

Healthy Fruit



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Tree Fruit Team

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Growth stage

Most locations in the state are now at late tight cluster or early pink. Peaches are at buds to early bloom

Weather? Weather!

There are a few general statements worth making about the effects of weather on orchard conditions this spring. After we carefully outlined preventative prebloom spray recommendations that growers should follow to minimize summer pest problems, we find that most orchards have had very difficult conditions for any spray activity. Between wind and rain, there have been very few clear, calm times available, and when those times were available, chances are the ground was (or still is) like a bog. This means that many growers have been unable to achieve the sort of thorough oil coverage necessary for good mite control. We will provide some suggestions on mite management strategies in the section on mites.

The alternating wet and windy weather has also held back the appearance of a number of orchard pests. Tarnished plant bug, leafminers, pear psylla, and pear thrips have evidenced a lower than normal level of activity, probably due to poor conditions for flight. Growers therefore need to be prepared for possible rapid influxes of these pests once the weather turns warm (normal?).

Scab and the Single Spray

The fact that the wind has barely dropped below gale force this spring has made it nearly impossible to spray fungicides. Some growers had a single fungicide application on before this past Monday, others did not. Meanwhile, spore development has barreled along at a record pace. Is this a recipe for disaster?

Probably it isn't, because until the April 29-30 deluge, we really hadn't had significant infection periods. The rains which did occur were short, and started at night. Research from UNH and Geneva have

shown that rain events which start at night release almost no ascospores before daylight. After daylight, foliage has generally dried quickly, short of the time needed for scab infection.

Now the situation has changed. The rain on April 29-30 was a major infection period. Given the wind, some growers may have been unable to spray, or feel that the coverage was less than perfect. By the time you read this, many of you will have applied either Nova or Rubigan. These are really the best fungicides for dealing with the scab situation as it now stands.

For those growers more inclined to use mancozeb, captan or some other protectant, it is imperative that you had applied the fungicide before the April 29 infection started. If you did not, the only real option at this point is a pair of SI applications. After that, returning to a protectant program should be fine.

If you are unsure of the protection you had going into the infection, there is still time to apply Nova or Rubigan to stop infections (assuming you are reading this by May 4!). Before the scab infection becomes visible and starts to sporulate, post-infection sprays of Nova or Rubigan can prevent further development.

Notice such treatment requires sprays, not a single spray. Even if you applied an SI fungicide within the 4 day window of recommended "kickback", I recommend that you be conservative and apply a second SI at about 7 days later. Under no circumstances should you extend the interval beyond 10 days.

That's the timing. Rates should be kept high. That means a minimum of 9 fl. oz. of Rubigan per acre or 4.5 oz. of Nova. If the interval from the start of the infection period has gotten beyond the 4 day window for the first SI application, I would go to 12 fl. oz. per acre of Rubigan, or 6 oz. per acre of Nova.

Depending on the temperature over the next week, the second SI will be applied in bloom. While this isn't ideal, because an insecticide shouldn't be applied, it is the best timing and presents no danger to bees and pollination. Trials at the HRC showed that the SIs have no effect on eventual fruit set.

Mites

As of today, no mite egg hatch has been observed at the Horticultural Research Center in Belchertown. We expect egg hatch to be occurring soon. Due to weather and ground conditions, many growers have not had the opportunity to make 2 (or even 1) dormant oil applications. With late tight cluster or early pink growth in most areas, a lack of oil coverage leaves growers in a tricky position. It may be necessary to seriously consider one of the early season miticides available: Apollo, Savey, Morestan, Agrimek, or Vendex in combination with summer oil. Apollo is not labeled for use after tight cluster; it may simply be too late now for Apollo use in many orchards. This leaves 4 alternative chemicals for growers to consider.

There is one very important step growers must take in determining whether and when to apply any of the early season miticides and that is to sample regularly for mite egg hatch and ensuing mite numbers. It is essential that growers continue to sample weekly through bloom if the initial count is below the action threshold.

Effectiveness and use of these chemicals have been discussed in detail in earlier pest messages.

There is one very important step growers must take in determining whether and when to apply any of the early season miticides and that is to sample regularly for mite egg hatch and ensuing mite numbers. Without sampling there is no way to judge when egg hatch has occurred and whether mites actually exist in potentially damaging numbers. For prebloom mite monitoring we recommend a procedure put forward by Glen Koehler of the University of Maine. Working with interior fruit clusters, check 5 middle-age leaves per tree on at least 6 trees per block for live mites (eggs and dead mites don't count). If there are 5 or less leaves with motile mites on the first 30 leaves, stop counting and assume the block is currently under the action threshold. Resample in one week. If there are 10 or more infested leaves among the first 30, stop counting and prepare to spray. If there are 6-9 leaves with mites among the first 30 leaves, sample another 30 leaves and so on, until a clearer picture emerges. **It is essential that growers continue to sample weekly through bloom if the initial count is below the action threshold.** It is

possible to have low numbers in the first one or two rounds because egg hatch has not begun in earnest, not because there are no mites. If the action threshold is reached by pink, Morestan or Savey can be used. If the action threshold is reached after pink, Agrimek or a combination of summer oil and Vendex can be used at petal fall.

Tarnished plant bug and Leafminer

For tarnished plant bug, trap capture numbers have been abnormally low to date, and bud abscission has been extremely low. Leafminer trap captures also continue to be low with no monitored orchards exceeding thresholds.

Growers should continue to monitor trap captures and treat when thresholds are reached. The thresholds are :

	Cumulative capture	
	ST to TC	ST to late PK
TPB		
Mainly extra fancy	3.5	5.0
Mainly # 1 fruit	5.5	8.0
Leafminer		
McIntosh	4	9
Non-McIntosh	8	21

Fungicide Errors from the New England Apple Pest Management Guide

In the Apple Pest Management Guide, it says in a couple of places that only one kind of EBDC fungicide can be used in a given season. This is no longer true. That does not mean that after you have exceeded application limits for one EBDC, you can switch to another. The total number of applications at the high rate for any combination of EBDC fungicide remains 4. The total number for the low rate remains 7.

We also recommend that Topsin M be used with a protectant fungicide, for resistance management. For Benlate, such combinations are required, but for Topsin M it is not a legal requirement.

Brown Rot, Bloom and Peaches

As peaches come into bloom, we are entering the time when peaches are first susceptible to brown rot infections. After shuck-split, unless the weather is very wet, peaches become less susceptible to infection until the pit hardens and the fruit starts to ripen.

Inoculum for brown rot comes from within the orchard, unless you have wild peaches growing nearby. The major source of inoculum is old, dried peach "mummies", which really are no longer peaches but are instead balls of the brown rot fungus. These may hang on trees, but are more often on the ground around trees. Another source is old wood infections, which develop when brown rot grows from the peach into twigs and even into larger branches. Once blossoms become infected, they rapidly become a source of more inoculum.

The mummies and old cankers produce spores when it rains. If blossoms are wet, then a spore which lands on it will grow and infect it. The fungus grows best at around 75 F, and at that temperature it may take as little as 12 hours for the fungus to infect the flower. At less optimal temperatures, the process is probably slower, and a rule of thumb is that brown rots take approximately 12 to 24 hours of wetness to develop. Muggy weather will increase the chances that blossoms stay wet longer.

Blossoms may be sprayed on either a protectant or a post-infection basis. The protectant fungicides include captan (which can damage some peaches), Bravo, sulfur or ferbam, which must obviously be applied before an infection period. For activity within 24 to 48 hrs after the start of an infection, use Ronilan or Rovral. These fungicides will also suppress spore production. However, the brown rot fungus can develop resistance to them, so limit their use to 3 applications a season, making sure to use at least one other fungicide during the season. A third group of fungicides is the familiar SIs, in this case Funginex, Nova, Indar and Orbit. As Wayne Wilcox, who has done extensive work with these fungicides, puts it, "forget Funginex and Nova, they're not in the same league with Indar and Orbit". Last week there was a brief description of Indar in *Healthy Fruit*. Indar is labelled for blossom blight only, but Orbit may be used for the both blossom blight and fruit rot.

Two to four applications of a fungicide are usually enough during bloom and shuck-split. The wetter the weather, the more fungicide will be necessary. The number of applications during bloom and shuck-split also depends on inoculum. If there were a lot of brown-rotted peaches which didn't make it out of the orchard the previous year then disease pressure will be much higher. Consider raking out mummies to reduce the inoculum.

Fungicide Resistance in the SIs

The apple scab fungus can become resistant to Nova and Rubigan, and other SI fungicides. This is an unfortunate fact. In a research orchard in Nova Scotia, and in some commercial orchards in Europe, SIs have become much less effective as the scab fungus has developed resistance. However, the nature of the SI resistance is not like the resistance we see to Benlate. With Benlate, once the scab fungus is resistant, increasing doses of the fungicide have no effect. The result is a spectacular failure of scab control in an orchard where Benlate resistance develops.

Resistance in the SI fungicides is less spectacular, and develops gradually. Increasing the dose of an SI will improve the control of a somewhat resistant strain of the scab fungus for at least a while. However, it would be better to minimize this shift towards resistance in your orchard, rather than risk loss of the SIs.

In the past, we have recommended using Nova or Rubigan in combination with a protectant such as captan or mancozeb. In to other benefits, this combination should delay resistance development. Theoretically this occurs because the resistant spores in a population, which escape the post-infection activity of the SI, will not be able to germinate and reproduce because the protectant will stop it. An alternative strategy suggests that a high rate of the fungicide will kill strains of the fungus which have become somewhat resistant, preventing further resistance development.

Recently, researchers in New York (Koeller, Wilcox and Olson) examined different strains of the scab fungus and different spray strategies to see which performed best in terms of delaying the shift to resistance. After a couple of seasons, they suggest the following ranking of resistance management strategies.

Best. SI fungicide at the high label rate plus a protectant.

Next. SI fungicide alone at a high label rate.

Next. SI at the lowest label rate plus a protectant.

Worst. SI at the lowest label rate.

Given the other benefits of a protectant fungicide (broader spectrum of diseases controlled and improved protection activity of the application) I recommend option 1. From a cost perspective, that may mean limiting the use of SIs to 2 or 3 applications a year. However, as this year shows, there may be times when the SIs are the only alternative.