Ohio Fruit ICM News

Editor: Shawn R. Wright
Ohio State University South Centers
1864 Shyville Rd., Piketon, OH 45661
Phone (740) 289-2071 extension 120
E-mail: wright.705@osu.edu

Volume 12 (19) July 11, 2008

In This Issue

Comments from the Editor
Fruit Observations and Trap Reports
Pest Development
Orchard Sprayer Calibration
Performance-Enhancing Bugs
Preliminary Monthly Climatologic Data for Selected Ohio Locations
Calendar
Ohio Poison Control Phone Number

Comments from the Editor - Sorry about the length, but I thought the two articles were important.

Fruit Observations and Trap Reports

Gretchen Sutton, Waterman Lab Apple Orchards, Columbus, 7/3/08 to 7/9/08

Redbanded leafroller:	18 (down from 20 last week)
Spotted tentiform leafminer:	91 (up from 59 last week)
San Jose Scale (mean of 2):	4 (up from 0 last week)
Codling moth (mean of 3):	0 (same as last week)
Codling moth DA/combo:	0 (same as last week)
Lesser appleworm (mean of 2):	3 (up from 0 last week)
Tufted apple budmoth:	0 (same as last week)
Variegated leafroller:	0 (same as last week)
Oblique-banded leafroller:	0 (same as last week)
Apple maggot (mean of 3):	1.3 (up from 0 last week)

North Central Ohio Tree Fruit IPM Program, Prepared by Cindy Crawford,
Ted Gastier – West District IPM Scout (Sandusky, Ottawa, Huron, &Richland Counties)
7/7/08

Apples

- Spotted tentiform leafminer – 236 (down from 250)
- Redbanded leafroller – 8 (down from 15)
- Oriental Fruit Moth – 21 (up from 1.71)
- San Jose Scale – 0 (same)
- Codling Moth – 1.1 (down from 3.2)

Lesser Apple Worms – 0 (same)
Apple Maggot – 0 (same)

Peaches
Redbanded leafroller- 14 (down from 21)
Oriental Fruit Moth – 1.6 (up from 0.6)
Lesser Peach Tree Borer – 6.1 (down from 6.7)
Peach Tree Borer – 1.7 (up from 1.1)

Lois McDowell – East District IPM Scout (Erie and Lorain Counties), 7/6/08 and 7/8/08
Apples
Spotted tentiform leafminer – 325
Redbanded leafroller – 13.3 (down from 21.2)
San Jose scale – 0 (same as last week)
Oriental Fruit Moth – 17 (down from 17.7)
Codling Moth – 6.8 (down from 14.5)
Apple Maggot – .08 (down from .39)
Peaches
Redbanded leafroller- 14.5 (down from 18)
Oriental Fruit Moth – 0 (down from 0.4)
Lesser Peach Tree Borer – 4 (down from 7.8)
Peach Tree Borer – 0.3 (down from 1.3)

Ron Becker, Program Coordinator, Agriculture & IPM, OSUE, Wayne County
Holmes - 7/2
Codling Moth - 0.55
Oriental Fruit Moth - 2.7
Peach Tree Borer - 0
Holmes - 7/9
Codling Moth - 1.0 up from 0.55
Oriental Fruit Moth -2.7 same
Peach Tree Borer - 0
Wayne - 7/3
Codling Moth - 1.2
Oriental Fruit Moth - 0
Peach Tree Borer - 1
Lesser Peach Tree Borer - 2
Wayne - 7/11
Codling Moth - 1.0 down from 1.2
Oriental Fruit Moth -
Peach Tree Borer - 8 up from 1
Lesser Peach Tree Borer LPTB -
Medina - 7/3
Codling Moth - 1.1
Oriental Fruit Moth - 0
Peach Tree Borer - 0
Lesser Peach Tree Borer - 0

Medina - 7/10

Codling Moth - 1.0 down from 1.1
Oriental Fruit Moth - 0 same
Peach Tree Borer - 0 same
Lesser Peach Tree Borer - 0 same

Pest Development - (Based on Scaffolds Fruit Newsletter, Coming Events (D. Kain & A. Agnello), NYSAES, Geneva)

GDD accumulations in Ohio range from the low-1100's's in the northern Ohio to low 1600's in southern Ohio through July10.

Growing Degree Day Ranges Base Temp.50F (Normal +/- Std Dev)	
Spotted tentiform leafminer 2nd flight peak	861-1217
Lesser appleworm 2nd flight begins	889-1305
Comstock mealybug 1st flight peak	931-1143
Redbanded leafroller 2nd flight peak	965-1353
San Jose scale 2nd flight begins	1013-1309
American plum borer 2nd flight begins	1020-1232
American plum borer 2nd flight peak	1310-1676
Spotted tentiform leafminer 2nd flight subsides	1328-1672
Codling moth 2nd flight peak	1337-1977
Rose-of-Sharon first bloom	1347
San Jose scale 2nd flight peak	1432-1790
Apple maggot flight peak	1455-1763
Redbanded leafroller 2nd flight subsides	1469-1855
Lesser appleworm 2nd flight peak	1473-2263
Comstock mealybug 2nd gen. crawlers emerging	1505-1781
Spotted tentiform leafminer 3rd flight begins	1522-1864
Obliquebanded leafroller 2nd flight begins	1528-1836
Oriental fruit moth 3rd flight begins	1597-1893
Comstock mealybug 2nd gen. crawlers peak	1658-1737
Spotted tentiform leafminer 3rd flight peak	1775-2121
Obliquebanded leafroller 2nd flight peak	1784-2108
San Jose scale 2nd flight subsides	1785-2371
Oriental fruit moth 3rd flight peak	1821-2257

Orchard Sprayer Calibration by Dr. Erdal Ozkan, Pesticide Application Technology Specialist, Extension Agricultural Engineer, The Ohio State University

Applying pesticides at the proper rate is essential to achieving satisfactory weed, disease, and insect control. The directions on the container label tell what application rates give the best results. However, proper application rates will be attained only if sprayers work well and are calibrated correctly. Calibration takes a special meaning and importance when the target being sprayed is not field crops but trees. Target conditions vary from

one orchard to another due to variations in shapes and sizes of trees, spacing between trees, row spacing and different foliage densities..

One of the things we want to know when calibrating sprayers is how much spray is applied over an "acre" of the target crop. In most field crop spraying, gallons per acre (GPA), does not change from one field to another. However, when we are talking about an "orchard acre", we have more than just the length and the width of the area sprayed, we have to consider tree height, shape, canopy density, and all other variables. When determining the desired application rate of an orchard sprayer we need to further adjust the application rate per "ground acre" by the factors mentioned above.

Many suggest we should base our decisions to determine the dilute application rate on the volume of target canopy on an acre of orchard regardless of many of the factors mentioned above. This approach is usually referred to as "Tree Row Volume" or "TRV" based application rate. Once you determine the TRV per acre, you can adjust this dilute application rate based on some other coefficients such as a density factors, or tree type factor. For now, let's leave explanation of the TRV method and other things one must do to determine the most optimum application rate to another time. In this article we will focus simply on **estimating the dilute application rate per "ground acre"** since most applicators first would like to know this before making some fine adjustments in sprayers to alter its liquid discharge rate (application rate).

There are many methods to choose from to determine this. One method that is often used because it is easy and quick, but subject to error is to

1) Fill up the sprayer tank completely up to the lid
2) Find a level ground and put a marking somewhere on the inside of the tank opening,
3) Measure an area in the orchard equal to one acre and spray this area at your normal spraying settings.
4) Return to where you had measured the initial water level in the tank
5) Refill the sprayer tank with water up to the same marking you placed when the tank was full
6) The amount of water that was needed to refill the tank is equal to gallons per acre application rate.

This method assumes that all your nozzles are the right kind and size and in excellent condition. With this method, you may have one nozzle clogged and spraying only 50% of what it is rated for, and the next nozzle may be worn out, or not the right size and spraying at a rate 50% more than its rated output. These inaccuracies will cancel each other out and the final gallons applied per acre may be exactly what you intended to apply. Relying on this method is not a good idea.

A preferred method that will tell you more about the conditions of your sprayer is to

1) Determine the Row Spacing (distance between two rows of trees) in feet in the orchard.
2) Determine travel speed in Miles per Hour (MPH):

Travel speeds change depending on the ground conditions, and the topography. To determine the actual travel speed travel speed in miles per hour, follow this procedure: a) Measure a distance (in ft), b) drive the distance and record the time elapsed in seconds, c) Divide distance by time and multiply the resulting number by 0.68

3) Determine Gallons per Acre (GPA) application rate:

To do this: a) Attach hoses to each nozzle on the sprayer and run the sprayer at the pressure recommended for your application, b) Measure nozzle output in ounces per minute, c) Convert ounces per minute to gallons per minute (GPM) by dividing ounces by 128 (there are 128 ounces in one gallon), c) Replace any nozzle when the measured output deviates by more than 10 percent of the rated output of that nozzle (see nozzle catalogs for rated outputs), d) Use the formula below to determine the GPA application rate:

$$GPA = \frac{\text{Total GPM } \mathbf{X} \text{ 495}}{\text{MPH } \mathbf{X} \text{ Row spacing (ft)}}$$

4) Make adjustments:

Compare the actual application rate resulting from the calibration process with the intended application rate. If the actual rate is more than 5% higher or lower than the desired rate, you need to make adjustments. You can start by changing the pressure. Lowering the spray pressure will reduce the spray delivered; higher pressure means more spray delivered. Do not exceed the pressure rate recommended for the nozzles when adjusting the pressure rate. You can also correct the application error by changing the actual travel speed. Slower speeds mean more spray delivered, faster speeds mean less spray delivered. If these changes do not bring the application rate to the desired rate, then you may have to select a new set of nozzles with smaller or larger orifices.

5) Recalibrate the sprayer after any adjustment and when spraying in a different orchard than the one where the previous calibration was made. Calibrating a sprayer once when it is purchased is not enough. It should be calibrated several times throughout the season to compensate for wear in pumps, nozzles, and metering system

6) Safety is extremely important. Use water instead of chemical mixtures when calibrating your sprayer, and wear gloves and protective clothing.

With the calibration methods mentioned above, what you are finding out is the carrier rate (dilute rate) in gallons per acre. Nothing has been said so far on the amount of active material that has to be mixed in the carrier (water). This varies depending on the rate recommended in the label. Some labels require more concentrated spray solutions (1X, 2X, 3X etc). Check the labels and adjust your application rate and the active ingredient concentrations in the tank accordingly.

In summary, properly maintained spraying equipment is critical to pest control and user safety. A properly calibrated sprayer saves you thousands of dollars in chemical cost, improves yield, and reduces the chance of damage to your orchard as a result of over application, and potential risk of contamination of the environment with pesticides.

Performance-Enhancing Bugs by Art Agnello, Entomolgy, Geneva (*Source*: Scaffolds, July 7, 2008

There are many insects present in apple orchards that provide a benefit to growers by feeding on pest species. It is important that growers and orchard managers be able to recognize these natural enemies, so that they are not mistaken for pests. The best way to conserve beneficial insects is to spray only when necessary, and to use materials that are less toxic to them (see Tables 5 & 12, pp. 58 and 64 of the Recommends). This brief review, taken from IPM Tree-Fruit Fact Sheet No. 18 (available online at: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/ben/ben.asp), covers the major beneficial insects that are likely to be seen in N.Y. orchards, concentrating on the most commonly seen life stages. Factsheet No. 23, "Predatory Mites" (online: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/pm/pm.asp), reviews mites that are important predators of leaf-feeding mites.

CECIDOMYIID LARVAE (Aphidoletes aphidimyza)

These gall midge flies (Family Cecidomyiidae) are aphid predators, and overwinter as larvae or pupae in a cocoon. Adults emerge from this cocoon, mate, and females lay eggs among aphid colonies. The adults are delicate, resembling mosquitoes, and are not likely to be seen. The eggs are very small (about 0.3 mm or 1/85 in. long) and orange. They hatch into small, brightly colored, orange larvae that can be found eating aphids on the leaf surface. These predacious larvae are present from mid-June throughout the summer. There are 3–6 generations per year. In addition to aphids, they also feed on soft-bodied scales and mealybugs.

SYRPHID FLY LARVAE (Family Syrphidae)

The Family Syrphidae contains the "hover flies", so named because of the adults' flying behavior. They are brightly colored with yellow and black stripes, resembling bees. Syrphids overwinter as pupae in the soil. In the spring, the adults emerge, mate, and lay single, long whitish eggs on foliage or bark, from early spring through midsummer, usually among aphid colonies. One female lays several eggs. After hatching, the larvae feed on aphids by piercing their bodies and sucking the fluids, leaving shriveled, blackened aphid cadavers. These predacious larvae are shaped cylindrically and taper toward the head. There are 5–7 generations per year. Syrphid larvae feed on aphids, and may also feed on scales and caterpillars.

LADYBIRD BEETLES (Family Coccinellidae)

• Stethorus punctum: This ladybird beetle is an important predator of European red mite in parts of the northeast, particularly in Pennsylvania, and has been observed intermittently in the Hudson Valley of N.Y., and occasionally in western N.Y. Stethorus overwinters as an adult in the "litter" and ground cover under trees, or in nearby protected

places. The adults are rounded, oval, uniformly shiny black, and are about 1.3–1.5 mm (1/16 in.) long. Eggs are laid mostly on the undersides of the leaves, near the primary veins, at a density of 1–10 per leaf. They are small and pale white, and about 0.3–0.4 mm (1/85 in.) long. Eggs turn black just prior to hatching. The larva is gray to blackish with numerous hairs, but becomes reddish as it matures, starting on the edges and completing the change just prior to pupation. There are 3 generations per year in south-central Pennsylvania, with peak periods of larval activity in mid-May, mid-June and mid-August. The pupa is uniformly black, small and flattened, and is attached to the leaf.

• Other Ladybird Beetles: Ladybird beetles are very efficient predators of aphids, scales and mites. Adults are generally hemisphere-shaped, and brightly colored or black, ranging in size from 0.8 to over 8 mm (0.03–0.3 in.). They overwinter in sheltered places and become active in the spring. Eggs are laid on the undersides of leaves, usually near aphid colonies, and are typically yellow, spindle-shaped, and stand on end. Females may lay hundreds of eggs. The larvae have well-developed legs and resemble miniature alligators, and are brightly colored, usually black with yellow. The pupal case can often be seen attached to a leaf or branch. There are usually 1–2 generations per year. One notable species that is evident now is Coccinella septempunctata, the sevenspotted lady beetle, often referred to as C-7. This insect, which is large and reddish-orange with seven distinct black spots, was intentionally released into N.Y. state beginning in 1977, and has become established as an efficient predator in most parts of the state.

LACEWINGS (Family Chrysopidae)

Adult lacewings are green or brown insects with net-like, delicate wings, long antennae, and prominent eyes. The larvae are narrowly oval with two sickle-shaped mouthparts, which are used to pierce the prey and extract fluids. Often the larvae are covered with "trash", which is actually the bodies of their prey and other debris. Lacewings overwinter as larvae in cocoons, inside bark cracks or in leaves on the ground. In the spring, adults become active and lay eggs on the trunks and branches. These whitish eggs are laid singly and can be seen connected to the leaf by a long, threadlike "stem". Lacewings feed on aphids, leafhoppers, scales, mites, and eggs of Lepidoptera (butterflies and moths).

TRUE BUGS (Order Hemiptera)

There are many species of "true bugs" (Order Hemiptera) such as tarnished plant bug, that feed on plants, but a number of them are also predators of pest species. The ones most likely to be seen are "assassin bugs" or reduviids (Family Reduviidae), and "damsel bugs" or nabids (Family Nabidae). These types of predators typically have front legs that are efficient at grasping and holding their prey.

PARASITOIDS

Parasitoids are insects that feed on or in the tissue of other insects, consuming all or most of their host and eventually killing it. They are typically small wasps (Order Hymenoptera; e.g., families Ichneumonidae, Braconidae, Chalcididae), or flies (Order Diptera; e.g., family Tachinidae). Although the adult flies or wasps may be seen occasionally in an orchard, it is much more common to observe the eggs, larvae, or pupae

in or on the parasitized pest insect. Eggs may be laid directly on a host such as the obliquebanded leafroller, or near the host, such as in the mine of a spotted tentiform leafminer. After the parasitoid consumes the pest, it is not unusual to find the parasitized larvae or eggs of a moth host, or aphids that have been parastized ("mummies"). Exit holes can be seen where the parasitoid adult has emerged from the aphid mummy.

GENERALIST PREDATORS

There is a diversity of other beneficial species to be found in apple orchards, most of which are rarely seen, but whose feeding habits make them valuable additions to any crop system. The use of more selective pesticides helps to maintain their numbers and contributes to the level of natural control attainable in commercial fruit plantings. Among these beneficials are:

• Spiders (Order Araneida): All spiders are predaceous and feed mainly on insects. The prey is usually killed by the poison injected into it by the spider's bite. Different spiders capture their prey in different ways; crab spiders (Thomisidae and Philodromidae) and jumping spiders (Salticidae) forage for and pounce on their prey -- the crab spiders lie in wait for their prey on flowers -- and web-building spiders (e.g., Araneidae, Theridiidae, and Dictynidae) capture their prey in nets or webs.

• Ants (Family Formicidae): The feeding habits of ants are rather varied. Some are carnivorous, feeding on other animals or insects (living or dead), some feed on plants, some on fungi, and many feed on sap, nectar, honeydew, and similar substances. Research done in Washington has shown certain species (Formica spp.) of ants to be effective predators of pear psylla.

• Earwigs (Family Forficulidae): Although these insects may sometimes attack fruit and vegetable crops, those found in apple orchards are probably more likely to be scavengers that feed on a variety of small insects.

Preliminary Monthly Climatologic Data for Selected Ohio Locations - June 2008. This data is from the National Weather Service.

	Temperature (F)		Precipitation (inches)	
	Average	Departure From Normal	Monthly	Departure From Normal
Akron/Canton	69.2	1.7	7.76	3.55
Cincinnati	72.8	0.8	5.21	0.71
Cleveland	70.9	3.4	5.21	3.89
Columbus	73.2	2.0	10.39	4.08
Dayton	71.6	1.4	6.63	4.21
Mansfield	69.2	1.7	7.76	3.55
Toledo	70.1	1.3	5.55	3.80
Youngstown	68.8	2.9	3.18	-0.73

Calendar - Newly added in ***Bold***

Aug. 6, Currant Growing Workshop, Walnut Grove Farm, 59 Walnut Lane, Staatsburg, NY 12580. Dr. Kerik Cox, Steven McKay and Greg Quinn, will discuss growing

currants for the commercial market. Registration is free, but please call 518-828-3346 before August 4th so we can plan appropriately. This program is being sponsored by Cornell Cooperative Extension, NY Farm Viability Institute and the NYS Berry Growers Association.

August 20-21, NASGA Summer Tour. Based out of Columbus, Ohio. For more information contact Kevin Schooley kconsult@allstream.net Telephone (Canada) 613 258-4587. The hotel will be the Drury Inn and Convention Center http://www.druryhotels.com/properties/columbuscvc.cfm

August 21-22, Apple Crop Outlook and Marketing Conference, Chicago. In addition to the annual crop projections (from both USDA and USApple), the conference will feature presentations from several consumer marketing experts, roundtable discussions, networking opportunities and awards presentations. Online registration at www.usapple.org <http://www.usapple.org> begins May 15.

Sept. 6 The Kentucky State University/Ohio Pawpaw Growers Association/Pawpaw Foundation Pawpaw Workshop, Frankfort, KY For registration information, go to http://www.pawpaw.kysu.edu/pawpaw/2008workshop.htm or write Dr. Kirk Pomper, Kentucky State University, 129 Atwood Research Facility, Frankfort, KY 40601, or call 502-597-6174.

Oct. 5-9, High Tunnel Tour of England. A 5-day bus tour of high tunnel culture in England for growers, Extension folks, or any other interested people. Cost is $800 per person ($700 double), which includes most meals and all lodging (flight to London not included). We will tour cherries, raspberries, and strawberries and possibly other crops under tunnels. Deadline for registration is August 22. Full details and registration forms are posted at: http://www.hrt.msu.edu/TUNNELTOUR/. Contact Eric Hanson at MSU (517-355-5191 x1386, hansone@msu.edu) with any questions.

Nov. 6-8, Southeast Strawberry Expo, Hilton Charlotte University Place, Charlotte, NC. Includes Strawberry Plasticulture Workshop for New Growers, farm tour, educational sessions, and trade show. For more information, email info@ncstrawberry.com

Dec 8-10, North American Raspberry & Blackberry Conference. DeVos Place Convention Center, Grand Rapids, MI, as part of the Great Lakes Expo. For more information, email info@raspberryblackberry.com.

Dec. 9-11, Great Lakes Fruit, Vegetable and Farm Market Expo, DeVos Place Convention Center, Grand Rapids, http://www.glexpo.com/.

2009

Jan. 5-6, Kentucky Fruit & Vegetable Conference & Trade Show, Embassy Suites Hotel, Lexington, KY. For more information contact John Strang at phone 859-257-5685 or email: jstrang@uky.edu

January 12-14, OPGMA Congress, The Nia Center at the Kalahari Resort
Sandusky, Ohio

Jan 19-21, Indiana Horticultural Congress, Adam's Mark Hotel, Indianapolis.

Ohio Poison Control Number

(800) 222-1222
TDD # is (614) 228-2272