M I C H I G A N

Blueberry Newsletter

A newsletter from Michigan State University for the Michigan blueberry industry

June 14, 2011 Volume 5, Issue 4

News you can use

Crop development. In Van Buren County, Jersey in Covert as well as Bluecrop and Blueray in Grand Junction is at early green fruit. In Ottawa County, Bluecrop in West Olive is at early green fruit.

Insect management. Cranberry fruitworm flight is increasing and cherry fruitworm egglaying has been observed. Aphid numbers are increasing, keep checking for aphids. Be ready to hang blueberry maggot traps in the next week.

Grower meeting this Thursday, June 16 @ 6PM. The meeting will be at A & L Farms, 11901 144th Avenue, in West Olive (1/2 mile North of M-45). This Blueberry IPM meeting features Annemiek Schilder and Rufus Isaacs. Dr. Schilder will focus on disease control after bloom and though harvest, including fruit rots, canker diseases and effective fungicide use. Dr. Isaacs will focus on insect control, including fruitworms, blueberry maggot, an update on spotted wing drosophila and effective insecticide use.

Bluecrop in Grand Junction

Bluecrop in West Olive

GROWING DEGREE DAYS

From March 1

	2011		Last Year	
	Base 42	Base 50	Base 42	Base 50
Grand Junction, MI				
6/6	1029	604	1319	793
6/13	1213	733	1484	904
Projected for 6/20	1387	851	1696	1059
West Olive, MI				
6/6	856	481	1175	675
6/13	1020	592	1329	775
Projected for 6/20	1200	716	1524	914

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

Southwest Report

Mark Longstroth
Michigan State University Extension

Last week began hot, with highs near 90. Winds late Wednesday gusted up to 40 miles per hour in higher sites. Thursday brought cooler conditions with highs near 70. Rains on Thursday and Friday brought between an inch and half an inch of rain. The rain and cooler temperatures moderated the plant water stress we saw at the beginning of the month. The top soil is drying out. Soil temperatures are in the mid-60s. We are close to normal fruit development.

Blueberry fruit are 10 to 12 mm in diameter and shoot growth continues in most fields. Growers need to protect against anthracnose fruit rot and fruitworms. Both cranberry fruit worm and cherry fruit worm were biofixed in late May or early June and controls should be on the fruit. Fruitworm infested fruit were found last Friday. Aphids are becoming easy to find. We are also seeing small blue fruit in some fields that has not dropped from the bush. It is unclear whether this fruit is diseased, a result of winter injury or just poor pollination.

Central Report

Carlos Garcia-Salazar
Michigan State University Extension
Ottawa County

Weather conditions in the Central Region have fluctuated during the last seven days. There were days with temperatures that reached the 90s but they returned to the low 70s. In general, the maximum temperatures were on average 73° F and minimum temperatures averaging 56° F. Rain on the other hand has been sporadic, with a maximum accumulation of 0.48 inches. So far, growing degree-day accumulation in West Central Michigan ranges from 998 to 1013 (base 42° F) and 558 to 584 (base 50° F).

Raspberries are in full development, summer raspberries are in the green fruit stage and fall raspberries are in the flower bud stage. We are seeing problems related with cane borers and foliar feeders and tarnished plant bugs. The most common cane borer observed is the redneck cane borer (Fig. 1) which causes cane collapse if uncontrolled.

Fig 1. Damage caused by the redneck caneborer in raspberries. ***Photo: Pam Fisher, OMAFRA, Canada.***

Problems associated with foliar feeders are caused by the raspberry sawfly (Fig. 2). These problems can be controlled with some of the recommended insecticides. For a complete list of products recommended please follow the 2011 Michigan Fruit Management Guide (MSU Extension Bulletin E-154).

Fig 2. Damage by raspberry sawfly in primo canes. ***Photo: Phil Pellitteri, UW-Madison.***

Early season and day-neutral varieties of strawberries are in the first harvest, Up-Picks are open in Allegan and Ottawa County. No major problems with insects or diseases have been observed.

Blueberries are in the green fruit stage. Again, most problems are associated with winter damage. Right now this damage is recognizable because affected bushes are showing shoots with abundant small fruits but few or no leaves at all. Fruits in those canes will turn blue and will not reach maturity. In fact, shoots showing these conditions will collapse later during the summer. They should be pruned to prevent cankers later on.

Regarding insect problems, we are finding fruit damage caused by cherry fruit worm and newly hatched cranberry fruitworm. Growers that missed the first application at the beginning of petal fall will start seeing some fruit damage. With respect to diseases shoot strikes are minimal, except in fields where mummy berry control was deficient. In addition, fields with mummy berry problems are already showing fruit damage. When cut in half, affected green fruits are showing the characteristic white fungal growth. This is the right time to conduct the first evaluation of the effectiveness of our mummy berry control program.

This week we are conducting our fourth Twilight Meeting. The meeting will be on June 16, 2011 at A & L Farms, 11901 144th Avenue, in West Olive (1/2 mile North of M-45). This Blueberry IPM meeting features Dr. Annemiek Schilder, Dr. Rufus Isaacs, and Dr. Schilder who will focus on disease control after bloom and though harvest, including mid-season disease control, fruit rots, canker diseases and virus diseases, as well as effective fungicide use. Dr. Isaacs talk will focus on insect control, including fruitworms, blueberry maggot, an update on spotted wing drosophila and effective insecticide use.

There is a $10 charge for these meetings, which include dinner and handout materials. Growers need to call the MSU Extension office in the county hosting the meeting they plan to attend so that meal arrangements can be made. Please RSVP by contacting Judy Hanson (616) 994-4548 or (hanson26@msu.edu).

Insect update

Keith Mason & Rufus Isaacs
Department of Entomology
Michigan State University

Bloom is over in the fields we scouted, and bees have been removed from most of the fields we visit.

Feeding by leafrollers has decreased over the past two weeks at the farms we scout, and the number of these pests observed should continue to diminish as growers apply insecticides to control fruitworms. Growers and scouts should continue to check fields for feeding damage by leafrollers during the next week. 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 (CFW) moths were caught at all of the farms we scouted, but the flight of this pest is almost over at the farms we scout in Van Buren County and past its peak at the farms we checked in Ottawa county. We expect the flight for cherry fruitworm to continue to end at southern Michigan farms in the next 7 to 14 days. Growers and scouts should continue to check cherry fruitworm traps until harvest. Cherry fruitworm eggs were first observed two weeks ago at the Grand Junction farm (31 May). We observed eggs at all the farms we monitored last week (6 June), and eggs were also observed this week at the farms we visited. Very little single berry damage (much less than 1% of berries with damage) was observed this week at all the farms we scouted. This damage is indicative of cherry fruitworm feeding or the early stages of cranberry fruitworm feeding (Fig. 3).

Cranberry fruitworm (CBFW) flight has picked up at all the sites we visit, and moths were caught at all those sites. We are approaching the peak of CBFW flight in Van Buren County and the flight of this moth should peak in 7 to 14 days in Ottawa County. No cranberry fruitworm eggs were observed, and no multiple berry damage (the result of continued feeding by cranberry fruitworm) has been seen yet this season. However the cranberry fruitworm model on enviroweather predicts egglaying for this pest is continuing.

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	6/6	2	30	5%	-	-
	6/13	2	86	20%	-	-
Grand Junction	6/6	2	18	40%	-	-
	6/13	2	35	45%	-	-
			OTTAWA COUNTY			
West Olive	6/6	6	2	30%	-	-
	6/13	3	8	40%	-	-

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

Fig 3. Early signs of feeding by fruitworms. Note hole in the berry and premature coloring.

We have seen an increase in the number of blueberry aphids at the farms we scout. We observed single aphids and colonies with 5 to 10 individuals (Fig. 4.). We are also seeing an increase in parasitized aphids and predators that eat aphids in the fields we scout. Growers and scouts should continue checking fields for aphids, and with the high levels of rain this spring there will be many vigorous young shoots for supporting aphid 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 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.

Fig 4. Search for aphid colonies on the underside of leaves on young shoots.

Growers and scouts should make plans to hang blueberry maggot traps in the next week to two weeks.

As of June 13th, no spotted wing drosophila (SWD) flies have been trapped. This issue of the Michigan Blueberry IPM Newsletter contains 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.

SWD Management Recommendations

Rufus Isaacs
Department of Entomology
Michigan State University

Background. The spotted wing Drosophila (SWD) is an invasive pest of berries, stone fruit, grapes, and some pome fruit crops. It is native to Asia but was detected in North America for the first time in California during 2008. Since then, it has spread throughout many of the primary fruit production regions of the United States. In Michigan, the first SWD were found after blueberry harvest in 2010. So far, it has been detected in 13 counties across the state (Fig. 5), and additional detections are expected as time progresses. For detailed fact sheets, identification guides, and how-to videos on monitoring for this pest, see the online resource at www.ipm.msu.edu/SWD.htm

SWD flies look similar to the many species of small vinegar flies that typically infest fruits and some vegetables in late summer. Unlike other vinegar flies, female SWD have a serrated ovipositor, or egg-laying device, used to cut a slit into the skin of intact fruit to lay their eggs. This makes SWD a more significant pest than the native vinegar flies that require damaged fruit to lay eggs. Soft skinned fruit such as blueberries, raspberries, and blackberries are at the greatest risk.

Larval feeding by SWD causes fruit to collapse and increases the risk of larvae being found at harvest time. Because this insect has already been found in major blueberry production regions of Michigan, it will be important to implement IPM programs in blueberry fields to ensure that the impact of this new pest is minimized. Effective

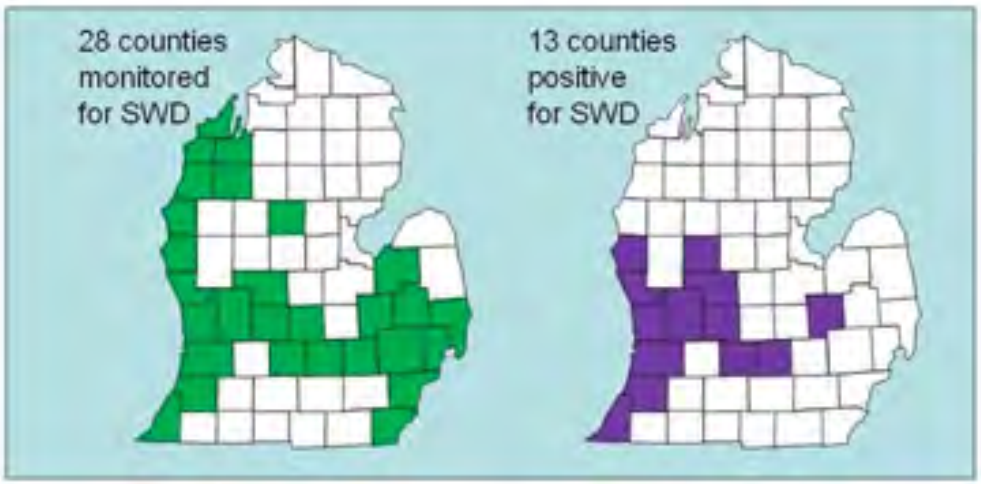

Fig. 5. Counties monitored for SWD in 2010 (left) and the counties where one or more SWD were found in fall 2010 (right).

management of SWD consists of these key components:

1. Monitor fields with traps and check them regularly – this is an essential first step!

2. Check trapped flies to determine presence and number of male and female SWD.

3. If SWD is detected in traps, apply effective insecticides registered for blueberries to protect the fruit (see below).

4. Continue monitoring to evaluate your management program, and respond quickly if needed.

5. If possible, remove leftover fruit on the bush to reduce SWD breeding and food resources.

6. Stay informed. These recommendations are subject to change based upon new information. Find the latest information at our SWD website: www.ipm.msu.edu.SWD.htm

Monitoring. The most important first step is to determine whether SWD are present in your fields. Monitor for SWD from fruit set until the end of harvest. This will help identify the start of fly activity, although the most important monitoring period is from fruit coloring until the crop is harvested, when the fruit are susceptible to SWD infestation.

These flies can be trapped using a simple monitoring trap consisting of a plastic 32oz cup with several 3/16"-3/8" holes around the upper side of the cup, leaving a 3-4 inch section without holes to facilitate pouring out of the liquid attractant, or bait (Fig. 6).

Fig 6. Trap for capturing SWD adult flies.

The holes can be drilled in sturdy containers or burned with a hot wire or soldering iron. The small holes allow access to vinegar flies, but keep out larger flies, moths, etc. Pour one inch of apple cider vinegar into the trap as bait. To help ensure that trapped flies do not escape, a small yellow sticky trap can be placed inside. The traps will also work without the yellow sticky insert, but then a drop of unscented dish soap should be added to the vinegar to ensure flies remain trapped in the liquid.

Traps should be hung in the bush canopy in the fruit zone, in a shaded area, using a wire attached to the top of the trap. Make sure the trap is clear of vegetation with the holes exposed so that SWD can easily fly in.

Traps should be checked weekly for SWD flies, by looking on the yellow sticky trap and in the liquid. At each check, fresh vinegar should be swapped out and disposed of, away from the trap location. Spotted wing Drosophila captures should be recorded each week in a log book.

Identification of flies. Vinegar flies are small (2-3 mm) with rounded abdomens. Traps baited with apple cider vinegar catch both male and female SWD flies. Native species of vinegar flies (and other insects) are also attracted and these need to be distinguished from SWD flies when checking the traps. Identification of SWD flies becomes easier with practice, especially when using a hand lens to examine the wings of trapped flies. Some native flies have dark patches on the wings, but will not have the distinctive dark dot that is present on the wings of SWD males (Fig. 7).

Female SWD do not have dots on the wing, so their ovipositor needs to be examined closely in search of its serrated characteristics. Use of a 30 X magnification hand lens or microscope is needed to detect the distinctive saw-toothed ovipositor on female SWD. It is important to check traps for female flies as these often emerge first from overwintering sites.

If you check a trap that has flies matching these descriptions but you are unsure of their identification, contact your local Extension office or a trained scout or crop consultant for assistance.

For flies suspected of being SWD that are trapped in counties where this insect has not yet been reported (Figure 1), we encourage growers, scouts, and consultants to place flies trapped on the sticky traps into another container (or pull those floating in the vinegar out of the liquid and place in a small vial) then send them for identification to: Howard Russell, SWD Monitoring, Diagnostic Services, 101 CIPS, Michigan State University, East Lansing, MI 48824-1311. Include the location and date of collection along with your contact information.

Identification may also be aided by use of the online key provided by Oregon Department of Agriculture at swd.hort.oregonstate.edu/files/webfm/editor/ID_D_suzukii_060210_sm.pdf

Fig 7. Male spotted wing Drosophila fly with distinctive wing markings. (2 mm long). ***Photo: G. Arabelian.***

Sampling fruit for larvae. If fruit are suspected of being infested, larvae can be sampled using a fruit dunk flotation method. Either collect a standard sample of fruit, or only suspicious (oviposition scars and soft spots) fruits. Place fruit in a plastic "ziplock" bag and crush lightly to break the skin. Add a sugar-water mixture (4 cups water to every 1/4 cup sugar). Spotted wing Drosophila larvae will float in the liquid and the fruit will sink. Detection of small larvae may require the use of a hand lens, and this works well with a light behind the bag to shine through onto the larvae.

Another method developed is to dissolve 1 Tbsp. of salt in 1 cup of water. Suspect berries are placed on a tray and the salt solution lightly poured over the fruit. Observe the fruit closely for 10-15 minutes to see if larvae exit through egg-laying holes. Larger SWD larvae will be visible emerging from the berries.

For both sampling methods, it should be noted that blueberry maggot larvae may also be present at the same time of the season, and these also have white larvae that can be present in ripe fruit. These larvae are very difficult to distinguish from SWD larvae, but specimens can be separated by trained entomologists.

SWD Control Options. Our 2010 trapping suggests that typical insect control programs kept this fly suppressed through the end of harvest. However, given the potential for rapid population increase by SWD, active monitoring through the ripening period will be needed. This will allow rapid response to detections of spotted wing Drosophila. Most of what follows is based on recent experiences in the western United States. As research results are available from Michigan, we will update these recommendations.

We currently do not know the relationship between catches in individual traps and infestation risk in fruit in the surrounding area. Since no action threshold is available for SWD, we are recommending a conservative approach in which fly capture on your farm triggers protection of fields if berries are at a susceptible stage. If fruit are ripening and SWD flies are trapped, growers should: 1) Increase monitoring intensity to assess fly distribution; 2) Implement cultural controls where possible, 3) Protect fruit through to harvest using registered insecticides. This is particularly important if female flies are found on traps. Female SWD are able to lay eggs into blueberries from the time of first coloring through to harvest, so this period is the window of susceptibility to SWD. If spotted wing Drosophila are found, the

available management options and best strategies will depend on the scale of infestation, whether the field is certified organic or not, and the time of the season.

Laboratory tests showed no indication of blueberry varieties being more or less susceptible to infestation. But, because SWD populations tend to increase in the later part of the summer, we expect late-harvested cultivars to experience higher pressure from SWD than those that are harvested early.

Cultural controls. Cultural controls may help reduce reproduction and survival of flies. These include scheduling timely harvests and removing over-ripe fruit from fields to minimize host plant resource for SWD to lay eggs into and for larvae to develop on. In small fields this may be done by hand, but that is impractical in large farms. A final cleanup picking to remove the last berries from the bushes may be worthwhile, but this approach has not yet been evaluated. Removing wild host plants that can harbor SWD such as wild grape, pokeberry, raspberry, blackberry, etc. near crop fields is another potential strategy, but again this has not been tested in our region.

Recent research in Oregon has compared various ways to prevent survival of SWD in infested berries. Two methods that worked well for this were bagging fruit inside clear or black plastic bags, and solarizing in which 1-2 ml clear plastic sheeting is placed over the fruit in a sunny location and sealed well around the edge using soil. Simply burying infested fruit was not effective.

Chemical controls. Michigan blueberry growers already use IPM programs to manage insect pests (such as the blueberry maggot fly) during the summer months. Many of the insecticides used for this pest will provide some protection against SWD. However, members of the neonicotinoid class (e.g. Provado, Assail, Actara) are considered weakly active on SWD and are not recommended for its control.

Insecticides for SWD control in blueberry

Class	Trade name	Active ingredient	PHI (days)	Days of residual activity#
Organophosphate	Malathion	malathion	1*	5-7
	Imidan	phosmet	3	7
Pyrethroid	Mustang Max	zeta-cypermethrin	1	7
	Danitol	fenpropathrin	3	7
	Asana	esfenvalerate	14	7
	Brigade	bifenthrin	1	7
Carbamate	Lannate	methomyl	3	3-5
Spinosyn	Delegate	spinetoram	3	7
	Entrust (organic)	spinosad	3	3-5
Pyrethrum	Pyganic (organic)	pyrethrum	0.5	2-3

*Check the label for the specific Malathion formulation you are using for the correct PHI. Some formulations may allow 0.5 day PHI.

Estimated residual activity from experience with other insect pests in Michigan and from SWD studies in Oregon.

It is important to realize that whereas blueberry maggot has only one generation a year, providing growers a week from emergence to egg-laying for protect their berries, spotted wing Drosophila females can start laying eggs one day after emergence. This means that monitoring should be a high priority, to detect the flies quickly so that management decisions can be made. SWD will complete multiple generations under Michigan conditions and there will likely not be distinct generations but rather continuous activity once the flies become active. For these reasons, if SWD are detected the spray intervals should be tightened to prevent crop infestation before harvest. Sprayers should be calibrated to provide thorough coverage of fruit, especially in the center of the bush where the flies like the shade. Applications that attempt to cover several rows at a time are unlikely to achieve good coverage of fruit on all the rows.

A number of registered insecticides have shown to be very effective against SWD in laboratory trials, including some recent ones done at MSU on flies from a colony that was collected in Michigan. The most effective chemicals are organophosphate and pyrethroid insecticides and one carbamate insecticide. The less effective options were spinosyn and pyrethrum class insecticides. Under field conditions, insecticides with fast knockdown activity have performed well at protecting fruit. Organic growers in the Pacific northwest have used 2-3 applications of Entrust effectively to protect fruit in the pre-harvest period, and this can be rotated with Pyganic to stretch the period of coverage and also to reduce the chance of resistance developing. It is important to note that Entrust provides ~5 days residual control and Pyganic provides ~3 days of control. Note also that Entrust has a 9 oz/acre seasonal maximum (see below for more details).

The table above provides a list of insecticides registered for use in blueberries that have also shown high activity against SWD. Selection of insecticides for SWD control should take into account the other pests present, harvest date, re-entry restrictions, and potential impacts on existing IPM programs. Most of these insecticides are also active on blueberry maggot and most will have some activity on Japanese beetles that may be active at the same time of the season. Always follow the specific label restrictions for blueberry. The level of control achieved will depend

on the SWD population, timeliness of application, coverage of fruit, and product effectiveness.

When selecting an insecticide for SWD control in blueberry, consider the REI, PHI, and especially the MRL restrictions in the destination country if exporting fruit. See the label for restrictions on distance to surface water and safety to pollinators and other beneficial arthropods. Remember to rotate classes of insecticides to delay development of insecticide resistance. This is especially critical in organic production where there are only two classes of insecticide registered for use against SWD.

Organic blueberries. Organic fruit growers should be aware that the insecticidal control tools available to them are less effective than conventional insecticides against SWD, and will require more timely application. However, experience in the west coast states indicates that SWD can be controlled in organic production through more intensive monitoring, timely application if flies are detected, and shorter intervals between sprays. Where possible to implement, cultural controls will also be important to help reduce the overall population level.

Organic insecticide options are limited but the experience so far in California and Oregon indicates that Entrust and Pyganic are the two most effective options for SWD control in organic production. Entrust is limited to three applications in a 30 day period followed by 30 days without any Entrust application, and there is a 9 oz/acre seasonal maximum. There is a 2ee Entrust label for suppression of SWD, with a 2 oz/acre rate listed. Until there is more information available, we are recommending the 2 oz/acre rate of Entrust. Rotate Entrust with the organic pyrethrum insecticide Pyganic to achieve some resistance management. Pyganic EC 5.0 is labeled at 4.5-18 oz/acre in blueberries, and using the higher end of this rate range has provided five days of residual control in recent University of California trials.

Follow future developments. Spotted wing Drosophila is a new pest to North America and has only recently been detected in Michigan. There is active research and monitoring underway to minimize its impact on fruit production, including multiple research approaches at Michigan State University and elsewhere. As new information is available, it will be posted online at www.ipm.msu.edu/SWD.htm and will be distributed to fruit growers via MSU Extension programs.

Blueberry aphid management

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This season's wet spring has stimulated higher than normal shoot growth in blueberry bushes, providing lush foliage that is ideal for aphid development. High aphid counts are being reported during this week's scouting, approaching 50% of young shoots infested in some fields. Aphid colonies can generally be well controlled by natural enemies such as lady beetles and lacewings, but these high aphid populations indicate that growers should be watching aphid abundance in their fields and taking appropriate action in virus-susceptible fields. The blueberry aphid (Illinoia pepperi) is the vector of blueberry shoestring virus which can cause bush decline and significant yield reductions. It is also a potential vector of blueberry scorch virus that was detected in Michigan in the past few years. Because of the ability of aphids to serve as vectors of plant disease, they should be controlled to minimize virus spread in infected fields and in susceptible fields near to virus-infected fields.

Scouting for aphids. Blueberry aphids are most often found on the undersides of young leaves at the base of plants. To scout for aphids examine two young shoots near the crown on each of 10 bushes in a field and record the number of shoots where aphids are found. Multiply by five to get the % infested shoots. Tracking this number through the growing season can help identify whether populations are increasing, remaining steady, or declining. It is also a good idea to record the number of shoots with parasitized aphids to get a measurement of the level of biocontrol present in your field. 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.

Varietal susceptibility to shoestring virus. Some varieties are resistant to shoestring virus. Resistant varieties include Bluecrop and Atlantic. Varieties with moderate resistance include Draper, Aurora, Liberty, Legacy, and Brigitta. Aphid control should be considered in fields of susceptible varieties, especially if there are symptoms of shoestring virus present. Aphid control is most important in fields containing varieties that are susceptible to the shoestring virus, such as Jersey, Blueray, Burlington, Earliblue, Elliott, Jersey, Rancocas, Rubel, Spartan, and Weymouth. If fields of these varieties contain symptoms of shoestring, aphid control should be a priority during the season and infected bushes showing symptoms should be tagged and removed in the late fall once aphids are not able to be spread through the field during removal.

Aphicides for control of blueberry aphid. There are some aphid control materials available to blueberry growers that have excellent aphid activity. These should be applied after bloom in June as aphid populations start to increase, with application by ground sprayers to ensure coverage of the lower parts of the bush. Good coverage is essential for effective aphid control, and this will be more

challenging in weedy fields. Controlling the aphids now will limit spread of the virus, thereby reducing the loss of yield or need for removing infected plants.

The most effective insecticides for aphid control are the systemic neonicotinoid insecticides Assail 30SG (2.5-5.3 oz/ac), Provado (4 oz), and Actara (3-4 oz). Foliar application of one of these products will move in treated leaves, helping ensure that aphids receive a lethal dose. They also provide long-lasting control. Because these insecticides are very effective and blueberry aphids do not readily form winged individuals, getting excellent control early in the season typically provides season-long control.

Selection of an insecticide for aphid control may be made considering the other pests present, to get multiple insects controlled with one spray. For example, Assail and Provado are also labeled for blueberry maggot (but check the rates!), and Assail (5.3 oz/acre) is also very effective against fruitworms.

Soil-applied neonicotinoids Admire and Platinum can also be used to provide aphid control. These must be banded under the bush and watered in to allow them to get into the plant tissues. With the time needed for uptake into the foliage, these applications should be made soon after bloom to allow time for uptake before aphid populations get too large.

Broad spectrum insecticides applied after bloom for control of other pests such as fruitworms can also provide some control of aphids. Lannate and the various pyrethoids registered for blueberry are active on aphids if applied to target the lower shoots. However, these are also highly disruptive to natural enemies, so fields should continue to be monitored for aphids to ensure that the populations do not increase again later in the season.

Harvest-time considerations. In mechanically-harvested fields, patterns of virus infection are often along the rows, indicating spread by harvesters. Aphid control prior to harvest is particularly important in fields with a history of shoestring virus infection to prevent this method of spread. Washing harvesters before moving to the next field is a simple strategy to further reduce the spread of BBSSV within and between blueberry farms.

MSU has produced a new bulletin titled "Blueberry Aphid and Shoestring Virus" which is Extension bulletin E3050. This is available for purchase through the MSU Extension Bookstore, at http://web2.msue.msu.edu/bulletins2/

2011 Grower Events

June 16
6-8PM
Location: A & L Farms, 11901 144th Avenue, West Olive, MI
$10, includes dinner and handout materials.
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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