Vineyard IPM Scouting Report for week of 29 April 2013
UW-Extension Door County and Peninsular Agricultural Research Station

Cool temperatures and Grape flea beetle.

Extended cool spring temperatures will result in an extended bud swell period. This makes the grape buds more prone to damage from the grape flea beetle. You should be scouting your vineyards. When scouting, you can look for the presence or absence of the adult grape flea beetle as they are large enough to see without the aid of a hand lens. It is best to scout for adults during relatively calm days and during a sunny period. Do not confine your scouting just to confirming the presence or absence of adults. If your vines are approaching the bud swell stage or are at the bud swell stage, examine the buds for damage. The adult flea beetles will mine out the center of the swollen bud, resulting in the loss of the primary bud. Loss of the primary bud will result in some yield loss. The secondary bud usually remains undamaged by the grape flea beetle. If more than 4% of buds are damaged, you should consider applying some management. For control recommendations, see page 15 of the 2013 Midwest Small Fruit and Grape Spray Guide. For more information on grape flea beetle go to eViticulture.

Adult Grape flea beetle (above) on swollen grape bud.

Damage from Grape flea beetle (above) to a swollen grape bud. The hole in the bud is a telltale sign that the bud has been consumed from the inside.

Frequently Asked Questions: Lime Sulfur

This spring I have received a few phone calls about the use of liquid lime sulfur in grapes. What I learned from these calls was that some growers are applying liquid lime sulfur very early in the dormant season. Ideally, liquid lime sulfur should be applied when vines are dormant just prior to bud break. The information below should help address other questions about liquid lime sulfur.

When should liquid lime sulfur be used?

Liquid lime sulfur should be used if you have been experiencing problems in the previous growing seasons with Phomopsis or Anthracnose.

When should liquid lime sulfur be applied?

The ideal time to apply liquid lime sulfur is at bud swell.

Will the application of liquid lime sulfur reduce the need for a standard fungicide spray program?

A standard fungicide program will still need to be adhered to during the growing season to prevent Phomopsis infections. Liquid lime sulfur reduces inoculums but does not result in 100% control of Phomopsis.

Why use liquid lime sulfur?

In organic vineyards liquid lime sulfur is a good option to control inoculums.

Liquid lime sulfur is a major means to control Anthracnose.

How does liquid lime sulfur work in controlling pathogens?

Toxic to overwintering inoculum of Anthracnose, Phomopsis, and Powdery mildew.

Can you apply liquid lime sulfur to sulfur sensitive grapes?

Dormant application can be made to both sulfur tolerant and sulfur intolerant grape varieties. If sulfur intolerant varieties are past bud break there is greater risk of sulfur phytotoxicity.

How do I protect my equipment from liquid lime sulfur?

Spray painted surfaces of equipment with a light coating of Pam cooking oil or mineral oil.

How much liquid lime sulfur should be applied per acre?

Read and follow the label of the product purchased. Most product labels are 28 to 29% calcium polysulfide and recommend 2 to 20 gallons in 100 to 200 gallons of water.

How should liquid lime sulfur be applied?

If using an air blast sprayer turn off most all the nozzles and direct the other nozzles to deposit spray on the cordons and trunk. Many growers will use a handgun to deliver the spray, resulting in using less spray mixture. Regardless of the method used, the objective is to thoroughly saturate the bark of the cordons and vine. Overwintering inoculums reside in bark cracks and crevices and the spray material needs to contact the inoculums to be effective.

Phomopsis cane and leaf spot

Figure 1. Phomopsis on the cane and leaf (inset).
Photo credit https://go.dmacc.edu/programs/viticulture/blog/

Tissue Infected

Phomopsis can infect canes, leaves, rachises, flowers, tendrils, and berries. Young tissue is most susceptible to phomopsis. At this time of year, management efforts should be directed at protecting young leaves and shoots as we progress from bud break to shoot development.

Environmental Conditions Conducive to Phomopsis Infection

Extended periods of cold, wet weather after bud break up to early summer may result in phomopsis infection and subsequent disease development. The optimum temperature range for disease development is 59 to 68° F (15 to 20° C). Be aware that these temperature ranges are the optimum temperatures at which phomopsis causes disease, but disease development often occurs at both lower and higher temperatures, but less disease occurs at these temperature extremes. Bugaret (1986) reported that most infections in the field occur shortly after bud break when temperatures ranged from 46 to 64° F (8 to 18° C) (see Erincik et al 2003). Phomopsis also requires moisture for infection. Wet weather results in spore release and subsequent infection. As the length of period of leaf wetness increases, the amount of phomopsis infection increases (Erincik et al. 2003). Depending on temperature, the duration of leaf wetness, and susceptibility of the grape variety to phomopsis anywhere from 4 to 12 hours of leaf wetness are needed for infection. In general, heavy rains during the month of May will result in higher incidence of phomopsis than a relatively dry May.

Berry Infections

Phomopsis on the grape berries is often not recognized until veraison. Berry infection by Phomopsis occurs early in the season pre-bloom to 4 weeks post bloom. Early in the infection period of the grape berry, phomopsis becomes inactive and the disease ceases development. Grape berries infected with phomopsis seldom show any visual symptoms until sugar levels start to rise steadily at the onset of veraison. As sugars rise in the grape berries the disease becomes active again and this results in fruit rot(s) and often the fruit falls from the clusters (shatters).

Management

Use dormant pruning to remove infected canes that are the source of primary inoculum. Dormant pruning has been used successfully to manage phomopsis (Gadoury 1995) but during cool wet springs growers should be cautious of not overlooking phomopsis cane and leaf spot.

Downy Mildew

Tissue Infected

Downy mildew can infect all green tissue of grape plants. Often the first symptom of the disease is noticed on leaves. Since all green tissue is susceptible to downy mildew at this time of year, management should be directed at protecting emerging and developing young shoots.

Environmental Conditions Conducive to Downy Mildew Infection

Downy mildew infections occur during moderately warm wet weather after bud break and throughout the growing season. The optimum temperature range for disease development is 64 to 76° F (18 to 25° C). Again, be aware that these are the optimum temperatures and downy mildew may cause disease at the extremes of the optimum temperatures. Downy mildew can tolerate temperature minimums between 54 to 58° F (12 to 13° C) and maximum temperature of 86° F (30° C). Besides temperature, downy mildew needs moisture to cause disease. A film of water is needed on green plant parts for the spore storage structures (sporangium) to release zoospores. The zoospores germinate resulting in a germ tube entering grape tissue.

Progressed downy mildew symptoms (A) and early symptoms ("yellow oily" appearance) of a downy mildew infection (B).

Berry Infections

Similar to phomopsis, most infections of grape berries by downy mildew occur pre-bloom to 4 weeks post bloom. Four weeks after bloom, grape berries are resistant to infection. Other green plant parts remain susceptible to downy mildew infections throughout the growing season.

Scouting

Begin scouting when shoots are 10 cm (4 inches) in length, 10 mm (0.4 inches) of rain has occurred, and temperatures of at least 10° C (50° F) have occurred during a 24 hour period. This is known as 10-10-10. More simply warm wet nights spread the disease.

Black Rot

Black rot on Frontenac grape berries in June 2010.

Tissue Infected

Similar to downy mildew all young green tissue is susceptible to black rot infection. At this time of year, the most susceptible tissue are young unfolding leaves. Management should be directed to protecting these young expanding leaves

Grape leaves once fully expanded are resistant to black rot infection, so attention should be focused on shoots which are actively growing during increased warm temperatures.

Environmental Conditions Conducive to Black Rot Infection

Black rot also has a reliance on rainfall and temperature for spore dispersal and disease development. Rainfall triggers release of spores (ascospores) from within grape mummies and these spores can be transported by wind. A second type of black rot spore (conidia) can be formed within cane lesions and on grape mummies and be transported to green tissue by splashing rain. Similar to both phomopsis and downy mildew, for black rot infection to occur certain temperatures and hours of leaf wetness are necessary (Table 1 on page 5). The potential for infection from black rot occurs from 2 to 3 weeks after bud-break up to veraison.

Berry Infections

Grape berries are extremely susceptible for 2 to 3 weeks after cap fall. Over time the berries become less susceptible to black rot infection. Concord grapes are highly resistant to black rot infection 4 to 5 weeks after bloom. *Vinifera* berries have a longer period of susceptibility, 6 to 7 weeks after bloom. No research is available on the susceptibility of berries to black rot for French-American grape hybrids.

Management

Besides using conventional fungicides for managing black rot, efforts should focus on removing the inoculum source from the vineyard. Grape mummies should be removed during dormant pruning. In addition, canopy management methods which increase air flow will help in managing black rot.

Conventional Fungicides for Management of Phomopsis, Downy Mildew, and Black Rot

Be aware that if you have experienced problems with black rot in the past in your vineyard that early season protective sprays should include Mancozeb. Mancozeb is highly effective in managing all three diseases whereas Captan, although highly effective in managing phomopsis and downy mildew, Captan is less effective than Mancozeb for managing black rot. For early season fungicide recommendations see page 12 of the 2012 Midwest Small Fruit and Spray Guide.

Table 1. Temperature range and hours of continuous leaf wetness needed for infection to occur by black rot.

Temperature		Hours of Leaf Wetness
° C	° F	
7.0	45	No infection
10.0	50	24
13.0	55	12
15.5	60	9
18.5	65	8
21.0	70	7
24.0	75	7
26.5	80	6
29.0	85	9
32.0	90	12

In formation in table adapted from R. A. Spotts, Ohio State University.

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Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI and West Madison Agricultural Research Station (WMARS), Madison, WI

2013

Brianna at PARS 4.29.2013

Brianna at WMARS 4.29.2013

Foch at PARS 4.29.2013

Foch at WMARS 4.29.2013

Frontenac at PARS 4.29.2013

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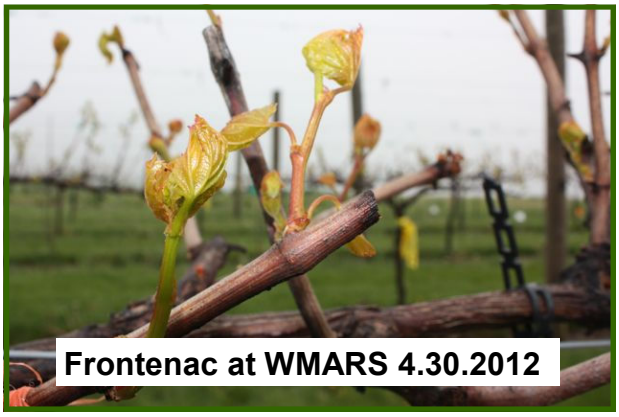

Frontenac at WMARS 4.30.2012

2012

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2013

La Crescent at PARS 4.29.13

La Crescent at WMARS 4.29.13

La Crosse at PARS 4.29.13

La Crosse at WMARS 4.29.13

Marquette at PARS 4.29.13

Marquette at WMARS 4.29.13

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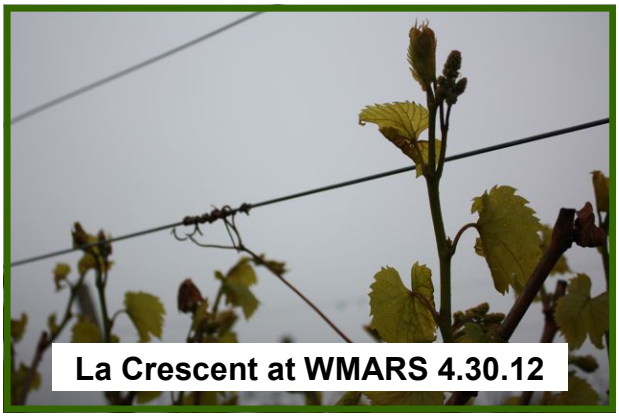
2012

La Crescent at PARS 4.30.12



La Crescent at WMARS 4.30.12

La Crosse at PARS 4.30.2012

La Crosse at WMARS 4.30.2012

Marquette at PARS 4.30.2012

Marquette at WMARS 4.30.2012

Degree Day[1] (base 50) Accumulation from April 1 to April 28, 2013 at Peninsular Agricultural Research Station in Sturgeon Bay, WI

Date	2013	2012	5 Year Average[2]
4/1 to 4/28	22	48	65

[1]Modified method.
[2]Average from 2008 to 2012.

Degree Day[1] (base 50) Accumulation from April 1 to April 28, 2013 at West Madison

Date	2013	2012	5 Year Average[2]
4/1 to 4/28	62	120	121

[1]Modified method.
[2]Average from 2008 to 2012.

Accumulated degree days[1] (base 50) for the month of March in Sturgeon Bay and Madison, WI.

Year	Madison WI	Sturgeon Bay WI
	GDD (base 50, ceiling 86)	
2013	1[2]	0
2012	252	106
2011	13	3
2010	72	38
2009	51	12
2008	1	0
2007	90	41
2006	22	7
2005	40	9
2004	49	11

[1]Modified method.
[2]Data from http://www.doa.state.wi.us/degreedays/

Please scout your vineyards on a regularly scheduled basis in an effort to manage problem pests. This report contains information on scouting reports from specific locations and may not reflect pest problems in your vineyard. If you would like more information on IPM in grapes, please contact Dean Volenberg at (920)746-2260 or dean.volenberg@ces.uwex.edu