Ohio
Fruit ICM News

Editor: Ted W. Gastier, Extension Educator, Agriculture
Ohio State University Extension, Huron County
180 Milan Avenue, Norwalk, OH 44857 419-668-8219
FAX: (419) 663-4233 E-mail: gastier.1@osu.edu

Volume 9, No. 16 May 5, 2005

In This Issue

Calendar

May 10: High Tunnel Meeting, Mark Phillips Farm, Clark's Summit, Pennsylvania (eastern PA.) Contact John Esslinger for information at 570-963-6842.

June 28: Ohio Fruit Growers Society Board Meeting, Burnham Orchards, Berlin Heights, OH, 6:30 to 8:00 p.m. Contact Tom Sachs at 614-246-8290 or e-mail Tsachs@ofbf.org or Kathy Lutz at 614-246-8292 or e-mail growohio@ofbf.org.

June 28: Ohio Apple Marketing Program Board Meeting, Burnham Orchards, Berlin Heights, OH, 8:00 to 9:30 p.m. Contact Tom Sachs at 614-246-8290 or e-mail Tsachs@ofbf.org or Kathy Lutz at 614-246-8292 or e-mail growohio@ofbf.org.

June 29: Ohio Fruit Growers Society Summer Tour, Burnham Orchards, Berlin Heights, OH, 8:00 a.m. to 3:00 p.m. Check out <http://www.ohiofruit.org/ofgs/> (click on 2005 Summer Tour). Burnham's website is <http://www.burnhamorchards.com>.

Options for Controlling Powdery Mildew on Apples

Source: Dave Rosenberger, Plant Pathology, Highland, Scaffolds Fruit Journal, Volume 14, Issue 7, May 2, 2005

The fungus that causes powdery mildew on apples overwinters in infected apple buds and then colonizes new tissue as leaves and shoots emerge in spring. Flower clusters and terminal shoots that develop from infected buds support the primary infections that produce conidia for secondary spread to other leaves and fruit. Primary infections appear as white powdery deposits on malformed flower clusters and terminal leaves. These primary infections become visible sometime between the tight cluster and pink bud stages.

Mildew infections on fruit cause net-like russetting similar to that attributable to phytotoxicity from prebloom copper sprays. Fruit russetting usually results from mildew infections prior to petal fall, so pink sprays may be needed to prevent mildew fruit russetting. Under New York conditions, however, fruit infections are relatively uncommon and seem to occur only in high-inoculum orchards of susceptible cultivars, and then only in years that are unusually favorable for mildew development. In New York, mildewcide sprays are needed primarily to protect new leaves that are formed during the spring growth flush that begins during bloom and often extends into late June.

Fungicide options for controlling mildew include sulfur, the strobilurin fungicides (Sovran, Flint), the SI scab fungicides (Nova, Rubigan, Procure), or the SI mildewcide (Triadimefon). Triadimefon is a generic substitute for Bayleton, which is no longer marketed for tree fruits.

Mildew is NOT controlled by dodine, captan, Vangard, Scala, Polyram, or the mancozeb fungicides. Benlate and Topsin M may still control mildew in some orchards, but mildew is resistant to these benzimidazole fungicides in most orchards.

Sulfur has only protectant activity against mildew, and it therefore must be in place on new tissues before mildew infections occur. Where sulfur is used as the primary protection against mildew, the sulfur sprays should be initiated at tight cluster, at about the same time that the first signs of primary mildew infections appear in trees.

Sovran and Flint work both as protectants and anti-sporulants. They provide effective mildew control if they are applied beginning at pink or bloom. If no mildewcides are applied until petal fall, however, Sovran and Flint are not the best choices for initiating mildew control because they do not provide enough post-infection activity to arrest mildew infections initiated during bloom.

The SI fungicides are extremely effective against apple mildew because they provide post-infection and antisporulant activity. In orchards with light to moderate mildew pressure, the SI fungicides have provided excellent mildew control when applied at petal fall and first cover even if no other mildewcides were applied prior to petal fall. However, omitting mildewcides prior to petal fall and then using the SI's to "clean up" the problem may increase selection pressure for SI-resistant strains of powdery mildew. In recent years, we have recommended that mildewcide sprays be started at pink or bloom so as to minimize selection pressure for SI resistance, but no one really knows if apple powdery mildew is capable of developing resistance to full label rates of SI fungicides. In some orchards, low rates of triadimefon (Bayleton) and other SI fungicides no longer control mildew like they did when those products were introduced in the 1980's. Two or three applications of mildewcide may be sufficient to suppress mildew for the entire season if inoculum levels are low. However, four to six applications may be needed to protect highly susceptible cultivars and/or young orchards where shoot g

However, I am not aware of any orchards where mildew cannot be controlled when SI fungicides are used at higher labeled rates. It is possible that the mildew fungus may be incapable of overcoming high rates of SI fungicides. In orchards where SI fungicides are no longer effective for controlling apple scab, Triadimefon 50W at 3-4 oz/A can be mixed with Polyram, mancozeb, or captan in bloom, petal fall and first cover sprays to control mildew and cedar-rust diseases. When triadimefon was first introduced as the active ingredient in Bayleton, rates as low as 1.5 oz/A of the 50W formulation provided good mildew control. Because of the shift toward SI resistance, 4 oz/A of Triadimefon may now be needed to ensure good mildew control in many orchards. Even at this higher rate, Triadimefon may be less expensive than the other SI fungicides. Because triadimefon never had any scab activity, using this mildewcide should not have any stimulator effect on SI-resistant apple scab, even though triadimefon is in the SI chemistry group.

None of the mildew fungicides will completely eradicate powdery mildew from terminal shoots that had primary infections, although the SI fungicides may suppress symptoms on some leaves on shoots that are carrying primary infections. The objective of mildewcide sprays is to prevent secondary infections. Good mildew control during 2005 will reduce the number of primary infections for 2006, but don't expect sprays in 2005 to eliminate the primary infections or "flag shoots" that resulted from poor mildew control during the 2004 season.

In orchards that contain mildew-susceptible apple cultivars, a mildewcide should always be included in at least the petal fall and first cover sprays, even if inoculum pressure is very low. Mildew control programs initiated after first cover are almost always ineffective.

rowth continues into mid-summer. Low rates of sulfur fungicides (2-3 lb/A) can provide economical protection of new terminal leaves during summer if strobilurin or SI fungicides are used to control mildew during the period between bloom and first cover.

Avoiding Frustrating and Expensive Spray Glitches

Source: Dave Rosenberger, Plant Pathology, Highland, Scaffolds Fruit Journal, Volume 14, Issue 7, May 2, 2005

Caution #1:

Attempting to apply foliar boron and pesticides packaged in water-soluble bags as a tank mix can result in clogged strainers, endless frustrations, and potentially lethal rises in blood pressure on the part of the sprayer operator if the mixing is done incorrectly! Boron complexes with water-soluble packaging and prevents the packaging from dissolving completely. The common result is a sticky goo that clogs strainers and is difficult to clean up.

If foliar boron sprays must be applied at the same time as pesticides in water-soluble bags, the water-soluble bags should always be dissolved completely before boron is added to the spray solution. Once the bags are dissolved, boron can be safely added to the mix: The dissolved bags will not precipitate if they are fully dissolved before the boron is added.

Some growers have reported that the small amount of water left in the sprayer pump and pipes after a boron spray is applied may carry enough boron to interfere with the dissolving of water-soluble bags when the sprayer is refilled. Thus, sprayers must be completely emptied after a boron spray before water-soluble bags are added to a new tank of water. Alternatively, it may be necessary to dissolve the water-soluble packets in an external feed tank, then added the resulting pesticide solution to the sprayer tank that is being used to apply pesticide-boron mixture.

Caution #2:

Over the past few years, I have seen quite a few orchards where foliar zinc sprays applied just before or after bloom have caused phytotoxicity to apples (fruit russetting) and plums (defoliation). Fully chelated zinc EDTA has been recommended and used for many years without causing phytotoxicity. Problems have occurred, however, when growers have opted for less expensive formulations of zinc that apparently contain small amounts of non-chelated zinc. "Cheaper" foliar zinc products may prove quite expensive at the end of the season if they cause phytotoxicity. Be wary of zinc products that contain zinc oxide in any form.

Grape Flea Beetle

Altica chalybea

(order Coleoptera, family Chrysomelidae)

Source: Midwest Small Fruit Pest Management Handbook, Bulletin 861 Photos are available at:. <http://ohioline.osu.edu/b861/pdf/ch05_150-152.pdf>

Damage

The grape flea beetle is occasionally a serious pest of grapes in the Midwest. Flea beetles cause two types of damage. Larvae and adults feed on the upper and lower leaf surfaces, although this injury is usually not serious. The most serious damage occurs in the spring as the adults emerge from overwintering sites and feed on newly swollen grape buds. The adult beetles chew holes in the sides and ends of the buds. Their feeding damages primary and occasionally secondary and tertiary buds. If all three buds are destroyed, no berries will be produced. If secondary or tertiary buds are not destroyed, a partial crop may develop but could be lost to an early frost. These beetles do not cause major damage once the buds have grown to 1/2 inch or more. Flea beetle attacks usually are confined to limited areas.

Appearance

The adult of the grape flea beetle is a dark, shiny, metallic greenish-blue or steel-blue beetle about 3/16-inch long. Newly hatched larvae of the grape flea beetle are dark brown and approximately 1/16-inch long. As the larvae grow, their color lightens and they reach a length of almost 1/3 inch. The larva's head is black, and there are six or eight shining black dots on each of the other segments of the body, each dot emitting a single brownish hair. The under surface is paler than the back. Larvae have six legs, which are black, and there is a fleshy, orange-colored proleg on the terminal segment.

Life Cycle

The flea beetles overwinter as adults and emerge at bud swell, which is usually in April. Upon emergence, adult beetles begin to feed upon newly swollen grape buds. Female beetles lay eggs under loose bark of the grapevine. Larvae hatch and crawl to the developing grape leaves, where they feed on the upper surfaces. Adult beetles and larvae also feed on leaves, but the injury they cause usually is negligible. When they are fully developed, the larvae drop to the soil, burrow 1 inch or less, and pupate. They emerge later as adults. There may be a partial or full second generation each year.

Monitoring by Scouting

Grape bud damage caused by the grape flea beetle is most often concentrated in vineyard borders near wooded areas. Early-season vineyard monitoring and past evidence of beetles in the vineyard will help determine the need for an early-season application of insecticide. Scouting of the vineyard for grape flea beetle should begin at bud swell (late April in northern Ohio) and continue until bud development is past the critical stage. These shiny metallic beetles are easily spotted on grape canes and buds on warm, sunny days in the spring. Surveys for adult beetles should be conducted along the vineyard perimeter, on all sides, and near the center of the vineyard. At least 25 vines should be surveyed at each of the five locations.

Threshold

If scouting finds that 4% or more of buds are damaged, then insecticide is needed to prevent economic damage.

Cultural Control

Woodlots and wasteland areas near cultivated vineyards can be a continual source of flea beetles, and these areas should be cleaned up, if possible, to help reduce overwintering sites for the beetles. Cultivation of open areas between rows and around the vineyard can reduce the number of newly emerging adults by exposing the delicate pupae to desiccation and death. Cultivating does not eliminate emerging beetles from under the trellis and adjoining woodlots. Cultivating alone cannot be relied upon to control flea beetles.

Chemical Control

If beetles are present above threshold at bud swell, a broad-spectrum insecticide should be applied to prevent bud damage. According to the *Midwest Commercial Small Fruit and Grape Spray Guide 2005* (Publication 865), effective materials for controlling grape flea beetles are as follows:

Material	Rate/acre	Comments
Sevin 80 S	2.5 lb.	Scout at least twice weekly as bud swell occurs.
Sevin 80 WSP	2.5 lb.	
Sevin XLR (4EC)	2 qt.	
Sevin 4 F	2 qt.	
Danitol 2.4 EC	5.3 fl oz	

Timing is critical. Insecticide should be effective against adults migrating to vines from their hibernation sites. A second application of insecticide in June, when larvae are feeding on the grape foliage, can help to control an outbreak the following year.

Pest Phenology

Coming Events	Degree Day Accum. Base 50°F
European red mite egg hatch	74 - 208
Oriental fruit moth 1st flight peak	78 - 204
Redbanded leafroller 1st flight peak	103 - 193
Lesser appleworm 1st catch	104 - 286
Lesser peachtree borer 1st catch	110 - 553
White apple leafhopper nymphs present	123 - 404
Spotted tentiform leafminer sap-feeders present	130 -325
First codling moth catch	141 - 491
Lesser appleworm 1st flight peak	181 - 483
European red mite egg hatch complete	183 - 298

Revised thanks to *Scaffolds Fruit Journal* (Art Agnello)

Critical Temperatures for Various Fruits

Sources: 2005 Commercial Tree Fruit Spray Guide, Pennsylvania Tree Fruit Production Guide, Sonia Schloemann, Umass Extension Small Fruit Educator

Stage of Development	10% Kill (° F)	90% Kill (° F)
Apples		
Full pink	28	25
First bloom	28	25
Full bloom	28	25
Petal fall & fruit set	28	25
Peaches		
First pink	25	15-18
First bloom	26	21
Full bloom	27	24
Petal fall & fruit set	28	25
Pears		
Full white	26	22
First bloom	27	23
Full bloom	28	24
Petal fall & fruit set	28	24
Sweet & sour cherries		
First white	27	24
First bloom	28	25
Full bloom	28	25
Petal fall & fruit set	28	25

For excellent illustrations of frost damage to apples, stone fruit, grapes, and blueberries see <http://www.canr.msu.edu/vanburen/frost.htm>

Stage of Development	10% Kill (° F)	90% Kill (° F)
Apricots		
First bloom	25	19
Full bloom	27	22
In the shuck	27	24
Green fruit	28	25
Prunes & Plums		
White bud	26	21
Bloom	27	23
Petal fall & fruit set	28	24
Grapes		
Bud break	25	16
First leaf	27	21
Second leaf	28	22
Strawberries		
Tight bud	n/a	25
“Popcorn”	n/a	28
Open blossom	n/a	30
Fruit	n/a	28
Blueberries		
Buds swollen	n/a	21
Flowers unopened	n/a	28
Full bloom	n/a	32

Fruit Observations and Trap Reports

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

Apple:	4/27 to 5/4/05 late bloom on 5/4
Redbanded leafroller	0 down from 2
Spotted tentiform leafminer	6 down from 14
San José scale	0 down from 1
Codling moth (3 trap mean)	0.0 same as last week
Lesser appleworm	0 same as last week
Tufted apple budmoth	0 same as last week

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

Lodi apples in bloom, rest at pink. Peaches range from 10% bloom to full bloom.

Trap catches:

Spotted tentiform leafminer = 0 to 822
Redbanded leafroller = 0 to 8
Codling moth = 0
Oriental fruit moth = 0 to1
San Jose scale = 0

Beneficials found: multicolored Asian lady beetle

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

Trap catches:

Spotted tentiform leafminer = 14 to 360
San Jose scale = 0
Codling moth = 0
Oriental fruit moth = 0
Lesser peachtree borer = 0

Ted Gastier, Huron County Extension Educator

Low temperatures reported by growers and weather stations around Ohio on the morning of May 4th:

Site	**Degrees F**
Akron-Canton	31
Cincinnati	35
Cleveland	37
Columbus	31 (tied record)
Dayton	32
Mansfield	27 (new record)
Toledo	25 (new record)
Youngstown	32
Wooster	27
Piketon	29
Kingsville	32
Milan	29
Licking County Lynd's Fruit Farm reported by Dick Wander	25

Degree Day Accumulations for Ohio Sites

May 4, 2005

Ohio Location	**Degree Day Accumulations Base 50°**	
	Actual	**Normal**
Akron-Canton	110	165
Cincinnati	259	305
Cleveland	92	156
Columbus	208	215
Dayton	172	222
Kingsville	70	124
Mansfield	103	160
Norwalk	84	143
Piketon	241	326
Toledo	90	131
Wooster	118	144
Youngstown	93	144

Preliminary Monthly Climatological Data for Selected Ohio Locations
April 2005

Weather Station Location	Monthly Precipitation	Normal Monthly Precipitation	Year-to-Date Precipitation	Normal Year-to-Date Precipitation	Average High	Normal High	Average Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	4.35	3.39	14.18	11.31	61.5	59.0	38.8	37.1	50.2	48.1
Cincinnati	3.78	3.96	16.41	13.53	66.4	64.7	45.1	42.7	55.7	53.7
Cleveland	5.57	3.37	15.19	11.08	58.5	57.3	38.8	37.9	48.7	47.6
Columbus	4.36	3.25	18.11	10.87	64.9	62.9	43.4	41.2	54.2	52.0
Dayton	3.97	4.03	17.13	12.21	63.3	60.7	42.0	40.4	52.7	50.6
Fremont	5.02	3.03	11.84	9.17	61.7	58.9	35.0	37.8	48.3	48.4
Kingsville	4.72	3.15	11.91	9.40	57.6	55.2	36.5	36.8	47.1	46.0
Mansfield	4.92	4.17	15.30	12.33	60.7	58.4	38.4	36.1	49.5	47.3
Norwalk	6.06	3.13	16.07	9.53	59.3	57.7	37.1	36.9	48.2	47.3
Piketon	2.81	3.80	11.72	14.40	68.2	63.4	42.2	41.4	55.2	52.4
Toledo	2.71	3.24	10.76	9.67	61.0	58.9	39.4	37.7	50.2	48.3
Wooster	4.14	3.06	12.90	9.90	63.3	59.6	38.1	36.7	50.7	48.1
Youngstown	5.38	3.33	15.68	10.75	60.6	58.2	37.7	36.5	49.2	47.3

Temperatures in degrees F, Precipitation in inches

Record High Set: April 6, Mansfield, 76 degrees

Table Created by Ted W. Gastier, OSU Extension, from National Weather Service, OARDC & Local Data