of this address in any bookmarks you may maintain that point to ***Scaffolds***.

Also, we will post a version of Scaffolds online that is formatted to be more easily read on smartphones and other mobile devices. Look for "*ScaffoldsMD* for Mobile Devices" under the current link to the PDF version.

As always, we are willing to consider contributions (particularly from N.Y. sources) in the form of articles on topics in any of the fruit crop protection or crop production areas, as well as N.Y. field observations, trap data, etc. Our preferred deadline for such dispatches is 2 p.m. on Monday.

WEATHER STATION MAINTENANCE – GET READY FOR THE GROWING SEASON

(Juliet Carroll, Fruit IPM Coordinator and Leader of NEWA, NYS IPM Program, Geneva; jec3@cornell.edu)

[Box Text: INSIDE THE BOX]

To keep your NEWA-connected weather station running in top shape this season, consult the [Maintenance Guidelines](#) and the [Troubleshooting Guide](#) we put together for Rainwise weather stations in NEWA. Developed with input from Rainwise Technical Support personnel and incorporating questions and answers from our workshops, "*Improving the Reliability of your Weather Station*", the Guide provides a comprehensive overview and detailed steps for fixing problems that arise with your weather station. Simple fixes, such as turning the station off and then on to reset it, are on the main web page.

Common maintenance issues, like the need for a new battery, if not taken care of, can lead to anomalies in data or data not being reported. You can download the [Maintenance and Troubleshooting Guide](#) and keep it on hand for reference. The troubleshooting guide is organized by the types of problems you might encounter with your weather data. These include:

- Rainfall Data Not Collected – [Rainfall Missing](#)
- Excess Rainfall Data Collected – [Excess Rainfall](#)
- Station is Not Transmitting – [Data Transmission](#)
- The Receiving Base is Not Uploading Data to RainwiseNet – [Data Upload Failure](#)

When weather stations are 3 to 5 years old, they may begin to show a need for repair – new sensors (temperature/relative humidity, leaf wetness, etc.), or a new battery. Keep an eye on your weather data to make sure it is within normal parameters. Scan [Hourly Data](#), (under Weather Data on the blue main menu on NEWA) or check your data feed on RainwiseNet.

We've upgraded the [NEWA Hourly Data page](#) to include a State selection box. Select your state and then either select a station, month, and year using the drop-down boxes, and hit "Get report" or click on a month provided in the table (blue links; purple links are previously viewed). Once you make the selection, the page of results will display in an "Hourly Data Summary" for that month.

If NEWA isn't getting your weather data, the Hourly Data page will show patched gaps as brown italicized font — indicating missing or extrapolated data that could indicate a weather station problem. Hourly Data

variables can show you daily weather patterns, extremes in temperature and rainfall that are beneficial to maintaining your crops, but also maintaining your weather station.

Only functioning weather stations are included in the drop-down lists. If you can't find the station you are looking for, chances are it is currently inactive. Any weather stations inactive for more than a month are taken out of NEWA until they are back up. A list of inactive weather stations is provided in the "Select station" drop down box.

This time of year is an excellent time to maintain your weather station. Take a look at the station, make sure the rain gauge bucket is clean, and check all the connections.

We'd like to acknowledge the New York State Apple Research and Development Program for funding our workshops and making it possible to create the Troubleshooting Guide and web pages that are now available to everyone connected to NEWA across the Eastern US.

[Section: DISEASES]

2016 FUNGICIDE UPDATE FOR NY

(Kerik Cox, Plant Pathology, Geneva;

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Fungicide selection for apple scab management is still a complicated matter for apple producers. The issues of fungicide selection are complicated by fungicide resistance, pre-mix products of multiple fungicides, an abundance of new chemistries in one fungicide group, potentially injurious tank mix combinations, and the need to manage diseases other than apple scab. In recent years, control failures due to fungicide resistance in *Venturia inaequalis* (the apple scab pathogen) appear to have subsided as growers switched to some of the newly released succinate dehydrogenase inhibitor (SDHI) fungicides. However, without careful use and fungicide group rotation, it will only be a matter of time before the new SDHI fungicides are overcome. While the paradigm of marketing pre-mix fungicides may fall out of favor in the coming years, the complexity of tank mixes at petal fall and incompatibilities between new and existing fungicide products will continue to present new issues. Below, I present an update on new fungicide products and perspectives on the use of existing products.

Overwintering inoculum

If there was a high level of apple scab in the fall, inoculum reduction should be practiced this spring. If inoculum reduction was practiced in the fall, it is necessary to repeat inoculum reduction measures in the spring. Now that the snow **may be** gone for the season, it is important to implement inoculum reduction as soon as tractors can enter the orchard. The two best options for inoculum reduction are to shred leaves with a flail mower or treat the leaf litter with an application of urea. In the case of flail mowing, the leaves need to be swept or raked from underneath the canopy into row middles. Subsequently, the row middles should be mowed with the flail mower set to scalp the sod. If applications of urea are used, applications should be made at 40 lbs of feed grade urea per acre in 100 gallons of water. Dolomitic lime can be used instead, but it should be applied at rate of 2.5 tons per acre. Of the two options, applying urea is the typically the simplest approach, but take care to rinse the sprayer with water afterwards, since the urea is caustic and can wear out a sprayer pump over time. Indeed, the farm managers in Geneva have reported wearing out pumps in a single season when adequate rinsing was not practiced.

Available fungicides

Dodine (syllit)

Syllit (dodine) should be applied in the early season given that applications aren't allowed in apples after pink according to the label. However, applications after bloom are still allowed on pears. Although it's been several years since we've detected dodine resistance in commercial plantings, we have found a few *V. inaequalis* isolates from research orchards that seem to be capable of growing in the presence of dodine in culture. However, the orchard populations from which these isolates were collected were fairly sensitive to Syllit, which still provided excellent control during the season of collection. In this regard, Syllit should still be applied in combination with mancozeb and applied no more than twice. (The label now requires mixing with either mancozeb or captan, but mixing with captan increases the risk of phytotoxicity.) If there are heavy rains prior to pink, Syllit may be a good choice, as it has some post-infection utility, even in blocks that have been shifted towards resistance. Since copper is often applied at sliver/green tip to suppress fire blight inoculum, Syllit plus mancozeb could be applied from late green tip to tight cluster. If powdery mildew is a concern, Syllit may not be a good choice at tight cluster,

as it has no activity against mildew. Although the key application timings for powdery mildew in NY usually occur from bloom to 1st cover, reduced efficacy of the demethylation inhibitors (DMIs) and quinone outside inhibitors (Qols) due to resistance may necessitate earlier applications for powdery mildew, with the first spray at tight cluster. Aside from mildew, Syllit is not very effective on rust diseases, but in most cases these rust diseases could be managed by the mancozeb recommended as a tank-mix partner for Syllit.

Captan and Mancozeb

Combinations of mancozeb and captan applied on a 5–7-day schedule have been popular for the last few years. However, these two fungicides are contact fungicides and must be applied before rains, or at least before a Mills infection period is completed after rains begin. (Sprays applied in the rain will have very limited residual activity after the rains end.) Moreover, captan and mancozeb have little to no effect on powdery mildew and the 3 lb/A rate of mancozeb may not be effective against rust in high-inoculum situations. As the season progresses to bloom and the tank mixes become complicated by the fact that growers need to manage insects, diseases, and crop load, captan should be used with caution, because it is phytotoxic if

absorbed into plant cells. Adjuvants, oils, and other tank mix partners that cause excessive wetting or enhance uptake will increase the chances that captan will get through the cuticular layer of leaves and fruit. This is especially the case if sprays are applied under slow drying conditions in the early morning, in the late evening, or during a light rain. Although there haven't been as many reports of captan-related injury in recent years, I suggest that growers still curtail applications of captan at petal fall and first cover when the cuticles of apple leaves and fruit are not fully developed, especially if we have extended periods of cool, cloudy weather during those growth stages. New fungicides formulated in organic carriers are being released faster than can be evaluated by extension scientists in the context of low volume applications (<50 gal/A) that are common in modern high-density apple plantings. If mancozeb is to be selected over captan at this timing, it will be important to also avoid any prebloom applications of mancozeb or polyram that exceed 3 lbs/A to remain in compliance with labeling restrictions. If rates of mancozeb higher than 3 lbs/A are used at any time during the early season, the label will not allow post-bloom applications of mancozeb.

SDHI fungicides

There are several SDHI fungicide chemistries registered for apples, and several more are forthcoming (Table 1). The SDHI fungicides are either marketed alone or pre-mixed with another fungicide chemistry such as a QoI or AP (anilinopyrimidine) fungicide. The SDHI fungicides in general have a high level of activity against apple scab and a low to moderate level of activity against apple rust diseases and powdery mildew. The AP fungicides are typically more effective in colder weather, but even then have no activity against powdery mildew and apple rust. Hence, it would be best to apply products with AP fungicides prior to bloom. The SDHI fungicide products with QoI mix partners are fairly effective against powdery mildew and rust diseases. These premix products could therefore be applied from bloom to first cover. Since the SDHI plus QoI premix products also work well for summer disease, using them at first cover and in the final pre-harvest covers would be advisable. While there are concerns about QoI fungicide resistance in NY and New England, the performance of the SDHI plus QoI premix products does not seem to be affected by the presence of QoI-resistant apple scab or powdery mildew. Regardless, one should include 3 lbs of mancozeb (a multi-site contact fungicide) with all of the SDHI fungicides in early season sprays to preserve the

life span of this fungicide group. Mancozeb is preferable to captan given the aforementioned concerns regarding captan use at petal fall and 1st cover, but they can be combined with captan in summer sprays. Nevertheless, many of the SDHI fungicides are petroleum-based SC formulations, which could slightly enhance the uptake of captan under slow drying conditions, so caution is warranted. Table 1 summarizes the various features of the current and forthcoming SDHI fungicide products.

Table 1. Features of current and forthcoming SDHI fungicide products.

Trade name (Manuf.)	Fungicide Chemistries	Disease efficacy	Registration Status (Restricted)	Use on Long Island
Fontellis (DuPont)	SDHI	High: apple scab, Low to Moderate: Rust & Mildew	SLN	No
Merivon (BASF)	SDHI+QoI	High: apple scab, Moderately High: Rust and Mildew	Restricted Use	No
Pristine (BASF)	SDHI+QoI	High: apple scab, Moderately High: Rust & Mildew	Not restricted	Yes
Luna Tranquility (Bayer)	SDHI+AP	High: apple scab, Moderate: Mildew, Low: Rust	SLN	No

Luna Sensation (Bayer)	SDHI+QoI	High: apple scab, Moderately High: Rust & Mildew	Outside NY	No
Aprovia (Syngenta)	SDHI	High*: apple scab, Low to moderate: Rust & Mildew	Outside NY	No
Isofetamid (ISK)	SDHI	High*: apple scab, Low: Rust and Mildew	Not registered	No

* In high disease pressure years, I have observed an exceptionally high level of apple scab efficacy.

QoI or strobilurin fungicides

The QoI or strobilurin fungicides provide a high level of activity against apple scab, apple rust diseases, powdery mildew, sooty blotch and flyspeck, and summer fruit rots. Unfortunately, resistance to QoI fungicides in apple scab is widespread in Michigan, and has been documented in orchards in NY and many New England states. The development of resistance may appear gradual at first, but can quickly progress to a near complete loss of effectiveness similar to that experienced for the benzimidazole fungicides. Given the risk and uncertainties with the level of QoI resistance present in orchards in the region, it may be best to avoid using the stand-alone QoI fungicide products from pink to 1st cover. Instead consider using a SDHI plus QoI fungicide premix product such as

Merivon, Pristine, or (except in NY, where it is not labeled) Luna Sensation. They would provide the same activity as Flint or Sovran, but with less risk of resistance development.

DMI fungicides

Resistance to the DMI fungicides (Rubigan, Rally, Indar, Topguard, Inspire Super) in apple scab is fairly widespread, and we believe that DMI resistance in apple powdery mildew may also be fairly widespread. Since it is impossible to grow apple powdery mildew in culture, we cannot test the fungus for DMI resistance, and can only make inferences from grower frustrations with using the products and the need for higher rates in research trials. Indeed, resistance to this group of fungicides is rate-dependent and gradual, meaning that resistance may be overcome by higher product rates and the use of DMI chemistries with higher intrinsic activity, especially in orchards with only low to moderate disease pressure and/or on cultivars that are less susceptible to apple scab (i.e., more resistant than McIntosh). In the case of difenoconazole, one of the two fungicides in Inspire Super, it appears that the apple scab pathogen has hit a metabolic ceiling for resistance. A metabolic ceiling would be the point at which the level of resistance provided by the metabolic

machinery of *V. inaequalis* that has shifted toward resistance cannot exceed the amount/potency of the fungicide applied at the upper end of the label rates. Simply put, if Inspire Super is applied at the highest labeled rate, the effective dose of difenoconazole is greater than what *V. inaequalis* can tolerate, even in populations with a high level of DMI resistance.

Regardless of this phenomenon, DMI fungicides should still be used with extreme caution, and should not be relied on for post-infection activity. Reliability of Inspire Super is especially questionable in cultivars that are highly susceptible to scab (e.g., McIntosh) located in blocks where there is a history of scab control failures with older DMIs like Rubigan, Topguard, or Rally.

One of the more noticeable effects of DMI resistance is the failure of DMI fungicides to provide acceptable control of powdery mildew at rates that were historically effective. This is most commonly observed with the DMI fungicides difenoconazole (Inspire Super) and fenbuconazole (Indar 2F). By comparison, the DMI fungicides myclobutanil (Rally) and flutriafol (Topguard) are more effective against powdery mildew. The label for Rally has also changed over the years to allow higher rates (up to 10 oz/A). Whereas growers achieved excellent control of scab with 4 oz/A of Rally

when this fungicide was first introduced, many growers are now using 5 or 6 or even 8 oz/A, so as to get better control of mildew. However, using rates above 6 oz/A at petal fall and 1st cover may, at least under some circumstances, result in undesirable plant growth regulator effects, such as smaller length/diameter ratios (i.e., less "typy" fruit) and/or slightly decreased fruit thinning (Rosenberger et al. 2003). Regardless, if DMIs are used for powdery mildew control, it may be worthwhile to include a low rate of sulfur to compensate for the presence of DMI resistance. If summer temperatures exceed 85°F, applications of sulfur may be injurious to the crop.

Summary

In summary, a strong apple scab fungicide program with good fungicide resistance management would start with an application of copper at silver to green tip, which will control early season infections while also helping to reduce fire blight inoculum. Once the season has started, one should consider two applications of Syllit plus mancozeb and/or two applications of an SDHI fungicide plus mancozeb before bloom in a standard protectant program. Later applications during petal fall to 1st cover could include two applications of a QoI or SDHI plus QoI (Merivon). It might also be advisable to

use a DMI plus sulfur during petal fall and first cover for rust or powdery mildew, thereby saving the remaining SDHI or QoI applications in the form of Merivon or Pristine for pre-harvest cover sprays to manage latent summer diseases like fly speck, sooty blotch, and bitter rot.

References

Rosenberger, D.A., Robinson, T.L., Schupp, J.R., Engle-Ahlers, C.A., and Meyer, F.W. 2003. Effect of steroldemethylation inhibiting fungicides on apple fruit set, fruit size, total yield, and gross returns. HortScience 38:601-604.

[Section: CHEM NEWS]

PRODUCT REGISTRATION UPDATE

(Art Agnello, Entomology, Geneva; ama4@cornell.edu)

[Box Text: CHEM BRIEFS]

Following is list of some changes to the insecticides available for use in NY tree fruit crops for the 2016 growing season; more are likely to follow:

Cancelled

- Thionex - Endosulfan products are no longer registered for use in tree fruits; they had an EPA-mandated stop-use date of **July 31, 2015**.

New Registrations

- Des-X (insecticidal soap, Certis; EPA Reg. No. 67702-22-70051) is now registered in all tree fruits, for use against soft-bodied insects such as aphids, mealybugs, and psyllids; very short residual period, acceptable in organic programs.
- Portal XLO 0.4EC (fenpyroximate, Nichino; EPA Reg. No. 71711-40) is a new low-odor formulation of this insecticide and acaricide labeled for use in apples and pears against mites, leafhoppers, mealybugs and pear psylla, plus mites and leafhoppers in stone fruits.
- Zeal 2.88SC (etoxazole, Valent; EPA Reg. No. 59639-202) is a new liquid formulation of this acaricide, labeled for use against European red mite and twospotted spider mite in all tree fruit crops.

New 2(ee) labels

The NYS DEC recently approved the following registrations:

- Exirel (EPA Reg. No. 352-859) to control the unlabeled pest apple leafcurling midge in apples

- Beleaf 50SG (EPA Reg. No. 71512-10-279) to control the unlabeled pests codling moth and San Jose scale in apples.

Users must have a copy of the 2(ee) recommendation in their possession at the time of use; these are available on the PIMS website at:

http://pmep.cce.cornell.edu/regulation/2ee/unlabeled_pest/fruits/apples/insecticides/index.html

Going, going?

- Lorsban (chlorpyrifos): Last November, the EPA proposed to revoke all tolerances in response to a petition citing a lack of some specific safety standards data pertaining to watersheds. This was followed by a 60-day comment period that ended on Jan. 5, 2016. This issue is currently still being reviewed, and we are awaiting a ruling.

- Belt (flubendiamide): In early March of this year, the EPA issued a notice of intent to cancel all products with this a.i., citing potential risk to aquatic invertebrates. The registrants (Bayer, Nichino) have refused to voluntarily cancel these registrations and are seeking a review of the product's registration in an administrative law hearing.

Until final rulings have been issued in these cases, existing stocks of both products can still be used and crops treated with them can still be sold legally.

Please note that the 2015 Cornell Pest Management Guidelines for Commercial Tree Fruit Production is available this year from the Cornell Store, both in a printed book format as well as online once again; however, the online version is not free, but must be purchased (for \$38.00, the same price as the print version). There is also a bundle option, which provides both for 40% more than the cost of either version alone. If you do not receive the Tree Fruit Guidelines as part of your membership in a county-based CCE fruit program, visit <https://demo.cuguidelines.net/> for purchasing details.

Update From Debbie Breth

(Lake Ontario Fruit Team, Albion; dib1@cornell.edu)

Fungicides:

- Vivando (metrafenone) is a new fungicide effective on powdery mildew on grapes with supplemental labels for apricots and cherries. During the 2015 growing season, BASF received reports that selected apple varieties (Macoun, Baldwin, and SnowSweet) were

injured when tank mix applications of Vivando fungicide were applied. Therefore, BASF advises that growers DO NOT make applications of Vivando fungicide to apples or other pome fruit crops. Vivando fungicide can still be used for control of powdery mildew on grapes, apricots, cherries, peaches, fruiting vegetables, cucurbit vegetables and hops. After spraying Vivando fungicide, growers are advised to completely drain the spray tank, thoroughly rinse it and make sure the spray lines to the nozzles are completely clean before the next use, particularly if the next crop is apples. BASF is in the process of cancelling all state registrations for Vivando on pome fruit. The pome label was only a supplemental so will easily be removed.

- Merivon now has a full label in NY (<http://132.236.168.99/ppds/542979.pdf>) for pome fruit, stone fruit, and strawberries. It is no longer a Special Local Need label. The strawberry use will replace Pristine.

- Luna Sensation is a combination of SDHI (fluopyram) and QoI (Flint) and could be registered in NY by the end of April. It provides excellent control of scab, powdery mildew, summer diseases, and storage rots in late season use. In cherries, it will control brown rot, cherry leafspot, and powdery mildew. For now, Luna Tranquility is still a Special Local Need label in NY – for a

SLN label, go to

<http://132.236.168.99/ppds/537525.pdf>, and the label, <http://132.236.168.99/ppds/537526.pdf>. It may have full NY label also in late April.

- Serifel (*Bacillus amyloliquefaciens* strain MBI 600*) is a biofungicide registered for use in strawberries for foliar diseases. Please read the label (<http://132.236.168.99/ppds/541668.pdf>) for more instructions.

Miticides:

- Nealta (cyflumetofen) is a new miticide you might see in trade magazines registered by EPA in pome fruit, grapes, and strawberries, but is not yet registered in NY. It will control all life stages of mites at first sign of infestation. It may be approved in NY in May, so stay tuned.

Insecticides:

- Vydate will not be available for use in 2016 due to loss of production facility.

- Exirel was registered in NY last January (<http://132.236.168.99/ppds/542437.pdf>) with the active ingredient Cyazypyr®/cyantraniliprole for use against a range of chewing and sucking pests on pome fruits, including codling moth, oriental fruit moth,

obliquebanded leafroller, plum curculio, European apple sawfly, pear psylla, and rosy apple aphid. It has a PHI of 3 days, and a 12-hr REI. EXIREL is an oil in water emulsion. The crop safety of EXIREL alone or in tank mix with many common insecticides, fungicides, nutritionals and adjuvants has been found to be acceptable. Tank mixes of EXIREL with some products formulated as emulsifiable concentrates (EC), strobilurin fungicides (for example Cabrio and Quadris), copper and sulfur-based fungicides, chlorothalonil based fungicide formulations (for example, Bravo Weather Stik), and the fungicides Captan, Tanos, Rally and Manzate may result in adverse crop response. Some materials including oils, surfactants, adjuvants, nutritionals and pesticide formulations when applied individually, sequentially, or in tank mixtures may solubilize the plant cuticle, facilitate penetration into plant tissue, and increase the potential for crop injury. The application of strobilurin fungicides in a short time sequence (i.e., seven days apart or less between applications) before or after EXIREL may also result in adverse crop response. Read all the labels for compatibility before setting up a tank mix. Exirel is also labeled against cranberry fruitworm and cherry fruitworm in bushberries and in stone fruit for cherry fruit fly, codling moth, oriental fruit moth, leafrollers,

and spotted wing drosophila. Exirel is not labeled for use in raspberries.

Plant Growth Regulators:

- Apogee now has a supplemental label for use in sweet cherries to reduce shoot growth. See label for instructions (<http://132.236.168.99/ppds/543033.pdf>). Do not use on tart cherries.

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