



Blueberry Newsletter

A newsletter from Michigan State University for the Michigan blueberry industry

April 26, 2010

Volume 5, Issue 1

News you can use

Timely information for growers.

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News you can use

Newsletter sponsorship for 2011. Many thanks to MBG-The Blueberry People and the Michigan Blueberry Advisory Committee for their generous sponsorship of this newsletter.

Regional Update. The last two weeks have been cool and rainy, with highs in the 40s-50s and lows in the 30s-40s. There have been no significant freezes, but winter injury has become more apparent in some areas. Rain last Friday resulted in Mummy berry infections from wetting periods of 30 hours or more with average temps in the low 40s. A dry weekend was welcomed; The outlook for this week is for warmer but continued wet weather through Thursday. Highs will be in the upper 50s, lows in the upper 40s. Fruit development has been slow. Soils are saturated and soil temps are in the mid-40s. We are approx. 1 week behind normal in growing degree days.

Next grower meeting. This Thursday, April 28, 6-8PM, Room 141, Lake Michigan College - South Haven Campus, 125 Veterans Drive. \$10, includes dinner. RSVP required. See calendar of events for more information.



Bluecrop in West Olive



Bluecrop in Grand Junction

GROWING DEGREE DAYS

From March 1

	2011		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
4/18	181	79	412	214
4/25	227	98	483	248
Projected for 5/2	304	131	598	320
West Olive, MI				
4/18	120	48	345	163
4/25	153	59	407	189
Projected for 5/2	234	94	511	250

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

Blueberry grower updates scheduled for 2011

*Mark Longstroth & Carlos Garcia
Michigan State University Extension*

Blueberry grower updates have been scheduled in Van Buren and Ottawa counties for the 2011 growing season. These will be 2 hour long evening meetings from 6 to 8 PM. The meetings will start with a dinner at 6 PM and be followed by talks by MSU Extension Educators and Specialists. There are two pairs of meetings, which will begin in Van Buren County and be repeated in Ottawa County the next week. This will allow growers some flexibility in attendance. There will be a \$10 charge for these meetings to cover meals and other materials. Some of these meetings may have a reduced charge when sponsors cover part of the cost of the meeting. Growers will need to call the appropriate MSU Extension office in the county they plan to attend so that meal arrangements can be made.

The first set of meetings begins Thursday April 28, in South Haven, and repeats in Ottawa County on May 5. These meetings will focus on early season disease and insect control as well as protecting blueberries against freeze damage during bloom. Speakers at the meetings will be Mark Longstroth, MSUE Small Fruit Educator; Dr. Rufus Isaacs, MSU Small Fruit Entomologist and Dr. Annemiek Schilder, MSU Small Fruit Pathologist. Mark Longstroth will discuss using irrigation systems and other methods to reduce spring freeze injury. Rufus Isaacs, will discuss winter monitoring for early season pests focusing on cranberry and cherry fruitworms and will update the group on [spotted winged drosophila](#) monitoring in Michigan. Annemiek Schilder will discuss early-season disease control, particularly mummy berry.

The Van Buren County meeting is scheduled for Thursday April 28, from 6

PM to 8 PM, at the Lake Michigan College's South Haven Campus, 125 Veterans Drive, in room 141. The cost of the meeting is \$10 which includes dinner. RSVP for the meal count by calling or emailing Mark Longstroth (longstr7@msu.edu) or the Van Buren County Extension office at (269) 657-8213 (msue80@msu.edu).

The Ottawa County meeting will be held May 5. For more information or to RSVP contact Judy Hansen (616) 994-4548 (hanson26@msu.edu).

The second set of meetings will begin on June 9 at True Blue Farms near Grand Junction and repeat in Ottawa County on June 16.

There is a weed control meeting scheduled for mid June in Van Buren County.

VAN BUREN COUNTY REGISTRATION

RSVP for the meal count by calling or emailing Mark Longstroth (longstr7@msu.edu) or the Van Buren County Extension office at (269) 657-8213 (msue80@msu.edu).

VAN BUREN COUNTY REGISTRATION

For Ottawa County meetings RSVP by contacting Judy Hansen (616) 994-4548 (hanson26@msu.edu).

Another wet week for SW Michigan fruit

*Mark Longstroth
Michigan State University Extension*

Southwest Michigan, Van Buren County. Blueberry fields are saturated and water is standing in many fields. Flower buds are bursting in many varieties and leaf buds are showing green leaf tissue that is susceptible to mummyberry shoot strike infection. Growers need to be prepared to [protect against mummy berry](#) shoot blight. There have already been several mummyberry infection periods. Early variety fruit buds are bursting. The most advanced leaf buds at the tips of the shoot have over a 1/4 inch of green

tissue exposed. Mummy berry [apothecia are emerging](#) from the mummies. Most apothecia are just emerging. The most advanced apothecia are about 1/4 inch wide and capable of releasing spores. Trumpet emergence varies widely and is closely tied to the variety in the field. Early growing field will be more developed than later varieties. Some growers have been able to get early sprays on but most have been hampered by wet field conditions and frequent rains. If shoot blight is a problem this year growers will need to focus their time on protecting flowers during bloom to prevent the fruit mummy phase of the disease. Many fields were heavily pruned this year. The crop generally looks good. Bud set is very variable with some fields with heavy fruit set and others with light set. There is little sign of winter injury to mature plantings. The new planting at the Trevor Nichols Research Complex suffered extensive shoot dieback. This was probably due to later growth after planting last fall.

Insect update

Keith Mason & Rufus Isaacs
 Department of Entomology
 Michigan State University

This week:

1. Put up your cherry fruitworm traps.
2. Check for early season feeding by spanworms and cutworms.
3. Watch for *Hoplia* flower beetle feeding.

With the cooler temperatures and rain over much of the past week, plant and insect development has been slow. We observed no feeding by [spanworms](#) or [cutworms](#) at any of the farms we visited, and the *Hoplia* flower beetle is not out yet at these sites. Growers and scouts should continue to check fields for feeding damage by these early season pests during the next two weeks (Fig 1A-C). 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 sections of flower or leaf buds that appear to have a piece missing. These pests are generally not economically important in Michigan, and no treatment thresholds have been developed, but if 3 to 5% of buds have feeding damage, growers may want to consider a specific control targeting these insects.

We hung cherry fruitworm traps at all the farms we scout in Van Buren and Ottawa County (Fig. 2). Although we don't expect the flight for this pest to

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	4/22	set	-	-	-	-
	4/29	-	-	-	-	-
Grand Junction	4/22	set	-	-	-	-
	4/29	-	-	-	-	-
OTTAWA COUNTY						
West Olive	4/22	set	-	-	-	-
	4/29	-	-	-	-	-

begin for another 7 to 10 days (around 200 to 250 GDD₅₀ after March 1st), it is better to hang traps too early than too late. Growers and scouts should be ready to set cherry fruitworm traps in the next week to ensure detection of the start of the flight for this pest. Traps should be hung in the top half of a bush 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 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 fruitworm, but also enable the timing of the start

(biofix) of the cherry fruitworm model at the enviroweather.msu.edu website. This model can be used for predicting optimal spray application dates for controlling cherry fruitworm.



Fig 2. Fruitworm traps should be hung in the upper portion of perimeter bushes adjacent to woodlots or in known "hot spots"; Photos: K. Mason.



Fig 1. Early season pests and damage: A. Spanworm feeding; B. *Hoplia* flower beetle adult; C. *Hoplia* feeding damage; Photos: K. Mason.

Bifenture labeled for use in blueberry

Rufus Isaacs

*Department of Entomology
Michigan State University*

A new registration has been granted for use in blueberries for the insecticide Bifenture 10DF from United Phosphorus Inc. The active ingredient of this insecticide is the pyrethroid insecticide bifenthrin. Bifenture is labeled at 5-16 oz/acre for control of a wide range of insects including fruitworms, blueberry maggot, and aphids. Activity on Japanese beetle is also expected, but that pest is not listed on the label. A 25 foot buffer zone to aquatic habitats is required for ground application, and this foot buffer zone should be 150 feet if application is by air. Examples of aquatic habitats listed on the label include lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries, and commercial fish ponds. This insecticide has a 1 day PHI and a 12 hour re-entry interval, and applications must be spaced at least 7 days apart. For resistance management, make sure to rotate this insecticide with non-pyrethroids.

Early season insect management

Rufus Isaacs

*Department of Entomology
Michigan State University*

With the emergence of green tissue on blueberry shoots, there are some springtime insect pests that growers should be thinking about. Although the spring weather has been cool, some pests can be active in this weather, so scouting fields now and preparing for the spring pests coming along in the next month will be time well spent.

Lecanium scale was seen at unusually high levels in a few fields in Ottawa county last year. These small insects have a hard shell covering (3 mm diameter) and they are found on stems where they feed on plant sap. When

populations are high, scale insects can reduce bush growth and their excretions can make fruit sticky and serve as a medium for sooty mold growth.

Pruning out infested canes is one cultural control that can be used to reduce scale populations, but since this insect is often on fruiting wood this may not be a preferred strategy. Scale insects are typically attacked by a wide range of natural enemies, and these insects will often respond to an infestation by greatly reducing scale survival. If considering an insecticide application, selection of more biologically-based or selective insecticides will help allow the natural enemies to help reduce scale infestations. A delayed dormant application of oil at 1% by volume can be used to smother and suffocate the overwintering scales, and if there is still only a little green tissue this approach can be used within the temperature safety range recommended for oil applications (avoid application before hot or freezing weather or in advance of rain). The insect growth regulator Esteem 35WP is registered for use against Lecanium scale at 5 oz/acre, and this will disrupt scale's ability to molt to the next growth stage plus it will reduce the scale's ability to lay eggs. This product is recommended to be applied with a spray oil to improve coverage and performance. For some photos of scale insects on blueberry: www.blueberries.msu.edu/scales.htm

Cutworms are the caterpillars of noctuid moths that emerge in early spring and are active night-time feeders. These insects spend the daytime in the leaf litter rolled up in a spiral, and they move up the bush at night to feed on young buds and shoots. Additionally, **spanworms** may be active in early spring and feeding on buds. These inchworms can sometimes be seen climbing along shoots, but they also have a great ability to be camouflaged and to keep very still to avoid detection. Regular scouting of fields is essential to determine the presence of cutworm or spanworm damage. Focus on areas that may have had missing buds before or

areas that are more weedy since those tends to have higher cutworm populations. A working threshold of 1% fruit bud loss can be used to determine the need for chemical control. Cutworms are well controlled by most synthetic pyrethroids or by Sevin.

For images of cutworms: www.blueberries.msu.edu/cutworms.htm or spanworms: www.blueberries.msu.edu/spanworms.htm

No SWD trapped yet this spring

Rufus Isaacs

*Department of Entomology
Michigan State University*

The Michigan SWD Response Team has been working this past winter to deliver education programs to the blueberry industry on spotted wing drosophila, including how to monitor and manage it. Traps were checked all through the winter and early spring at sites where there were high fly counts last season, and so far this spring there have been no detections of SWD. Trap checking will continue each week, and catches will be reported through the summer. MSU Extension and its partners will be deploying a network of monitoring traps across the state and these will help to identify the first fly activity. As a reminder, flies were found only after harvest last year so we are hopeful that will again be the case in 2011.

This blueberry newsletter will include a detailed article on SWD management in the next edition, and we intend to provide regular updates on this pest through the 2011 season. In the meantime, please sign up for the June 1 workshop on Spotted Wing Drosophila Monitoring and Management to be held at the Trevor Nichols Research Complex. Information on this pest will also be given at this Thursday's blueberry MSU Extension meeting organized by Mark Longstroth. For all of MSUs information on this pest: www.ipm.msu.edu/SWD.htm

Spring herbicide choices for blueberry

Eric Hanson & Bernie Zandstra
 Department of Horticulture
 Michigan State University

Several old and new herbicides are now available, and recommendations for their use are outlined in MSU Bulletin E-154, Fruit Management Guide. Be familiar with herbicide labels and precautions. Most fields are past bud break now and wet conditions have hampered herbicide applications.

Princep (simazine), Karmex (diuron), Sinbar (terbacil), and Solicam (norflurazon) are older preemergent herbicides that most growers have worked with. Costs are low (Princep, Karmex) to moderate (Sinbar, Solicam). Princep and Karmex are stronger on broadleaf weeds, whereas Sinbar and Solicam are effective on grasses. Combining broadleaf and grass materials controls a broader spectrum of annual weeds. These materials control many germinating annual weeds for 1-3 months. Make applications during the next couple weeks, or in the late fall. Solicam tends to provide longer control than the other materials.

Chateau needs to be applied before bud break so it is too late for use in most fields this spring. This is a newer preemergent product with some postemergent activity if applied with surfactant or crop oil concentrate (COC). Chateau controls a wide range of broadleaf and grass weeds, including chickweeds, dandelion, common groundsel, lambsquarters, eastern black nightshade, several pigweeds, ragweed, and most annual grasses. Apply Chateau before bud break at 6 to 12 oz product per acre. Bushes need to have been in the field for 2 years. Chateau also provides a longer period of control than most blueberry herbicides, so it is effective in the late fall as well as the spring. Chateau will burn developing buds and young leaves if the base of plants is sprayed.

Callisto provides preemergent and postemergent control of several pigweed species, chickweeds, horsenettle, lambsquarters, marestail, eastern black nightshade, ragweed, and smartweed. It is weak on grasses so it should be combined with a grass herbicide such as Sinbar or Solicam. Apply Callisto before bloom, either in one 6 fl. oz. per acre application, or two 3 oz. applications at least 14 days apart. Postemergent activity is improved with COC, but Callisto with COC will also injure blueberry leaves and young stems that are contacted. Callisto is labeled for non-bearing and bearing blueberries. For effective postemergent activity, delay Callisto treatments until weeds have begun growing. Callisto will suppress some perennial weeds such as aster and goldenrod.

Sandea was just labeled for Michigan blueberries, and provides preemergent and postemergent control of many broadleaf weeds. The primary value of Sandea is for yellow nutsedge control. Treat nutsedge when 3-5 leaves are present. Two applications with non-ionic surfactant are most effective. Rates are 0.5 to 1.0 oz per acre and no more than 2 oz per year. Pre-harvest interval

is 14 days. Sandea also controls pigweed, ragweed, and smartweed.

Stinger was also just labeled for Michigan blueberries and also has preemergent and postemergent activity. Stinger is most active on weeds in the composite and legume families, such as thistle, asters, dandelion, goldenrod, ragweed, and clovers. It also controls nightshades, smartweeds, wild buckwheat and plantain, as well as wild bean or groundnut. Timing is somewhat complicated. Blueberries are most sensitive to Stinger near bloom, so it should not be applied from one week before to one week after bloom. PHI is 30 days. The best times for treatment appear to be before bloom when weeds are growing, shortly after bloom but not within 30 days of harvest, and after harvest. Rates are 2.6 to 5.3 fl oz per acre, and not more than 10.6 oz per season. Stinger is a residual material, so accurate rates per acre are important, even if spot treating by hand.

SelectMax is a newly labeled, selective, postemergent grass herbicide similar to Poast and Fusilade. Like the other grass herbicides, SelectMax needs to be applied when grass is growing actively early in the season. Use 9 to 16 fl oz per

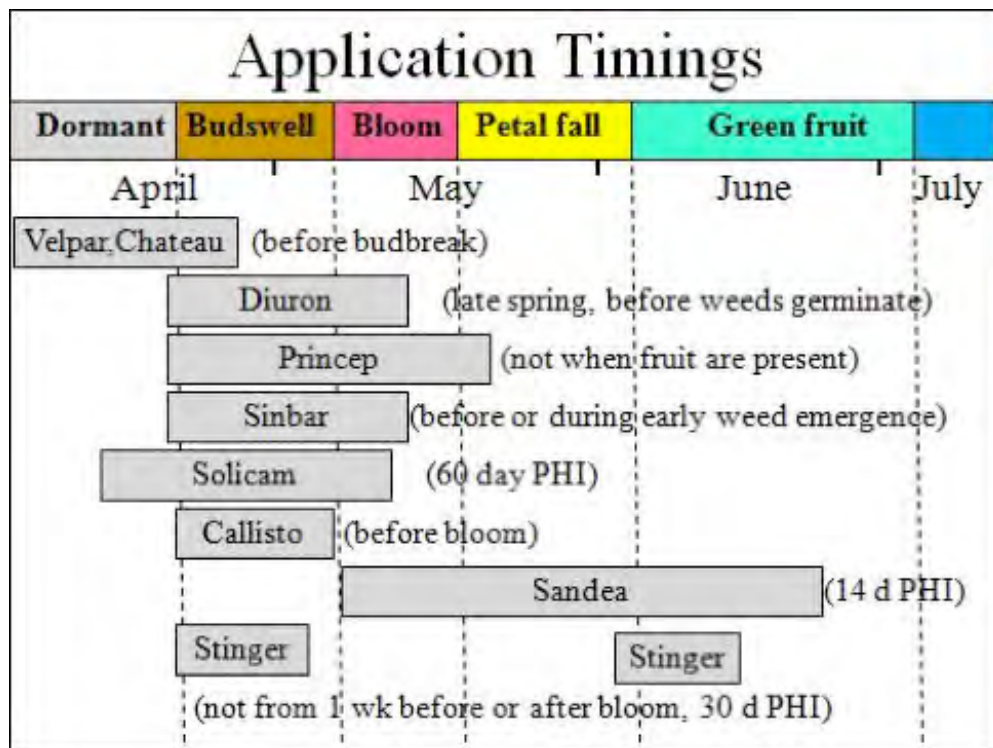


Fig 3. Application timing for herbicides based on plant development, not calendar dates.

acre with a non-ionic surfactant for best effect.

Application timing. Optimizing timing is confusing because some of the newer materials are different from the older products. Materials with strong postemergent activity (Callisto, Sandea, Stinger) need to be applied to emerged weeds for best control, but label restrictions need to be followed. Others can only be applied prior to bud break (Chateau, Velpar). Fig. 3 should help determine application timing. Time herbicide based on plant development, not calendar dates.

Herbicide combinations are often needed for control of a broader range of weeds. Combining herbicides with different modes of action (see Table 2) also reduces the potential to develop resistant weed populations. Growers should work with the newer products

Table 2. Common modes of action of preemergent blueberry herbicides	
Herbicide	Mode of action
Karmex, Princep, Sinbar, Velpar	Inhibit photosystem II
Casoron	Inhibit cellulose synthesis (cell walls)
Sandea	ALS Inhibitor
Solicam	Disrupt carotinoid synthesis (pigments)
Surflan	Inhibit microtubules (cell division)
Devrinol	Inhibit VLCFA's (cell division)
Callisto	HPPD inhibitor (pigments)
Chateau	PPO inhibitor (disrupts membranes)

(Callisto, Chateau, Sandea, Stinger) to learn how they perform on their farms. These herbicides have different modes of action than the traditional blueberry herbicides such as Princep, Karmex, and Sinbar. As a result, they should be

helpful in discouraging development of herbicide resistant weed populations.

D I S E A S E M A N A G E M E N T

Scouting and management of mummy berry in blueberry

*Annemiek Schilder
Department of Plant Pathology
Michigan State University*

If you haven't been monitoring mummy berry mummies under your blueberry bushes, now is the time to do so. It is advisable to scout in "hot spots" first, especially wet areas and close to the woods. Due to heavy snow cover over the winter and wet spring, an early crop of apothecia is ready to shoot ascospores into the air and cause shoot strike infections (if green tissue is present). Mummy berry mummies look like tiny black pumpkins (about 3/8 inch in diameter) and may be partially embedded in the soil or located underneath leaf litter. Germinated mummies have small brown finger-like projections that develop into apothecia that look like small brown trumpets or

goblets. There can be anywhere from one to six or seven apothecia on a mummy. Germination is heavily influenced by soil moisture. During a very wet spring, we have measured up to 40% germination in high pressure sites, and 2011 may fall into that category. In dry fields or dry years, less than 5-10% of the mummies germinate. It appears that mummies can survive at least two years if they have not germinated, but once they germinate, they die.

Apothecia are now visible in many fields with a history of mummy berry at this time and range from barely open to almost 1/4 inch in diameter in the most advanced sites. Remember that the larger the apothecial cup, the greater the number of ascospores released and the higher the infection risk. Also, the more apothecia occur per unit area, the greater the infection risk.

In 2010, we set up mummy berry "nurseries" on various Michigan farms. We used metal duct connectors and pushed them 3/4 down into the soil to

provide a barrier to keep mummies from being washed or blow away. However, a barrier can be made of any suitable material, provided that water can flow freely through the soil and the rim is not so high as to cause shading or modify the environment. It may not even be necessary to provide a barrier if the mummies are not at risk of being disturbed. Fifty mummies were collected after harvest when they were still light in color and easy to see and were placed in the enclosure in a part of the field that is conducive to mummy berry. Mummies were lightly pushed into the soil surface. Two nurseries were set up per farm if sufficient mummies were found. We are reporting on their development on a weekly basis until they are spent. Already, the nurseries are proving to be very convenient as they preclude the need to scout for apothecia for a long time.

For management of mummy berry, there are various options. First is it important to ascertain that there are apothecia that are large enough to shoot

For management of mummy berry, there are various options. First is it important to ascertain that there are apothecia that are large enough to shoot ascospores (> 2 mm or roughly 1/16 inch) in the field and that green leaf tissue is present. If you saw shoot strikes or mummified berries in the field last year, it is safe to assume that there are apothecia or apothecial initials. If there are infected wild bushes nearby or neighboring fields that have mummy berry, there is also a risk of infection since the ascospores are windborne, and potentially can travel at least a mile on the wind (however, there is a dilution effect, so the numbers that reach neighboring fields tend to be low). The wettest sites or areas in the field are at the highest risk. Dormant sprays with lime sulfur appear to suppress the development of functional apothecia, and a ground spray of urea can burn apothecia if they are present. Protective fungicide sprays can prevent shoot strikes, which are the primary infections.

The most effective products are the systemic fungicides Indar (fenbuconazole) and Orbit (propiconazole). These should be applied before or immediately after an infection period (see article by Mark Longstroth). Frost can predispose shoots to infection, and fungicide sprays applied within 24 hours of a frost are advised if the plants are not protected already with an effective fungicide. The protectants Serenade (*Bacillus subtilis*; add Nu-Film-P adjuvant), Captevate (fenhexamid + captan), Omega (fluazinam) have can be used as alternate fungicides and are rated as good against mummy berry shoot strikes. Bravo (chlorothalonil), and Ziram (ziram) are moderate to good. In addition, the product Regalia (giant knotweed extract) induces natural resistance in the plant to mummy berry infection and can be used to tank-mix with or in alternation with other fungicides. For prevention of the secondary disease stage (fruit infection), the most effective materials are Indar,

Pristine (pyraclostrobin + boscalid), and Omega. Pristine and Omega also provide good control of anthracnose fruit rot and Phomopsis twig blight.

Understanding mummy berry shoot strike infections helps achieve control

Mark Longstroth¹ & Annemiek Schilder²
¹MSU Extension

²Department of Plant Pathology
 Michigan State University

Plant diseases often have unusual lifestyles. Mummy berry needs to infect blueberries twice every year to survive. Initially spores from the overwintering mummies need to infect the new growing shoots. Then spores from the shoot strikes need to infect the flowers and fruit to form the overwintering mummies.

The overwintering mummies need moisture and a cold period of at least 900 to 1,200 chill hours (hours with temperatures between 32° and 45°F [0° and 7°C]). This range is similar to the chilling required by blueberries to complete their winter dormancy. This ensures that the host and the disease



Fig 4. Mummy berry trumpets near Covert on 25 April. The largest trumpets are over 1/4 inch in diameter, they will release spores in approx. 2 weeks; Photo: M. Longstroth.



begin growth together in the spring. Wet winters and especially snow cover increase winter survival of the mummies. The winter of 2010-2011 looks to have been very good for mummy survival.

In early spring, the overwintering mummies in blueberry fields sprout trumpet-shaped fruiting bodies called apothecia, or more commonly mushrooms or trumpets. Mummies can produce up to ten trumpets in a season. In Southwest Michigan blueberry fields tiny initials are emerging from the mummies. As the tips of the apothecia expand to 1/12 inch (2 mm) in diameter, they start to eject ascospores into the air. As apothecia expand, the number of

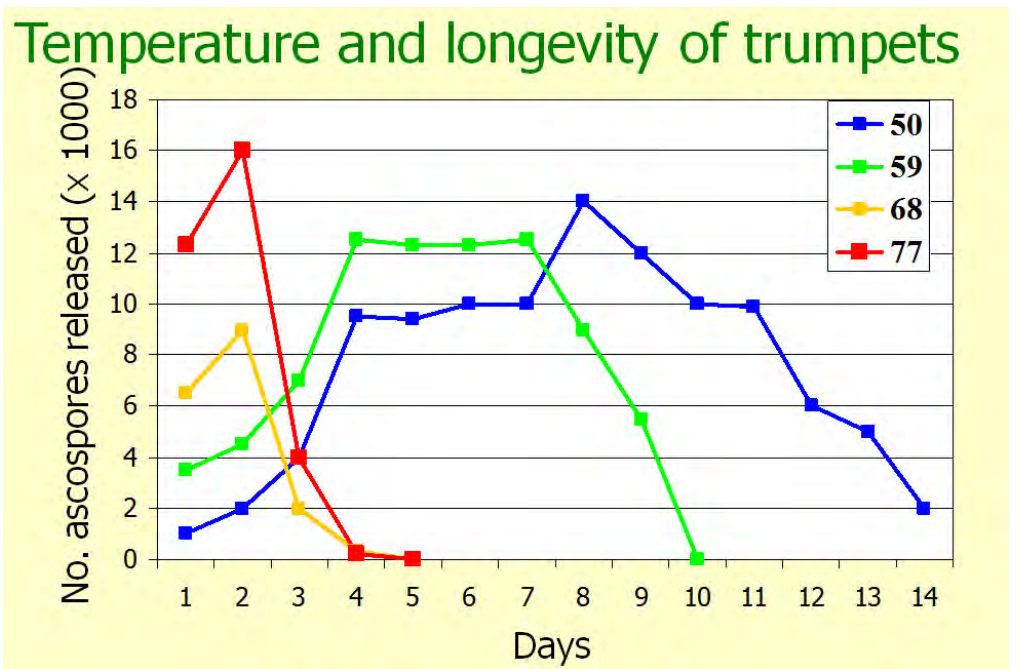


Fig 5. Mummy berry trumpet longevity at different temps (from Wharton and Schilder).

spores released increases. Apothecia can persist for three weeks under cool conditions, but persists for only a week under warmer temperatures. The cool wet weather this spring has been great for trumpets and terrible for growers trying to apply protective sprays. The forecast for the foreseeable future is for a cool wet spring. You can expect average temperatures in the 50s and long lived trumpets.

As the leaf buds expand, exposing green tissue, they become susceptible to infection by ascospores from the apothecia. Ascospores are discharged at any time and depending on wind speed, temperature and relative humidity. Ascospores tend to be discharged in the late morning when relative humidity drops and wind speed picks up. The ascospores are carried to the expanding buds by air currents and need free water for germination. The leaf tissue must be long enough for the fungal spore to sprout and infect the young tissue. The optimum temperature for infection is 57°F (14°C). At 57°F, with adequate moisture, germination and infection can occur within 4 hours. At 36°F (2°C), at least 10 hours of leaf wetness are required for infection.

Young leaf tissues are susceptible to infection from about a quarter inch green. Leaf tissues are more susceptible to infection after exposure to freezing temperatures. This susceptibility can last for up to 4 days after the freeze event.

The number of shoot strikes in a field is often related to the number of apothecia in the field. Lots of mummies and trumpets means lots of shoot strikes. Since the ascospores are dispersed by the wind they can move a good distance from the apothecia and spores can blow in from neighboring fields or from escaped bushes around the field. Growers should monitor their fields for mummy berry trumpets and watch the weather to anticipate disease infection periods.

It is possible to use the [Enviroweather](#) website to monitor for mummyberry

Table 2. Risk of mummy berry shoot infection under different temperatures and leaf wetness durations in lowbush blueberry.

Wetness Duration (hours)	Mean temperature during wet period				
	35F	43F	50F	57F	65F
2	0	0	0	0	0
4	0	0	0	0	0
6	0	Low	Low	High	High
8	0	Moderate	High	High	High
10	Moderate	High	High	High	High
15	Moderate	High	High	High	High
24	High	High	High	High	High

Data courtesy of Paul Hildebrand, Ag Canada, Nova Scotia

infection. There is no specific mummy berry model in the blueberry section. Growers should use the [Multi-Crop Disease Summary](#) tool in the fruit section of MSU’s website, [Enviroweather](#). This tool reports the hours of wetness and the average temperature during the wetting for all the stations in the region. It can be used to estimate the hours of wetness and the duration of a wetting even on your farm. This allows growers to determine the disease risk during or soon after wetting events.

Fungicide update for blueberries

*Annemiek Schilder
Department of Plant Pathology
Michigan State University*

There are various trends in crop protection worldwide that are changing the landscape for fungicides. Several years ago, the threat of soybean rust, an invasive disease of soybeans, speeded up the review of sterol inhibitor (SI) fungicides by the EPA. While there are several new sterol inhibitors in the pipeline for blueberries, none have been labeled yet. A fungicide that is expected

to become registered for blueberries later this year is **Quash** (metconazole), which in blueberry trials in Michigan had good to excellent activity against mummy berry and anthracnose fruit rot and will likely have activity against leaf rust. Another product in the pipeline is **Proline** (prothioconazole) which is also expected to have efficacy against mummy berry and leaf rust. The newer SI’s will likely have a shorter pre-harvest intervals than Indar and Orbit, facilitating their use later in the growing season, e.g., for leaf rust control. Growers may also have noticed that some fungicides containing metals, like copper, have become more expensive – one of the reasons is the increasing price of copper and other mined metals worldwide. Furthermore, the availability of natural fungicide products, including biological control agents (e.g., Serenade) and plant extracts (e.g., Regalia, Sporan), has been steadily increasing. This has increased the number of disease control options for organic producers.

Generic fungicides are now becoming more common since the patents have run out on a number of older fungicides. In order to extend fungicide patents, some companies have also started

Brand name Product	Active Ingredient	Generic Products
Aliette	fosetyl-Al	Legion
Aliette	phosphites (same breakdown product as fosetyl-Al)	ProPhyt, Phostrol, Agri-Fos, Rampart, Fosphite, Fungi-Phite, Topaz
Bravo	chlorothalonil	Chlorothalonil, Chloronil, Echo, Equus
Orbit	propiconazole	Bumper, PropiMax, Propiconazole E-AG, Amtide Propiconazole
Ridomil	metalaxyl	MetaStar, Metalaxyl

developing pre-mixes of different fungicide active ingredients. Generic products by law have to have the same amount of active ingredient as the original fungicides. However, they may have different inert ingredients or different formulations.

Generic products may be more economical than brand name products, but most have not have been separately evaluated in Michigan and may not be specifically recommended in the E-154 Fruit Management Guide. However, they are described in the “Fungicides and Bactericides for Fruit Crops”

section. For more information on individual products, you can check out their labels and material safety data sheets on the following website: www.cdms.net. Generic products are expected to be similar in disease control efficacy to their brand name counterparts. However, there may be minor variations in efficacy, behavior or even potential phytotoxicity due to different formulations.

Read the fungicide label carefully as you would for any new product. Do **not** assume that the labels of generic products are exactly the same as the

brand name fungicides that you are used to. Sometimes there are differences in the crops that the product is labeled for or in the label instructions or restrictions. An example of this is Iprodione, which is labeled for blueberries, whereas the brand name product Rovral is not. The table below lists generic products of common fungicides.

2011 Grower Events

April 28

6-8PM

**Location: Lake Michigan College - South Haven Campus,
Room 141, 125 Veterans Drive, South Haven**

\$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

May 5

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 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.

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