



# Newsletter Extension

## Fruit ICM News

Volume 4, No. 16  
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## Calendar

**June 20 & 21: Direct Marketing Summer Tour in NE Ohio and NW Pennsylvania**, sponsored by Ohio Direct Ag. Marketing Association (DAMA), evening of June 20 and all day on June 21. Cost is \$50.00 per person, which includes bus travel, Tuesday evening picnic, Wednesday breakfast and Wednesday lunch. To register, contact Rob Leeds, OSU Extension, Delaware County at (740) 368-1925 or [leeds.2@osu.edu](mailto:leeds.2@osu.edu). Refer to past ICM News for more detailed information.

**June 24-27: International Dwarf Fruit Tree Assoc. (IDFTA) Annual Summer Tour:** Scheduled for the Lake Champlain Valley of New York, Vermont, and Quebec. Various registration options are available for the days you would like to attend. For more information, visit the IDFTA WWW site <http://www.idfta.org/> or contact IDFTA business manager Charles Ax at (570) 837-1551, [attorney@ptdprolog.net](mailto:attorney@ptdprolog.net).

**June 28: Ohio Fruit Growers Society Summer Tour**, Vogley Enterprises, East Sparta, Ohio, Stark County. Cost is \$6 per person or \$12 for the family. For registration, contact OFGS at (614) 249-2424 or [growohio@ofbflorg](mailto:growohio@ofbflorg) so they can prepare the proper number of lunches.

**July 8: Eighth Annual Horticulture Field Night**, OSU Piketon Research Centers, 1864 Shyville Road, Piketon, OH. (East from Rte. 23 & 32 intersection, just off Rte. 32.) View more than 500 research & demonstration plots and 18 different fruit and vegetable projects from 5:00 pm to 9 pm. Ask the experts. No admission charge. Open to the public; supper for everyone. For more information contact Brad Bergefurd, Extension Agent, at 1-800-297-2072, or e-mail him at [bergefurd.1@osu.edu](mailto:bergefurd.1@osu.edu).

**July 27-28: Ohio Berry Tour**, Central Ohio. Tour stops include Rhoads Farm Market (Circleville), Circle S Farms (Grove City), Schacht Farm Market (Canal Winchester), Jacquemine Farms (Plain City), and Doran's Farm Market (New Albany). We will keep you posted as definite times are set and registration information becomes available. Contact Berry Coordinator Sandy Kuhn at (800) 297-2027 or [kuhn.37@osu.edu](mailto:kuhn.37@osu.edu) for information needed before then.

**August 3: OVPGA & Ohio Fruit Growers Society Young Grower Tour**, in northeast Ohio, 8:30 a.m. to 7:30 p.m. This bus tour provides a broad variety of fruit and vegetable operations that use different marketing strategies. Tour is designed for growers 40 years of age and younger, and others are welcome if interested. Contact John Wargowsky at (614) 249-2424 or [jwargows@ofbf.org](mailto:jwargows@ofbf.org) for more information.

## Fungicides for Bramble Disease Control

*Source: Michael A. Ellis, Department of Plant Pathology, The Ohio State University, OARDC, Wooster*

Fungicides can play an important role in the bramble disease management program. However, in order to obtain maximum benefits with minimal use, fungicides must be integrated with the use of the previously described cultural practices and resistant or less susceptible varieties. We must remember that several important bramble diseases cannot be controlled with fungicides. These include Verticillium wilt, several rust diseases, and all of the virus diseases. On the other hand, fungicides can be a very effective component in control programs for Botrytis fruit rot (gray mold), powdery mildew, Septoria leaf spot, raspberry leaf spot, anthracnose, cane blight, and Phytophthora root rot.

Although fungicides are an important disease management tool, it should be noted that **VERY FEW** fungicides are currently labeled for use on brambles in the United States. The lack of currently registered fungicides combined with the fact that several important diseases cannot be controlled with fungicides makes the diligent use of cultural practices within the disease management program **EXTREMELY IMPORTANT**. The following comments are intended to provide some general information about the currently registered fungicides. For the most current information on fungicide recommendations on brambles, growers should obtain the most recent copy of Ohio State University Extension Bulletin 506-B2, Ohio Commercial Small Fruit and Grape Spray Guide. This publication is revised annually.

**Note:** It is always the grower's responsibility to read and follow all label instructions. In today's modern agriculture, new regulations (such as the "Food Quality Protection Act") and recommendations can change rapidly; therefore, the following information could change before you read it.

### **Benlate 50WP**

Benlate is labeled for control of Botrytis fruit rot and powdery mildew. Although not mentioned on the label, Benlate should also provide some level of control for anthracnose, cane blight, Septoria leaf spot and raspberry leaf spot. Benlate is about the only "broad spectrum" fungicide currently labeled on brambles that can be applied during the growing season. The label states that it can be applied at 3/4 lb per acre at early bloom (5 to 10%) and at full bloom. Three additional applications at 14-day intervals can be made as needed. Do not apply Benlate within 3 day of harvest. Thus, a maximum of 5 applications of Benlate can be made on brambles per season. However, a major problem with the use of Benlate is the development of fungicide resistance. Many fungi have developed resistance to Benlate after repeated exposure, including those that cause gray mold (Botrytis fruit rot) and powdery mildew.

To maintain its useful life, Benlate should be used no more than necessary (ideally, no more than once or twice a year). Resistance does not "go away" after Benlate use is discontinued; that is, once the fungicide quits working in a particular planting, it's lost to that planting for good.

**Note:** Neither Benlate, Ronilan, or Rovral should be used alone for season-long control of Botrytis fruit rot because of the potential for pathogen strains to develop resistance to each fungicide. Ronilan and Rovral should not be used with each other in an alternating spray program because their chemistry is very similar. Applications of either Ronilan or Rovral should be alternated with applications of Benlate for Botrytis control.

### **Captan 50WP and 80WP**

In about 1989, Captan lost its federal registration for use on raspberries and blackberries. The loss of registration was due to the cost of re-registration of Captan on a relatively small crop such as brambles; therefore, the company voluntarily removed brambles from the Captan label. It is important to note that the loss of registration was not due to a toxicological problem.

In 1994, Ohio received a 24(C) registration (special local need) for the use of Captan on raspberries and blackberries. Captan will be of most benefit in situations where the cane infecting fungi (anthracnose, cane blight, and spur blight) become established in the planting and require additional fungicide applications to achieve satisfactory control. Captan should also have activity against the leaf spot diseases (septoria leaf spot and raspberry leaf spot) of brambles. Captan will also be beneficial as a broad spectrum protectant fungicide for tank mixing with Benlate, Ronilan and Rovral in order to prevent or delay fungicide resistance development by Botrytis cinerea to these fungicides.

**Note:** We have been working through the IR-4 program to obtain federal registration for Captan on brambles. By the time you read these recommendations, Captan may have a federal label. Contact Mike Ellis at 330-263-3849 if you have questions about the current status of Captan on brambles.

The 24(C) labels state that for the control of anthracnose, botrytis, and spur blight -- Apply 4 pounds of Captan 50-WP (2 1/2 lb of Captan 80-WP) per acre when blossoms are in bud (young canes are 8-10" long). Make a second application two weeks later. Apply a fall spray after old canes are removed.

For the control of fruit rot -- Apply 4 pounds of Captan 50-WP (2½ lb of Captan 80-WP) per acre at early bloom (5 to 10% bloom) and again at full bloom. Additional applications can be made at 10-14 day intervals as needed. Do not apply within 3 days of harvest.

Please note that the 24(C) label must be in the possession of the user at the time of pesticide application. A copy of the label can be obtained from:

Mike Ellis  
Dept. of Plant Pathology  
OSU/OARDC  
Wooster, OH 44691  
Phone: 330-263-3849

### **Liquid Lime Sulfur**

Lime sulfur is recommended for use on brambles as a delayed-dormant application in early spring (when buds show 1/4 inch green). It is used at the rate of 10-20 gal per acre. If applied at this rate later in the

season (after ¼ inch green) it can cause severe damage to leaves and young canes. Lime sulfur is recommended for control of the cane infecting fungi (anthracnose, cane blight, and spur blight). The delayed dormant application in spring is intended to eliminate or reduce the overwintering inoculum for these diseases on canes. Where cane diseases are a problem, this spray is very important. Where good sanitation is used, (old fruited and infected canes are removed from the field) and cane diseases are not a problem, the need for this spray may not be necessary, or at least it would probably be safe to use the lower rate, especially on red raspberries.

Lime sulfur has a bad smell (rotten eggs) so there can be a problem spraying it around your neighbors. Some growers have received complaints from neighbors after applying lime sulfur. In addition, lime sulfur is very caustic. It is harmful to machine parts, paint (especially on cars), and sprayers. Special care should be taken to avoid drift to nontarget objects, and proper protective clothing should be worn by the applicator.

### **Sulfur**

Sulfur is available as a wettable powder or in flowable formulations. Sulfur is registered for control of powdery mildew. Sulfur has little or no activity against the other bramble diseases caused by fungi. Because powdery mildew is generally not a serious problem in the Midwest, sulfur is generally of little importance within the bramble disease management program.

### **Ronilan 50WP & 4F and Rovral 50WP & 4F**

These fungicides are closely related (dicarboximide fungicides) and both have excellent activity against Botrytis fruit rot (gray mold), but have little or no activity against the other fungal pathogens on brambles. Like Benlate, both fungicides are at risk for resistance development by the fungus that causes gray mold fruit rot. If the fungus develops resistance to either Rovral or Ronilan, it is automatically resistant to the other. Therefore, these materials should not be used more often than necessary; the less they're used, the longer they'll last. Ideally, we should limit their use to no more than 2 or 3 applications per season.

### **Ronilan**

The label states that it is for use on "raspberries". No other brambles are mentioned on the label; therefore, it should only be used on raspberries and will provide excellent control of Botrytis fruit rot (gray mold). The label states that the first Ronilan application should be made no later than 10% primary bloom. Timing of subsequent applications varies from 7 to 14 days based on weather conditions and resultant disease pressure. Ronilan can be applied at rates ranging from 1 to 2 lbs product per acre. As with all fungicides, use rate and spray intervals should be determined by disease pressure (wet weather and amount of fungus inoculum available). No more than 8 lbs of Ronilan may be applied per acre in one crop season. Ronilan may not be applied within **9 days** of harvest.

### **Rovral**

Of the fungicides used for Botrytis control, Rovral is currently the only one labeled on raspberries that can be applied up to and including the day of harvest (0 day PHI). It should provide excellent control of Botrytis fruit rot (gray mold). In addition, the label states it can be used on "caneberries"; therefore, it can be used on all brambles. Rovral may be applied to caneberries at the rate of 1 to 2 pounds per acre. Apply Rovral first at early bloom (5-10% bloom) and make a repeat application again at full bloom. Two additional applications can be applied at 14 day intervals or as required. The final application can

be made up to and including the day of harvest.

## **Ridomil Gold**

Ridomil Gold is labeled for control of Phytophthora root and crown rot on raspberries. It has no activity against the other bramble diseases. It is available in an EC (liquid), WSP (wetable powder in a water soluble pouch), or a GR (granular) formulation. Although Ridomil is very effective for control of Phytophthora root rot, it should be emphasized that cultural practices (primarily good soil drainage) are the primary means for controlling this disease. In other words, Ridomil is most effective when used in combination with good cultural practices and/or the avoidance of highly susceptible varieties. It is often ineffective if used on poorly drained sites, and on highly susceptible varieties.

**Note on Disease Resistancy:** Phytophthora root rot is most serious on red raspberry and some of its hybrids. The black raspberry varieties Cumberland and Munger are reported to be susceptible, and the varieties Bristol, Dundee, and Jewel appear to be moderately to highly resistant. Among red raspberry varieties, none are immune to the disease, but varieties do differ greatly in their level of susceptibility. Among varieties grown in the Midwest and Northeast, Titan, Ruby and Hilton are extremely susceptible, and Festival, Heritage, Reveille, and Taylor are moderately to highly susceptible. Latham, Newburgh, Cherokee, Boyne, Killarnoy, and Fall Red are considered fairly resistant. The disease has not been documented on blackberry.

## **Effective Use of Fungicides for Botrytis Fruit Rot Control in Brambles**

*Source: Michael Ellis, OSU*

### **Importance of Bloom Sprays**

Research has shown that bloom is a critical time for infection by Botrytis. The fungus colonizes flower parts and moves into the young green fruit, where it remains dormant until the fruit becomes ripe. As fruit ripens, the fungus becomes active and fruit rot develops. The direct infection of mature fruits can occur but is generally considered to be of secondary importance.

### **Timing Bloom Applications for Botrytis Control**

We must emphasize protective coverage of all flowers during bloom. This is difficult because flowers are continually opening. To be practical, we should try to limit the fungicide program to no more than 2-3 applications during bloom **per variety**. It is important to remember that if you have several varieties with a range of maturation dates, bloom may extend over a 2 to 3 week period. Therefore, it is important to treat each variety separately. The first application should be made around 5-10% bloom with the second application being made at full bloom or slightly after. It is important to remember that the early blossoms are the "primary bloom" and represent a significant part of the crop. Protecting these early blossoms is probably more important than protecting the last blossoms to open.

If wet weather persists prior to and during early bloom, the first application may need to be made as soon as the first flowers are open. In contrast, if weather conditions are extremely dry, this spray can usually be delayed until wet weather is forecast. The gray mold fungus is very active when the weather

is foggy or rainy, but it is relatively inactive during dry periods. The optimum temperature for fungus activity and disease development is approximately 60-80° F. Although infection can also occur at lower temperatures, progressively longer periods of wetness are required as temperatures fall below 60. These principles should be used in determining fungicide use intensity. Thus, shorter intervals between sprays and higher rates should be used when conditions are optimal for disease development; longer intervals between sprays and lower rates should be used when conditions are less favorable for disease development.

### **Additional Fungicide Sprays During Harvest for Botrytis Control**

On strawberries it has been observed that the vast majority of Botrytis infection occurs during bloom. In fact many strawberry growers in Ohio spray for Botrytis only during bloom and have eliminated fungicide applications during harvest. Although the vast majority of Botrytis infections on raspberry occur during bloom, it appears that infection of mature fruit is more common on raspberry than on strawberry. Thus, the approach of spraying fungicide only during bloom on raspberry is probably sufficient during dry growing seasons. However, in wet growing seasons or if wet weather exists during harvest, or if high levels of rot develop on old, unpicked fruit in the field, additional fungicide protection during harvest may be required. This is especially true if the berries are going to be stored for over 24 hours prior to processing. Many growers have observed postharvest development of Botrytis when they try to hold berries for any length of time. Preharvest sprays may be beneficial in reducing the amount of Botrytis development in cold storage. When preharvest sprays are made, it is critical to observe the preharvest interval (PHI) of the fungicide. At present, Rovral is the only fungicide that can be applied up to and including the day of harvest (0 day PHI). It is also important to recognize that for sprays during harvest to be effective, thorough coverage of the berries is critical.

Cultural practices that promote faster drying of fruit and timely harvest of ripe fruit are also extremely important, regardless of fungicide use. If fruit are allowed to sit in the field until they are overripe, or are damaged during harvest, they will deteriorate and rot regardless of fungicide use.

## **Area Produce Auction Up and Running**

*Source: Brad Bergesford, Extension Agent, OSU Piketon*

The Bainbridge Produce Auction has officially kicked off the 2000 growing season with an excellent supply of high quality, locally grown bedding plants, perennials, nursery stock cut flowers, hanging baskets, and early season including greenhouse grown tomatoes, strawberries, cucumbers, peas, and much more. Wholesale Auctions are held every Friday beginning at 2:00 p.m. at the Route 41 south location. Growers interested in expanding their wholesale produce marketing opportunities may want to consider the produce auction. To expand agriculture production and marketing opportunities for area farmers, farm families from Bainbridge, Ohio have added another building to the newly formed Bainbridge Produce Auction. Working with Brad Bergesford of the OSU Extension Enterprise Center, in December 1998 the group of farmers purchased a farm 4 miles south on Route 41 just off of Route 50 outside of Bainbridge. In June 1999 the Bainbridge Produce Auction facility was built by the farmers. The grand opening of the Wholesale Produce Auction occurred in July, and produce auctions were held every Monday, Wednesday and Friday throughout last year's growing season. The Bainbridge Produce Auction is located west of Bainbridge, 4 miles south on State Route 41 just off of U.S Route 50. Auctions are held on Fridays beginning at 2:00 p.m. For more information regarding the Bainbridge Produce Auction, contact Brad Bergesford at 1-740-289-3727 or 1-800-297-2072.

## Fruit Observations

### Insect Key

AM: Apple maggot  
CM: Codling moth  
DWB: Dogwood borer  
LPTB: Lesser peachtree borer  
OBLR: Oblique banded leafroller  
OFM: Oriental fruit moth  
PC: Plum curculio  
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 (6/1-6/7)

Source: Dr. Celeste Welty, OSU Extension Entomologist

Traps used: STLM=wing traps, SJS=Pherocom-V, Others=Multiplier-1® traps

#### Apple

RBLR: 6 (up from 0)  
STLM: 663 (up from 439)  
DWB: 0.0 (down from 1)  
SJS: 0 (unchanged)  
CM: 6.3 (down from 11.7)  
OBLR: 0 (unchanged)  
TABM: 0 (down from 1)  
VLR: 3 (up from 0)

#### Peach

OFM: 24 (up from 18)  
LPTB: 0 (down from 2.0)  
PTB: 1.5 (up from 0.0)

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### Site: East District; Erie & Lorain Counties (6/1-6/7)

Source: Jim Mutchler, IPM Scout

Traps Used: STLM=wing traps, Others=Multiplier® traps

#### Apple

RBLR: 0.0 (unchanged)  
CM: 3.8 (up from 3.7)  
SJS: 0 (unchanged)

#### Peach

OFM: 21.7 (up from 7.3)  
RBLR: 0 (unchanged)  
LPTB: 23.0 (up from 10.0)  
PTB: 2.3 (down from 2.7)

**Other pests:** plum curculio strikes, green apple aphid, potato leafhopper, green peach aphid, lilac borer,

fire blight, scab

**Beneficials at work:** lacewing eggs & adults, banded thrips, lady beetles

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**Site: West District; Huron, Ottawa, & Sandusky (5/31-6/6)**

Source: Gene Horner, IPM Scout

Traps Used: STLM=wing traps, Others=Multiplier® traps

**Apple**

RBLR: 0.0 (unchanged)

SJS: 0.0 (unchanged)

CM: 2.9 (up from 2.7)

**Peach**

OFM: 19.0 (up from 11.3)

RBLR: 0 (unchanged)

LPTB: 18 (up from 4.5)

PTB: 3.0 (up from 2)

**Other pests:** green apple aphid, green peach aphid, lilac borer, oriental fruit moth strikes, white apple leafhopper, fire blight

**Beneficials at work:** Banded thrips, *Stethorus punctum*

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**Site: Wayne County (6/2-6/8)**

Source: Ron Becker, Extension Program Assistant

Traps used: STLM=Wing traps, PC=Circle trunk trap, Others=Multiplier® traps

	Apple			
	North	South	East	West
RBLR:	0	0.5	0	0
STLM:	310	100	0	46.3
CM:	5.1	2.7	3.0	13.2
PC:	0			0

	Peach		
	North	South	West
OFM:	70	24	27
LPTB:	0	8	0
LPTB:	0	0	0

**Orchard observations:** North: light red mite, aphid, white apple leafhopper, and potato leafhopper.

West: heavy red mite in several blocks - mixed cultivars. Also light leaf mining.

**Northern Ohio Apple Scab Activity - SkyBit Product**



SkyBit based on observations: June 5, 6; possible infection & damage  
**Based on Forecasts: June 8-17, active but no infection**

**North Central Ohio Spectrum Technologies Orchard Monitors for Apple Scab**  
 Spectrum Technologies Monitors and Software\* Observations: June 1-7 No Infection  
 (Software\* based on Modified Mills Chart)

## Northern Ohio Fire Blight Activity - SkyBit Product

SkyBit based observations: June 1; possible infection and damage  
 Based on Forecasts: **June 11-16; possible infection & damage**

## Degree Day Accumulations for Selected Ohio Sites January 1, 2000 to date indicated

Location	Actual DD Accumulations June 7, 2000		Forecasted Degree Day Accumulations June 14, 2000			
	Base 43° F	Base 50° F	Base 43° F	Normal	Base 50° F	Normal
Akron - Canton	1070	561	1219	1109	668	641
Cincinnati	1412	818	1589	1554	953	958
Cleveland	1057	563	1204	1063	668	612
Columbus	1364	785	1525	1288	904	768
Dayton	1325	750	1492	1315	874	795
Mansfield	1060	560	1215	1137	673	669
Norwalk	1088	586	1237	1050	693	610
Toledo	1095	574	1244	1040	681	603
Wooster	1149	620	1292	1037	721	585
Youngstown	1025	520	1164	1004	617	566

### Phenology

Coming Events	Range of Degree Day Accumulations	
	Base 43° F	Base 50° F
Peachtree borer flight peaks	864-2241	506-1494
	869-1548	506-987

Obliquebanded leafroller 1 <sup>st</sup> flight peak		
Oriental fruit moth 2 <sup>nd</sup> flight peak	1000-2908	577-2066
Apple maggot 1 <sup>st</sup> catch	1045-1671	629-1078
Redbanded leafroller 2 <sup>nd</sup> flight begins	1096-2029	656-1381
Codling moth 1 <sup>st</sup> flight subsides	1112-2118	673-1395
Spotted tentiform leafminer 2 <sup>nd</sup> flight peak	1295-2005	824-1355

*Thanks to Scaffolds Fruit Journal (Art Agnello)*

## Preliminary Monthly Climatological Data for Selected Ohio Locations May 2000

Weather Station Location	Monthly Precip	Normal Monthly Precip	Year-to-Date Precip	Normal Year-to-Date Precip	Average High	Normal High	Average Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	6.49	3.73	18.74	14.61	71.2	69.7	50.9	48.2	61.1	59.0
Cincinnati	5.21	4.28	22.98	17.55	75.6	74.0	55.1	51.8	65.4	62.9
Cleveland	5.45	3.49	15.43	13.77	71.1	68.6	51.9	47.3	61.5	57.9
Columbus	5.42	3.93	18.54	14.83	75.3	72.3	54.5	50.1	64.9	61.2
Dayton	2.98	3.88	14.73	15.06	74.2	72.5	55.0	51.0	64.6	61.7
Mansfield	5.15	4.35	17.38	15.29	71.5	69.3	51.3	48.3	61.4	58.8
Norwalk	5.22	3.55	15.69	13.08	71.7	69.4	52.8	47.0	62.2	58.3
Toledo	6.80	2.91	14.97	12.01	72.7	70.5	50.9	46.7	61.8	58.6
Wooster	4.51	4.01	15.01	13.91	73.3	70.6	50.7	46.5	62.0	58.5
Youngstown	4.04	3.52	14.62	13.85	70.8	68.7	49.5	46.2	60.2	57.5

Temperatures in degrees F, Precipitation in inches

Record high temperature set: Mansfield, May 7<sup>th</sup> 85° F

Record high temperature tied: Mansfield, May 8<sup>th</sup> 83° F

*Table Created by Ted W. Gastier, OSU Extension from National Weather Service Data*

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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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