

May 2022

Early Season Pest Management in Apple and Peach Orchards

By Ashley Leach, Assistant Professor, Extension Entomologist, Department of Entomology

With bloom in varying stages across the state (and some orchards already well past bloom), let's talk about early-season pest management. We are quickly looking at first and second cover sprays for tree fruit in Ohio. Luckily, there are several Integrated Pest Management (IPM) approaches that can help lessen losses to these pests (Figure 1).

1. Pheromone Disruption

Many tree fruit pests rely on pheromones to find suitable mates within the orchard ecosystem. You can block these mating attempts by using pheromone disruption. Major tree fruit pests like Codling moth and Peachtree borers can be targeted using this technique.

2. Scouting/Monitoring

Many tree fruit pests can be monitored using pheromone traps. These traps provide invaluable information that will guide your insecticide applications. If interested, reach out to a local extension educator and they can set you up with a vendor list to purchase traps for your own farm.

3. Biological Control

Many secondary pests in orchards are favorite snacks for predators and parasitoids in the orchard. Aphids and mites are readily consumed

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Figure 1. IPM strategies for apple and peach orchards.

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CFAES

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by a suite of predators including hover flies, ladybugs and lacewings. Preferentially choose insecticide products with lower impacts on natural enemies to conserve these predators and parasitoids in your orchard.

4. Chemical Control

Numerous insecticide products offer highly efficacious control of major early-season orchard pests. For example, think about products like Delegate® WG, Altacor®, RIMON® 0.83EC, Imidan® 70-W, or Endigo® ZCX for some of your initial cover sprays.

Peachtree Borers

Peachtree borers represent a complex of moth pests (Synanthedon exitosa and Synanthedon pictipes) which attack the trunk and branches of stone fruits. Feeding by this pest causes a reduction in plant vigor and, under hiah infestations, can girdle young trees.

► Pheromone disruption

Pheromone disruption is a great tool to manage borers, especially considering the recent loss of chlorpyrifos. One example is Isomate PTB Dual which controls against both species of borers. New research indicates that even smaller acreage fruit farm, Dr. Welty found hundreds of parasitoids farms can use this approach.

Scouting/monitoring

If you are planning to use an insecticide to control Peachtree borer, use a pheromone trap to determine best application timing. Larvae are only vulnerable to insecticide from the time they hatch until they burrow beneath the bark. Sprays should be initiated 7 days after a male detected in a trap.

► Some chemical control options

Chemical control measures are incredibly limited with the loss of chlorpyrifos. Some pyrethroids can be used, e.g., Asana XL, however you need to carefully time interventions to maximize the potential of killing migrating larvae. In some cases, high-volume, concentrated insecticide applied in the fall may provide some control.

San Jose Scale (SJS)

SJS feeds on tree sap, which under high pest pressure, can reduce yield. SJS can migrate to fruit and increase unmarketability by marring the surface of the fruit.

Biological control

Parasitoids love SJS! At the Columbus research killing SJS. Try to prioritize compounds with lower impact on parasitoids to maximize biocontrol.

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Grower's Corner

Can you remind me where I can send my fruit samples for disease diagnosis?

Yes I can! Commercial fruit samples can be sent to the Fruit Pathology Laboratory in Wooster for disease diagnosis. Instructions on how to send a sample and the best days of the week to send samples can be found on the fruit pathology website (see QR code) or by calling Dr. Melanie Lewis Ivey (330-263-3849). The Ohio Produce Grower and Marketers Association (OPGMA) supports the diagnosis of fruit and vegetable diseases, and there is no fee for commercial samples. Homeowners can send their samples to the Plant and Pest Diagnostic Clinic in Reynoldsburg, OH (ppdc.osu.edu or 614-292-5006). There is a nominal fee for homeowner samples.



u.osu.edu/fruitpatholo gy/diagnostics/

Some chemical control options

| IRAC* | Product | Rate (oz) | Timing | | |
|--|---------|--------------|---------------------------------------|--|--|
| 7C | Esteem | 4-5 | At crawler emergence | | |
| 16 | Centaur | 34.5 | Pre-bloom or crawler emergence | | |
| 23, 7C | Senstar | 18 | After petal fall or crawler emergence | | |
| 4D | Sivanto | 10.5 – 14 | Apply after bloom. | | |
| *IRAC represent different insecticide modes of action, remember to rotate compounds. | | | | | |

NEW RESEARCH! New mating disruption technology has been developed that would disable SJS's ability to reproduce, thereby lowering populations. Ongoing field trials show promising results, and we look forward to trialing this technology in the 2023 field season in Ohio apple production. Contact Dr. Ashley Leach for more information on this trial.

Please consult your production guide for a full listing on insecticide products available. As a reminder, always check product labels for additional safety information and timing for both field re-entry and harvest.

Spotted Lanternfly Video – Scouting Tips

By James (Jim) Jasinski, Professor and IPM Program Coordinator; Amy Stone, Extension Educator – Lucas County; Thomas Dehaas, Extension Educator – Lake County; Ann Chanon-Extension Educator – Lorain County

While it has generally been a cooler than average spring this year, a few hot days have pushed accumulated degree days past the point where Spotted Lanternfly (SLF) have begun emerging from their overwintering egg masses from known populations in Cleveland (Figure 1). Given the northern emergence location of this pest, it is nearly certain emergence has begun all over the state.



Figure 1. Spotted lanternfly emergence forecast map.

In general, the early nymphs are smaller and mostly black with white spots (Figure 2), almost spider or tick like, while the last nymph stage is the largest and mostly red with black and white spots. are dripping off the foliage.

Spotted Lanternfly has been detected primarily in the northern and eastern parts of the state but can be easily transported to any corner of the state, so we hope the public and growers remain vigilant in looking for this new pest. If a suspected SLF stage is found, please report to the <u>Ohio</u> <u>Department of Agriculture (614-728-6400) or any</u> OSU Extension Educator. Take pictures, collect stages and carefully note location as someone will be sent back to confirm detection. See page 12 for link to video.



Figure 2. Nymph stage of spotted lanternfly.

Specialty Crop Specialist Brad Bergefurd Retires

By Melanie Lewis Ivey, Associate Professor, Extension Fruit Pathologist, Department of Plant Pathology

After 32 years with OSU Extension, Brad Bergefurd has retired (as of May 27th). Brad was the Specialty Crops Specialist at South Centers in Piketon, OH. He focused his research and Extension activities on strawberry and hop production and collaborated extensively with the weed, plant pathology, and entomology state specialists. Brad was also a regular contributor to Ohio Fruit News (OFN).

Brad will be continuing his career with specialty crop productions with as a Technical Agronomist with BRANDT. Brad's home base will be in Ohio, but he will be conducting field studies, teaching field days, hosting workshops and consulting with farmers in Ohio, Tennessee, Kentucky, Indiana and Michigan. Brad will also continue to collaborate with us here at OSU and hopefully he will continue to write a couple of articles for OFN!



Thresholds Triggered Across State for Codling Moth Control

By Ashley Leach, Assistant Professor, Extension Entomologist, Department of Entomology

Codling moth is on the move! In the graph shown (Figure 1), we have degree day models for four different sites across Ohio (Piketon, Columbus, Wooster, and Ashtabula). As expected, the southern sites (Piketon, Columbus) show higher Codling moth activity compared to our more northern sites (Wooster, Ashtabula). **Make sure to time first or second cover sprays in line with egg-laying hatch.**

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Generally, the first cover spray can be applied when eggs are at 3-5% hatch and then a second application around 10-14 days later.

Depending on the insecticide product you want to apply, you can use the following table (Table 1) to determine when applications are needed based on the development of Codling moth in your area. For example, if you are looking to target Codling moth populations with insect growth regulator like Rimon, make sure you make your first application between 50- and 75-degree days. However, if you are planning to use Exirel wait until 150-250 degree-days. As you consider your insecticide program for the second generation of Codling moth, **make sure you rotate your chemistries or IRAC codes**. Please note that there are other products to control Codling moth, and this is not an exhaustive list of insecticides that can control Codling moth. Consult the Midwest Fruit Pest Management Guide for more options and information.

| Table 1: Insecticide products to control Codling moth during initial pesticide applications. | | | | | | | |
|--|-------------------------|--|--|---|--|--|--|
| (IRAC | roduct code to left) | Application timing (number of degree days) | Rate (fl oz/A unless noted) | Notes | | | |
| 15 | Rimon | 50-75 | 20-40 | | | | |
| 18 | Intrepid | 100-200 | 5- 6 | | | | |
| 18 | Confirm | 100-200 | 20 | | | | |
| 28 | Altacor | 150-250 | 2.5 - 4.5 | | | | |
| 4A | Assail | 150-250 | 4 - 8 | *can provide efficacy against Plum curculio | | | |
| 4A | Belay | 150-250 | 6 | | | | |
| 5 | Delegate | 150-250 | 4.5-7 | | | | |
| 28 | Exirel | 150-250 | 8.5 - 17 | *can provide efficacy against Plum curculio | | | |
| 1B | Imidan | 250 | 2.125– 5.75 lbs./ac | | | | |
| 22 | Avaunt | 250 | 5 - 6 | *can provide efficacy against Plum curculio and oriental fruit moth | | | |
| 3 | Asana | 250 | 4.8 - 14.5 | *can provide efficacy against Plum curculio and oriental fruit moth | | | |
| 3 | Baythroid | 250 | 2 - 2.4 | *can provide efficacy against oriental fruit moth | | | |
| 3 | Danitol | 250 | 16 – 21.33 | *can provide efficacy against Plum curculio and oriental fruit moth | | | |
| 31 | Cyd-X | 250 | 1 - 6 | *organic option | | | |

Ohio Produce Growers & Marketers Association

2022 OPGMA Summer Tour

June 21, 2022 8:30 Am to 2:00 PM Hosted by Bauman Orchards 161 Rittman Avenue

Rittman OH 44270 Register On-line or call 740-828-3400

Preparing for Herbicide Drift

By Doug Doohan, Professor, Extension Specialist, Department of Horticulture and Crop Sciences

Incidences involving herbicide drift have escalated drastically since the introduction of dicambatolerant soybeans and cotton about 5 years ago. We recently surveyed specialty crop growers in 12 states and found that 66% had confirmed or suspected that their crops were affected by drift in the last 5 years. Keeping in mind that farmers most likely to complete the survey were those affected by drift, this number is still an astounding and alarming statistic. A broad base of publicly available data implicates dicamba as the primary problem in this recent period; however historically, glyphosate and 2,4-D have been the primary causal agents. Keeping in mind that Xtend soybeans are sprayed not just with dicamba but also with glyphosate, as will the newer 2,4-Dtolerant Enlist soybeans (i.e., sprayed with 2,4-D and glyphosate), 2,4-D and glyphosate too are certain to be problems for the fruit grower going forward.

For the typical Midwestern fruit grower herbicide drift is not a matter of if but of when, at least for the foreseeable future. Not all fruit crops are equally sensitive, but all types can be severely damaged depending on the circumstances. Take the following deliberate steps to minimize the occurrence and severity of drift, and its consequences when it does occur.

 Evaluate your risk factors and communicate with owners and operators of surrounding properties. Make sure that your neighbors in approximately a $\frac{1}{2}$ mile radius around your farm are aware that you are growing high value fruit crops that are very sensitive to herbicides (Figure 1). Make sure that your neighbors and any custom applicators spraving their property use application methods that produce large droplets and minimize drift. Your neighbors may be unaware that for fruit crops there are no established residue tolerance for dicamba, and a drift event may thus result in a complete loss of your crop even if yields are not negatively impacted. Remind them that there

are effective alternatives to using dicamba or 2,4-D that are not volatile and thus less likely to drift. Communicate the presence of your farm to township highway departments, utilities, and other agencies that might be spraying right-ofways or roadsides. If these areas run through your property, keep them free of weeds so they are less likely to be sprayed.



Figure 1. Posting signs is one way to communicate that there is an herbicide sensitive crop nearby.

- **Register with Fieldwatch/Driftwatch** (driftwatch.org). Pesticide applicators are required to check the registry before spraying. You can also mark your property with signage available from Fieldwatch/Driftwatch.
- **Do not rely on crop insurance**. Insurance companies typically do not consider herbicide drift an "act of God" and therefore do not provide coverage for drift damage. Check with your insurance provider before drift happens and know where you stand.

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- · Know the rules and regulations that govern herbicide application. Labels for some herbicides prohibit spraying if wind is blowing in the direction of an adjacent field of specialty crops. You can look up specific product labels at CDMS (cdms.net) or Greenbook (areenbook.net). Label instructions are part of pesticide regulations, and applicators who do not follow them can face fines or lose their applicator's license. In addition to the national label, your state pesticide regulatory agency may have additional restrictions, such as cut-off dates for spraying dicamba or other herbicides.
- Maintain financial and production records. If a drift event occurs, good recordkeeping will prepare you to document financial losses for reduced or lost yield, reduced quality, and the inability to recoup production costs. Historical yield data can be used to approximate yield losses associated with drift injury. Production budgets documenting costs of inputs, labor, and depreciation equipment will document production-related financial losses.
- Prepare a detailed set of maps, including landscape features (wooded areas, wind breaks, buildings, farm ponds, adjacent property). These maps can be a handy way to track where damage occurred and where samples were collected. Since these may be used as evidence for a loss claim, make sure the maps are accurate. To-scale, handdrawn maps may be acceptable, but a better alternative is outlining the farm and fields on a series of aerial photographs or satellite images (such as Google maps; Figure 2).
- Avoid Establishing New Plantings in Areas with High Drift Hazards. Considering the current weed control practices for corn, soybean and cotton described above, growers should reconsider the prospect of establishing new orchards or vineyards in areas that are



Figure 2. Detailed maps are useful to track where herbicide damage occurred.

dominated by row crop agriculture. Such areas pose the highest risk to the vineyard owner. Sometimes, high risk areas cannot be avoided; in such situations maintain buffers of at least 250 feet and plant evergreens and shrub windrows between your site and row crop fields. The buffer and the windrows will slow the wind and may reduce the distance that droplet drift will travel.

- Learn the typical symptoms of injury caused by herbicide drift and how to distinguish them from other similar symptoms (Figure 3). Learn the signs indicating that drift has occurred using the resources listed under Additional Resources (see Side Box).
- Talk to other growers. Conferences and grower support organizations can help growers share regional information and resources, including available experts or lawyers. Consider establishing a relationship with a lawyer before a problem arises or discussing the issue preemptively with a current legal advisor.

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With Dr. Mark Gleason

Available on:





https://www.smartapplespray.plantpath.iastate.edu

Spotify Spotify Apple Podcasts

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Preparing for herbicide drift from page 7

· Reporting drift/ Seeking compensation. If you are convinced that herbicide drift injured your crop it's advisable to seek a second professional opinion. То conclusively demonstrate that a particular herbicide is present, you will need to have a sample of the injured plants analyzed for the herbicide. You can collect samples and have them analyzed by a commercial laboratory, adhering to their sampling and shipping protocols. Establishing sample chain of custody will be important if compensation is sought through the justice system, thus legal advice is almost always required. You should also consider contacting the Ohio Department of Agriculture (ODA). The ODA will send out an investigator to collect evidence including samples for residue Based on the findings of the analysis. investigation the ODA might assess penalties against the applicator. Before pursuing legal action, first contact the applicator and try to work out a settlement. The only way for you to recover your losses from herbicide drift is to reach a settlement with the applicator or initiate a civil lawsuit.



Figure 3. Learn the signs indicating that drift has occurred using the resources listed below under Additional Resources (see Side box).

This article was adapted from a <u>fact sheet series</u> published by OSU Extension. (ipm-drift.cfaes.ohiostate.edu/dicamba-and-24-d-fact-sheet-series)

Additional Resources

University of Missouri Herbicide Injury ID App The Herbicide Injury ID app helps you diagnose plant damage that may have been caused by herbicides and links to herbicide information and other resources. Works for Android and iPhone/iPad.

herbicideinjuryid.missouri.edu/Support/

IPM Herbicide Symptoms database

University of California Division of Agriculture and Natural Resources

A searchable gallery of herbicide damage photos for a wide variety of crops and products, plus information on herbicide trade names, active ingredients, and modes of action. herbicidesymptoms.jpm.ucanr.edu

Herbicide Injury Website

North Carolina State Extension

An excellent series of fact sheets and photos on the symptoms of common herbicides on several fruit and vegetable crops. Also includes a handy Injury Site Visit check list. weeds.ces.ncsu.edu/weeds-herbicide-injury/

Herbicide Site of Action Key

University of Wisconsin

Compact but useful 2-page key to identifying herbicide plant injury noticed at emergence or later in the growing season. ipcm.wisc.edu/download/pubsPM/2018 HerbicideInjury web .pdf

Plant Injury from Herbicide Residue

Virginia Cooperative Extension Service Publication PPWS-77P

Discusses effects and persistence of several growth regulator herbicides, including dicamba and 2,4-D. www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/PPWS/ PPWS-77/PPWS-77P-pdf.pdf

University of Missouri Herbicide Damage Trials

Excellent photos of drift damage at various levels of severity

- Investigations of Sensitivity of Ornamental, Fruit, and Nut Plant Species to 2,4-D and Dicamba

weedscience.missouri.edu/2017-2018TreeResults.pdf

- Evaluations of Dicamba and 2,4-D Injury on Common Vegetable and Flower Species

weedscience.missouri.edu/Vegetable%20Injury%20with%2 0Dicamba%20and%202,4-D%202018.pdf

Diagnosing Herbicide Injury on Garden and Landscape Plants

Purdue Extension Smart diagnostic tips written for homeowners. www.ag.ndsu.edu/pdl/documents/ID 184 W.pdf

Dicamba and 2,4-D Visual Sensitivity Scale for 2017 The University of Georgia Comparative sensitivities among common horticultural

crops. gaweed.com/HomepageFiles/Visual%20Sensitivity%2 0Scale%20for%20Dicamba%20and%202_4-D%20in%20GA.pdf

Managing Chestnut Weevils in Ohio Orchards

By Amy Miller, PhD Candidate, The Ohio State University, Fruit Pathology Lab

One of the biggest challenges for chestnut growers and marketers in the eastern United States is management of chestnut weevils. The lesser chestnut weevil (Curculio sayi) is a native North American weevil species that formerly occupied the range of the American chestnut. Its range has now expanded to include many areas east of the Rocky Mountains where chestnut trees have been planted. These weevils occur throughout Ohio. Female weevils lay eggs through chestnut burs into developing chestnut kernels in late August-early September. After nuts ripen and fall from the tree, the weevil eggs hatch and the larvae tunnel through the fresh chestnut kernels (Figure 1 - Top), eventually chewing exit holes through the shells (Figure 1 – Bottom) and burrowing into the soil. If weevil infested nuts are harvested and not treated, the larvae will emerge in the nut display at the market or after customers have taken nuts home.

Industry standard weevil management includes spraying adult weevils with carbaryl at the time when they are actively laying eggs, typically in late August. Air blast sprayers are used to apply chemical to the chestnut burs, which are located on shoot tips throughout the tree canopy. Ohio growers have noticed a decreased effectiveness in this spray regime and are not sure whether this is attributed to development of chemical resistance or to inadvertent selection for weevils that are active later in the season when chemical spray would interfere with harvest.

Empire Chestnut Company (Carrollton, OH) has sponsored a research project to explore weevil management in spring, at the time of weevil emergence from the ground, to augment or replace late summer chemical management (Figure 2). Treatments in this experiment include a chemical with bifenthrin, spray biological treatments with nematodes and fungi, and physical control by grazing hogs (Figure 3) in the orchard. Treatments will be compared to nontreated controls.

Treatments were applied at seasonally appropriate times December 2021-May 2022, and weevil population monitoring is ongoing May-October 2022. Adults will be monitored with traps May-September 2022, and weevil incidence in ripe chestnuts will be assessed in October 2022. This experiment will be repeated in 2023.



Figure 1. Weevil larvae tunnel inside a ripe chestnut (Top) and a weevil larva emerges from a ripe chestnut (Bottom).

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Figure 2. Traps (canopies) are used to catch and monitor chestnut weevils throughout the different treatment and control areas in the chestnut orchard.

Experimental Treatments:

Bifenthrin: Bifenthrin is in the Pyrethroid family and is neurotoxic to insects on contact. It is effective against a wide variety of insects and is labeled for weevils and other beetles for a variety of crops. An application of bifenthrin on the ground in the chestnut orchard may kill adult weevils on contact as they emerge from their underground chambers.

Nematodes: Several species of nematodes are known to kill insects (known as entomopathogenic nematodes). This experiment tests nematodes in the genera Steinernema and Heterorhabditis. Steinernema species, when they are third-stage juveniles, are ambush predators of insects. Heterorhabditis species actively seek out insect hosts in the soil. All parasitic species enter insect hosts through spiracles and other natural openings. They infect host insects with deadly bacteria and then feed upon the deceased host body. They have been used effectively against pecan weevils in the southeastern U.S.

Fungi: The fungus *Beauveria bassiana* occurs naturally in soils throughout the world and is a parasite on many species of insects and arthropods (known as an entomopathogenic fungus). Spores of the fungus can penetrate the

outer cuticles of arthropods, grow through their bodies, and create white spore-producing mold from the cadavers. This fungus has been effective against weevil species in crops throughout the world.

Physical Disruption: Chestnut weevils enter the ground as larvae and metamorphose into adults while underground. Weevil larvae can tunnel underground chambers, but adult weevils cannot. If weevil chambers are collapsed while adults are still underground, they remain trapped and have no way to emerge. Livestock, especially hogs, can be very disruptive to soil structures while grazing. In this experiment, hogs were intensively and rotationally grazed under chestnut trees after harvest in 2021. Animals wallowed and rooted in the soil. It is hypothesized that the major disruption to weevil chambers will drastically reduce the population of emerged adults.



Figure 3. Hogs graze under chestnut trees in late fall after harvest

Grower Resources:

- OSU Fruit Pathology website (u.osu.edu/fruitpathology)
- OSU Fruit and Vegetable Safety website (https://producesafety.osu.edu)
- OSU Fruit and Vegetable Pest Management website (entomology.osu.edu)
- OSU Fruit and Vegetable Diagnostic Laboratory (u.osu.edu/vegetablediseasefacts/)
- OSU Bramble: Production Management and Marketing Guide (Bulletin 782) (extensionpubs.osu.edu)

For printed copies of any of the OSU resources mentioned in this newsletter please contact the OSU Extension office in your county.



To help scout for early SLF stages, Amy Stone of Ohio State University Extension is featured in a <u>video</u> describing how to locate and identify SLF egg masses and nymphs, both black and red stages (<u>voutu.be/jhcURU2yCGE</u>).



Phytophthora crown rot of strawberry is a common disease seen when we have cool and wet springs in Ohio. Typical symptoms include wilting, a weak root systems and discoloration in the crown tissue. A quick field test that growers can use is the Phytophthora specific immunoflow assay that is available from <u>Agdia Inc</u>. (Agdia.com; 800-622-4342) For in season fungicide recommendations for Phytophthora crown rot, commercial growers can consult the Midwest Fruit Pest Management Guide starting on page 172.

OSU Upcoming Events - 2022

Ohio Produce Growers & Marketers Association Summer Tour – June 21 <u>register here</u> Ohio Controlled Environment Agricultural Center Annual Conference – July 20 <u>register here</u> SAVE THE DATE CFAES – Wooster Apple Field Day – July 26 Ohio State Fair – July 27th – August 7th Farm Science Review – September 20th -22nd

For a list of CFAES events and schedule changes go to the CFAE Events Page

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