http://ipm.osu.edu/fruit/index.html

THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

Volume 8, No. 17
May 20, 2004

In This Issue:

Calendar

May 26: Twilight Tree Fruit Field Meeting, 7:00 pm to 9:30 pm at Branstool Orchards, Utica, OH. Meet at the farm market on the north side of S.R. 62, 1½ miles east of the Utica intersection of S.R. 62 & S.R. 13. Please plan to arrive by 7 pm sharp so the program and wagon tour can begin! In field meeting and wagon tour of primarily peaches, but also includes apples, pears, cherries, and grapes. On hand will be Dr. Diane Miller, OSU Fruit Specialist, and Dr. Mike Ellis, OSU Plant Pathologist. We will examine several aspects of an extremely well-managed orchard, including winter & spring pruning, orchard floor management, thinning practices, disease management, plus much more. *Bring plant specimens for identification.* At 9 p.m. Marshall Branstool will share a video of fruit growing practices in Italy, where he attended the International Dwarf Fruit Tree Association Conference this past winter. Additional details available from Howard Siegrist, Licking County Extension Educator at 740-349-6904 or siegrist.1@osu.edu.

June 30: Ohio Fruit Growers Society Summer Tour, OARDC Horticulture Unit 2, Wooster, Registration begins at 7:00 a.m., program begins at 8 am to 3 pm. Registration fee.

Codling Moth

Source: http://tfpg.cas.psu.edu/part2/part22bi.htm

Codling moth, *Cydia pomonella*, was introduced from Europe in colonial times and now occurs throughout North America as well as most of the world, wherever apples are grown. In the past in Pennsylvania, the codling moth was maintained at low population levels by insecticides sprayed to

control other pests and usually did not seriously affect apple production in commercial orchards. However, during the last few years the significance of this pest drastically changed, and numerous orchards have experienced increased pressure from this pest. The codling moth has been known to infest 95 percent of the apples in an orchard when control measures were not taken against it. Given this insect's ability to adapt to various fruits (i.e., the ability to coincide with different fruiting times) and to develop resistance to insecticides, fruit growers must continually be on guard against a resurgence of codling moth.

Description and Life Cycle

The adult female moth is approximately 3/8 inch long and grayish in color. The male is slightly smaller and has a grouping of hair-like scales near the wing base. The wing is generally a darker shade of gray near the base, with a dark patch containing coppery scales near the inside wing tip. The larvae have a cream to pinkish body and a brown head with dark speckles on the prothoracic shield behind the head.

Larvae reach 1/2 to 5/8 inch long at maturity. Oriental fruit moth larvae, which are often confused with the codling moth larvae, are smaller, lack spots on the prothoracic shield, and have a comblike structure on the posterior end visible under magnification.

Codling moth eggs, laid singly, appear as flat, slightly oval discs. At first translucent, they later become reddish, and finally enter the black head stage just before hatching, when the dark head capsule can be seen.

Codling moth overwinter as full-grown larvae within a cocoon under leaf litter, loose bark scales, or any other sheltered place they may encounter. Pupation occurs at about first pink, with first flight occurring about full bloom, and peak flight occurring approximately 2 weeks after full bloom. First-generation eggs are laid on leaves near fruit or on the fruit and hatch in about 8 to 14 days. Newly hatched larvae bore through the fruit surface, generally at the blossom or calyx end, and feed near the surface for a time before boring to the core. Larvae feed on the seeds and surrounding flesh until they are fully grown in 3 to 4 weeks. They then exit the fruit, seek shelter, spin a cocoon, and may or may not pupate. Some first-generation larvae do pupate, emerge as adults in 2 to 3 weeks at about the fourth or fifth cover spray, and produce a second generation. The majority of the second generation overwinter as mature larvae.

First-generation larvae that do not pupate enter a quiet phase, overwinter as larvae, and begin producing eggs for first-generation larvae the following year. Individuals of the second generation may also pupate and attempt to produce a third generation at the seventh or eighth cover spray. This generation, which does not survive the winter, is termed a suicide generation. Individuals can, however, inflict additional late-season fruit injury.

Damage to apples may be shown either by a tunnel emanating from the apple side or calyx and extending to the core, or by "stings," small shallow holes the size of pin pricks, with a little dead tissue on the cavity walls. Stings are caused by early instar larvae that have been poisoned and die shortly after puncturing the apple skin. Larvae that feed on the core characteristically leave frass exuding from the point of entry. Stings lower the value of the fruit from fresh market to processing grade apples. Tunneling causes the fruit to be rejected.

Monitoring and Management

Pheromone traps for monitoring populations of adult male codling moths can be used to determine if and when controls are necessary. Traps should be placed at the density of one trap per 5 acres by the

pink stage and situated on the outside of the tree, 6 to 7 feet above the ground. The higher the trap placement, the better codling moth is observed. Check traps daily until the first adult is caught and then weekly thereafter. If the action threshold of five moths per trap per week is exceeded, an insecticide application should be made within 7 to 10 days. Repeat applications should only be made if the number of captured moths exceeds this threshold 14 days after the insecticide application.

Optimum timing of insecticide applications based on egg hatch can be determined with the aid of a degree-day model. First adult capture in a pheromone trap is used as a biofix, and degree-days are accumulated thereafter. Growers wishing to time sprays based on egg development and hatch should make an application of broad-spectrum insecticide 250 degree-days after the first capture of males in the sex pheromone traps. A second application can be applied 14-21 days following the initial application if needed.

Mating disruption may represent a valuable alternative to insecticide treatment for isolated orchards with a low codling moth population. The Isomate C pheromone dispensers (ties) and sprayable pheromones are commercially available and can be used for codling moth control. See accompanying table for insecticide efficacy against CM and other pests.

Key to Pests
AM -- apple maggot
CM -- codling moth
LAW -- lesser appleworm
OBLR -- obliquebanded leafroller
OFM -- Oriental fruit moth
PC -- plum curculio
RAA -- rosy apple aphid
RBLR -- redbanded leafroller
SJS -- San Jose scale
STLM -- spotted tentiform leafminer
WALH -- white apple leafhopper

Apples: Insecticide & Miticide Efficacy [a, b]

Source: http://tfpg.cas.psu.edu/tables/table4-7.htm

Pesticide [c]	AM	CM	LAW	OBLR	OFM	PC	RAA	RBLR	SJS	STLM	WALH
Actara	-	-	-	-	-	2	1	-	-	2	1
Agri-Mek	-	-	-	-	-	-	-	-	-	1	3
Asana XL	2	1	1	1	1	2	1	1	4	1	2
Assail	-	2	1	4	1	-	1	4	-	1	1
Avaunt	3	2	3	4	2	1	-	2	-	4	2
azinphos-methyl	1	1	1	1	2	1	3	2	3	4	4
B. thuringiensis	-	3	3	2	3	-	-	1	-	-	-
Calypso	2	2	1	4	2	1	1	4	3	1	1
carbaryl	2	2	2	3	2	2	3	3	4	3	1
chlorpryrifos 4E	-	-	-	-	-	-	2	2	1	-	-

Danitol	2	1	1	2	1	2	3	1	4	1	2
Diazinon	2	2	2	3	2	2	1	2	2	3	2
endosulfan	4	4	4	4	4	3	3	4	3	3	2
Esteem	-	2	-	2	2	-	2	-	1	1	-
Imidan	1	2	1	2	2	1	3	2	3	4	4
Intrepid	-	2	2	1	2	-	-	1	-	2	-
Lannate	3	2	2	1	2	3	3	1	4	2	2
Lorsban 50WP	-	-	-	1	2	-	2	2	2	4	-
permethrin	-	-	-	1	1	2	1	1	4	1	2
Provado	-	-	-	-	-	-	1	-	-	1	1
SpinTor	3	3	4	1	3	4	-	2	-	1	-
Supracide	-	-	-	-	-	-	1	1	1	-	-
Surround	3	3	3	4	3	3	-	4	3	4	4
Warrior	2	1	1	1	1	1	1	1	-	1	1

[a] Pest control rating system when used at recommended rates: 1 = excellent, 2 = good, 3 = fair, 4 = poor, -- = not rated for this insect or mite. Ratings are based on moderate insect or mite pressure. Heavy infestation may require either higher dosage or shorter intervals, or both.

[b] Fruit finish on yellow varieties when used as directed excellent for all products except the following: good for diazinon and Lorsban 50WP.

[c] Uppercase names are trade names, lowercase names are common names for products with more than one trade name.

Strawberry Botrytis Fruit Rot

Source: http://ohioline.osu.edu/b861/b861_9.html

One of the most serious and common fruit rot diseases of strawberry is gray mold. Gray mold is caused by the fungus *Botrytis cinerea*. Under favorable environmental conditions for disease development, serious losses can occur. The gray mold fungus can infect petals, flower stalks (pedicels), fruit caps, and fruit. During wet springs no other disease causes a greater threat to flowers and fruit. The disease is most severe during prolonged rainy and cloudy periods during bloom and harvest. Abundant gray-brown, fluffy, fungal growth on infected tissue is responsible for the disease's name "gray mold."

Symptoms

Young blossoms are very susceptible to infection. One to several blossoms in a cluster may show blasting (browning and drying) that may spread down the pedicel. Fruit infections usually appear as soft, light brown, rapidly enlarging areas on the fruit. If it remains on the plant, the berry usually dries up, "mummifies," and becomes covered with a gray, dusty powder. Fruit infection is most severe in well-protected, shaded areas of the plant where the humidity is higher and air movement is reduced. Berries resting on soil or touching another decayed berry or a dead leaf in dense foliage are most commonly affected. The disease may develop on young (green) fruits, but symptoms are more common as they mature. Often, the disease is not detected until berry picking time. During harvest, the handling of

infected fruit will spread the fungus to healthy ones. After picking, mature fruits are extremely susceptible to gray mold, especially if bruised or wounded. Under favorable conditions for disease development, healthy berries may become a rotted mass within 48 hours after picking.

Disease Development

The fungus is capable of infecting a great number of different plants. It overwinters as minute, black, fungal bodies (sclerotia) and/or mycelium in plant debris, such as dead strawberry leaves in the row. In early spring, these fungal bodies produce large numbers of microscopic spores (conidia), which are spread by wind throughout the planting. They are deposited on blossoms and other plant parts where they germinate in a film of moisture. Infection occurs within a few hours.

Disease development is favored by wet conditions accompanied by temperatures between 41 F and 86F. Conditions that keep flowers and fruit wet, such as rain, dew, or sprinkler irrigation encourage Botrytis rot.

Strawberries are susceptible to *Botrytis* during bloom and again as fruits ripen. During the blossom blight phase of the disease, the fungus colonizes senescing flower parts, turning the blossoms brown. The fungus usually enters the fruit through flower parts, where it remains inactive (latent) within the tissues of infected green fruits. As the fruit matures, the fungus becomes active and rots the fruit. Thus, while infection actually occurs during bloom, symptoms are usually not observed until harvest. This is important to remember when one considers control. Temperatures between 70 and 80F and moisture on the foliage from rain, dew, fog, or irrigation are ideal conditions for disease development. The following information is from the *2004 Midwest Commercial Small Fruit & Grape Spray Guide:*

Botyris Blossom Blight & Fruit Rot Control Materials

Material	**Rate/acre**
* Benlate 50 WP	1 lb.
or Topsin-M 70 WSB	1 lb.
or Elevate 50 WG	1.5 lb.
or Switch 62.5 WG	11 to 14 oz.
plus Captan 50 WP	4 lb.
or Thiram 65 WP	4 lb.
OR Captan 50 WP	6 lb.
or Thiram 65 WP	5 lb.
or Switch 62.5 WG	11 to 14 oz.
or Elevate 50 WG	1.5 lb.

* Benlate is no longer available for sale. Remaining supplies can be used except in "Pick-Your-Own" patches. Neither Benlate, Switch, Elevate, nor Topsin-M should be used alone for season-long control of Botrytis because of the potential for pathogen strains to develop resistance.

Degree Day Accumulations for Ohio Sites May 19, 2004

Ohio Location	Degree Day Accumulations Base 50	
	Actual	Normal*
Akron-Canton	390	312
Cincinnati	558	507
Cleveland	375	297
Columbus	523	406
Dayton	496	466
Kingsville	338	233
Mansfield	387	306
Norwalk	406	277
Piketon	573	435
Toledo	380	288
Wooster	427	287
Youngstown	376	281

Pest Phenology

Coming Events	Degree Day Accum. Base 50F
Peachtree borer 1st catch	299 - 988
Codling moth 1st flight peak	307 - 824
Oriental fruit moth 1st flight subsides	442 - 1026
San Jose scale 1st generation crawlers present	569 - 784
Apple maggot 1st catch	629 - 1297
Redbanded leafroller 2nd flight begins	656 - 1381
Codling moth 1st flight subsides	673 - 1412
Oriental fruit moth 2nd flight begins	772 - 1215

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Fire Blight Report for Erie County

Source: Ted Gastier, OSU Extension Educator, Huron County from old-style leaf-wetness monitor and Spectrum Technologies software

May 10, 11, 12, 15, & 17 - high infection risk whether or not fire blight was present in the area in the last 2 years (unless a spray application had been made).

WeatherTracker® Apple Scab Report

Source: Ted Gastier, OSU Extension Educator, Huron County and cooperating growers

Level of Infections Reported Listed by Ohio Counties

Date	Light Infection	Medium Infection	Heavy Infection
5/10	Lucas		
5/11	ColumbianaLucas Ottawa Sandusky	Erie	
5/12	Geauga Licking Ottawa	Erie Licking Sandusky	
5/13	Holmes	Ottawa	
5/14	Holmes		
5/15		Holmes Wayne	ColumbianaErie Sandusky
5/16		Lorain	ColumbianaErie Sandusky
5/19	Lorain		

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: 5/12 to 5/19/04	
Redbanded leafroller	0 same as last wk
Spotted tentiform leafminer	0 down from 2

San Jose scale	0 down from 9
Codling moth	35.7 down from 37
Lesser appleworm	77 up from 29
Tufted apple budmoth	5 up from 3
Variegated leafroller	0 same as last wk
Obliquebanded leafroller	1 up from 0

Site: Medina, Wayne, and Holmes Counties
Ron Becker, IPM Program Assistant

Apple: 5/12 to 5/19/04	
Redbanded leafroller	Holmes: 1.5 down from 11
	Wayne: 2 down from 8.3
	Medina: 2.5 down from 20.5
Spotted tentiform leafminer	Holmes: 27.5 same as last week
	Wayne: 42 down from 70.3
	Medina: 1.2 down from 180
Oriental fruit moth	Holmes: 0 same as last wk.
	Wayne: 2 same as last wk.
	Medina: 2 up from 0.5
Codling Moth	Holmes: 1 up from 0.5
	Wayne: 9 up from 0
	Medina: 1.5 up from 0

Leafminer eggs, European red mite, and potato leafhopper were noted in scouting the trees. Light hail damage occurred the night of May 17.

Site: West District; Huron, Ottawa, Richland, and Sandusky Counties
Lowell Kreager, IPM Scout/Technician

Apple 5/11 to 5/18/04	
Codling moth	4.6 down from 4.8
Lesser appleworm	4.6 down from 5.7
Oriental fruit moth	7.7 down from 20.9
Redbanded leafroller	10.1 down from 43.5
Spotted tentiform leafminer	367 down from 622
Peach 5/11 to 5/18/04	
Lesser peachtree borer	1 first report
Redbanded leafroller	59.2 up from 29.2

Codling moth biofix date at some locations was 5/7/04

Beneficials include lacewings and native lady beetles

Site: East District; Erie and Lorain Counties
Jim Mutchler, IPM Scout/Technician

Apple 5/11 to 5/18/04	
Codling moth	0.4 first report
Oriental fruit moth	9.1 down from 15.6
Redbanded leafroller	5.8 down from 25.6
Spotted tentiform leafminer	600 down from 682
Peach 5/11 to 5/18/04	
Oriental fruit moth	1.0 down from 4.3
Redbanded leafroller	3.8 down from 25.5

Beneficials include native lady beetles

The Ohio Fruit ICM News is edited by:

Ted W. Gastier
Extension Agent, Agriculture
Tree Fruit Team Coordinator
Ohio State University Extension Huron County
180 Milan Avenue
Norwalk, OH 44857
Phone: (419)668-8210
FAX: (419)663-4233
E-mail: gastier.1@osu.edu

| Back |