My childhood was spent in Rochester, not quite an hour's drive from my office today, but in a sense still far away from where I ended up. We lived in the city proper, on the southeast side near the once-notorious "Can of Worms", a tangle of highways known for vexing non-native drivers who encountered it unprepared. There was no farmland remotely visible from my house, let alone fruit trees, although I was always aware that apples were grown somewhere "out in the country", where the cows were. Each spring, as the weather started to improve and our parents looked forward to getting us out of the house, my five siblings and I would agitate to convince my father that we should all go for a ride – out in the country – ostensibly to see some green landscape, but mainly as a pretense to stop for ice cream at Seabreeze.

Our crowded station wagon would always head east along the lake, eventually crossing into Wayne County, until my father would try to distract us from our squabbles by yelling, 'Hey kids – look at all the apples in bloom!' And we'd suddenly notice the orchards all around us on the roadside, repeating 'Wow, look at all the apples', never mind that many of them were probably cherries, peaches or pears. I didn't have any real interest in farming, but I always remember feeling a sense of wonder at what was going on out there in the orchards. In my simplistic view, it seemed like a pretty cool thing — you have apple trees, which bloom in the spring, then the apples grow in the summer, and then you pick them in the fall. What could be better than that?

Obviously, I now know that's not quite all there is to it, as I'm more than a little familiar with all the in-between steps that come before the apples blooming in the spring get you to the picking in the fall. Still, I can't quite forget that young kid's wonder every year at the trees being suddenly covered with blossoms in the spring, despite all the miserable cold and snow a couple months earlier, and getting replaced by thousands of little green fruits that somehow make it past the ravages every disease, insect, and extreme weather event imaginable, to redden and grow into the iconic and incomparable fruits for which this area is so well known. I get to witness this every year, and puzzle over the countless variations of all the possible setbacks that threaten to foil the whole process, but somehow never do. What could be better than that?
Have you set up your mySCAFFOLDS account yet?

Just kidding – you don’t need one. Scaffolds will continue to be available via email and online this year; no account required. As always, we ask subscribers to inform us of any address changes, so that we don’t clog up the bandwidth with undeliverable messages that end up in the lost mail cloud.

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

THE WORD ON BIRDS

Dr. Paul Curtis, vertebrate pest management specialist in the Dept. of Natural Resources at Cornell University, has published an article in the journal Crop Protection entitled "Bird species and abundances in fruit crops and implications for bird management", which is available as a free PDF download until April 21 at: https://authors.elsevier.com/c/1YfDSxPFYiYC6

ORGANIC APPLE SURVEY

Dr. Greg Peck has requested that we pass along the following request regarding input from organic apple growers:

A survey is being conducted by a multi-institutional research and extension team from Cornell University, The Rodale Institute, and the University of Vermont. The purpose of the survey is to identify disease challenges to organic apple production in Eastern US. We will use the data for developing a USDA research and outreach proposal. Your responses will remain anonymous and you will not be identified by name or operation in any of our publications or presentations. Please complete the short survey if you are growing apples organically.

https://cornell.qualtrics.com/jfe/form/SV_eG2TiXbVrDnfsB7

PEST FOCUS

Highland:
Redbanded leafroller 1st catch, 3/14!
Winter has traditionally been cold, but we haven't had the consistent snow as in the previous years. In many places, the temperature hasn't been too far below freezing, with the exception of the polar vortex in early February and a cold snap in late fall. The only snow seems to come in the form of larger nationwide storms that pass through NY while devastating regions to the south and north. In the Hudson Valley and Long Island, green tip is imminent or under way for the early varieties, but the rest of the production areas of the state could have several weeks. In the coming weeks, there is a forecasted upswing of warmer days, which may be punctuated by intermittent regional snow storms. This could accelerate all apple growing regions toward green tip and beyond. With warm daytime temperatures currently forecast for late March, the potential snow storms could become regional rain storms leading to problems with diseases in early April. Hence, we may need to consider early season management for apple scab and other diseases. In the 2018 season, many areas of the state had little to no rainfall from late May through June. In western NY, many places suffered from near drought all season long until late August-early September, when heavy rain fell for several weeks. This was the case in Geneva, where there was little to no apple scab all season until September, when pin-point and late season apple scab showed up on unsprayed trees or those receiving treatments at extended intervals.

Because of the late season rains, considerable overwintering inoculum for apple scab and summer diseases might be present despite not seeing a lot at harvest. As fruit comes out of storage, the presence of rots and pinpoint scab may also indicate late season build-up of orchard inoculum. Hence, taking steps to reduce orchard floor inoculum may greatly reduce the pressure from apple scab and potentially even summer fruit rot epidemics in the coming season. As soon as it is possible to enter the orchard (will the soils ever dry out this spring?), remove any remaining fruit drops and pruned shoots left on the floor from winter pruning that may contain bitter rot or black rot inoculum. If apple scab leaf inoculum reduction was not practiced in the fall with flail mowing or urea sprays, it will be important to do this as soon as the tractors can enter the orchard. Even if the planting is in green tip, inoculum reduction may still provide some benefit by reducing inoculum pressure by tight cluster or pink, when tissues are at their greatest susceptibility to apple scab.

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, leaves should be swept or raked from underneath the canopy into row middles. Then go over the row middles with the flail mower set to scalp the sod. If urea is 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, applied at a rate of 2.5 tons per acre. Of the various options, applying urea is the simplest approach, but take care to rinse the sprayer with water afterwards since the urea is caustic and can corrode a sprayer pump over time. The use of orchard floor urea may also reduce inoculum of other diseases (e.g., Marsonina blight), as it hastens leaf litter decomposition. The application of urea on the orchard floor will also enhance the decay of any plant organic matter, including fruit drops and pruned shoots, that harbor the pathogens causing summer cankers and fruit rots.

continued...
The conditions for fire blight development were favorable in 2018, but it wasn’t a devastating fire blight season for NY. However, a "delayed-dormant" application of copper at silver tip will help reduce inoculum for both apple scab in buds and fire blight in cankers for orchards with problems in 2018. As the weather begins to warm (>60°F) in the coming weeks, fire blight cankers could begin to ooze. Be on the lookout for these. While we had some short periods of warm weather in January and February, overwintering cankers are still dormant in the Geneva high-inoculum fire blight research orchards and there has been no sign of oozing. It's important to note that cold weather will not kill fire blight bacteria overwintering in cankers. The bacteria will remain viable at low (<32°F) temperatures. By the time we reach bud break, cankers could be oozing. To reduce early season apple scab and fire blight inoculum, make the "delayed dormant" silver tip application of a high (>15%) metallic copper equivalent (MCE) copper fungicide (e.g., Badge, Kocide, Cuprofix). The early season may prove to be too wet, and it might be difficult to make this application. In this case, just make a green tip application of copper as soon as you can. At green tip, it is generally still safe to apply this rate of copper.

Once green tip is reached, it’s advisable to continue with protectant fungicides against apple scab, timed according to infection events predicted by weather conditions. If the buds are approaching 1/4-inch green, then one may wish to stick to a program of Captan with Mancozeb at half maximal rates. The combination is referred as "Captozeb" in the vernacular sense. The combination has good protectant and redistribution properties, but has little to no post-infection activity, and must be applied before rains. Re-application is warranted when unprotected tissues emerge or when considerable rainfall (>1") occurs.

It is advisable to use the NEWA apple scab forecasting system (http://newa.cornell.edu/index.php?page=apple-diseases) or RIMpro to identify predicted ascospore releases and potential infection events to improve application timing. When practical, one can apply fungicides to get the best coverage prior to predicted large releases of ascospores (>15% discharge) during weather conditions conducive to infection (Figure 1).

As bloom approaches, consider some of the modern single-site fungicides (e.g., Luna Tranquility, Luna Sensation, Flint, Fontelis, Merivon, Syllit, Rally, Rhyme, Inspire Super, Aprovia). Many of the single-site fungicides will provide a broader range of activity against other fungal pathogens like powdery mildew and fruit rots, which may cause latent infections at bloom, whereas the "Captozeb" combination does not. Given fungicide resistance concerns, it’s no longer recommended to apply single-site fungicides for post-infection activity. Instead, think of making applications of single-site fungicides between infection periods. Use the NEWA or RIMpro system to identify periods

continued...
where substantial ascospore release (>15% discharge) has occurred and another infection period is predicted soon after (Figure 2).

For example, apply your selected single-site fungicide (with 3 lb/A mancozeb) for "next week's" infection within 24–48 hours after the last infection period. It should protect against the next predicted infection and perhaps afford some curative activity if any germinating spores slipped through the fungicide coverage from the previous week. Of the single-site materials available, dodine, sold as Syllit, will likely be your strongest performer for applications between infection periods. However, Syllit may only be applied twice before pink. Another option would be to use Aprovia, Sercadis, Luna Tranquility or Inspire Super. The former two products are exceptionally effective on apple scab, while the latter two are also highly effective, and include an anilinopyrimidine (AP), which works best in the colder temperatures that often occur prior to bloom. As the season progresses into bloom, Luna Sensation or Merivon, quinone outside inhibitor (QoI) fungicides, would be good choices for orchards planted along the lake where apple powdery mildew pressure can be high.

**Summary**

A strong early disease management program should begin with an application of copper at bud break, "silver tip" to early green tip. This application will help reduce overwintering apple scab and fire blight inoculum and protect against early season apple scab infections. Orchard floor inoculum reduction should be practiced as soon as orchards can be entered. This is accomplished by sweeping the orchard to remove prunings and any remaining apple drops, which may harbor inoculum from many fungal pathogens. After sweeping, apply urea to degrade overwintering leaf litter to reduce apple scab inoculum and any other plant debris not removed by sweeping. From green tip to bloom, a program of protectant fungicides centering around captan and mancozeb should be implemented to protect the developing fruit clusters. If there are prolonged wetting periods in the early season, an application that includes mancozeb along with either Aprovia, Sercadis, Syllit, Luna Tranquility, or Inspire Super may be helpful. As we proceed toward bloom, additional applications of single-site fungicides (e.g., Luna Sensation, Merivon) may be needed to manage powdery mildew and other fungal diseases that may begin as latent infections during bloom. Keep track of apple scab ascospore discharge and infection events predicted from local weather on NEWA: [http://newa.cornell.edu](http://newa.cornell.edu)– select Pest Forecast on the menu and then click on Apple Diseases to enter the model.
A nationwide survey is currently underway to gather information from farmers and growers on the economic impact of the brown marmorated stink bug (BMSB) on agriculture. The objective of the survey is to better provide you with the help you need in managing this pest. We'd like to find out when BMSB became a problem for you, where you currently get information on how to control them, how much damage you have suffered, your use of and interest in various management practices, and your feelings about biological control methods and their potential for your operation. The results of the survey will be used by Extension programs across the United States to fine tune management advice for the BMSB and help prioritize research and outreach activities.

If you'd like to participate, the survey should take you about 20-25 minutes to complete. Your individual survey responses will be confidential and the data collected will only be reported in summaries. Your participation is voluntary and you can decide not to answer a given question if you choose. The link to the survey can be found on the homepage of the StopBMSB.org website: http://www.stopbmsb.org/

If you have any questions about the Brown Marmorated Stink Bug Management Survey for Commercial Producers, please contact Jayson Harper by e-mail at jkh4@psu.edu or call 814-863-8638.

'DEEP LOOK' VIDEO ON BMSB AND THE SAMURAI WASP

An impressive BMSB-Samurai Wasp video produced by PBS Digital Studios/KQED was just released, featuring Nik Wiman at Oregon State University and the USDA SCRI BMSB project team. It was filmed at North Willamette Research and Extension Center, and took a lot of preparation by the team to get damage shots, particularly postdoc research associate David Lowenstein and faculty research assistant Heather Andrews. Check it out at: https://bit.ly/2TpawFB

PRODUCT REGISTRATION UPDATE
(Art Agnello, Entomology, and Kerik Cox, PP&PMB Geneva; ama4@cornell.edu and kdc33@cornell.edu)

Following is a list of the changes we are aware of to the pesticides available for use in NY tree fruit crops for the 2019 growing season; expect more to follow on an irregular schedule:

New Registrations
- Danitol 2.4EC - has received a Section 2(ee) registration for use against spotted lanternfly on pome fruits (14-day PHI) and stone fruits (14-day PHI); also grapes (21-day PHI). The label recommends foliar applications when adults are actively flying. This product is an addition to other pesticide options listed in the current Tree Fruit Guidelines.
- Apogee 2EE for pink application timing (Erwinia amylovora, BASF; EPA Reg. No. 7969-188) is a gibberellic acid inhibitor used for vigor management, management of fire blight, and suppression of bitter pit in Honey-crisp (cv) apples.

Please note that the 2019 Cornell Pest Management Guidelines for Commercial Tree Fruit Production is available 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 $41.00, 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, for purchasing details, visit https://ipmguidelines.org/.

### UPCOMING PEST EVENTS

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<th>Event</th>
<th>43°F</th>
<th>50°F</th>
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<tbody>
<tr>
<td>Current DD* accumulations (Geneva 1/1–3/25):</td>
<td>33.5</td>
<td>8.3</td>
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<tr>
<td>(Geneva 1/1–3/25/2018):</td>
<td>55.9</td>
<td>20.1</td>
</tr>
<tr>
<td>(Geneva &quot;Normal&quot;):</td>
<td>58.6</td>
<td>22.1</td>
</tr>
<tr>
<td>(Geneva 1/1-4/1, predicted):</td>
<td>46.1</td>
<td>11.4</td>
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<tr>
<td>(Highland 1/1–3/25):</td>
<td>61.3</td>
<td>22.4</td>
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**Ranges (Normal ±StDev):**

<table>
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<th>Event</th>
<th>Range</th>
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<tbody>
<tr>
<td>Green fruitworm 1st catch</td>
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<tr>
<td>Pear psylla adults active</td>
<td>31-99</td>
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<tr>
<td>Pear psylla 1st oviposition</td>
<td>40-126</td>
</tr>
<tr>
<td>McIntosh silver tip</td>
<td>63-107</td>
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<tr>
<td>McIntosh green tip</td>
<td>99-145</td>
</tr>
</tbody>
</table>

*all DDs Baskerville-Emin, B.E.

**NOTE:** 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 Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.