Michigan Blueberry I.P.M. Update

August 7, 2007 Volume I, No. 15

Contents

The Blueberry IPM Update is a publication produced by Michigan State University Extension. To receive a copy of this newsletter, send an email to masonk@msu.edu.
Also available online through blueberries.msu.edu and at:
www.isaacslab.ent.msu.edu/blueberryscout/blueberryscout.htm

CROP STAGES

In Van Buren County, Jersey in Covert are within 7 days of second harvest. Bluecrop in Grand Junction are within a week of third harvest. Harvest is complete for Blueray in Grand Junction.

In Ottawa County, Harvest is complete for Blueray in Holland. Rubel are within a week of second harvest and Bluecrop is ready for third harvest in West Olive.

Rubel ready for second harvest at West Olive.

Editor's Note:

As harvest is well underway, and everyone is increasingly busy, The Michigan Blueberry IPM Update will now be published every other week until late August. We will notify subscribers via email and on the Michigan Blueberry IPM Update website if any critical issues arise.

The next and final Newsletter will be sent out August 21st.

We hope you find the information in this newsletter useful in guiding what to look for as you scout your own farm. The scouting data shown in the Disease and Insect Updates below are taken from four Michigan blueberry farms. As conditions are different from farm to farm, we must stress that the information in this newsletter should not be used as a substitute for scouting your own fields. Your spray decisions should be made based on what is seen on your own farm.

Please use this newsletter to determine when and how to look for certain pests, identify potential pest problems, and to get information on the biology of pests and other aspects of integrated pest management. See the Insect and Disease Updates below for descriptions of some scouting methods that can be used on your farm.

DEGREE DAYS AND WEATHER NOTES

Weather Forecast: Hot conditions are expected to continue with a chance of rain Tuesday and Thursday. High temperatures will be in the upper 80's to low 90's with lows in the mid to upper 60's. By 8-13 GDD_{50} will increase by ~175, and GDD_{42} will increase by ~235. Complete weather summaries and forecasts are at available enviroweather.msu.edu

GDD (from March 1)	Base 42	Base 50
	Van Buren County	
7-23	2505	1671
7-30	2808*	1872*
8-6	3011*	2041*
	Ottawa County	
7-23	2425**	1589**
7-30	2638**	1746**
8-6	2859**	1911**

*enviroweather data for the Grand Junction station is missing some dates, so data from Hartford was substituted for missing values.
** enviroweather data for the West Olive station is missing some dates, so data from Hudsonville was substituted for missing values.

PEST OF THE WEEK
Sharpnosed leafhopper

Rufus Isaacs and Keith Mason, MSU Entomology

Figure 1. Adult Sharpnosed leafhopper on a leaf
Photo: Jerry A. Payne, USDA ARS

Figure 2. Sharpnosed leafhopper on a trap
Photo: Keith Mason

Adult sharpnosed leafhoppers are small and brown, about 5 mm long, with a pointed head and cream-colored flecks on the body and wings (Figures 1 and 2). The wingless nymphs are yellow-white with red to brown coloration that develops an hourglass pattern. This insect, which is present in Michigan, is a vector of blueberry stunt disease (Figure 3). This disease occurs in eastern North America but is presently uncommon in Michigan.

Figure 3. Symptoms of blueberry stunt disease: Left – short, bushy appearance of infected plants. Middle –cupping and red spots on leaves. Right - A stunted bush (on left) compared to a normal bush. Click here for more info on blueberry stunt disease.

The sharpnosed leafhopper overwinters as an egg inside fallen leaves, and eggs hatch as leaf buds open in the spring. There are typically two generations per year with adults present in mid and late summer. The late summer generation adults deposit the overwintering eggs and this is typically during late harvest and after harvest. The timing of these generations can be monitored with yellow sticky traps. The same traps that are used for blueberry maggot can be used to monitor sharpnosed leafhopper. Leafhopper control is recommended in fields where this disease has been detected, with a focus on protecting bushes from transmission of the disease by this vector.

DISEASE UPDATE

Timothy Miles and Annemiek Schilder
Department of Plant Pathology, Michigan State University

This week all scouted plots were between the 1st and 2nd harvest. In the previous issue, we discussed fruit rots and the different symptoms associated with them, specifically anthracnose (orange spore masses; caused by *Colletotrichum acutatum*) and Alternaria (dark-green spore masses; caused by *Alternaria* spp.). Over the past two weeks we have seen an increase in the number of fruit rot symptoms in the field. Anthracnose and Alternaria were seen in all four of the scouted plots (Figure 1 and 2). Also, we have noted that the 'Jersey' plot in Covert, MI has tended to be more susceptible to anthracnose then the other sites which are Blueray and Rubel. Anthracnose in particular is favored by hot, humid weather.

Fruit rots and their control

Fruit rots can cause significant pre- and post-harvest yield losses. Berries with high fruit rot levels also tend to have higher microbial counts. Healthy berries can get infected by *Colletotrichum* spores washing down from infected berries in clusters during rain events or overhead irrigation. Infections can even occur by infected berries or spores touching healthy berries on the harvester or sorting line. At this time, Alternaria spores are also ubiquitous in the air of blueberry fields. Pre-harvest Alternaria rot typically affects calyx end of the blueberry, but post-harvest Alternaria infections occur mostly at the scar, which provides moisture for infection. Ripe berries are very susceptible to infection by both anthracnose and Alternaria fruit rot. Before harvest, fruit rots can be controlled by proper timing and reducing the frequency of overhead irrigation as well as fungicide sprays programs. While fungicides cannot cure already infected berries, spraying Abound, Cabrio, Switch or Pristine at this time (even between harvests) can reduce the number of secondary infections and the incidence of post-harvest rot.

Scouting for fruit rots

Scouting for fruit rots in the field at this time can give an indication whether fungicide sprays are needed.

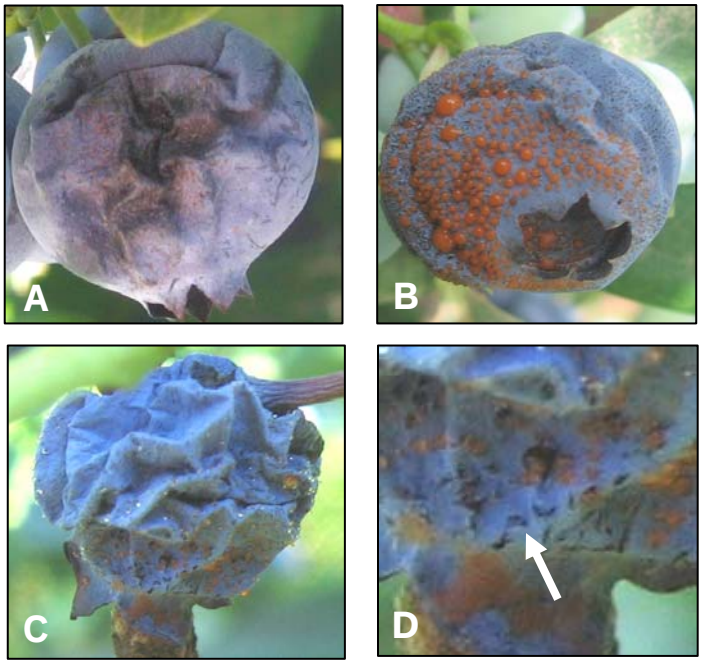


Figure 1. Anthracnose symptoms at various infection stages. A) The berry develops a sunken area and small orange pimple-sized dots begin to erupt through the surface. B) The eruptions give rise to large, orange, gelatinous spore masses on the surface of the fruit. C) The berry will then shrivel up and spore masses can become dry and crystallized D) Cracks in the blueberry skin through which the spore masses exude can be seen in this close-up.

Figure 2. Alternaria fruit rot symptoms seen in the field; notice the dark green to black sporulation and shriveling around the calyx cup (Grand Junction, MI).

Farm	Date	Mummy berry fruit infections per bush *	Alternaria fruit rot per bush**	Anthracnose fruit rot per bush**	Phomopsis twig blight per bush***
Van Buren County					
Covert	7-23	4.9	0.3	0	-
	7-30	-	0.7	0.1	-
	8-6	-	0.8	1.5	-
Grand Junction	7-23	17.7	0.4	0.2	-
	7-30	-	0.2	0	-
	8-6	-	0.2	0.7	-
Ottawa County					
Holland	7-23	13.1	0.2	0.2	-
	7-30	-	0	0	-
	8-6	-	0.5	0.2	-
West Olive	7-23	25.0	0.3	0	-
	7-30	-	0.2	0	-
	8-6	-	0.5	0.4	-

* - Fruit infected with the mummy berry fungus (berries were scouted on the bush and surrounding it).
** - Number of infected clusters showing signs of sporulation (average infected clusters per bush).
*** - Phomopsis twig blight was not collected after 7-9-07 because values generally remained consistent throughout the scouted plots.

INSECT UPDATE

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

BLUEBERRY APHID

Aphids were detected at the Grand Junction, Holland and West Olive Farms. The percentage of infested shoots is low at all farms and the level of parasitism continues to increase. You should be scouting your bushes for aphids. If they are present on or near varieties that are susceptible to shoestring virus, the use of an insecticide for control of the aphids should be considered, to reduce the chance that virus will be transmitted from bush to bush, or field to field.

TUSSOCK MOTH

No larvae were observed in our scouting, but second generation Tussock Moth should be present at this time.

BLUEBERRY MAGGOT

One fly was captured at the Holland farm. Flies are still being caught at other sites in Allegan and Ottawa County. Some sites are reporting high captures of this pest. Continue to use traps to monitor this pest throughout the harvest period.

JAPANESE BEETLE

Beetles were observed at the Covert, Grand Junction and Holland farms. The number of beetles observed has generally decreased at sites where harvest is complete or where growers are using insecticides to control this pest. Fresh beetle feeding damage can be been found on leaves and fruit. Continue to scout for this pest through out the harvest period (see below for methods). For insecticide control options see the newsletter from 6-26-07.

Top: Leaf feeding by Japanese beetle.
Bottom: Japanese beetle feeding on fruit.

SCOUTING FOR JAPANESE BEETLE

Begin scouting for Japanese beetle in mid to late June. Visually scan the canopy of 10 bushes on the field border and 10 bushes in the interior of the field. Count the number of beetles observed. As beetles are very mobile, check for the presence of feeding damage on leaves and fruit to let you know if beetles have been active in the field recently. See pictures above for examples of fruit and leaf feeding.

FRUITWORMS

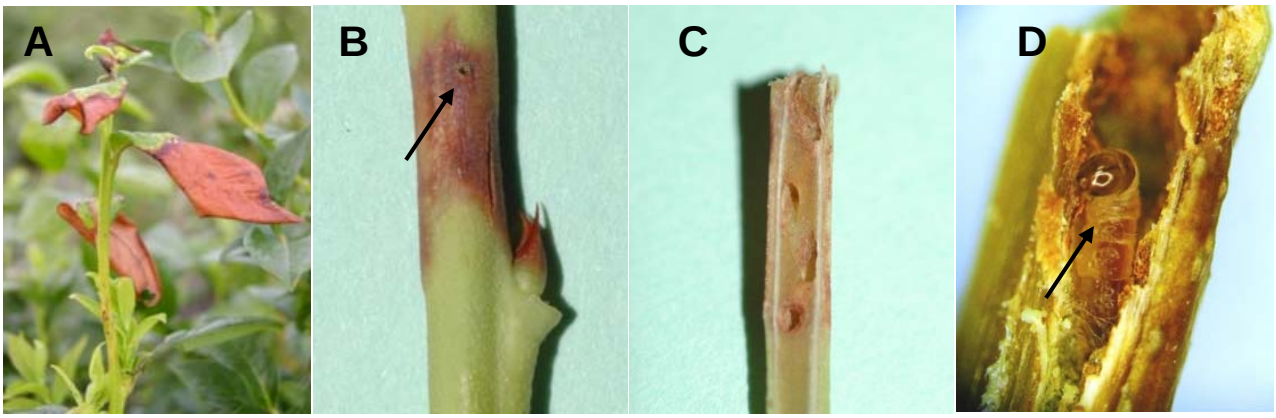
Cranberry and cherry fruitworm moth flight is over in both Van Buren and Ottawa Counties. Be sure to record locations where you noticed fruitworm damage this season and monitor those areas for fruitworm activity in future years.

Farm	Date	CBFW moths per trap	CFW moths per trap	Blueberry aphid % infested shoots	Blueberry maggot per trap	Japanese beetle per 20 bushes
Van Buren County						
Covert	7-23	0	0	0	0	3
	7-30	0	0	0	0	6
	8-6	0	0	0	0	15
Grand Junction	7-23	0	0	5%	0	0
	7-30	0	0	0%	0	0
	8-6	0	0	5%	0	8
Ottawa County						
Holland	7-23	0	0	5%	0	36
	7-30	0	0	0%	0	28
	8-6	1	0	5%	1	1
West Olive	7-23	0	0	75%	0	1
	7-30	0	0	25%	0	1
	8-6	0	0	30%	0	0

TIPS FOR IDENTIFICATION AND CONTROL OF BLUEBERRY TIP BORER

Rufus Isaacs and Keith Mason, MSU Entomology

The blueberry tip borer (*Hendecaneura shawiana*) is a sporadic insect pest of blueberry, whose damage symptoms become increasingly evident in late July. Fruitworm management programs after bloom usually keep this pest in check, but seeing the stems with brown leaves (Figure A) is an indication that this pest is present and should be watched in fields where the symptoms are showing up. Although no estimates of economic impact have been made for blueberry tip borer, infested shoots will have reduced fruiting potential in the following year.



The damage can be seen during regular weekly scouting of fields, with infested shoots having leaves with brown tips (Figure A). These drying leaves are typically above where a larva is feeding inside the stem, and the larva's point of entry is usually visible as a small (1 mm diameter) pinhole on the side of the stem with some brown tissue around this area (Figure B). This is the entry hole that a tiny young larva chewed earlier in the season when entering the stem. Larvae enter soon after they hatch from an individual clear egg that was laid on the young stem by the female moth.

As the larva feeds and grows inside the stem it tunnels through and feeds on the tissues in the shoot (Figure C). The larvae can be seen with a hand lens if an infested stem is broken open (Figure D). A mature larva will bore 8-10 inches inside a stem before it pupates in the stem to emerge next year. There is only one generation per year.

Moth flight probably occurs during mid-late June around the time of fruitworm activity. However, because the pheromone of this pest has not been identified, monitoring traps cannot be used. The only alternative is to closely monitor for the presence of early larval tunneling into the stems, which causes the discoloration shown in Figure B.

Fields with high levels of infestation should be monitored for the distribution of tip borer infestation this year, so that appropriate adjustments can be made next year. If the damage is along the border of the field, or if it is only in the bottom half of the bush, an adjustment of the spray program in 2008 may be needed to get improved coverage. Pruning out infested shoots at this time of the year may also help suppress the infestation next year, but make sure to cut off most of the shoot to get the larva as it can bore well below the symptoms. Larvae inside pruned shoots will dry out and die as the shoots desiccate.

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For more information, see our website at
blueberries.msu.edu

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