



Michigan Blueberry IPM Newsletter

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Grand Junction



West Olive

Van Buren County
Jersey in Covert are at early fruit coloring and in Grand Junction, Blue-ray and Bluecrop are within 7 to 10 days of first harvest.

Ottawa County
Blue-ray in Holland and Rubel and Bluecrop in West Olive are all at early fruit coloring.

BLUEBERRY NEWS YOU CAN USE...

Disease management: Newly-formed mummified fruits have been observed in the bushes and on the ground. Continue to monitor their development to get an idea where infections will begin next year.

Insect management: Japanese beetle emergence continues. Blueberry maggot flies have been caught in Van Buren County. Fruitworm activity is decreasing.

Harvest of early varieties is underway.

	2009		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
6/29	1677	1045	1584	993
7/6	1835	1146	1759	1112
Projected for 7/13	2019	1274	1975	1272
West Olive, MI				
6/29	1504	907	1401	838
7/6	1652	999	1569	950
Projected for 7/13	1835	1126	1775	1100

See [MSU Enviroweather website](http://MSU_Enviroweather_website) for more information.

INSECT MANAGEMENT

Rufus Isaacs & Keith Mason, Department of Entomology, Michigan State University

Cranberry fruitworm flight is almost over in Van Buren County, and flight of this pest is also declining in Ottawa County. No egg laying by either cranberry or cherry fruitworm was found at the four farms that we sampled, but damage from fruitworm larvae feeding was seen. Aphid numbers continue to decline in response to recent insecticide applications. Japanese beetles are out, but numbers are low in fields that have recently been treated with insecticides. There are reports of blueberry maggot fly captures at some farms in Berrien county and southern Van Buren county.

Aphids were found at all four sampled farms, and the percentage of infested shoots has decreased. Generally we are finding 0 to 20% of new shoots have aphids on them, but some fields have infestations with up to 55% of shoots with aphids. Parasitized aphids (mummies) were found on approximately 5–10% of the new shoots at all of the farms we sampled. Growers and scouts should continue to monitor blueberry aphids and mummies on new growth to help assess the effectiveness of aphid control programs.



Fig 1. Japanese beetle on a Bluegray cluster in Holland.

Cranberry fruitworm flight has generally decreased over the past week at all sampled sites. Moths were caught at all four sampled farms and the number caught ranged from 1 to 21 per trap. No cherry fruitworm moths were caught at any of the four farms. All four farms were scouted for the presence of fruitworm eggs, and neither cranberry fruitworm nor cherry fruitworm eggs were seen. Early fruitworm feeding damage has remained low, but steady, at the Covert and Grand Junction farms and most of this damage is from cherry or cranberry fruitworm larvae feeding in a single berry. However, webbing together of multiple berries, indicating cranberry fruitworm feeding, was seen at the Covert, Grand Junction and West Olive farms. Follow the link to the [model for fruitworm control](#) to see cranberry fruitworm egg laying predictions based on the MSU Enviroweather weather stations in your area.

Leafroller larvae and tussock moth larvae were not observed at any of the farms scouted.

Blueberry maggot traps should already be set in fields. No blueberry maggot flies were caught at the four scouted farms, however there are reports from growers, scouts and MSU Extension Educators that flies were caught this week in southern Van Buren and in Berrien county. A degree day model for blueberry maggot emergence is available online at www.enviroweather.msu.edu in the Fruit, Insects section. This is predicting emergence of blueberry maggot across the southern half of Michigan's lower peninsula. [For more on blueberry maggot, follow this link to a previous article in the Blueberry IPM Update.](#)

Japanese beetles were observed near all four sampled farms, but very few beetles were seen in fields because of recent insecticide applications. No beetle feeding damage was seen on leaves or fruit at any of the four samples farms. Growers and scouts should continue checking fields for Japanese beetles (JB). Record the total of JB on each of 10 bushes from the field border and 10 interior bushes. To sample a border bush begin on one side of the bush and circle around the bush while visually scanning the canopy. Avoid bumping the bush during counting as beetles will drop or fly off. To sample interior bushes, avoid disturbing the beetles by walking between bushes and scan the halves of two adjacent bushes that face the row middle and count this as one bush. Try to sample from as large an area of the field as possible. [For more on Japanese beetle, click on this link to see an article from an earlier edition of the Blueberry IPM Update.](#)

Insect Scouting Results

Farm	Date	CFW moths per trap	CBFW moths per trap	BBA % infested shoots	BBM adults per trap	JB per 20 bushes
Van Buren County						
Covert	6/29	0	7	0%	0	1 (dead)
	7/6	0	3	0%	0	4
Grand Junction	6/29	0	7	25%	0	0
	7/6	0	1	20%	0	0
Ottawa County						
Holland	6/29	0	19	0%	0	0
	7/6	0	21	5%	0	2
West Olive	6/29	1	15	60%	0	0
	7/6	0	13	30%	0	0

CFW=cherry fruitworm; CBFW=cranberry fruitworm; BBA=blueberry aphid; BBM=blueberry maggot; JB=Japanese beetle



DISEASE MANAGEMENT

Annemiek Schilder & Tim Miles, Department of Plant Pathology, Michigan State University

This week all scouted plots were at early fruit ripening. Twig blight symptoms were somewhat reduced in incidence compared to last week. Twig blights can lead to wilting of developing fruit clusters (Figure 2) due to death of the vascular tissue leading to the cluster. Also, infected mummy berry fruits were detected on the bush and on the ground (Fig. 3A and 3B) with the highest average of 15.3 newly mummified fruits being detected at the Grand Junction site.



Fig 2. Withering fruit cluster caused by twig blight seen at West Olive MI on July 2.



Fig 3. Newly-formed mummified fruit on the bush (A), and eventually falling to the ground (B) at Holland, MI on July 2. Note the wrinkled tan/brown to pink color with shallow ridges.

Blighted Twigs

Last week (6–25–09) blighted twigs were collected from each of the scouted plots and 10 pieces were incubated on media in the lab. Then the fungi were identified with a microscope. There was quite a bit of variation between the four fields as to the causal organism (Table 1). *Phomopsis vaccinii* was predominantly isolated from the blighted twigs. In West Olive, as many as 50% of the blighted twigs yielded *Phomopsis*. Other pathogens isolated were *Colletotrichum acutatum* and *Botrytis cinerea*. In addition, fairly high numbers of non-pathogenic fungi (saprophytes) were isolated from the twigs. These organisms move in after infection by pathogens or other injury.

Table 1. Fungi isolated from blighted twigs collected from blueberry fields in west Michigan, 2009 (10 twigs plated per site).

Farm	<i>Phomopsis vaccinii</i>	<i>Colletotrichum acutatum</i> (Anthracnose)	<i>Botrytis cinerea</i>	Other fungi
Van Buren County				
Covert	0%	0%	10%	90%
Grand Junction	40%	0%	0%	60%
Ottawa County				
Holland	20%	20%	0%	60%
West Olive	50%	0%	0%	50%

*Other fungi include *Epicoccum*, *Cladosporium*, *Penicillium*, *Alternaria*, and yeasts.

Mummy Berry

Mummy berry is one of the most economically important blueberry diseases in Michigan as there is a zero tolerance for mummified fruit in processed berries. In earlier issues, we have extensively covered the life cycle, symptoms, and effective management strategies for this disease. The first external symptoms of fruit infection are a tan-brown to pink discoloration of fruit. In the later stages, the fruit becomes shriveled with shallow ridges and may fall to the ground (Figure 3A and 3B above). When scouting for mummy berries, it is extremely important to not only scout on the bush but also on the ground as mummies tend to detach from the cluster prematurely. They are easier to see when the ground is clear of weeds and debris. The amount and location of the mummy berries gives insight into where the inoculum will be present next year and also into the efficacy of previous fungicide applications. In 2007 and 2008 newly mummified fruits on a single bush were strongly correlated with the incidence of apothecia and shoot strikes on that same bush, illustrating that an earlier stage of the disease might be useful at predicting a later stage of the disease.

Disease Scouting Results

Farm	Date	Avg number of mummy berry shoot strikes per bush*	Avg number of newly-mummified fruits**	Avg number of blighted twigs per bush*** (Note: Peak blight was observed on June 11 and 19.)
Van Buren County				
Covert	6/25	0.3	--	16.4
	7/2	0.0	0.7	12.9
Grand Junction	6/25	0.4	--	2.9
	7/2	0.0	15.3	1.9
Ottawa County				
Holland	6/25	0.1	--	4.7
	7/2	0.0	1.5	3.2
West Olive	6/25	3.6	--	11.9
	7/2	0.0	1.1	10.3

*Average number based on 10 bushes.

**Average based on scouting on and below 10 bushes.

*** Blighted twigs may be caused by various fungi, including *Phomopsis vaccinii*, *Colletotrichum acutatum*, and *Botrytis cinerea*.



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