M I C H I G A N

Blueberry Newsletter

A newsletter from Michigan State University for the Michigan blueberry industry

April 27, 2010 Volume 4, Issue 4

MICHIGAN STATE UNIVERSITY

News you can use

Frost warning. Tonight's temperatures are to fall just below freezing.

Disease management. Monitor mummy berry apothecia and shoot strikes and consider a fungicide application to protect shoots and flowers from infection. Frost enhances leaf infection by the mummy berry fungus if at least 6 hours of leaf wetness occur within 4 days following a frost event.

Insect management. Put up Cherry fruitworm traps if you haven't done so already; Continue to monitor cherry fruitworm traps. Plan to put up Cranberry fruitworm traps in the next couple of weeks. Also, continue to scout for shoot damage by early-season leafrollers and beetles.

Blueberry Meeting this Thursday. A pre-bloom blueberry grower meeting is scheduled for the evening of April 29, 6 to 8 PM, at Cornerstone Ag. Cornerston Ag is located at 01240 57th Street, north of Phoenix Rd., east of Grand Junction.

Bluecrop at trace bloom in Grand Junction

Bluecrop at pink bud in Holland

Crop development. In Van Buren County, Jersey in Covert is at pink bud, and the first flowers on Bluecrop and Blueray in Grand Junction are starting to open. In Ottawa County, Blueray in Holland, and Rubel and Bluecrop and West Olive are at pink bud.

GROWING DEGREE DAYS — From March 1

	2010		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
4/19	419	218	234	95
4/26	497	255	327	154
Projected for 5/3	591	309	427	208
West Olive, MI				
4/19	351	165	165	58
4/26	422	197	234	97
Projected for 5/3	521	253	314	135

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

Using sprinklers to protect blueberries from freezing temps

Many Michigan growers use sprinkler systems to protect blueberry flowers from spring freezes. Sprinklers are very effective under certain circumstances but can actually increase injury if used at the wrong time. Sprinklers used for irrigation do not protect below 23-24°F. If the system fails due to cold or wind the blueberries will get much colder than in areas where you are not sprinkling. When you use sprinklers to prevent freezing injury, you are using the energy that water releases when it freezes, and changes from a liquid to a solid, to keep the temperature in the ice right at the freezing point 32°F. As long as you keep the ice WET, the ice temperature will stay at 32°F. If the ice dries out and water starts to evaporate from the ice the ice will get colder than the air temperature as it evaporates.

Protection with sprinklers. If you understand that you need to keep the ice wet, and when your system will fail to keep the ice wet, you will understand how to use your sprinklers to prevent freeze injury. The freeze protection from sprinkler systems is limited by the irrigation rate. Most sprinkler systems in Michigan blueberries are designed to provide about 0.12 to 0.15 inches of water per hour. This volume protects plants to about 22° F with no wind or 24° to 25° F with a light wind. More water is needed to protect at lower temperatures and higher wind speeds, see Table 1.

Most irrigation systems cannot easily be changed to deliver more water and protect to lower temperatures. Increasing the operating pressure is not advisable because the volume is not increased substantially (You need to increase the pressure 4 times to double the output). Higher pressure can break lines and reduces the uniformity of application. Larger nozzles can be installed in some systems, but only if the capacity of the system, mainlines, well and pump can handle the added volume. For example, 9/64-inch nozzles that deliver 0.12 inches water per hour require 60 gallons per minute per acre of blueberries. Switching to 5/32-inch nozzles would deliver 0.15 inches per hour but requires 68 gallons per minute per acre. Irrigation systems are not designed to apply enough volume to protect from temperatures in the low.

Critical temperatures. Growers should only use sprinklers to protect blueberry from freezing, at around bloom time.

Table 1. Irrigation rate (inches/hr) needed to protect fruit buds under different wind and temperature conditions.

Temperature (°F)	Wind speed (mph)		
	0-1	2-4	5-8
27	0.10	0.10	0.10
26	0.10	0.10	0.14
24	0.10	0.16	0.30
22	0.12	0.24	0.50
20	0.16	0.30	0.60
18	0.20	0.40	0.70
15	0.26	0.50	0.90

From: Univ. of Florida Ext. Circ. 287

The temperature range where sprinkler can protect the crop is relatively narrow from 24 to 32 F. This narrow temperature range is also the range that will hurt blueberry open flowers. When blueberries begin to grow in the Spring the buds can handle very cold temperatures. Swollen buds can tolerate 15-20° F. The lower end of the range is where almost all the flowers are killed and the upper end is where damage begins to occur. At "early pink bud" (individual flowers are visible in bud), injury occurs between 18° and 25° F. These are temperatures colder than you can protect to with an irrigation system. In "late pink bud", when the flowers have separated in the cluster but the flower petals are still closed, 25-28° F is lethal. This is in the range where we can protect but if there is a wind or the temperature gets a little colder than predicted we could cause more damage than if we had not turned on the system. Once we turn on the system we need to keep it on until the temperatures are above freezing or you will cause a lot of damage as the temperature of the ice goes down colder than outside the irrigated area.

It is because of this narrow margin of error that I recommend that growers only try to protect at bloom when the temperature range that will cause damage is well inside the range that we can protect to with an irrigation system. Fully open flowers are killed between 28° and 31° F. Right after bloom when the petals fall, is the most sensitive, 31° F will damage green fruit. If the temperature gets colder or if it is windy, we have a safety margin and our system can still protect the blueberries. If we were operating the system at the edge of its effectiveness it is more likely to fail. Dr. Mike Mainland of North Carolina State says that he would not turn on a frost protect system in blueberries unless there were open flowers in the field.

Table 2. Starting temperature for overhead sprinkler freeze protection based on dew point of the air.

Dew point	Start irrigation at
26F	34F
25 to 24	35
23 to 22	36
21 to 20	37
19 to 17	38
16 to 15	39

When to turn on the System

Once you have looked at the field and see open flowers and checked the weather and see that the temperature is supposed to get down to 26° F. You need to decide if you are going to turn on the system that night. I would not turn on the system if the temperature were forecast to fall below 24 F. If windy conditions (more than 10 MPH) were forecast I would not turn on the system at all. When you turn the system on and start to irrigate the air temperature will fall in the field. This is because the water is evaporating and cooling the air. The dryer the air, the greater the temperature falls. How dry the air is will dictate when you turn the system on. This can be calculated from the dew point, which is measured with a wet bulb thermometer or a sling psychrometer.

Once you start the system it is necessary to keep it running until the ice starts to melt on its own. If your system fails and the ice dries out and begins to evaporate it will change from a blueberry heating system to an effective refrigeration system that can significantly reduce your crop. As long as water drips from the ice the system is working. If the ice is clear, this indicates the system is working properly and the water is freezing uniformly.

When can I stop irrigating? Stop irrigating when the ice is melting and temperature is rising. Ice breaking free from branches indicates water is forming under the ice and it is likely safe to quit. Normally this is when temperatures are above freezing and rising. Beware of sudden dips in the temperature soon after sunrise.

Mark Longstroth
Michigan State University Extension

Table 3. Critical temperature ranges for blueberry buds in Michigan.

Stage	Temperature range (°F)
Bud swell	10-15F
Bud burst	15-20F
Tight cluster	20-25F
Early pink bud	23-25F
Late pink bud	23-25F
Early bloom	25-28F
Full bloom	28F
Green fruit	32F

From: A pocket guide to IPM scouting in Highbush blueberry (Michigan State University Extension bulletin E-2928); adapted from "Blueberry freeze damage and protection measures", North Carolina Horticulture Information leaflet 201-E.

Potential frost event tonight!

The cool dry air that blew in yesterday (4/26/2010) will be around for the next two days. Yesterday and last night were windy so we had no radiation frost this morning. The big question is will the wind die tonight? This morning we do not have a good answer for that. If the wind dies then we can expect the temperatures will fall relatively rapidly to the dewpoint (frostpoint below freezing?). Dew points are expected to fall into the mid-20s by tomorrow morning so if the wind dies we can see temperatures to 25F again as we saw Monday, April 19.

Bluetta and other early varieties are blooming and would be hurt be temperatures below 29.

Bluecrop is just starting to bloom and open buds would be hurt by temperatures below 28, but most closed buds should be able to withstand temperatures to 25F and less developed flowers may be able to go as cold as 23F.

Jersey and other later varieties which are not as developed should be take those temps near 24F with little damage.

Tonight would be a good evening to run frost fans. The conditions are such that blooming fields should probably be protected if the wind dies. Less developed fields may not need protection, even if the wind dies. Focus your efforts on the most developed fields. Leaf buds will not be hurt by the low temperatures we expect.

Mark Longstroth
Michigan State University Extension

First mummy berry shoot strikes spotted

This week mummy berry shoot strikes were observed at two of our scouted plots in Southwest Michigan (Grand Junction and West Olive) as well as at two other locations (Bangor and Benton Harbor). The incidence of these infections was relatively low at both sites (< 1 shoot strike on average per bush) (Figure 1). These shoot strikes are likely the result of ascosporic infections during rainy weather occurring between April 7-13. In addition, frost damage was observed at our Holland site (Figure 2), which looks noticeably different from a shoot strike because of the lack of sporulation, and the localized necrosis at the leaf tip as opposed to the veins. Because of the latent nature of mummy berry ascospore infection (12-14 days after infection before symptoms become apparent), shoot strike symptoms will increase, so be on the lookout for shoot strikes in the next two weeks. Shoot strike symptoms consist of wilting of developing leaves and shoots with a browning of the midribs and lateral leaf veins, often described as an "oak leaf" pattern of necrosis. Under humid conditions, gray spore masses will develop on these infected shoots. These spores (conidia) then get carried to the flowers by bees and other pollinating insects as well as wind and rain, which leads to infection and mummification of the fruit later in the growing season. Therefore shoot strikes that occur during full bloom are the most significant for fruit infection. Since most of the scouted plots are entering bloom, if shoot strikes are observed and open blossoms are present, protect the blossoms from infection with a systemic fungicide application (e.g., Indar or Pristine). Leaf wetness is not needed for flower infection. In fact, good pollinating weather is also conducive to flower infection.

Fig 1. First shoot strike of the season observed near West Olive on 4/26; *Photo: T. Miles.*

Apothecia present but diminishing

The percentage of germinated mummies and apothecia dropped in all sites, most likely due to the dry weather we have been experiencing over the last week. The highest number of apothecia was found at the West Olive site, averaging 14.1 apothecia per bush (Figure 3). As was observed last week, many of the

Fig 2. Frost damage on blueberry leaves near Holland on 4/26; *Photo: T. Miles.*

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Fig 3. Mummy berry apothecia near West Olive on 4/26; *Photo: T. Miles.*

Table 1. Mummy berry ratings at the four scouted sites, April 2010.

Farm	Date	% Germinated mummies**	Avg number of apothecia on the ground*	Max apothecia cup diameter (mm)	Avg number of shoot strikes per bush*
		VAN BUREN COUNTY			
Covert	4/18	0	0	n/a	0
	4/26	0	0	n/a	0
Grand Junction	4/18	12.5	22.1	9	0
	4/26	4.4	7.6	6	0.5
		OTTAWA COUNTY			
Holland	4/18	7.8	0.6	5	0
	4/26	0	0	n/a	0
West Olive	4/18	40.6	39.1	11	0
	4/26	18.3	14.1	9	0.9

**Average of 10 bushes; **Number of germinated mummies divided by the number of total mummies on 4/12.*

apothecia were dry in appearance, probably due to limited precipitation and warm temperatures. We had suitable conditions for shoot strike infection this past weekend (April 24-25) and there may be a short window yet today to still apply Indar or Orbit as a curative spray today for infections that occurred over the weekend. If apothecia are still present in the field, there will be another risk of shoot strike infection later this week because rain is in the forecast, and temperatures are predicted to be between 50 and 70°F in the daytime. Also, predicted frost events will increase shoot susceptibility to infection for up to four days after the frost event. This week growers should continue to scout for mummy berry apothecia and consider fungicide treatment for prevention of shoot strikes before or immediately after a wetting period. For more information about mummy berry symptoms, biology, and management practices, check out the Mummy Berry Fact Sheet (http://web2.msue.msu.edu/bulletins/Bulletin/PDF/E2846.pdf).

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

2010 Virus survey

The Small Fruit Pathology lab at MSU is conducting a survey of the current state of blueberry virus problems in Michigan. We are offering to test, for free, blueberry plants that are exhibiting unusual symptoms that might be caused by a virus. **We will be ready to receive samples at the following twilight grower meetings: April 29, May 6, June 10 and June 17. You are invited to bring samples from your blueberry planting that you would like to be virus tested.** We will be testing for blueberry shoestring virus, blueberry leaf mottle virus, tomato ringspot virus, tobacco ringspot virus, peach rosette mosaic virus, blueberry scorch virus, and blueberry shock virus. If you have samples you want tested, please do the following:

1. **Make sure it is a fresh sample (sampled within 24 hours of the meeting) and kept refrigerated until leaving for the meeting. Placing the sample in a zip-lock bag with a moist paper towel usually works well.**
2. **Be sure to take symptomatic tissue. If tissue is necrotic, be sure to also include green tissue taken from near the necrotic tissue.**
3. **Write your name and contact information, as well as the variety of blueberry, on the sample bag. Include any other information you think is pertinent (e.g. how long the problem has been seen, etc). If you use email, please include an email address.**
4. **Place tissue from only one bush in each bag but feel free to bring multiple bags.**

Questions? Please feel free to contact:
Jerri Gillett (Research Assistant)
Email: gillett@msu.edu
Lab phone: 517-355-7539

Remember to bring your samples to the meeting on Thursday!

Insect activity is low

Insect activity over the last week was low at the farms we scouted. The colder weather has reduced insect activity, so there is little to report. During scouting on April 26, no new feeding was detected in the fields we monitor. Warm temperatures are expected by Friday so growers should continue to check fields for feeding damage by leafroller, climbing cutworm, or spanworm during the next week.

***Fig. 4** (above): Hoplia flower beetle feeding damage and **Fig. 5** (below) spanworm feeding damage; photos: K. Mason.*

As of April 26, no cherry fruitworm moths have been caught at any of the farms we scouted. We expect the flight for this pest to begin in the next week, so growers and scouts should set traps for cherry fruitworm as soon as possible to assure accurate timing of the beginning of flight. Cranberry fruitworm traps should be set next week. Traps should be checked twice weekly until moths are caught consistently to identify fields with pressure from these pests and the timing of the biofix for predicting optimal spray application dates.

We are still catching the contaminant moth, Pseudexentera vaccinii in cherry fruitworm traps. The contaminant moth is ~½ inch long which is much larger than cherry fruitworm which is ~¼ inch long. 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 Fig. 6 to help with identification.

Keith Mason & Rufus Isaacs
Department of Entomology
Michigan State University

***Fig 6.** Cherry fruit worm (TOP) and the contaminant found in cherry fruitworm traps, Pseudexentera vaccinii (BOTTOM); photos: K. Mason.*

Table 4. 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	4/19	0	--	--	--	--
	4/26	0	--	--	--	--
Grand Junction	4/19	0	--	--	--	--
	4/26	0	--	--	--	--
			OTTAWA COUNTY			
Holland	4/19	0	--	--	--	--
	4/26	0	--	--	--	--
West Olive	4/19	0	--	--	--	--
	4/26	0	--	--	--	--

Pollinating highbush blueberries

Pollination is an essential input to profitable blueberry production. Other things being equal, well-pollinated fields have larger berries, higher yields, and more even ripening than fields with sub-optimal pollination. This article focuses on pollination of northern highbush blueberry, *Vaccinium corymbosum*, which is the species grown in northern states and provinces.

Across this blueberry industry, most pollination is by honey bees that are brought to fields in hives. Bumble bee colonies can also be purchased for placement in fields, and there are many other wild native bee species that nest in and around crop fields. By combining these pollinators into an Integrated Pollination Management strategy, the risk of poor pollination may be minimized.

Pollen is moved by bees. For pollination to occur, sufficient blueberry pollen must be moved from the male part of flowers (anther) to the female part (stigma) while the flowers are receptive. Bees are responsible for this movement of pollen, so blueberry pollination depends on having enough bees active in the field during bloom to

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deliver pollen. Each flower must be visited once by bumble bees or most native bees or three times by honey bees to grow to maximum size. There are millions of flowers per acre in a productive blueberry field, so there is a lot of work for the bees to do!

The pollen produced by blueberry flowers doesn't waft on the wind, and it is held inside the flower by salt shaker-like structures called anthers until bees visit. They may release the pollen by jiggling the flower with their legs, as is the case for honey bees. Bumble bees and some other native bees are better adapted to release the pollen using a vibration behavior. As the bees move from flower to flower, pollen grains are deposited on the tip of the stigma. Once compatible pollen is deposited on the stigma it germinates and fertilizes the ovules which produce the tiny seeds. Fertilized seeds stimulate berry growth, leading to larger berries.

Before planting: parthenocarpy, self-compatibility, and inter-planting. Northern highbush cultivars have some degree of parthenocarpy, producing berries even without pollen deposition. However, these berries will be small, slow to ripen, may drop off, and most would not be considered marketable. Many popular northern highbush blueberry cultivars are self-fruitful, meaning they can be fertilized by pollen of the same cultivar. This is one reason why solid blocks of Bluecrop are highly productive. In other cultivars, such as Nelson, cross pollination (from another cultivar) is essential for full pollination and yield, achieved by bees moving pollen between cultivars as they fly from row to row. In this situation, planting fields with alternating blocks of co-blooming and compatible cultivars ensures cross-pollination. While alternate rows of two compatible cultivars would be the best for cross-pollination in this situation, alternating blocks of up to 10 rows will typically allow enough exchange of cross-compatible pollen for good fruit set and yield. There is a range of dependence on cross pollination across highbush blueberry cultivars, so before selecting cultivars and their planting arrangement growers should check the level of self-fruitfulness with your nursery.

Using honey bees

Wait until bloom has started to bring in bees. Flowers of blueberries are generally less attractive to honey bees than other flowers due to the relatively low nectar reward. Because of this, it is best to bring in bees once the crop has started to bloom so that bees forage more on blueberries than other flowers. If brought in too early, bees will learn to forage elsewhere (such as dandelion) reducing their focus on your crop fields. Under warm spring conditions, highbush blueberry flowers are viable for 3-4 days after the flowers open, so it is best to move bees into blueberry fields after 5% bloom but before 25% percent of full bloom.

Renting healthy colonies. If you are renting honey bee hives, you should receive healthy and vigorous bees. A healthy colony contains around 30,000 worker honey bees and will have six frames of brood. Having weak hives will affect how much pollination the fields receive, so it is worth taking time to ensure you have strong hives. If you suspect weak colonies, talk to your beekeeper about whether they can supply additional hives or replace the weaker ones. One strong hive of 40,000 bees will provide better pollination than two 20,000 bee hives. One way for growers to ensure they receive strong colonies is to establish a pollination agreement that lays out the grower's expectations. This can include the strength of the colonies and how quickly the colonies will be taken out of the field after bloom. An example contract is available online at www.maarec.psu.edu/pdfs/Pollination_Contract.pdf

Stocking densities. Feral colonies of honey bees and abundant native bee populations used to contribute to blueberry pollination, especially in fields near woods. However, mite pests have decimated the numbers of feral honey bee colonies, and many farms do not provide habitat for native bees to survive in high abundance. This makes fruit production more dependent than ever on managed bees, so it is important to stock fields with sufficient bees to supply enough visits to flowers. Research and experience in blueberries has shown variation across northern highbush cultivars in their needs for bee pollination (Table 1). If fields are managed for maximum production and have higher flower densities and yield, increased levels of honey bee stocking may be needed, especially since feral honeybees are no longer present to provide 'insurance'. While Table 1 shows 2.5 hives per acre as the highest level, recommended for Jersey and Earliblue, some growers are using even greater stocking densities to ensure good pollination. This is partly because they consider additional bees a good investment to make sure they get maximum potential yield, even if spring weather is cool and there are only a few good days for honey bee activity. A good rule of thumb is that you'll need 4 to 8 honey bees per bush in the warmest part of the day during bloom to get blueberries pollinated.

Table 4. Recommended stocking density of honey bees for highbush blueberry pollination.

Variety	Honeybee hives/acre
Rubel, Rancocas	0.5
Weymouth, Bluetta, Blueray	1.0
Bluecrop	1.5
Elliot, Coville, Berkeley, Stanley	2.0
Jersey, Earliblue	2.5

Hive placement. If possible, place the colonies in sheltered locations with the entrances facing east. This will encourage earlier activity as the hive warms in the morning sun. Hives should be spread out around the farm to maximize floral visitation, with a maximum of 300 yards between hives.

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Using bumblebees. Bumble bees are very efficient at pollinating blueberry, with activity at lower temperatures than honey bees, faster visits to flowers, and higher rates of pollen transfer per flower visit. A bumble bee species native to eastern North America, *Bombus impatiens*, has been reared for use as a crop pollinator. Our recent evaluations with this species in commercial Jersey fields found they provided comparable yield and fruit set when compared with honey bees. These insects are available commercially and can be shipped directly to the farm, but orders need to be placed well in advance of bloom to guarantee delivery. Rearing bumble bees takes time so orders should be made 14-16 weeks in advance to guarantee delivery. Koppert is one supplier based in Michigan that provides the bees in Quads, each containing four colonies housed within a weather-proof box.

One Quad per acre is a good starting density if using bumblebees alone, but growers may also purchase bumble bees to integrate with honey bees, thereby diversifying pollination sources. This approach should help ensure movement of pollen between flowers during conditions that are unsuitable for honey bees. Place Quads through the farm and be sure they are placed away from honey bee hives, so that honey bees don't rob the nectar from the colony. Unlike honey bees, bumble bees can be moved if needed during bloom. A door on the box of the Quads can be used to collect the bumble bees during a day, thereby allowing them to be moved if needed during during spraying. This also provides the flexibility for them to be moved to later blooming cultivars in the farm, or to other later crops such as cranberry where they can continue to provide pollination.

Native pollinators. In our recent studies at MSU, over 150 native (wild) bee species were found in Michigan blueberry fields. About ten of these were sufficiently abundant during bloom and carried enough blueberry pollen to be considered valuable crop pollinators. Most of these are solitary ground-nesting digger bees in which the female bee tunnels into the soil, lays an egg in a side tunnel then collects pollen that is placed in a ball next to the egg as food for the larva. This process is repeated multiple times for the many eggs that each female bee lays while blueberries are in bloom. These bees need undisturbed soil and they sometimes nest underneath blueberry bushes in the weed-free strip. Other native bees such as bumble bees are active through the whole season. These species also need undisturbed soil to nest in abandoned rodent burrows or grass tussocks, but they can also use old mattresses, compost piles, and other protected sites with small entrances.

In small blueberry fields surrounded by diverse landscapes, native bees can provide the majority of pollination. However, as blueberry farm size and intensity increase, the high abundance of flowers that open in a short period of time and the small amount of natural area near to fields results in too few native bees for full pollination. Consequently, growers rent honey bee colonies or they raise them themselves. By creating bee habitat that includes a mix of plants that bloom before and after blueberries, growers can help support native bees as part of an Integrated Pollination Management strategy. For more on native plants to support pollinators, visit www.nativeplants.msu.edu. You can also download a free copy of Conserving Native Bees on Farmland from MSU Extension at web2.msue.msu.edu/bulletins/Bulletin/PDF/E2985.pdf for more information on strategies that can fit into your farm. Every little bit of habitat will help, so consider this a long-term process of building bee habitat back into the farm landscape. Currently, the Farm Service Agency is providing a generous cost share for growers in West Michigan interested in establishing pollinator habitat in their farms. See your local FSA or NRCS office for details.

Pest management during pollination. To protect pollinators, do not apply broad-spectrum insecticides when blueberry flowers are open. By monitoring for pest problems carefully during bloom, growers can help minimize the need for pest control. If an insecticide application is necessary during bloom, the compounds that are least toxic to bees should be used, with careful observation of the pollinator restrictions on the label. Two insecticides that can be applied during bloom for control of moth larvae in blueberry are products containing *Bacillus thuringensis* (Bt), and the insect growth regulators Intrepid and Confirm. Inform the beekeeper 2-3 days before application so that precautions can be taken to minimize bee exposure. Make applications when bees are not foraging: late evening application is better than morning application because the insecticide has time for the residue to dry before bees are active. Dust formulations must be avoided because particles can be picked up easily by the bees' hairy bodies. More information and a list of chemicals with their toxicity to bees is available from a recently-updated extension bulletin from Oregon State University at extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf

Summary

Pollination is an essential part of growing blueberries. Getting high levels of fruit set and large berries requires bees to deposit enough pollen on stigmas during bloom. Across most of the commercial blueberry industry, honey bees are the main source of pollination, providing intense activity during warm weather. There are other important pollinators, including managed and wild bumble bees and many other species of wild bees that have wider ranges of activity in response to light and temperature. These bees should be considered as part of an integrated pollination strategy to help insure pollination in a variable range of conditions during bloom. As with pest management, reliance on one strategy may not be the most sustainable approach to pollination, so diversifying the sources of pollination can spread risk to ensure consistent pollination every spring.

Rufus Isaacs
Department of Entomology, MSU

Rimon 0.83EC label expanded

Insecticide 2010 label expansion
The Rimon 0.83EC (novaluron) label was expanded to cover peaches, plums, blueberries and pears in Michigan. Rimon is an Insect Growth Regulator (IGR) insecticide that acts by disrupting the generation of chitin in the insect exoskeleton. This prevents normal development of the insect larval instars and when in contact with eggs suppressing embryo-genesis. Rimon has no direct activity on adult insects, but hatching of eggs laid by treated adults will be suppressed, as well as larvae and nymphs via ingestion. Rimon is registered for use in apples and pears for the control of codling moth, leafrollers and pear psylla; peaches and plums for control of oriental fruit moth and leafrollers; blueberries for control of fruitworms, leafrollers and blueberry maggot. Rimon is safe on many beneficial insects, but should not be sprayed on blooming trees when bees are actively foraging. Rimon 0.83 EC is restricted in apples to 4 applications per season and 150 fl oz per acre per year; pears to 3 applications per season and 96 fl oz per acre per year; peaches and plum to 3 applications per season and 150 fl oz per acre per year; and blueberries to 3 applications per season and 90 fl oz per acre per year.

Compound: Rimon 0.83EC

Label Change/Addition: New labeled use

Crops and target pests:
Pears-Psylla, codling moth, leafrollers

Blueberries-fruitworms, leafrollers, maggot

Peaches/Plums-oriental fruit moth, leafrollers

John Wise
Department of Entomology
Michigan State University

2010 grower meetings

APRIL 29 6:00PM
Pre-bloom meeting - Van Buren County
Location: Cornerstone Ag.
01240 57th Street, Grand Junction
Information: Mark Longstroth, 269-330-2790

MAY 6 6:00PM
Pre-bloom meeting - Ottawa county
Location: Carini Farms
15039 Port Sheldon Rd., West Olive
Information: Carlos Garcia, 269-260-0671

JUNE 10 6:00PM
Pre-harvest meeting - Van Buren County
Location: to be determined
Information: Mark Longstroth, 269-330-2790

JUNE 17 6:00PM
Pre-harvest meeting - Ottawa County
Location: Carini Farms
15039 Port Sheldon Rd., West Olive
Information: Carlos Garcia, 269-260-0671

JUNE 24 6:00PM
Weed Control Demo - Allegan County
Location: Getzoff Farm
7093 116th St., Fennville
Information: Paul Jenkins, 517-648-5099

MICHIGAN STATE UNIVERSITY EXTENSION

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