



Blueberry Newsletter

A newsletter from Michigan State University for the Michigan blueberry industry

May 24, 2011

Volume 5, Issue 3

News you can use

Timely information for growers.

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GDD are reported for the primary blueberry-producing regions of Michigan.

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News you can use

Crop development. Jersey in Covert is nearing 50% bloom, and Bluecrop is at full bloom and Blueray is between 50% and full bloom in Grand Junction. Bluecrop in West Olive is at 50% bloom.

Insect management. Cherry fruitworm flight is going strong. Better get your cranberry fruitworm traps up - flight is beginning at some sites! Time to start checking for aphids.

Dual Magnum is registered for use on blueberry. The United States Environmental Protection Agency has approved a 24c SLN label for use of the herbicide Dual Magnum on several crops, including high bush and low bush blueberry. Dual Magnum should be applied to the soil in a band on each side of the rows of high bush blueberry, before weeds germinate. The labeled rate is 0.67- 1.33 pints per acre. For low bush blueberry, apply as a broadcast postemergence (to the blueberries) application before weeds germinate. The rate is the same as for highbush blueberries. Dual Magnum primarily controls annual grasses. It also is very active against pigweeds and eastern black nightshade. It will give fair to good preemergence suppression of yellow nutsedge. There is a 28 day



Jersey in Covert



Bluecrop in Grand Junction

GROWING DEGREE DAYS

From March 1

	2011		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
5/16	531	272	762	401
5/23	684	370	913	499
Projected for 5/30	813	443	1140	671
West Olive, MI				
5/16	412	199	646	309
5/23	552	286	785	397
Projected for 5/30	686	363	1008	564

See <http://enviroweather.msu.edu> for more information.

preharvest interval. This is an indemnified label, and growers need to accept all liability for crop damage or

injury or yield decline. The label should be posted soon on the Syngenta website: www.farmassist.com.

Blueberries at full bloom in SW Michigan

Mark Longstroth

Michigan State University Extension
Van Buren County

Last week was cool with a warm weekend. Highs rose from the 60s to the 80s on Sunday. Strong storms moved through the region Sunday evening. Rainfall totals across the region ranged from less than an inch, to two inches. This week will be cooler with continued unsettled and rainy conditions. High temperatures should stay in the 60s. Soils are still wet. Most sites have received over ten inches of rain since March 1. Soil temperatures are in the mid-60s. We are still a week [behind average](#) for fruit development. Check for the closest weather station at: enviroweather.msu.edu.



Fig 1. Mummy berry flower infection; Photo: M. Longstroth.

Blueberries are blooming. Early varieties such Bluetta are past bloom and have small green fruit. Bluecrop is at early petal fall. Jersey and Elliot are at full bloom. Water is standing in many fields. Mummy berry shoot strikes appeared during bloom and were numerous last week. Strong winds associated with storms knocked off many of these fragile dried shoots off the bushes but a few remain. Blueberry flowers are susceptible to infection during pollination (Fig. 1). There have been mummy berry shoot strike infections on the blossoms. Flowers are brown, some never developed. As bloom ends

growers need to protect against [anthracnose fruit rot](#) and [fruitworms](#). Both [cranberry fruit worm](#) and [cherry fruit worm](#) adults have been trapped. Growers need to trap to determine biofix and use the Enviroweather models for [fruitworms](#). Obliquebanded [leafroller](#) are causing distorted shoots.

For the last month as I go out into blueberry fields I am more and more disappointed with the 2011 blueberry crop. Every time I go out I mentally subtract 10% from the 2011 crop. At this time I would be surprised if Michigan harvested more than 90 million pounds in 2011. Growers I talk to are relieved to hear that it is not just them but the problems are similar in other areas. Many areas show similar symptoms. Many pruned fields have lots of dead canes that the growers swear were alive when the field was pruned in the winter.

The coldest temperatures of the winter were on January 23. I see much more winter injury than I would expect from a low around -20 on Jan. 23 during an extended cold snap. Growers are wondering what other factors weakened the plants. Was it the hot dry conditions of 2010 or lingering effects of cold in 2009.

Many of the fields of low input growers just did not have any fruit buds last fall. I expect part of this is due to 3 years of low prices in blueberries and growers not pruning or fertilizing for 3 or more years.

Central region report

Carlos Garcia-Salazar

Michigan State University Extension
Ottawa County

Weather conditions in the Central Region remain unchanged. Daily temperatures remain low in comparison to 2010. During the past week minimum temperatures observed in the area averaged 50° F. Meanwhile, maximum temperatures reached the lower 80's with an average temperature of 73° F. These temperatures are not much different from the previous week.

Minimum temperatures have remained above the freezing point and no spring frost damage has been reported, yet.

Regarding precipitation, during the past week there were days with no precipitation that allowed growers to get into the fields to initiate their pest and disease control program. In general, the amount of rain accumulated in Central Michigan during the past week was less than 0.5 inches.

Given the prevailing environmental conditions the amount of Growing Degree-Day accumulation (GDD) in the region as of May 23, 2011 reached 285 GDD (base 50° F) and 551 GDD (base 42° F). Despite the observed improvement in the environmental conditions, that GDD accumulation remains lower with respect of the previous season. Because of this difference in GDD accumulation plant growth and development remains more than one week behind with respect to the 2010 growing season.

At this time, summer raspberries are in flower bud stage and fall raspberries are in 12 to 18" cane stage. There are no evidences of insects or disease problems and their growth is very healthy.

For strawberries, late season varieties are in the white bud stage. Early varieties on the other hand are in 50% bloom. No diseases or insect problems are present at this time. Meanwhile, blueberries growth and development is in progress.

Blueberry growth stages found at this time in the Central Region goes from early bloom in late season varieties (Elliott) to 100% bloom in the most advanced varieties like Bluecrop.

Major problems observed across the Central Region are related to winter damage. Damage is more evident in Jersey fields across the Central Region (Fig. 2 and 3 on next page). Fields affected require extensive pruning of damaged tissues and fungicide treatment to prevent cankers. It is important to mention that any delay in the initiation of the disease control



Fig 2. Winter damage in Jersey, Allegan County; Photo: C. Garcia-Salazar.

the initiation of the disease control activities may increase the risk of extensive mummy berry and phomopsis infections late in the season.

Regarding blueberry diseases, no more mummy berry mushrooms are observed but in some fields mummy berry shoot strike infections are showing up. This is happening in fields where growers are having problems to enter the field due to excessive water. For fields that are showing extensive dieback due to



Fig 3. Winter damage in Jersey, Ottawa County; Photo: C. Garcia-Salazar.

winter damage is important to maintain an active disease control program to prevent further damage. Fields affected by spring frosts of winter damage always get secondary infections by phomopsis that uses damaged tissues as port of entry. If you see dieback problems in your field and you are not sure if this is due to winter, mummy berry or phomopsis please call your County Extension office for assistance or take shoot samples and send them for identification to the MSU Lab. Products recommended for early season mummy berry and phomopsis control are Indar 2F (6 fl oz) or Indar 75 WSP (2 oz) or Orbit (6 fl oz). For a complete list of products and recommendations for mummy berry and phomopsis control please follow the 2011 MI Fruit Management Guide (MSU Extension Bulletin E-154).

With respect to insect pest problems in blueberries, there are enough degree days accumulated for the beginning of the Cherry Fruit Worm emergence (CFW). This has been already recorded in Van Buren County. At this time CFW traps should be already in place to detect the beginning of the emergence of the overwintering adults. Timely detection of sustained moth catch is necessary to synchronize our pest control measures with the CFW egg-laying period. This is important for fields with a history of CFW infestations.

On May 26-27, 2011 we will be conducting our third Good Agricultural Practices for food safety in berry production. The program starts with **Registration** from **8:30 to 9:00 a.m.** on

May 26, 2011. The classroom program will be conducted at the Trevor Nichols Research Complex in Fennville, MI and the hands-on will be conducted at farms of growers attending the workshop. There is a \$150.00 registration fee for the first person and \$100.00 for the second participant from the same farm. This includes lunch and educational materials. For growers unable to pay the full registration fee there will be a limited number of scholarships. **Space is limited; please pre-register** by calling Ms. Judy Hanson (616) 994-4548 hanson26@msu.edu at the MSU Extension Ottawa County office in West Olive, Michigan.

On June 1, 2011, we will be hosting another training workshop for berry growers interested in learning about the biology, monitoring and control of the Spotted Wing Drosophila (SWD). Growers, berry crop scouts, and IPM consultants should attend this workshop. **Training will start at 9:00 AM with classroom training followed-up by field hands-on training from 1:00 to 5:00 PM.** Participants will learn about how to identify this new insect, how to trap for it, and how to sample fruit. This program is designed for growers, scouts, and consultants to learn about SWD before the field season starts, so management of this pest can be integrated into IPM programs. This training will be conducted at the Trevor Nichols Research Center, 6237 124th Avenue, Fennville, MI 49408. There will be a \$25.00 registration fee which includes lunch and educational materials. **Space is limited so you must pre-register** by calling Ms. Judy Hanson (616) 994-4548 hanson26@msu.edu at the MSU Extension Ottawa County office in West Olive, Michigan.

Insect update

Keith Mason & Rufus Isaacs
 Department of Entomology
 Michigan State University

Bloom is in full swing in the fields we scouted. We have seen increased numbers of cherry fruitworm moths in traps and cranberry fruitworm flight is beginning in some fields in the more southern part of our blueberry production region.

There was no sign of feeding damage by *Hoplia* flower beetles in any of the fields we checked. Likewise, we did not observe feeding by [spanworms](#), or [cutworms](#), and bushes are far enough along that we do not expect to see much impact from the feeding of these insects.

A very low amount of feeding by [leafrollers](#) (much less than 1% of clusters with damage) was observed at the Covert farm. It is possible that feeding damage by these pests may increase at some farms before growers begin to spray for fruitworms, and growers and scouts should continue to check fields for feeding damage by leafrollers during the next two weeks. To scout for these pests examine 10 shoots on 10 bushes on the field border and 10 shoots on 10 bushes in the field interior. Look for leaf or flower clusters that have feeding holes and/or webbing in the cluster. Leafrollers are generally not economically important in Michigan, and they are normally very well controlled by insecticide applications targeting fruitworms.

Cherry fruitworm moths were caught at all of the farms we scouted, and the contaminant moth (Fig. 4) that is common in cherry fruitworm traps (*Pseudexentera vaccinii*) is still flying although the number of these moths in



Fig 4. The contaminant moth found in cherry fruitworm traps, *Pseudexentera vaccinii*; Photo: P. Jenkins.

Table 1. 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	5/16	0	set	0	-	-
	5/23	1	0	0	-	-
Grand Junction	5/16	0	set	0	-	-
	5/23	4	2	5%	-	-
OTTAWA COUNTY						
West Olive	5/16	0	set	0	-	-
	5/23	4	0	5%	-	-

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

cherry fruitworm traps has declined greatly over the past two weeks. The contaminant moth is ~ 1/2 inch in length which is much larger than cherry fruitworm (1/4 inch). Cherry fruitworm also have an iridescent banding pattern across the wings while the contaminant moth has darker markings on a light gray body. See the photos below to help with identification.

We expect the flight for cherry fruitworm to peak at some southern Michigan farms in the next 5 to 7 days. Growers and scouts should continue to check cherry fruitworm traps until harvest. Cranberry fruitworm traps were hung in fields May 16th, and two moths were caught at the Grand Junction farm. There are also other early reports of cranberry fruitworm captures at other sites in southwest Michigan, so we are at the very beginning of fruitworm flight. Growers and scouts should hang cranberry fruitworm traps as soon as possible if not they have not done so already to allow for accurate timing of the start of flight for this pest. Cherry and cranberry fruitworm traps should be hung in the top half of bushes on the perimeter of a field. Place traps in known "hot spots" where the pest has been seen in the past. These areas are generally adjacent to woodlots, so if you are not sure if you have cherry or cranberry fruitworm, these are the best areas to begin trapping. Put traps in the outer part of the canopy on a sturdy branch. Traps should be checked twice weekly until moths are caught

consistently. This will not only identify fields with pressure from cherry and cranberry fruitworm, but also enable the timing of the start (biofix) of the cranberry fruitworm model on [enviroweather.msu](#). This model can be used for predicting optimal spray application dates for controlling cranberry fruitworm.



Fig 5. Small aphid colony on a new shoot; Photo: K. Mason.

We also have seen the start of blueberry aphid activity in the farms we scout. Low numbers of aphids were observed in fields at the Grand Junction and West Olive farms. Fewer than 5% of shoot were infested with aphids and we only observed single aphids or colonies with fewer than five individuals. Growers and scouts should begin checking fields for aphids, and with the high levels of rain this spring it will be important to check the vigorous young shoots for colonies.

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. Also record the number of shoots with parasitized

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. 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.

We also hung spotted wing drosophila (SWD) traps in all the fields we scout, and as of May 23rd, no SWD flies have been trapped. Subsequent issues of The Michigan Blueberry IPM Newsletter will contain more detailed information on monitoring and control of spotted wing Drosophila. For more information about this new invasive pest, please check out the MSU spotted wing Drosophila page at www.ipm.msu.edu/SWD.htm.

Thrips showing up in some blueberry fields

*Rufus Isaacs and John Wise
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Flower thrips have been reported in a few isolated SW Michigan blueberry fields this past week. These tiny insects tend to be found on the flowers and also inside the flowers, where their feeding can lead to flower abortion and/or scarring of the fruit that develop from these flowers. Learn more about flower thrips and their damage at www.blueberries.msu.edu/thrips.htm.

To scout for thrips, look on the outside of flowers and break open flowers to look inside. These are small insects (1-2 mm) and you will require a hand lens to see them clearly. Shaking flowers over a white tray is an effective method for determining whether there are thrips

inside the flowers. This will provide a presence/absence result, but there are no economic thresholds yet developed for this pest on blueberry.

We have relatively little experience with thrips control in Michigan because these insects tend to be a problem so rarely, with significant infestations once every 10 years or so. In previous trials at Michigan State University run by John Wise, SpinTor (spinosad) was a very effective insecticide. The more recently-registered insecticide Delegate which is a similar type of insecticide also lists thrips on the label. Spinosad products are generally considered as more effective against thrips, but Delegate is expected to have greater residual activity. Additionally, the organic insecticide Entrust (spinosad) is labeled for thrips control. With each of these products, it is advisable to use an adjuvant to help with spreading and to ensure good coverage.

Because thrips tend to be active during bloom when bees are in the fields, extreme caution should be used when attempting chemical control during this time of the season. Weigh up the level of damage being observed by the pest and consider the risk to pollinators. Application in the late evening after all the bee activity is finished for the day will allow the residues to dry before bee activity the next morning. For example, the Entrust label states that the product is toxic to bees for three hours following application.

The challenges of disease control during rainy spells

Annemiek Schilder

Department of Plant Pathology

Michigan State University

Extended periods of wet weather spell “feast” for fungal plant pathogens, since they are highly dependent on moisture. While relatively cool temperatures earlier this spring may have slowed down fungal development some, wet conditions are very conducive to fungal diseases in general. Repeated or continuous wetting of infected tissues over periods of several days will aid spore production as it allows thorough wetting of infected canes or other overwintering plant parts and promotes fungal spore development. In addition, rain assists rainsplash-dispersed pathogens like *Phomopsis* and *Colletotrichum* in splashing the spores to susceptible plant tissues. Furthermore, extended wetness periods (12-48 hours) provide ample moisture for spore germination and infection of plant tissues. Diseases in blueberries that are promoted by wet weather include mummy berry (primary infection), *Phomopsis* and *Botrytis* twig and blossom blights, and anthracnose and *Alternaria* fruit rots. Wet periods during bloom are especially conducive to development of twig and blossom blights.

The challenge is to apply sprays before rainfall events – with as much rain as we’ve had it is difficult to keep the plants covered with fungicides. In addition, with rapid plant growth, new growth may not be covered or the fungicide residue will be too diluted to be effective. A study by Xu et al. (2008) showed that when captan was applied to apple leaves, captan was lost primarily due to wash-off by rain. As little as 1 mm (1/25 inch) of rain washed off about 50% of the captan. Subsequent rainfall did not result in much additional loss of the fungicide. This shows that a portion of the captan

following an application can be washed off easily but that the remaining residue is more tenacious. Our studies in grapes showed that 0.1 inch of rain may wash off 20-25% of protectant fungicides such as Ziram, Penncozeb, but that it took 1 to 2 inches of rain to significantly reduce disease control efficacy. This suggests that there is usually sufficient active ingredient left after light rain events, but to achieve good to excellent control, a reapplication is needed after a major rain event or when significant plant growth has occurred. And even protectant fungicides require some time to bind to the plant surface so it is advisable not to spray them just before a rain event. A spreader-sticker may help the fungicide adhere to the plant surface.

During rainy periods, especially when followed by windy conditions, it is difficult to get the fungicides on at the right time, e.g., before an infection period. Spray timing may be further complicated by fields being flooded preventing access with spray equipment. Systemic fungicides generally provide better disease control than protectant materials during rainy periods. Systemic fungicides should be used alone or in the tank mix with protectant fungicides to get: 1) better coverage, 2) improved rainfastness, 3) post-infection (curative) activity, and 4) a broader spectrum of disease control. The degree of post-infection activity varies by fungicide and the disease and can may range from 12-96 hours. Systemic fungicides may be rainfast within a few hours after application but longer drying periods (e.g., 24 hours if possible) may enhance absorption into the plant. When relying on post-infection activity, use fungicides at the highest labeled rate and ensure that coverage is optimized by adjusting nozzles, spray volume, and speed; and by spraying every row if possible. Surprisingly, even systemic fungicides suffer from wash-off by rain but less so than protectant materials. Remember that systemic fungicides may also be diluted inside plant tissues due to rapid

plant growth and may need to be reapplied sooner during warm periods that speed up plant growth.

Anthracnose infection risk model launched on Enviroweather website

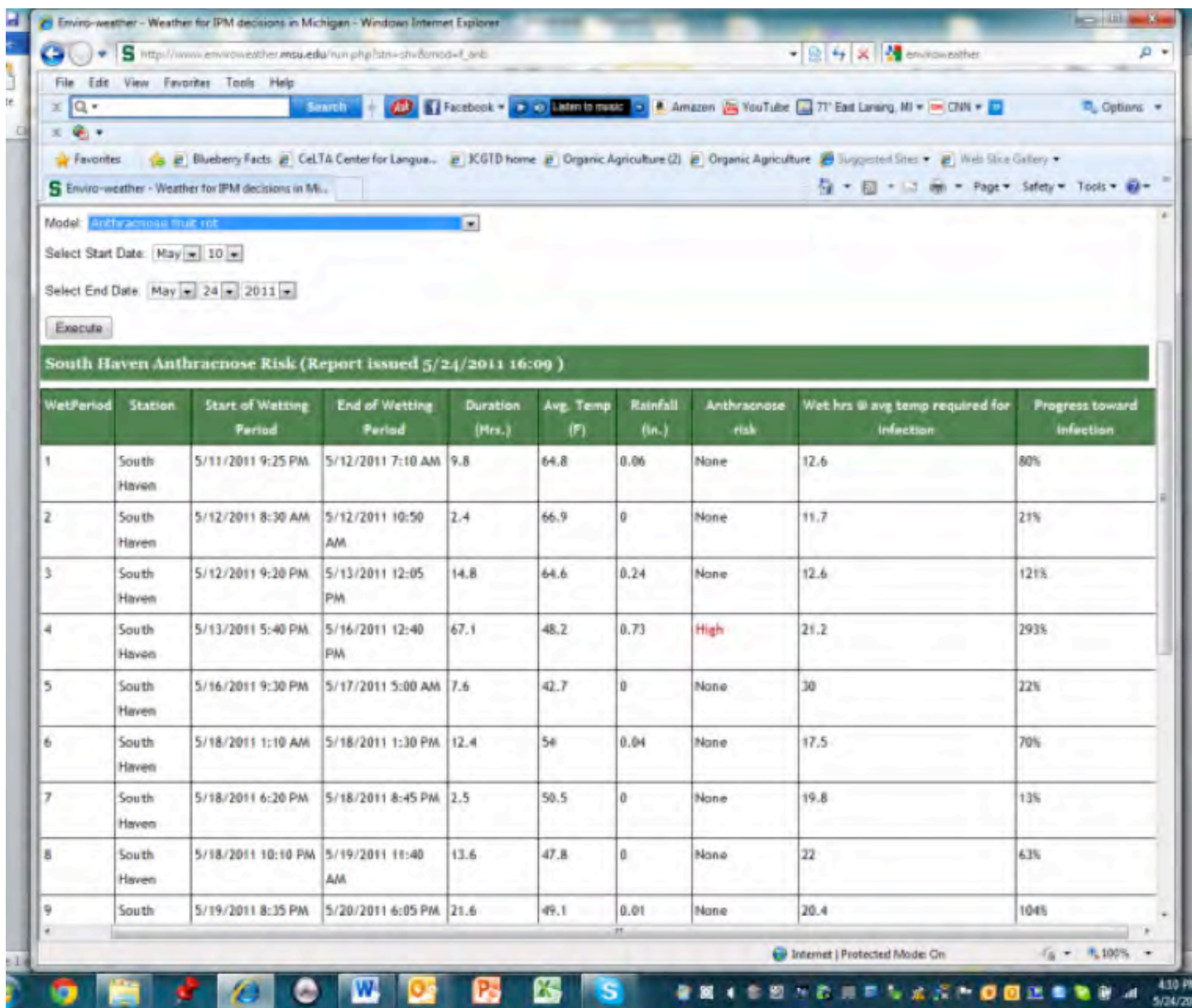
Annemiek Schilder

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The anthracnose fruit rot model is now available on the Enviro-weather website. The model indicates the risk of fruit infection from bloom until harvest assuming that *Colletotrichum acutatum* inoculum is available in the field. If you have a susceptible cultivar and have had anthracnose fruit rot in the past, this is a likely assumption, particularly in the period from bloom until pea-size berry and during fruit ripening. The risk of infection is based on wetness duration and temperature that promote fungal spore germination and penetration of the fruit surface. The closer to the optimum temperature (77F) and the longer the fruit stays wet (from rain, dew or irrigation), the greater the risk of infection. The risk is indicated as “none”, “low”, “moderate” or “high”. The model can only use past weather information, which means that it can tell you what the risk of infection was last night, but not what it will be a week from now.

The model uses weather data from Enviro-weather weather stations throughout Michigan. You can look online to find out what the model says for the weather station closest to your farm. To access the model, go to [Enviroweather \(http://www.enviroweather.msu.edu/homeMap.php\)](http://www.enviroweather.msu.edu/homeMap.php), then pick the station of your choice by clicking on the dot on the Michigan map, then go to “Fruit” (top green bar), then under “Blueberry” on the left, select “Anthracnose fruit rot”. The output looks like this, see next page.



You can change the weather station in the upper left corner and run the model for that weather station by pressing the “Execute” button.

The anthracnose risk model will give you an indication of the weather conditions that constitute high-risk for anthracnose fruit rot, and is a learning tool as well as a management tool. Growers can use it for preventive fungicide sprays (Captan, Ziram, Pristine, Cabrio, Abound, Omega, etc.) when the weather forecast is predicting weather with potentially long wetness periods (e.g., longer than 18-24 hours) or apply post-infection sprays if the plants were unprotected during an infection period. It is up to the grower to decide how much risk he is willing to take, but it is a safe bet to use at least “moderate” risk as a trigger for action. Systemic fungicides such as Pristine, Abound, Cabrio, and Omega should be applied to green fruit within 24-48 hours after the model calls for an infection period to get curative activity. Once a fungicide has been applied, the plants are considered covered for the next 10-14 days (depending on the length of the residual activity of the fungicide) and the model can be considered again at the end of the spray interval. If a lot of rain has fallen since the last application, you may want to shorten the interval.

2011 Grower Events

Spotted Wing Drosophila Workshop

June 1

9AM-12PM

Trevor Nichols Research Center

6237 124th Avenue, Fennville, MI

\$25

Please note: you must pre-register and registration is limited!

Register by calling Judy Hanson at (616) 994-4580.

June 9

6-8PM

True Blue Farms, Grand Junction

\$10, includes dinner.

RSVP required. RSVP by calling or emailing Mark Longstroth

(longstr7@msu.edu) or the Van Buren County Extension

office at (269) 657-8213 (msue80@msu.edu).

More information: Mark Longstroth, 269-330-2790

June 16

6-8PM

Location: Ottawa County, venue TBD

\$10, includes dinner.

RSVP required. RSVP for the meal count by contacting Judy

Hansen (616) 994-4548 (hanson26@msu.edu).

More information: Carlos Garcia, 616-260-0671.

June Weed Control Meeting

Date, location and time: TBD

More information: Mark Longstroth, 269-330-2790

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