

Michigan Blueberry IPM Newsletter



CONTENTS

Page

- 1 Blueberry news you can use...
Growing degree days
- 2 Insect management
- 3 Update: Intrepid® & Karner Blue butterfly
- 4 Disease management
- 6 Fungicide supply & Omega 500F label
- 7 Fertilization and winter injury



Van Buren County

Jersey in Covert are between 25-50% bloom; in Grand Junction, Blueray is at 50% bloom, and Bluecrop is at full bloom.



Ottawa County

Blueray in Holland, and Rubel and Bluecrop in West Olive are at 25% bloom.

BLUEBERRY NEWS YOU CAN USE...

Disease management. If blossoms are open, fungicide applications to prevent mummy berry fruit infection are recommended.

Insect management. Check cranberry fruitworm traps twice a week to pinpoint the start of flight (biofix). It is time to start scouting for aphids.

MSU Blueberry IPM Meetings. Special thanks to the Bodtke Family for hosting the IPM meeting on May 13, and to Claudia Arkestyn (Wilbur-Ellis) and Kent Hughes (DuPont) for providing the food!

GROWING DEGREE DAYS

From March 1

	2009		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
5/11	427	196	525	282
5/18	644	330	607	324
Projected for 5/25	767	401	686	366
West Olive, MI				
5/11	552	279	428	211
5/18	508	236	502	245
Projected for 5/25	637	311	572	280

NEXT MEETING:

Thursday, June 11
(6-8PM), Carini Farms,
15039 Port Sheldon Rd.,
West Olive, MI.

See MSU Enviroweather website for more information

INSECT MANAGEMENT

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

Overall, insect activity remains low at all four farms that we sampled, but some feeding by leafroller larvae was seen at the Holland farm. Growers and scouts should continue to look for [spanworm](#) and [leafroller](#) feeding in fruit and leaf buds. Insecticides that are applied to control fruitworms will also control spanworm and leafroller, so growers that expect to spray for fruitworms may not need a separate spray to control these pests. A working threshold for control of early season leafroller and spanworm is 2% of the clusters with damage. Count 10 buds on 10 bushes spread through the field to pick up any hot-spots.

Bushes are starting to send out new shoots from the crown, so growers and scouts should start checking for blueberry aphids on the new growth. To scout for aphids examine two young shoots near the crown on each of 10 bushes and record the number of shoots where aphids are found and also record the number of shoots with parasitized aphids. Be sure to sample weekly from as wide an area in the field as possible to have a better chance of detecting whether aphids are present. Although natural enemies (parasitic wasps, lady beetles, lacewings, hover fly larvae) can keep this pest in check, aphids can transmit blueberry shoestring virus, so growers may want to consider using an insecticide to control aphids if there are blueberry varieties that are susceptible to shoestring on the farm.

All fields were scouted for blueberry aphid this week but no aphids were found.



Fruitworm activity is still low, a single cherry fruitworm moth was caught in Covert and cranberry fruitworm flight has not begun at any of the farms that were sampled. There are reports of single captures of cranberry fruitworm in Allegan County. Some warm nights are expected this week so we should see cherry fruitworm flight increase in southern counties (Berrien and Van Buren), and flight should begin in Ottawa county this week. We also expect to see cranberry fruitworm in traps near the end of this week or early next week.

Growers and scouts should already have cherry fruitworm and cranberry fruitworm traps set in fields. Traps should be checked twice weekly until moths are caught and then traps should be checked once a week until first harvest.

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	5/11	1	0	--	--	--
	5/18	1	0	--	--	--
Grand Junction	5/11	0	0	--	--	--
	5/18	0	0	--	--	--
Ottawa County						
Holland	5/11	0	0	--	--	--
	5/18	0	0	--	--	--
West Olive	5/11	0	0	--	--	--
	5/18	0	0	--	--	--

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



Endangered species protection bulletins released for Intrepid® in six west Michigan counties

Rufus Isaacs, Department of Entomology, Michigan State University

The United States Environmental Protection Agency has recently released an "Endangered Species Protection Bulletin" for Karner Blue butterfly in Allegan, Monroe, Montcalm, Muskegon, Newaygo and Oceana counties in Michigan. This announcement makes it seem like a new restriction, but it is not. The full label for Intrepid (Section 3) has always contained the same language in its Endangered

Species section: "Do not apply this product within one mile of sandy habitats that support wild lupine plants" and the same six west Michigan counties are listed. What is new is the EPA website where they are posting the Bulletins Live! maps showing the counties affected by the restrictions. These are available at www.epa.gov/espp/bulletins.htm.

The practical implications of this for Michigan fruit growers are that IF you farm in these counties, and IF you have fields that are within one mile of wild lupine habitat, then you are restricted from using Intrepid in those fields. See Figure 1 for a photo of wild lupine in bloom. We recommend that if you farm in these counties, you go to the website listed above and print off the bulletin for your county for the month that you plan to apply Intrepid. If you are in these counties, learn to identify wild lupine and the specific dry sandy areas where it grows. While the announcement does not make clear the enforcement of this restriction, it is a legal part of the label. This is made clear in the text as part of the announcement: Bulletins are enforceable as part of pesticide labeling and state law may require that you have a copy of the Bulletin applicable to your pesticide use in your possession. While not a federal requirement, EPA recommends that you print the Bulletin for your records.

If you do have sandy habitats that support wild lupine within one mile of your fields where you planned to apply Intrepid as part of your insect



Figure 1. Wild lupine in flower. Photo courtesy of US Fish and Wildlife Service.

management program, there are many other options available for control of insect pests. Intrepid is the only product with this restriction, and the similar product Confirm has no such restrictions.

More information on this plant and the Karner Blue butterfly are available from the US Fish and Wildlife Service at www.fws.gov/midwest/Endangered/insects/kbb/lupine.html



DISEASE MANAGEMENT

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

Mummy berry

This week the scouted plots were around 25% bloom. Mummy berry apothecia weren't observed in any of our scouted plots this week. However, shoot strike infections were found at much higher levels than the previous week, with the highest incidence being observed at Grand Junction averaging 32.2 shoot strike infections per bush (Figure 1). Shoot strikes are the major source of infectious spores for fruit infection. Good pollinating weather increases the risk of fruit infection as bees serve as carriers of infectious spores when they move from infected shoots to susceptible flowers.



If blossoms are open, fungicide sprays to prevent mummy berry fruit infection are recommended. Systemic fungicides such as Indar or Pristine are best, since we are trying to protect the flower stigma from infection. The spores germinate on the stigma and then the fungus grows alongside the pollen tubes through the pistil into the ovaries. Individual flowers are most susceptible right after they open and susceptibility decreases over time. Once the fungus reaches the ovaries, it colonizes in the developing berry. This infection is not noticeable while the fruit is still green but can be seen as white fungal growth if the berries are cut open.

Figure 1. Shoot strikes observed on 5–18–09 near Grand Junction, MI; A) Early symptoms and B) Late symptoms.

Disease Scouting Results

Farm	Date	Avg number of apothecia on the ground*	Max apothecia cup diameter	Avg number of shoot strikes per bush*
Van Buren County				
Covert	5/11	0.0	--	0.2
	5/18	0.0	--	1.9
Grand Junction	5/11	0.9	1/3 in (9 mm)	12.4
	5/18	0.0	--	32.2
Ottawa County				
Holland	5/11	0.1	1/3 in (9 mm)	0.9
	5/18	0.0	--	2.6
West Olive	5/11	0.5	1/3 in (9 mm)	4.9
	5/18	0.0	--	17.4

*Average number based on 10 bushes.

Fungicide supply tightening

Annemiek Schilder, Department of Plant Pathology, Michigan State University

A projected shortage in the worldwide fungicide supply may affect blueberry growers as well. Due to a reduction in the production of Dithane (an old production plant was shut down), which is used in a variety of crops, there may be an increased demand for other broad-spectrum fungicides like Captan, Bravo, and Ziram. In response to strong demand and higher costs of raw materials and fossil fuels, prices of some fungicides (including Captan) have been increasing. In addition, BASF has decided to reduce deliveries of Pristine by 50%, which could affect blueberry growers who use this product. Growers may need to reconsider which products are available and cost-effective in their operation. For instance, alternatives to Pristine for control of anthracnose fruit rot are Switch, Abound, and Cabrio. The new fungicide, Omega, may be an addition option for fruit rot control and a broad-spectrum alternative to Captan and Ziram.



Omega 500F fungicide labeled for blueberry

Annemiek Schilder, Department of Plant Pathology, Michigan State University

A new fungicide, Omega 500F (active ingredient: fluazinam) has been labeled for blueberries, currants, gooseberries, and lingonberries. Omega is a reduced-risk fungicide in the chemical group of the 2,6-dinitro-anilines. These fungicides affect respiration in fungal cells by uncoupling oxidative phosphorylation. Omega represents a new chemistry and can be used in alternation with other fungicides for fungicide resistance management purposes. Omega itself has a low risk of resistance development due to its multi-site mode of action.

Omega 500F is a non-systemic, broad-spectrum protectant fungicide with good residual efficacy and rainfastness. It is labeled for control of Phomopsis twig blight and fruit rot, anthracnose fruit rot, and Botrytis fruit rot in blueberries. Based on small plot fungicide efficacy trials in Michigan, North Carolina and New Jersey, I would rate the product as fairly good against anthracnose fruit rot, Phomopsis, and Botrytis, and poor against mummy berry. Applications for fruit rots are recommended at 7-10 day intervals.

Omega may be applied with all types of spray equipment normally used for ground application. Aerial application or application through sprinkler irrigation systems is not recommended. Apply Omega in sufficient water to obtain adequate coverage of the foliage, usually between 20 and 100 gallons per acre. Do not apply Omega within 25 feet of permanent water bodies, such as streams, lakes or reservoirs. Omega is generally compatible with other fungicides, insecticides, fertilizers, and micronutrients. However, a jar test is recommended before tank-mixing to test compatibility with tank-mix partners.

The PHI (pre-harvest interval) is 30 days. The re-entry interval for Omega 500F is 72 hours for high-exposure activities such as hand-harvesting, pruning, etc., because this product may cause allergic skin reactions in a small number of sensitive individuals. Do not apply more than 7.5 pints per acre per growing season.

Fertilizing winter-injured blueberries

Eric Hanson, Department of Horticulture, Michigan State University & Mark Longstroth, MSU Extension

Some Michigan blueberry fields are showing quite a bit of winter injury to buds and twigs. This raises several questions about cold injury and fertilization. Not all of these questions have been researched adequately, but here are some related facts and thoughts.

Should fertilizer rates be adjusted to account for reduced crop load? Bushes with reduced crop levels may have slightly reduced nutrient demand because less needs to be allocated to fruit, but these amounts are small. Based on reported mineral concentrations in blueberries, each ton of fruit contains about 2.4, 0.2 and 2.0 lbs of nitrogen (N), phosphorus (P), and potassium (K), respectively. Therefore, a 5 ton crop only contains about 12, 1, and 10 lb of N, P, and K. Even if all flower buds are killed by cold, the impact on plant nutrient demand is relatively minor. If the crop load is only partially reduced, effects on nutrient demand are even smaller. Keep in mind that the N fertilizer you apply this year is only a supplement; most of the N for this year's growth will come from reserves in the soil and in perennial plant parts. Older bushes recycle most of their nutrients from year to year so adjusting rates from year to year has limited effect on growth. So the general recommendation is to fertilize as in the past, adjusting rates if you have recent soil or tissue tests of plant nutrient levels.

Should bushes be fertilized differently to help them recover from cold injury? Again, we would say no. Typically, shoots grow more vigorously after flower buds and twigs are injured by cold. The carbohydrate and nutrient resources in the bush are allocated to fewer growing points so shoots may grow longer and/or more new canes may break from the crown. The effect is similar to that of pruning. We experienced an exception to this several years ago when many Jersey fields experienced severe injury to buds/twigs as well as apparent damage to the wood of older canes. Shoot growth was very weak on older canes with wood damage, and these canes eventually needed to be pruned out. Damage this year seems to be more to flower buds so we can expect normal shoot growth, which will not have as much competition from fruit. We can expect to see shoot growth to continue longer in fields with a light crop and adequate irrigation. We expect that fields in good vigor will set a large crop of flower buds this year and have the potential for a large crop next year.

How can I fertilize so plants are best able to tolerate winter cold? This question has not been well researched in blueberries, although there are numerous opinions and some related information in other crops. Hardiness is optimized by maintaining nutrient levels in the sufficient ranges, and by minimizing overall plant stress (drought, over-cropping, diseases, foliar pest feeding). The nutrient most often associated with cold hardiness is N. Excessive N use has been shown to reduce the hardiness of some fruit trees, and anecdotal observations suggest this is also true of blueberries. The key is to apply recommended rates at the right time. N applications after June should be avoided because this may encourage additional flushes of shoot growth late in the season, which may not harden off in time for winter. The bottom line is that following good cultural practices including fertilization recommendations optimizes hardiness. Use periodic leaf analyses and soil tests to monitor plant nutrition and make sure your fertility program is best for your site.

Some people believe that fall applications of K promote acclimation and hardiness. This approach is worth studying, but has not been researched in blueberries. Another interesting idea is applying foliar sprays of urea in the late fall. Sprays have been shown to increase N reserves in the buds of tree fruit crops, and promote growth the following spring. These practices need to be studied in blueberries.



Funding for this newsletter is provided by grants from the EPA and Project GREEN.

MSU is an affirmative-action, equal-opportunity employer. Michigan State University Extension programs and materials are open to all without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status or veteran status. Issued in furtherance of MSU Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Thomas G. Coon, Director, MSU Extension, East Lansing, MI 48824. This information is for educational purposes only. Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned.

