



Newsletter Extension

Fruit ICM News

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Calendar

August 20, 2001: Ohio Fruit & Vegetable Young Grower Tour, beginning at Hillsboro. Designed for growers 40 years of age and younger, the tour includes retail, wholesale, and auction marketing operations in addition to a wagon tour of fruit and vegetable research plots. Registration begins at 8:00 a.m. at the Southern State Community College just north of Hillsboro. For more information contact Ohio Fruit and Vegetable Growers at (614) 249-2424 or growohio@ofbf.org. Complete information and registration form is available at <http://www.ofbf.org> by clicking on "Upcoming Events."

September 18-20: Farm Science Review - *Pesticide credit can be earned at 2001 Farm Science Review!* Applicators with a pesticide license can receive recertification credit at this year's Ohio Farm Science Review. Pesticide recertification credit for core will be given to applicators during a hands-on demonstration about managing drift. Taught by Ohio State University Extension, the demonstration will be at the Pesticide Education Program display, number 1005 in the exhibit area. Pre-registration for the credit will be at the display area during the Farm Science Review. Each demonstration will be limited to the first 12 people who register. The sessions will be held every day of the review, at 11:00 a.m. and again at 2:00 p.m. Demonstrations will be one hour in length, and each applicator will be given core credit toward recertification.

Also at the Pesticide Education Program display, spray nozzle demonstrations will be given from 9:00 a.m. - 4:00 p.m. every day of the review. For more information about the recertification credit at Farm

Science Review, contact the Pesticide Education Program, OSU Extension, at (614) 292-4070 or visit the website at <http://www.ag.ohio-state.edu/~pested>

Mechanically Cleaning Carry-over Strawberries

Source: Charlie O'Dell, Virginia Tech, Commercial Horticulture Newsletter, January-February 1999, <http://www.ext.vt.edu/departments/commhort/1999-02/1999-02-03.html> as included in the Massachusetts Berry Notes Volume 13, No. 13, July 12, 2001 by Sonia Schloemann

"Show me the money" is what growers need from our strawberry research with hardy eastern U.S. varieties on plastic mulch for colder areas. Growers are rightfully concerned, unsure about risking the very expensive investments for equipment, plants, plastic mulch, drip irrigation, transplanter, and frost control needed for 1-crop annual plantings for our strong consumer demand for locally grown, flavorful, vine-ripe berries in the mid-Atlantic region. Our strawberry research is focused on developing a profitable recyclable production system for 3 cropping years per planting with hardy Eastern varieties. The challenge is to maintain adequate berry size and yields for second and third year crops from original plants in this hill system. Plants are maintained at original double-rowed spacing by the plastic mulch, which prevents daughter runners from being able to root and destroy the evenly spaced hill configuration, favoring easy harvest, clean berries, and larger fruit, plus in-row weed control. Renovation practices after harvest and management of second and third year plantings will be important to success, plus development of varieties more resistant to Anthracnose crown disease. At renovation, for example, after harvests and mowing of foliage, while crowns are highly visible, crown thinning/renewal may be necessary as with an asparagus knife. About one-half of each large crown is removed on such large crowned varieties as Chandler in warmer areas and Late Star in mid-Atlantic colder areas. Also vital for success will be September replacement by fertigation of nutrients depleted in the beds by the previous crop, based on late summer soil tests of the beds for nutrient inventory.

Another necessary carry-over task in late winter is cleaning of beds to remove dead leaves and previous season runner growth. This abundant dead plant material has served us well in colder areas as a "home grown" winter mulch atop the beds to help protect crowns. It also serves as a huge source of latent, infectious spores of Botrytis Gray Mold fruit rot and other diseases that must be removed before occurrence of active new spring growth and fungicide applications during bloom. Such late winter plant cleaning is also vitally important in matted row production for best Gray Mold disease control, along with fungicide crop protectant sprays during bloom. In our carry-over research plots, we've removed this dead plant material by hand, a difficult, laborious, bend-over job.

Research/Extension cooperating growers including the J.P. Via family and Hugh French and family also hand cleaned their carry over beds at a labor cost of \$500 - \$700 per acre. Small growers that don't have a late winter labor supply find hand cleaning beds to be an especially difficult task.

After seeing lawnmower blades modified to top-prune, lift, and discharge woody nursery prunings in a large commercial nursery in Southeast Virginia, we decided to try this concept for mechanically cleaning strawberry beds. Credit for this idea goes to Mr. Johnny Patterson of Lancaster Farms, whose many talents include welding and metals fabrication. He welded flat steel to the back "lift" sides of 21" mower blades, a strip 3-1/2" long so that one-half inch of each steel strip protruded from the back side of the blade directly behind each 3-1/2" sharpened cutting edge. The 1/2" of extra steel protruding from the upper side at the ends of the blade creates amazing "airplane propeller" lift! After our research farm support technician, Mr. Romney Smith, welded and balanced, then reinstalled the blade, we fired up the

mower engine. Blade suction lifted gravel stones off the research farm shop driveway and blew them out of the side discharge chute. Look out, folks! Only at near-idle speeds was the mower safe with the blade engaged on graveled areas.

The blade welding modification was completed in November, but we did not want to risk removing our home-grown crown mulch protection of dead runners and leaves atop the crowns and beds until late winter. The flying gravel stones showed us the concept works. Finally I could stand the suspense no longer. Just after the North American Strawberry Growers annual conference at Orlando, on Friday, February 12, 1999, I tried this "suction mower" on a guard row of plastic mulched strawberries at our research farm. It worked! To keep from cutting the plastic mulch, I had to adjust the blade/mower wheels until the blade was in its highest position 3" above the plastic mulch. The dead leaves and old runners are closer to the mulch, but are lifted and cut by the powerful wind/air suction of the blade. The wheels serve as height control, as the 21" wide 5 horsepower hydrostatic drive mower moves easily on top of the bed at just above idle speed. To me the effect was similar to a relaxing stroll following and merely guiding the mower, while taking in the late winter sun and air in an upright position! Behind the mower appeared shiny black plastic mulch with 2 neat rows of original mother plants cleaned and neatly trimmed well above the crowns. Yes, Johnny Patterson can be proud, even Orville and Wilbur Wright might be proud to see their propeller "lift" idea used to reduce such back-tiring drudgery in the strawberry fields.

To clean bed sides, I also put the mower on an angle with 2 wheels running in the row middle and 2 wheels running on the bed top. Again, the mower cleaned off the dead runner growth just fine. Enterprising growers could weld or bolt such modified mower decks to a frame to go over each bed, one mower centered over the bed and two mowers trailing it, each on the bed sides, all secured to a frame-mounted 3-pt. hydraulic tractor lift. One pass over each bed in late winter would clean the beds while the tractor driver gets some rest on the tractor seat. I believe we are another big step closer to showing you the money with carry-over plastic mulched strawberries as a 3 crop production system reality for this colder region.

Codling Moth Control in 2001

Source: Dr. Celeste Welty, OSU Extension Entomologist

An increase in the number of codling moth adults caught in pheromone traps in central Ohio during the past week indicates the start of the next generation. Depending on what air temperatures are reached in the next week, control of codling moth young larvae will be needed about 2 weeks from now. This year we can expect the second generation to be more prolonged than usual, due to an unusually prolonged first generation. At our research orchard in Columbus, moth catch in traps peaked during the first week of May, but moderate numbers of moths (>5 per trap per week) were caught through the third week of June.

Peachtree Borer Control

Source: Dr. Celeste Welty, OSU Extension Entomologist

Peachtree borer attacks the inner bark of stone fruit trees at the soil line. Insecticide cover sprays applied by conventional air-blast sprayers will do little to control peachtree borer; a bark drench with a high volume, low pressure handgun is required for good borer control.

In orchards that are treated for peachtree borer every year so that infestation is kept at fairly low levels, one treatment per year provides good control. The best timing for a single trunk drench is at the time of peak emergence of adult moths, which usually occurs in the last week of July or the first week of August. In orchards where infestation is high, two treatments are needed, one in late June soon after the first moths emerge, and a second about 6 weeks later, in early August.

Chlorpyrifos (Lorsban 4E) or endosulfan (Thiodan 3EC or Thiodan 50 WP) can be used for a trunk drench. One application of chlorpyrifos is effective for about 12 weeks; one application of endosulfan is effective for about 6 weeks. Consider the following restrictions before choosing which insecticide to use. Lorsban must be applied to the bark and must not be applied to the fruit; it may be applied only once per year on peaches and nectarines or three times per year on cherries, and it may not be used within 14 days of peach or nectarine harvest or within 6 days of cherry harvest. Thiodan may be used two times per year and it may touch the fruit. Thiodan should not be used within 21 days of cherry harvest or 7 days of plum harvest; for peaches, nectarines, and apricots, the pre-harvest restriction is 21 days if used only on the bark or 30 days if used on the fruit.

"Preys-Worthy"

Source: Adapted from Art Agnello, Entomology, Geneva, NY, Scaffolds Fruit Journal, Volume 10, No. 18

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.

Cecidomyiid Larvae, aka "Orange Maggot" (*Aphidoletesaphidimyza*)

This fly (Family Cecidomyiidae) is an aphid predator and overwinters as a larva or pupa in a cocoon. Adults emerge from this cocoon and 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 Ohio, 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 groundcover 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. 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" (Order Hemiptera) such as the 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 "damselfly 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), 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.

To view some of the above beneficial insects plus predatory mites, check out the **Natural Enemies Directory** from West Virginia University.

http://www.caf.wvu.edu/kearneysville/pest_descriptions/visualkey/naterviskey.html

Apple Market Loss Assistance

Source: John Wargowsky - Ohio Fruit Growers Society

The Senate Appropriations Committee this week unanimously approved its version of the fiscal 2002 agriculture appropriations bill. Unlike the agriculture spending bill recently approved by the House of Representatives, the Senate's version does not include market loss assistance of apple growers. Our industry's allies in the Senate plan to offer an amendment to provide \$250 million in apple market loss assistance when either the fiscal 2002 agriculture spending bill or the fiscal 2001 supplemental farm aid bill is brought before the full Senate for consideration. The Senate is expected to begin consideration of one or both of these measures as early as next week.

The U.S. Apple Association (USApple) urges industry members to immediately contact both of their state's U.S. Senators to voice support for \$250 million in market loss assistance for America's apple growers. Telephone contact can be made by calling the United States Capitol switchboard at (202) 224-3121, and asking to be connected to their senators' offices. Ask to speak with the staff member responsible for agricultural issues. In addition, apple industry members are urged to write both of their state's senators using the sample letter after the background.

Background

The House of Representatives approved its version of the fiscal 2002 agriculture appropriations bill (H.R. 2330) July 11, which provides \$15.7 billion in discretionary spending, including \$150 million in market loss assistance for apple growers. The House also approved its version of the fiscal 2001 supplemental farm aid bill (H.R. 2213) June 26, which provides \$5.5 billion in additional farm assistance including \$169 million in support for fruit and vegetable producers through their state departments of agriculture.

The Senate Appropriations Committee approved its version of the fiscal 2002 agriculture appropriations bill by a vote of 27-0 on July 17, which provides \$16.1 billion in discretionary spending. At the request of Senate Appropriations Chairman Robert C. Byrd (D-W.V.), committee members agreed not to offer any controversial amendments during the committee's consideration. However, several members indicated they plan to offer amendments to the bill when it comes before the full Senate for consideration.

Meanwhile, the Senate Agriculture Committee under Chairman Tom Harkin's (D-Iowa) leadership is presently crafting its version of the fiscal 2001 supplemental farm aid bill, which may come before the Senate for consideration in advance of the fiscal 2002 agriculture appropriations bill. USApple is working with our industry's allies in the Senate to garner support of market loss assistance for apple growers, which we hope can be added to the first of these two bills to come before the full Senate for consideration.

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

Waterman Lab, Columbus, Dr. Celeste Welty, OSU Extension Entomologist

Traps used: STLM = Wing trap, SJS = Pherocon V, Codling Moth = mean of 3 MultiPher® traps, Others = MultiPher

Apple: 7/11 to 7/18

STLM: 64 (up from 52)

RBLR: 2 (down from 7)
CM (mean of 3 traps): 4.0 (up from 0.0)
SJS: 10 (down from 22)
OFM: 3 (down from 4)
DWB: 0 (unchanged)
TABM: 1 (up from 0)
VLR: 0 (unchanged)
OBLR: 3 (up from 0)
AM(sum of 3 traps): 0 (down from 1)

Peach: 7/11 to 7/18

OFM: 3 (down from 7)
LPTB: 4 (up from 1)
PTB: 2 (down from 6)

Site: East District; Erie & Lorain Counties

Source: Jim Mutchler, IPM Scout

Traps Used: STLM=wing traps, SJS=Pherocon-V, Others=MultiPher®

Apple: 7/11 to 7/17

STLM: 335 (down from 625)
CM: 0.8 (down from 0.9)
SJS: 0.1 (up from 0)
OBLR: 7.0 (up from 1.0)
RBLR: 8.0 (down from 17)
AM: 0.1 (down from 0.3)

Peach: 7/11 to 7/17

OFM: 3.0 (up from 2.0)
LPTB: 5.0 (down from 8.7)
PTB: 8.7 (up from 7.3)
RBLR: 12.0 (down from 17.7)

Other pests include white apple leafhopper, green apple aphid, Japanese beetle, wooly apple aphid, lilac borer, oriental fruit moth strike

Beneficials include: lacewings everywhere, orange maggots, white maggots, lady beetles

Site: West District; Huron, Ottawa, & Sandusky

Source: Gene Horner, IPM Scout

Traps Used: STLM=wing traps, SJS=Pherocon-V, PC = circle traps, Others=MultiPher® traps

Apple: 7/11 to 7/17

CM: 0.2 (down from 1.8)
RBLR: 5.3 (down from 21.8)
SJS: 0.0 (unchanged)
STLM: 75 (down from 105)

PC: 0.0 (unchanged)
 AM: 0.8 (up from 0.1)

Peach: 7/11 to 7/17

OFM: 1.2 (down from 1.8)
 LPTB: 6.6 (up from 5.8)
 PTB: 4.2 (unchanged)
 RBLR: 8.4 (down from 33.2)
 TPB: 0.0 (down from 0.3)

Other pests include green apple aphid, white apple leafhopper, lilac borer, apple rust mite, Japanese beetle, plum curculio strike, tarnished plant bug, green peach aphid

Beneficials include: lacewings eggs & larvae everywhere, lady beetles, orange maggots, banded thrips, predatory mite

Phenology

Coming Events	Range of Degree Day Accumulations	
	Base 43° F	Base 50° F
Codling moth 2 nd flight begins	1355-2302	864-1549
Obliquebanded leafroller 1 st flight subsides	1420-2452	899-1790
San Jose scale 2 nd flight begins	1449-1995	893-1407
Redbanded leafroller 2 nd flight peaks	1479-2443	952-1698
Spotted tentiform leafminer 2 nd generation tissue feeders present	1504-2086	952-1201
Apple maggot 1 st oviposition punctures	1566-2200	1001-1575
Codling moth 2 nd flight peak	1587-3103	1061-2212
Spotted tentiform leafminer 2 nd flight subsides	1773-2514	1148-1818
Oriental fruit moth 2 nd flight subsides	1806-2783	1164-1963
Redbanded leafroller 2 nd flight subsides	1927-3045	1291-2160
Apple maggot flight peak	2033-2688	1387-1804

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Northern Ohio Apple Scab, Fire Blight, & Sooty Blotch Activity

from SkyBit®

	Dates	Level of Disease Activity
Observed	July 1, 4, 8, 17, 18	Possible scab infection & damage
	July 2, 3, 5-7, 9-16	Scab active, but no infection expected
	July 1, 3-5, 7, 8, 10, 17, 18	Possible fire blight infection and damage
	July 2, 6, 9, 11-16	No fire blight activity
	July 1-18	Possible sooty blotch infection & damage
Forecast	July 19-26, 28	Scab active, but no infection expected
	July 27	Possible scab infection & damage
	July 19-21	No fire blight activity
	July 22-28	Possible fire blight infection and damage
	July 19-28	Possible sooty blotch infection & damage

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to Date Indicated

Location	Reported Degree Day Accumulations						Forecasted Degree Day Accumulations July 25	
	July 4		July 11		July 18		Base 45° F	Base 50° F
	Base 45° F	Base 50° F	Base 45° F	Base 50° F	Base 45° F	Base 50° F		
Akron - Canton	1463	1040	1630	1172	1804	1311	2018	1490
Cincinnati	1887	1399	2079	1557	2266	1709	2504	1911
Cleveland	1484	1070	1655	1206	1832	1348	2043	1524
Columbus	1857	1387	2059	1554	2250	1710	2479	1905
Dayton	1766	1313	1955	1467	2139	1616	2373	1815
Mansfield	1477	1058	1642	1188	1816	1326	2009	1485
Norwalk	1504	1090	1680	1230	1858	1374	2068	1548
Piketon	1880	1386	2068	1539	2242	1678	2453	1854
Toledo	1535	1116	1722	1268	1909	1420	2128	1604
Wooster	1521	1097	1688	1229	1857	1362	2052	1523
Youngstown	1397	979	1550	1098	1716	1229	1916	1393

Ohio Drought Conditions

Conditions in Ohio as of July 14, 2001 according to Long Term Palmer Drought Severity Index

Source: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

Region	Category of Drought
Northeast Ohio	Severe
Northeast Hills	Moderate
Central Hills	Moderate
North Central	Moderate
Rest of State	Near Normal

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

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