Invasive Insects Threatening Blueberry Production in Missouri

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Why Just BMSB & SWD

From Midwest Blueberry Production Guide
From Growing Blueberries In Missouri
From Organic Blueberry Production Guide: Cornell University

1. Brown Marmorated Stink Bug

2. Spotted Wing Drosophila

IDENTIFICATION DISTRIBUTION DAMAGE Monitoring Management

BMSB Identification

ADULTS:
- White stripes on antennae and faint white bands on legs
- Outer edges of the abdomen alternating white and dark markings ("marmorated")
- Underside is pale, sometimes with grey or black markings
- Emit a pungent odor when disturbed

Eggs
- Laid in clusters on undersides of leaves (~28 eggs per egg mass). Bright green when first deposited and then turn white

Nymphs
- 5 nymphal instars
- First instars remain near hatched eggs
- 2nd-5th instars extremely mobile and called "tick-like".

Pictures: Dr. Tracy Leskey (USDA-ARS)

Look-Alike Insects

Brown Marmorated Stink Bug = BMSB
Halyomorpha halys
BMSB Distribution

Survey Status of Brown Marmorated Stink Bug - Halyomorpha halys
2014 & 2015

BMSB Damage

BMSB is strongly associated with tree fruit

BMSB Damage

Mature damage - shriveling and necrosis

BMSB Monitoring

In 2012 and 2013, researchers conducted trials of a pheromone known as "odor #10," which reliably lured BMSB into traps in the field.

Pheromone lure inside the trap top

BMSB Monitoring

In 2014 an improved lure was used including both a pheromone and a synergist

• Net sweeps and trapping conducted at every site
  • 5 locations in St. Louis Metro
  • 4 locations in Central MO
  • 3 locations in Southwest
  • Several other locations across the state
BMSB management options

➢ ATTRACT-AND-KILL / TRAP CROPPING
An attract-and-kill strategy for BMSB would involve luring large numbers of the insects to a specific area, and then treating that area.

➢ BIOLOGICAL CONTROL
Researchers are seeking to identify the natural enemies of BMSB, including a group of tiny parasitic wasps that attack BMSB eggs and a naturally occurring fungus that targets stink bugs.

➢ CHEMICAL CONTROLS
Researchers are working to identify insecticides that effectively control BMSB, so that growers can select materials based on their economic and environmental impacts.

BMSB Management

➢ Midwest Blueberry Production Guide
➢ No Mention
➢ Midwest Small Fruit and Grape Spray Guide
➢ Page 40 and 63
➢ Cornell Organic Blueberry Guide
➢ No Mention

Actara, Venom, Brigade, Danitol, and Lannate are all extremely broad spectrum synthetic insecticides with a long lasting residual effect!

Actara 3 days
Venom 12 hours
Brigade 1 day (RUP)
Danitol 3 days (RUP)
Lannate 3-7 days (RUP)

Spotted Wing Drosophila (Drosophila suzukii)

➢ Introduced into California in late 2008, SWD has since spread throughout California, Oregon, and Washington
➢ Due to a separate introduction in 2009, SWD has also spread from Florida to Louisiana, North Carolina, and South Carolina, etc.
➢ Invaded Missouri in late June, 2013
**Significance**

- Unlike other fruit flies, SWD attacks sound ripening fruit, also attacks some vegetables.
- Once eggs laid in fruit, no longer able to control with pesticides.
- Short lifecycle and overlapping generations make spray timing difficult.
- Requires sprays near harvest time.
- Requires multiple sprays which can lead to pesticide resistance.

**SWD Identification**

Female SWD have serrated ovipositors that allow them to attack fruit earlier than other Drosophila species, often before the fruit ripens.

**SWD Distribution**

Source: Washington State Univ.

**SWD Damage**

3rd instar larvae relative to Blueberry site.

Source: Washington State Univ.

**SWD monitoring**

How to make a trap to monitor for SWD:

- 4 gauge solid core wire
- 1 quart deli-type container
- Melt 3/16” diameter holes in side of cup using a soldering iron

Yeast bait recipe:
- ½ tablespoon active dry yeast, 2 tablespoons sugar, 6 oz. water

**A monitoring system detected first SWD captures**

11 FARMS (2013)

The first SWD confirmations:
- St. Charles (June 26)
- Truxton (June 26)
- Rogersville (June 27)
Invasive insect pests threatening specialty crops in Missouri: Monitoring, organic management, and farmer's education (2013-2014)

Many more confirmed cases:
- Could probably be considered state-wide
- Fewer growers had total loss

Seasonal SWD captures across 4 farms

SWD Management Options

- IPM options to manage SWD include monitoring, cultural management such as canopy management, sanitation and exclusion, and, if needed, timely application of insecticide sprays
- This pest is new to Missouri so no research has been conducted within the state on most effective insecticide treatments to manage SWD
- The fly is widespread in MO so protecting susceptible crops is recommended
- Sprays must be timed to kill adults before they lay eggs, as sprays will not control larvae already in the fruit
- Many bio-control agents are currently being tested, but none likely available till 2016