This is the point of the season at which we normally begin to hear reports of the first infestations of woolly apple aphid (WAA) in problem sites in western NY, and the earliest occurrences could already be starting to be noted (Fig. 1). In addition to apple, its hosts include American elm, hawthorn, and mountain ash. It overwinters as an egg in bark cracks and crevices, or as a nymph on roots underground and in various protected locations on trees. WAA is attracted to the base of root suckers and around pruning wounds and cankers on limbs and trunks, and colonizes both above-ground parts of the apple tree as well as the roots. In the spring, the nymphs, which are reddish-brown with a bluish-white waxy covering, crawl up from the roots to initiate aerial colonies. These initially build up on the inside of the canopy on sites such as wounds or pruning scars, and later become numerous in the outer portion of the tree canopy, usually during late July to early August.

The aerial colonies occur most frequently on succulent tissue such as the current season’s growth, water sprouts, unhealed pruning wounds, or cankers. The main injury to young and mature trees is stunting due to the formation of root or twig galls; mature trees are usually not damaged. Heavy infestations cause honeydew and sooty mold on the fruit and galls on the plant parts, which interferes with harvest operations because red sticky residues from crushed WAA colonies can accumulate on pickers’ hands and clothing.

Beginning now and extending through June, water sprouts, pruning wounds, and scars on the inside of the tree canopy should be examined for WAA nymphs. During mid-July, new growth around the outside of the canopy should be examined for WAA colonies. No economic threshold has been determined for treatment of WAA, but they are difficult to control, so the occurrence of any colonies should prompt the consideration of some remedial action.

WAA is frequently parasitized by *Aphelinus mali*, a tiny wasp that is also native to North America. Parasitized aphids appear as black...
mummies in the colony. *A. mali* has been successfully introduced to many apple-growing areas of the world, and is providing adequate control of the WAA in several areas. It does not provide sufficient control in commercial orchards in our region because of its sensitivity to many commonly used insecticides; however, the wasp is thought to reduce WAA populations in abandoned orchards.

WAA is difficult to control with insecticides because of its waxy outer covering and tendency to form dense colonies that are impenetrable to sprays. Insecticide treatments are more effective the earlier they are applied, since they are more capable of decreasing the population before it becomes widespread, and the insects’ waxy covering is less extensive earlier in the season. WAA is resistant to the commonly used organophosphates, but other insecticides are effective against WAA, including Diazinon and Movento, and some additional products such as Admire, Assail, Beleaf, or Sivanto Prime may be good alternatives. For Movento and Assail, addition of a non-ionic surfactant (e.g., LI-700 or Regulaid) or horticultural mineral oil will improve activity. Good coverage to soak through the insects’ woolly coverings is integral to ensuring maximum efficacy. Additionally, a Lorsban trunk application for borers made at this time (provided the fruit and foliage is not affected by the spray) will give collateral control of any crawlers that might be contacted by these sprays. In orchards where WAA has previously been noted as a recurring problem, the petal fall to first cover period (that would be right now) would be a good time for a protective application of Movento, preferably at the 8–9 oz/A rate. Because this material is systemic, the best efficacy will be obtained by following up with a second spray in 14 days. It is additionally effective against San Jose scale, the crawlers of which are anticipated to begin emerging within the next 2 weeks.

**CLEARWING BORER**

**CLARITY**

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

👀 In NY, there are two species of sesiid (clearwing) moths that attack peaches — the peachtree borer (PTB), *Synanthedon exitiosa*, and the lesser peachtree borer (LPTB), *S. pictipes*. The adult borers are striking clear-winged moths with yellow and steel-blue body markings. The adults of these insects have from one to four yellow-orange stripes across the abdomen, depending upon species and sex. The PTB enters the tree near soil level and does not require the presence of wounds or breaks in the **continued...**
bark for entry, but the LPTB nearly always enters the tree at a pruning scar, canker, mechanical injury, or winter-injured area. The LPTB additionally attacks cherries, causing the same type of injury in the upper trunk and scaffold branches of these trees. Both species pass the winter as borers inside the tree, and in the spring emerge as moths that lay eggs on or in the trunk during the summer. The LPTB moth emerges first, normally in mid- to late May, (we caught our first of this season in Geneva on May 28), and the PTB doesn't show up normally until mid-June; both stay active (laying eggs) through August. When the borer stages hatch, the PTB tends to crawl down the tree to soil level and burrow in there, but the LPTB will move to the nearest injured area, which may be on the lower trunk or just as easily up in the scaffold limbs. LPTB completes its development in one year, but some PTB larvae take two years to develop, so any control measure a grower would elect will require repeating for at least 2–3 years.

Injury is caused by larval feeding on the cambium and inner bark of the trunk close to the soil level (PTB) or on the upper trunk and lower scaffold branches (LPTB). Occasionally, larger roots are also attacked by PTB. Areas attacked often have masses of gum, mixed with frass, exuding from the bark. All ages of trees are injured. Young trees are at times completely girdled and subsequently die. Older trees are often so severely injured that their vitality is lowered and they are rendered especially susceptible to attack by other insects or by diseases. Although both species may be found in infested trees, younger plantings and those not afflicted by extensive cankers or other bark splits are attacked primarily by PTB.

Chemical control is difficult, owing to the concealed habit of the larvae. Preplant dipping of roots and crowns of peach tree seedlings before planting using Lorsban has given complete control of the peachtree borer for the 1st growing season and has reduced borers during the 2nd season. For in-season control, growers have traditionally relied on one or more coarse insecticide sprays (e.g., Asana, Lorsban, Proaxis, Warrior) of the trunks and lower scaffold branches to deter egg laying and kill newly established larvae. Because this is a labor-intensive measure that often fails to completely control these pests, many growers choose not to elect treatment, or else do an incomplete job, with the intention of getting what they can out of a planting until infestations combine with other peach production factors to warrant tree removal. However, there is a preferred alternative in the form of pheromone mating disruption (MD) tools for the control of these perennial pests.

Isomate-PTB Dual (Pacific Biocontrol/ CBC America, EPA Reg. No: 53575-34) is a twist-tie pheromone dispenser labeled for use against both of these species in all NYS stone fruits. They are placed in the trees at a rate of 150–250 ties/A at or before the first flight, with the higher rate (250/A) recommended when pest pressure is high. This product has replaced the Isomate-LPTB and Isomate-PTB formulations. We have conducted trials on the efficacy of Isomate-LPTB with and without the addition of directed trunk sprays in peaches, and after 2 years we saw that the pheromone completely suppressed trap catches of both PTB and LPTB for both seasons, compared with relatively heavy flights noted in the non-disrupted comparison blocks, showing that pheromone treatment was highly successful in disrupting the chemical communication of males and females of these two species.

These trials provided sufficient evidence that mating disruption alone should be able to provide adequate protection from borer infestations in commercial orchards, giving growers an effective non-chemical alternative to continued...
trunk sprays for managing this pest complex in their stone fruit plantings. Growers interested in this approach should be placing the pheromone ties during these next 1–2 weeks, before the LPTB flight gets solidly under way state-wide.

SWD TRAPPING UPDATE
(Julie Carroll, NYS IPM Program, Geneva; jec3@cornell.edu)

The following notice appeared in a post May 31 on the Spotted Wing Drosophila blog site [http://blogs.cornell.edu/swd1/2019/05/30/swd-yes-in-tart-cherry-orchards-not-in-berry-plantings/]:

- Traps were checked on Tuesday, May 28. In the seven tart cherry orchards we are monitoring, we found a single SWD in each of three orchards. In two of the orchards SWD was caught in traps set on the edge of the orchard, as was the case last week. These two orchards are now at sustained catch. In one orchard, now at first catch, the SWD was caught in the trap set in the interior of the orchard.

- Populations are still very low; i.e., 0.14 SWD being caught per day. Fruit is still hard and green, and SWD females can’t lay eggs in this fruit.

- As you plan your spray program for plum curculio (PC) and cherry fruit flies (CFF) (the big Tephritids, not the tiny Drosophilids), consider materials that will also knock back SWD. Below are listed the materials labeled on tart cherry for SWD. Details are available at: http://www.hort.cornell.edu/fruit/pdfs/swd/treefruit-grape-insecticides.pdf

  Entrust 80WP Naturalyte 2(ee)
  Entrust 2SC (2ee)
  Delegate WG
  Exirel

  Minecto Pro
  Asana XL 2(ee)
  Danitol 2.4EC
  Lambda-Cy EC 2(ee)
  Mustang Maxx Insecticide
  Grandevo
  Imidan 70W (not on sweet cherry)

[NOTE: The Tree Fruit Pest Management Guidelines contains some errors in the REI period for Imidan 70W; please note the correct values for the different tree fruits: Cherries - 72 hrs; Peaches & Nectarines - 96 hrs; Apricots, Plums & Prunes - 7 days.]

- I will continue monitoring traps until SWD numbers are in the double digits. I expect trap catch will drop to zero after insecticides for PC and CFF have been applied. If you don’t get an email from me, trap catch is zero in your orchard block. As always, if you have any questions, let me know.

MODEL BUILDING
Insect model predictions for Highland[H] / Geneva[G] / other sites

Plum Curculio spray window from McIntosh PF to 308 DD50; currently at 214[H] / 133[G] / 42[Wmson] / 45[Sodus]


San Jose Scale crawler emergence @ 310 DD50 after 1st flight (currently at 82[H]).
The unseasonably cool, wet weather conditions persisting post-petal fall this year could put high value apple varieties at risk for fruit finish disorders. One such disorder is scarf skin, the result of the formation of small subepidermal air pockets that reflect light, manifesting visibly as an opaque white sheen on the fruit skin (Fig. 2). A purely cosmetic defect, scarf skin has no known impact on the fruit’s nutritional value (Ferree et al. 1984a). However, packing houses will reject fruit due to the disorder’s excessive presence, allegedly as the whitish cast could be perceived by a consumer as pesticide residue. To date, no fresh market fruit national quality grade standard exists specifically for scarf skin, but the standard assessment for a U.S. No. 1 grade fruit (i.e., the aggregated area of the disorder affecting the apple must not be greater than 25%) is most likely applied to fruit with scarf as with other common fruit finish disorders such as russet (McArtney et al. 2006). It’s also important to differentiate scarf skin from white haze, another skin defect appearing as a grayish plaque caused by the colonization efforts of epiphytic yeasts (Tilletiopsis spp.) either before harvest or after storage. White haze is easily identified by using a sharp pocketknife and scraping away the yeast layer, revealing the unchanged fruit peel pigmentation beneath, whereas scraping a scarfed apple will have no effect (Weber and Zabel 2011).

What causes scarf skin?

The factors causing scarf skin are poorly understood, but like other fruit finish disorders they are most likely additive under the right conditions. For example, in russet disorders, chemical applications such as surfactants and foliar fertilizers that are usually harmless in warm and dry environments can exacerbate
russet symptoms in a cool, wet, and humid environment. Of the two studies that have investigated the impact of agrichemicals on scarf skin, they revealed that calcium chloride, captan, dodine, and Solubor had no impact on symptom development, but that season-long applications of the fungicides benomyl and dikar did significantly increase scarf skin symptoms (Ferree et al. 1984b; Weber and Zabel 2011). Considering that these fungicides are not in commercial use today, it is likely that they do not contribute to present occurrences. It is unfortunate that no research has been performed to evaluate modern pesticides' impact on scarf skin symptom development. What is known is that environmental conditions that cause either rapid or stop-and-go growth may also promote scarf skin development, as the erratic fluctuations interfere with fruit development.

What should I do about scarf skin?

Scarf skin is not a cultivar-specific phenomenon but is most commonly observed on red apples due to the clear contrast between skin color and the disorder. Cultivars with reported scarf skin symptoms include: Delicious, Elstar, Gala, Jonagold, Jonathan, Red prince, Rome Beauty, SnapDragon, Stayman, and Winesap. The critical period for scarf skin development is during the sixty days after petal fall, and symptoms are typically visible as early as mid-June on small fruit (Ferree et al. 1984b). Previous studies have successfully shown scarf skin reduction by regular applications with a mix of the plant growth regulator (PGR) gibberellin (GA\textsubscript{4+7}) timed at 10-day intervals from petal fall. McArtney et al. (2006) found that three GA\textsubscript{4+7} applications during this post-bloom period reduced scarf skin severity by as much as 14% compared with controls. Presently, the most successful program consists of 4 applications of GA\textsubscript{4+7} starting at petal fall at 10-day intervals. Applications should ideally be made under slow-drying conditions. Note that gibberellins should not be mixed with surfactants or other agrichemicals. Commercial products used for scarf skin control include Novagib (Fine Americas) and ProVide (Valent BioSciences). Check the label for proper application rates, as their concentration of active ingredient differs. Also note that gibberellins inhibit flower bud formation, so consider the use of an NAA or ethephon program to promote return bloom in cultivars prone to biennial bearing (Schupp 2018).

What is Cornell doing about it?

With funding provided by the NYS Apple Research and Development Program (ARDP), we have been investigating scarf skin in the cultivar SnapDragon in order to find the most cost-effective program for managing the disorder. We are exploring the use of GA\textsubscript{4+7} applications timed not only at the post-bloom period known to be critical for scarf skin development, but also timed for application after heavy rainfall events (1 or 2 inches), as sudden influxes of water (and additionally, the subsequent increase in microclimate humidity around the fruit) may cause irregular surges in growth and lead to scarf skin symptom development. Timing applications of GA\textsubscript{4+7} to rainfall thresholds may be an improved method to reduce the number of required PGR applications while maintaining or improving scarf skin control in this high-value cultivar. The study is under way at Cornell AgriTech and will continue through the 2019-2020 growing seasons. As we learn more about the disorder, management recommendations will be refined. 💫

References

continued...


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**PEST FOCUS**

<table>
<thead>
<tr>
<th>Location</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geneva</td>
<td>San Jose scale first catch today, 6/3.</td>
</tr>
<tr>
<td>Highland</td>
<td>Obliquebanded leafroller first catch today, 6/3.</td>
</tr>
</tbody>
</table>

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**Weekly Apple Scab Update for NY**

(6/3 to 6/8/19)

Below are apple scab predictions for NY apple regions based on the NEWA disease forecast system (http://newa.cornell.edu/index.php?page=apple-diseases). Information is kept concise. Alerts will also be posted to Twitter @FruitPathology with updates occurring throughout the week, which would allow notifications to send to mobile device. The various outputs are explained below table.

<table>
<thead>
<tr>
<th>Region</th>
<th>Hudson Valley</th>
<th>Wayne</th>
<th>Niagara</th>
<th>Champlain Valley</th>
<th>Finger Lakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>June 3rd</td>
<td>June 4th - 5th</td>
<td>June 4th - 5th</td>
<td>June 3rd - 5th</td>
<td>June 4th - 5th</td>
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<tr>
<td>Predictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaf Wetness</td>
<td>2</td>
<td>31</td>
<td>31</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Predictions are regional; the model works best under local conditions. Always check weather and crop stage before making a management decision.

**Infection predicted:**
- **"None"**: No infection predicted for the week.
- **"Date"**: An infection event is predicted for the date listed.

**Leaf Wetness Hours**: Hours of total leaf wetness are reported for predicted infections. If infection is multiple days, the total leaf wetness hours for all days is recorded.
Weekly Blossom Blight Update for NY
(6/3 to 6/8/19)

Below are blossom blight predictions for NY apple regions based on the NEWA disease forecast system [http://newa.cornell.edu/index.php?page=apple-diseases]. Information is kept concise. Alerts will also be posted to Twitter @FruitPathology with updates occurring throughout the week, which would allow notifications to send to mobile device. The various outputs are explained below the table.

<table>
<thead>
<tr>
<th>Infection Risk</th>
<th>Hudson Valley</th>
<th>Wayne</th>
<th>Niagara</th>
<th>Champlain Valley</th>
<th>Finger Lakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Past Petal Fall</td>
<td>*Past Petal Fall</td>
<td>Low</td>
<td>Low</td>
<td>*Past Petal Fall</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 5th-June 6th; June 8th</td>
<td>June 6th</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Highest EIP | - | - | 33 | 15 | - |
| Highest 4-Day DH | - | - | 253 | 88 | - |

* Predictions are regional; the model works best under local conditions. Always check weather and crop stage before making a management decision. Bloom date varies by cultivar, check your trees for any early blooming cultivars.

Infection risk:

- "Low": EIP and 4-day DH accumulation at/below 75 and 300, respectively; "Moderate": EIP and 4-day DH accumulation between low and high-risk values; "High": EIP and 4-day DH accumulation at or above 100 and 400, respectively with moisture predicted. "None": little to no risk predicted for the week;
- "Date": The date of highest risk for the week is listed.

Highest EIP & 4-Day DH: The highest EIP value and 4-day DH accumulation for the week is listed.
UPCOMING PEST EVENTS

Current DD* accumulations (Geneva 1/1–6/3):
(Geneva 1/1–6/3/2018):
(Geneva “Normal”):
Geneva 1/1-6/10, predicted):

Ranges (Normal ± StDev):

American plum borer 1st flight peak
Black cherry fruit fly 1st catch
Black stem borer 1st flight peak
Codling moth 1st flight peak
European red mite summer egg hatch
Lesser appleworm 1st flight peak
Pear psylla 1st summer generation adults
Redbanded leafroller 1st flight subsides
San Jose scale 1st flight peak
Spotted tentiform leafminer 1st flight subsides
White apple LH 1st brood adults 1st catch

*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.

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