

Michigan Blueberry I.P.M. Update



April 17, 2007

Volume I, No.1

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Welcome to the MSU Blueberry Newsletter!

In early 2007, MSU was awarded a grant by the regional EPA office to enhance our delivery of IPM information to the Midwest blueberry industry. Our project includes delivery of an IPM Update.

This is the first edition of our Blueberry IPM Update Newsletter, which will be provided weekly through the 2007 blueberry season.

Our aim is to improve the awareness of Midwest blueberry growers regarding IPM scouting practices and the availability of reduced-risk management options.

Each week, we will scout four west Michigan blueberry farms on Monday and will report the results in the newsletter when it is sent out on Tuesday. The newsletter will be posted at our website (blueberries.msu.edu), and if you would like to receive a notice when new versions are posted, just send an email request to the project manager, Keith Mason at masonk@msu.edu.

To help growers learn how to scout their fields we will also hold IPM workshops this summer to demonstrate scouting for blueberry insect and disease pests. Look for the announcements in the next issue.

We hope you find this useful. Please send any feedback to Keith Mason at masonk@msu.edu.

The MSU Blueberry Team

CROP STAGES

	Van Buren Co.		Ottawa Co.	
	Covert	Grand Junction	Holland	West Olive
Field 1	Jersey	Blueray	Blueray	Rubel
Stage	bud swell	bud swell	green tip	bud swell
Field 2	Jersey	Bluecrop	Jersey	Bluecrop
Stage	bud swell	green tip	bud swell	bud swell

Field 1 is used for disease assessments, Field 2 for insect assessments.

DEGREE DAYS AND WEATHER NOTES

	Van Buren Co		Ottawa Co	
	4-9	4-16	4-9	4-16
GDD*	4-9	4-16	4-9	4-16
Base 50	132	133	90	91
Base 42	274	286	201	213

Weather Forecast: Rain is possible midweek and warmer temperatures are expected by the end of the week. By 4-23 GDD₅₀ will increase by ~25, and GDD₄₂ will increase by ~60. For complete weather summary go to enviroweather.msu.edu
* Growing degree days from March 1, 2007.

DISEASE UPDATE

Key: CV = Covert; GJ = Grand Junction; HO = Holland; WO = West Olive.

	Van Buren County 4-16		Ottawa County 4-16	
	CV	GJ	HO	WO
Mummified berries per bush*	0.25	27	13	6
% germinated mummified berries	0	26	19	18
Mummy berry mushrooms per bush*	0	21	5	2

Notes: Infection periods for mummy berry will continue through this week. Warm weather at the end of the week will cause leaf development to move ahead and increase susceptible sites on bushes. Growers should scout for mummy berry and consider fungicide treatment if mummies and/or mushrooms are found.

* An area of ~ 9 sq ft was scouted under each bush.

INSECT UPDATE

Key: CV = Covert; GJ = Grand Junction; HO = Holland; WO = West Olive. CBFW = cranberry fruitworm; CFW = cherry fruitworm.

	Van Buren County 4-16		Ottawa County 4-16	
	CV	GJ	HO	WO
CBFW moths per trap	set	set	set	set
CFW moths per trap	set	set	set	set

Scouts and growers should set traps for these pests in the next few weeks. In the next week, it is not likely that cranberry fruitworm or cherry fruitworm will emerge.

[Click here for more info about fruitworms.](#)

PEST OF THE WEEK - Mummy berry

Mummy berry is an important fungal disease of blueberries throughout the United States and Canada.

Symptoms

The first symptom of shoot blight (shoot strike) is browning along the major leaf veins. The leaves wilt quickly and bend to resemble a shepherd's crook. A light gray powdery layer of spores develops at the leaf base. Flower strikes occur less frequently.

Disease cycle

The fungus overwinters in the mummified fruit on the ground. In early spring, trumpet-shaped apothecia (3 to 10 mm in diameter) produced on the mummies eject windborne ascospores that infect young shoots and flower clusters.

Infected green berries appear healthy but cutting them open reveals a white fungal growth in the locules. When berries start to ripen, infected berries appear pinkish tan and slightly ridged. They feel rubbery and contain a gray to black fungal mass inside. Infected berries eventually become faded, shrivel up, and fall to the ground. After the fruit skin has weathered off, the berries look like tiny black pumpkins.

The optimum temperature for formation of apothecia and infection is 50 to 57°F (10 to 14°C). At least 12 hours of wetness is required for infection. Frost may increase susceptibility



of blueberry shoots to infection. Conidia are produced on blighted shoots and flower clusters and are carried to flowers by wind, rain, and insects (bees). The fungus then colonizes the ovary of the developing fruit through the stigma.

Mummy berry management

There are many cultural controls that can be used to reduce pressure from mummy berry. These include:

- Remove or destroy mummies
- Cover mummies with soil or mulch – at least 2 inches (5 cm) thick
- Avoid wet sites or improve drainage
- Remove escaped or wild blueberries from vicinity
- Plant resistant cultivars
- Limit overhead irrigation until petal fall
- Apply effective fungicides from green tip until petal fall



Early shoot strike

Late shoot strike

Spores visible



Mummified berries with immature (left) and mature (right) apothecia in early spring.

FUNGICIDE LABEL UPDATE

Annemiek Schilder, MSU Plant Pathologist

Indar (fenbuconazole) has finally received a full registration for use in blueberries, which means that we do not have to request a Section 18 anymore. The fungicide will be available in two formulations: Indar 75WSP (water soluble packets) and Indar 2F (flowable). Indar 2F should be available at distributors in May, although quantities may be limited. They have the same active ingredient and are for all practical purposes the same. A fungicide efficacy trial in Michigan in 2006 showed that Indar 2F worked as well as Indar 75WSP. Both products list the following diseases on the label: *Alternaria*, anthracnose, leaf spot and blotch, mummy berry, *Phomopsis*, powdery mildew and rusts. In Michigan, however, we have not seen any efficacy of Indar against anthracnose, and we have not tested it against leaf diseases since these are not common in Michigan. The diseases that Indar has repeatedly shown good efficacy against are mummy berry and *Phomopsis* canker and twig blight.

The application rate for Indar 75WSP is 2 oz per acre; a maximum of four applications (8 oz) may be made per season. The application rate for Indar 2F is 6 fl oz per acre; a maximum of four applications (24 fl oz) may be made per season. Apply Indar in a minimum water volume of 10 gal/acre, if applied aerially, and 20 gal/acre if applied by ground. The pre-harvest interval is 30 days, and the re-entry interval is 12 hours. Do not make ground or aerial applications within 75 feet of streams, rivers, ponds, lakes or reservoirs. Since Indar is the least systemic of the sterol inhibitor fungicides, a non-polymer containing spray adjuvant approved for use with registered pesticide products, e.g., a crop oil, may be added to spray solutions according to the manufacturer's use instructions to improve disease control by aiding penetration of Indar into the plant tissue. This may be helpful when applying the fungicide after an infection period to enhance curative activity. Reduced efficacy may occur if water containing suspended soil particles, such as water from ponds, streams or unlined ditches is used.

Indar belongs to the sterol demethylation inhibitor (DMI) class of fungicides (Group 3). Since certain fungi can develop resistance to this class of products, the use of Indar 2F should be part of a resistance management strategy that includes alternation and/or mixing with fungicides that have a different mode of action. Examples of fungicides to alternate with earlier in the season are Topsin M +

Captan, Bravo and Captivate, whereas Pristine, Abound, Cabrio and Switch are good options when the weather warms up and more diseases need to be controlled (e.g., between pink bud and petal fall).

A Section 18 emergency exemption for **Topsin M** WSB (thiophanate methyl) has been approved for the 2007 season (April 1 - September 30, 2007). Topsin M breaks down to the same active ingredient as Benlate and is for all practical purposes similar to Benlate. Topsin M is a systemic fungicide that has excellent efficacy against *Phomopsis* and *Fusicoccum* canker diseases, good efficacy against *Botrytis*, and moderate efficacy against mummy berry. While usually tank-mixed with Captan for control of anthracnose, Topsin M only has fair efficacy against anthracnose and Captan does most of the work in this tank mix. The application rate is 1 lb/acre and a maximum of three applications is allowed per season. Application may be made by ground or air, but not through any type of irrigation system. Only use Topsin M in combination or rotation with a registered non-benzimidazole fungicide (e.g., Captan or Ziram). The worker re-entry interval is 12 hours and the pre-harvest interval is 7 days.

A new fungicide that is now labeled and may be of interest to blueberry growers is **Prev-Am** (sodium tetraborohydrate decahydrate, simply stated: boric acid). This is a fungicide as well as an insecticide/miticide, and can also be used as an adjuvant with other fungicides. In fungicide efficacy trials in Michigan in 2005 and 2006, Prev-Am showed good efficacy against anthracnose fruit rot. The application rate for disease control is 50 fl oz per 100 gallons and sprays should be applied every 7 to 10 days. The pre-harvest interval is 0 days and the re-entry interval is 12 hours. Do not apply this product aerially or through any type of irrigation system. The label lists *Botrytis* and powdery mildew as target diseases, and aphid, leafhopper, lygus bug, mealy bug and mite as target insects. However, we have not yet tested the product for these uses in Michigan. Be sure to read tank-mixing instructions on the label.

IS THAT BUD MITE DAMAGE? Rufus Isaacs, MSU Entomologist

Some blueberry scouts have been providing shoot samples to Carlos Garcia of MSU Extension in the past few weeks, to find out what's causing the buds to turn brown. Some were wondering whether the buds had been damaged by bud mites, but Carlos reports that he has checked these buds and found no mites. The most likely explanation is winter injury from the warm and then cold weather we have been having. If growers or scouts are interested in having their buds checked for bud mites, they can send samples to Carlos Garcia at the Trevor Nichols Research Complex, 6237 124th Avenue, Fennville, MI 49408. Phone: (269) 561 5040 and leave a message for Carlos if you are sending in samples. To collect samples, cut the top five fruiting buds from 10-20 shoots in an area where mite damage is suspected. Wrap these in paper towel and place in a ziplock bag with the date collected, farm, field, and variety information. Samples can be kept in the fridge if needed, but they should reach Carlos within 1 to 2 days of collection to ensure the samples will not decay.



Roll on summer!

UPCOMING MEETINGS

May 17 - Blueberry IPM Scout Training, Hands-On Workshop

Meet at 1 pm at Trevor Nichols Research Complex in Fennville, then drive to blueberry farm

June 13 - Blueberry Scouting and IPM Demonstration Workshops

10-12am at Bodtke Farm, Van Buren County
3-5pm at Carini Farms, Ottawa County

ARTICLES IN NEXT WEEK'S ISSUE

- More scouting information
- Blueberry Frost Protection
- Update on fruitworm monitoring and management

MSU Blueberry Team

Horticulture - Eric Hanson
Plant Pathology - Annemiek Schilder
Entomology - Rufus Isaacs
Trevor Nichols Research Station - John Wise
Van Buren Co. - Mark Longstroth
Ottawa Co. - Carlos Garcia
Berrien Co. - Greg Vlaming
Southeast Michigan - Bob Tritten

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