



Newsletter

Extension

Fruit ICM News

Volume 6, No. 23
July 18, 2002

In This Issue:

[Calendar](#)

[Elevate 50WDG Fungicide for Berry Crops](#)

[Mite Control in Tree Fruit](#)

[Are We in a Drought Yet?](#)

[Beneficial Insects](#)

[Pest Phenology](#)

[Degree Day Accumulations for Ohio Locations](#)

[SkyBit® Sooty Blotch Prediction Prediction for NC Ohio](#)

[SkyBit® Fire Blight Prediction for NC Ohio](#)

[Fruit Observations & Trap Reports](#)

Calendar

July 23: Licking County Twilight Fruit School, Branstool Orchards. Contact Howard Siegrist at 740-349-6900 for more information.

July 30: OSU 2002 Berry Tour, Champaign County. Stop #1, 9:00-11:30 a.m. at Rothschild's Farm, 3143 East U.S. Rte. 36, Urbana. Tour fields of raspberries, vegetables, flowers, and herbs; see the manufacturing facility where they produce raspberry preserves and gourmet creations; visit the sales area; and sip cappuccino in their Market Cafe. An optional lunch is available at \$10.95 per person (turkey, ham, or chicken salad). Stop #2, 1:00-3:00 p.m. at M & M Berry Farm, 345 North Mutual Union Rd., Cable, OH. Program and tour offer participants ideas for alternatives for improving the sustainability of their farming operations. The Mike Pullins family is currently expanding from 5 to 20 acres of black & red raspberry production.

For a brochure e-mailed to you please call 1-800-297-2072 or e-mail Melissa Fitzpatrick at fitzpatrick.73@osu.edu. Registration deadline is July 20th. For more information contact Sandy Kuhn, Berry Coordinator, 740-289-2071.

August 7: Pumpkin Field Day, Western Branch Research Station in South Charleston, 4:00-:00 p.m. OSU researchers Mac Riedel, Bob Precheur, Celeste Welty, Jim Jasinski, and Andy Wyenandt will talk about their work at the station and help answer any questions you might have. The field day will be informal, but will cover many topics, including the use of Sandea and Strategy herbicides in pumpkins,

fungicide and variety plot work, giant pumpkin production, the use of Admire, perimeter trap crops, Kairomone traps to reduce cucumber beetles, and cover crops used in pumpkin production. There are nearly 8 acres of pumpkin research at the farm. This is one of the greatest concentrations of pumpkin research in the state; don't miss your chance to see it all!

Directions: The Western Branch is located on the south side of S. R. 41, between I-70 and the town of South Charleston. For more details, please contact Jim Jasinski, 937-454-5002 or email: jasinski.4@osu.edu.

August 15-17: North American Strawberry Growers Association Summer Tour, southern Michigan and northern Indiana. Participants will tour a variety of sites, including the latest technology in fruit production, a local fair, and Amish produce markets. For more information, contact Erin Griebe at 810-229-9407, or NASGAHQ@aol.com.

Elevate 50WDG Fungicide for Berry Crops

Source: Mike Ellis, OSU-OARDC Plant Pathologist

Elevate 50WDG fungicide (Fenhexamid) was recently registered for control of Botrytis fruit rot (gray mold) on bushberries and caneberries. Elevate is an excellent material for Botrytis control and is a welcome and much needed addition to our arsenal of fungicides for use on small fruit. Elevate has been registered for use on strawberry and grapes for a few years. This material will be incorporated into the *Ohio Small Fruit and Grape Spray Guide* next year. If you have any questions, contact Mike Ellis at 330-263-3849 or by e-mail at ellis.7@osu.edu.

The following information was taken from the Elevate label:

Bushberries (Blueberries, gooseberries, currants and huckleberries): For control of Botrytis cinerea (gray mold), apply 1.5 pounds Elevate 50 WDG Fungicide per acre (0.75 lb AI/A). Begin application at 10% bloom and continue through harvest. Applications should be made every 7 days or when conditions favor disease development.

Avoid making more than two consecutive applications with Elevate 50 WDG Fungicide. After the second application, use an alternative fungicide effective in controlling Botrytis cinerea for two consecutive applications before reapplying the active ingredient in this product. Consult your local crop advisory for appropriate alternative products. The final application may be made up to and including the day of harvest (PHI=0). **Do not** apply more than 6.0 pounds of product per acre per season (3.0 lb AI/A/season).

Caneberries (Red and black raspberries, blackberries and loganberries): For control of Botrytis cinerea (gray mold), apply 1.5 pounds Elevate 50 WDG Fungicide per acre (0.75 lb AI/A). Begin application at 10% bloom and continue through harvest. Applications should be made every 7 days or when conditions favor disease development.

Avoid making more than two consecutive applications with Elevate 50 WDG Fungicide. After the second application, use an alternative fungicide effective in controlling Botrytis cinerea for two consecutive applications before reapplying the active ingredient in this product. Consult your local crop advisory for appropriate alternative products. The final application may be made up to and including the

day of harvest (PHI=0). **Do not** apply more than 6.0 pounds of product per season (3lb AI/A/season).

Mite Control in Tree Fruit

Source: Celeste Welty, OSU Extension Entomologist

Some Ohio apple orchards are having outbreaks of European red mite, which is not uncommon during hot, dry weather. Two-spotted spider mite outbreaks are also possible. At our research orchard in Columbus, mite density is the highest we have seen it during the past 8 years.

Among several options for miticides in mid-summer, the option that is best for integrated pest management is Savey or Apollo because they are least disruptive to predatory mites that provide biological control. Savey and Apollo are allowed only once per year, so cannot be used if already used at the preferred time of first cover. Savey has a 28-day pre-harvest interval (PHI) and Apollo has a 45-day PHI. The only concern about Apollo and Savey is that they have been used every year in some orchards, and thus there is a risk of resistance developing to them. If Savey or Apollo has been used in 2 of the past 3 years, it would be better to use a different miticide. Rotating between Savey and Apollo is not considered a true rotation as they have similar mode of action and cross-resistance is possible.

Several miticides are available that should do a good job of killing European red mite but with a high risk of killing the good predatory mites as well. In this category are Pyramite (25 PHI) and Vydate (14 PHI). Danitol (14 PHI) is also in this category, although it is best used as an insecticide rather than as a miticide.

Two older options are Kelthane (14 day PHI) and Vendex (14 day PHI). These are not very harsh on predatory mites, but at many sites these do not seem to do a good job at killing European red mite due to resistance.

The final option is a brand new product, Acramite (7 day PHI). This miticide is very safe on predatory mites, but the performance at killing European red mites has varied from excellent to fair in test plots in various northeastern States. The manufacturer (Uniroyal) is stressing the importance of using a surfactant (such as 'LI-700') in the spray mix, and using high volume of water (at least 75 gal per acre). At sites where water is hard, a conditioner of ammonium sulfate (such as 'Choice') is advised. At sites where pH is high (>8), pH adjustment is advised. There is also a suspicion that Acramite performance is better from concentrate airblast application than from dilute handgun application. We hope to learn more about how best to use Acramite after field trials are completed this year in Ohio and elsewhere.

On peaches, miticide options are similar although PHI must be considered carefully as harvest is underway for some cultivars. Miticides registered for use on peach and their PHIs are: Savey (28 days), Apollo (21 days), Pyramite (7 days), Vendex (14 days), and Acramite (3 days). Kelthane, Vydate, and Danitol are not registered for use on peach.

Are We In a Drought Yet?

Source: Clark Hutson, Seneca County Ag Agent, C.O.R.N. Newsletter 2002-22

Many people have been asking whether we are currently in a drought. The way to answer this question is to look to the Palmer Drought Severity Index (PDSI) http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif and other information from the Climate Prediction Center, an arm of the National Oceanic & Atmospheric Administration (NOAA) and the National Weather Service.

According to NOAA, common to all types of drought is the fact that they originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (e.g., a few weeks or a couple months), the drought is considered short-term. But if the weather or atmospheric circulation pattern becomes entrenched and the precipitation deficits last for several months to several years, the drought is considered to be a long-term drought.

Many quantitative measures of drought have been developed in the United States, depending on the discipline affected, the region being considered, and the particular application. The most frequently used indicators of drought are those developed by Wayne Palmer in the 1960's. These include the Palmer Drought Severity Index (PDSI), the Palmer Hydrological Drought Index (PHDI), the Palmer Z Index and the Crop Moisture Index (CMI). These indices have been used in countless research studies as well as in operational drought monitoring during the past 35 years. The Palmer drought index has proven to provide one of the best indications of drought for much of the United States. It is superior to other drought indices in many respects because it accounts not only for precipitation totals, but also for temperature, evapotranspiration, soil runoff, and soil recharge.

The Palmer Drought Severity Index is an index of the relative dryness affecting water sensitive economies. The data is provided in graphical and tabular formats for the contiguous United States.

While the PDSI does not currently show that Ohio and especially Northwest Ohio is in a drought, looking at topsoil moisture can also be helpful. According to the Climate Prediction Center, topsoil moisture for Ohio on July 14 was 69% dry in the top 6 inches. This can be compared to the 5-year mean of 38%, which puts current conditions in the very dry category. Listed below is a link to the Climate Prediction Centers Topsoil Moisture Monitoring page http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/topsoil.html

The "Good Guys"

Source: Adapted from Art Agnello, Cornell, Entomology, Geneva, Scaffolds Fruit Journal, July 15, 2002

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. This brief review, taken from *IPM Tree-Fruit Fact Sheet No. 18*, covers the major beneficial insects that are likely to be seen in New York orchards, concentrating on the most commonly seen life stages. Factsheet No. 23, *Predatory Mites*, reviews mites that are important predators of leaf-feeding mites.

Cecidomyiid Larvae (*Aphidoletes aphidimyza*)

This fly (Family Cecidomyiidae) is an aphid predator and overwinters as a larva or pupa 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 mid-summer, 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, 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 seven-spotted 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", 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 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) or flies (Order Diptera). 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 parasitized ("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 Araneae): 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; wolf spiders and jumping spiders forage for and pounce on their prey, the crab spiders lie in wait for their prey on flowers, and the majority of spiders 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. Recent 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.

Pest Phenology

Coming Events	Degree Day Accum. Base 50F
Codling moth 2 nd flight peak	931-2212
Apple maggot 1 st oviposition punctures present	1001-1575
Spotted tentiform leafminer 2 nd flight subsides	1148-1818
Oriental fruit moth 2 nd flight subsides	1164-1963
San Jose scale 2 nd flight peak	1271-1874

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Degree Day Accumulations for Ohio Sites July 17, 2002

Location	Degree Day Accumulations Base 50F	
	Actual	Normal
Akron-Canton	1377	1343
Cincinnati	1751	1824
Cleveland	1409	1307
Columbus	1721	1540
Dayton	1642	1597
Kingsville Grape	1240	1220
Mansfield	1382	1327
Norwalk	1366	1310
Piketon	1731	1772
Toledo	1538	1308
Wooster	1452	1244
Youngstown	1304	1207

SkyBit® Sooty Blotch Prediction for North-Central Ohio

Observed:

July 1-17: active, but no infection

Predictions based on weather forecasts:

July 18-28: active, but no infection

SkyBit® Fire Blight Prediction for North-Central Ohio

Observed:

July 1-8, 11-12, 15-17: not active

July 9-10, 14: possible infection & damage

July 13: active, but no infection

Predictions based on weather forecasts:

July 18-19: not active

July 18-19: possible infection & damage

Fruit Observations & Trap Reports

Insect Key	
AM:	apple maggot
CM:	codling moth
ESBM:	eye-spotted budmoth
LAW:	lesser apple worm
LPTB:	lesser peachtree borer
OBLR:	obliquebanded leafroller
OFM:	oriental fruit moth
PTB:	peachtree borer
RBLR:	redbanded leafroller
SJS:	San Jose scale
STLM:	spotted tentiform leafminer
TABM:	tufted apple budmoth
VLR:	variegated leafroller

Site: Waterman Lab, Columbus

Dr. Celeste Welty, OSU Extension Entomologist

Apple: 7/10 to 7/17/02

RBLR: 5 (up from 4)

STLM: 189 (up from 66)

CM (mean of 3 traps): 12.3 (up from 2.7)

TABM: 1 (same as last week)

SJS: 36 (up from 18)

VLR: 0 (same as last week)

OBLR: 7 (up from 2)

AM (sum of 3 traps): 5 (down from 7)

Peach: 7/10 to 7/17/02

OFM: 17 (up from 7)

LPTB: 1 (down from 2)

PTB: 9 (up from 0)

Site: Wayne County

Source: Ron Becker, IPM Program Assistant

Apple: 7/10 to 7/17/02

STLM: 438.8 (down from 478)

CM (mean of 3 traps): 0.42 (down from 0.5)

RBLR: 4.4 (down from 9.6)

Peach: 7/10 to 7/17/02

OFM: 0 (same as last week)

LPTB: 0 (down from 0.5)

PTB: 6.0 (up from 2.0)

Notes: Where trees had not been sprayed for wooly apple aphid, numbers increased noticeably. Green peach aphid is also increasing to the point of going over threshold. Red mites continue to be low in most orchards. Japanese beetles are also causing problems along perimeter rows, feeding on both leaves and fruit.

Site: East District: Erie & Lorain Counties

Source: Jim Mutchler, IPM Scout

Apple: 7/9 to 7/16/02

CM (mean of 3 traps): 1.5 (up from 1.1)

STLM: 365 (down from 625)

SJS: 33 (up from 0)

AM (sum of 3 traps): 0.2 (down from 0.3)

OFM: 0.5 (down from 1.0)

RBLR: 8.4 (down from 18.8)

ERM (infested leaves per 25 leaf sample): 2.9 (up from 1.8)

OBLR: 0.3 (down from 1.2)

Peach: 7/9 to 7/16/02

OFM: 0.7 (down from 2.0)

RBLR: 7.0 (down from 14.3)

LPTB: 2.7 (down from 7.7)

PTB: 2.7 (down from 3.7)

Beneficials present - native lady beetles, brown & green lacewings, orange maggots

Site: West District: Huron, Ottawa, Sandusky Co.

Source: Gene Horner, IPM Scout

Apple: 7/9 to 7/16/02

CM (mean of 3 traps): 1.9 (up from 1.7)

STLM: 17.2 (down from 23.0)

SJS: 1.0 (up from 0)

AM (sum of 3 traps): 0.8 (same as last week)

OFM: 7.2 (up from 6.6)

RBLR: 14.6 (down from 22.8)

OBLR: 0 (down from 0.4)

ERM (infested leaves per 25 leaf sample): 2.2 (down from 2.9)

Peach: 7/9 to 7/16/02

OFM: 10.8 (down from 11.3)

RBLR: 17.8 (down from 29.0)

LPTB: 3.0 (down from 5.4)

PTB: 1.5 (down from 6.4)

Beneficials present - lacewings, banded thrips

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| [Back](#) |