



Healthy Fruit [Special Edition] - Vol. 27, No. 18, September 10, 2019

Brown Marmorated Stink Bug (BMSB) update

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On September 11th, 2018, we issued a BMSB Pest Alert due to the detection of relatively high BMSB populations in some commercial orchards. That article provided information on BMSB biology and management, as it relates to apple harvest, as well as economic thresholds and insecticide options. **The full article can be found [here](#).**

For the first time in Massachusetts, there is now evidence of BMSB directly feeding on fruit crops in a commercial orchard setting. On 9 September 2019, BMSB nymphs were observed feeding on peach in Belchertown.



Pictures: Jon Clements

Pictured above; top left BMSB nymph tries to hide from the camera, top right and bottom left: BMSB nymph on peach. Bottom right: adult native stink bug (note the lack of alternating white bands on antennae and legs).

Below we present 2019 information concerning (1) BMSB activity and damage in commercial orchards, (2) the performance of the so-called 'ghost' traps on commercial farms, and (3) a more detailed description of how to distinguish fruit injury caused by stink bugs from that caused by bitter pit.

(1) 2019 BMSB ACTIVITY AND DAMAGE IN ORCHARDS.

BMSB monitoring using traps. A monitoring system involving pheromone-baited pyramid traps was implemented, in cooperation with private consultants, on May 9, 2019 at 15 farms across the state. Thus far no BMSB have been captured in these traps in spite of some damage being seen in fruit and BMSB observed in ghost traps.

Incidence of fruit damage attributable to stink bugs in MA orchards: On August 15th, 2019, we implemented a non-destructive fruit sampling system at each of four orchards. This survey is being conducted once a week. Below is a summary of findings. One orchard (D) is experiencing significant stink bug damage.

Sampling date	Orchard	Total fruit sampled	Total # fruit with stink bug injury	% of fruit with stink bug injury
8/22/19	A	320	3	0.9
8/22/19	B	320	3	0.9
8/22/19	C	320	2	0.6
8/22/19	D	320	53	16.5
8/29/19	A	320	1	0.3
8/29/19	B	320	2	0.6
8/29/19	C	320	2	0.6
8/29/19	D	320	59	18.4
9/5/19	A	320	2	0.6
9/5/19	B	320	3	0.9
9/5/19	C	320	3	0.9
9/5/19	D	320	51	15.9

NOTE: The information presented in the above table is cumulative damage data. It is not possible to distinguish between BMSB and other stink bug damage in fruit. Additionally, some of the damage noted here was observed earlier in the season and may have been caused by native stink bugs, BMSB, or both. Pest populations of stink bugs can vary greatly by location in state and on farm.

(2) PERFORMANCE OF GHOST TRAPS.

The use of insecticide-treated netting baited with the BMSB pheromone provides several advantages over insecticide sprays:

1. The material does not contact trees or fruit, subsequently, there is no residue on fruit. For certain situations and conditions, this might be an excellent option to relief from stink bug pressure in the orchard, especially during harvest time.
2. Being outside a trap, the pheromone molecules diffuse in the air farther and more easily. In addition, stink bugs do not need to enter a trap: they will be killed by simply walking over the netting.

In 2018, 245 BMSB were killed using ghost traps (see picture below) in 5 orchards (Sept. 5 - Oct. 12, 2018).

In 2019, ghost traps were deployed in 5 orchards, away from perimeter-row trees.



Below are the number of BMSB and green stink bugs (nymphs and adults combined) that have been recorded on ghost traps, by date:

Sampling date	Orchard	# BMSB recovered	# green stink bugs recovered
8/22/19	A	0	0
8/22/19	B	0	0
8/22/19	C	0	0
8/22/19	D	0	0
8/22/19	E	0	0
8/29/19	A	31	6
8/29/19	B	0	0
8/29/19	C	0	0
8/29/19	D	1	0
8/29/19	E	0	0
9/5/19	A	17	3
9/5/19	B	0	0
9/5/19	C	0	0
9/5/19	D	0	0
9/5/19	E	7	0

(3) BITTER PIT VERSUS BMSB DAMAGE.

Considerable confusion can arise when it comes to determining whether stink bugs, apple maggot, or bitter pit are responsible for damage to fruit near harvest. Below we discuss the types of damage caused by bitter pit and stink bugs.

Bitter pit: This is a disorder associated with nutrient imbalance. Some cultivars – Honeycrisp in particular – are more prone to bitter pit than others.

Bitter pit symptoms are shallow depressions, mainly confined to the calyx or flower end of the apple, with internal corking below the surface that does not meet the skin. The pits may be few in number to numerous, and although they may extend over much of the fruit surface, they are more prevalent on the calyx end of the fruit. A transverse section through the spot will reveal brown, dry, spongy tissue just beneath the skin. In short:

- With bitter pit, there is never a 'sting' site in the center of the depression.
- Upon slicing, corking separated from the skin surface.

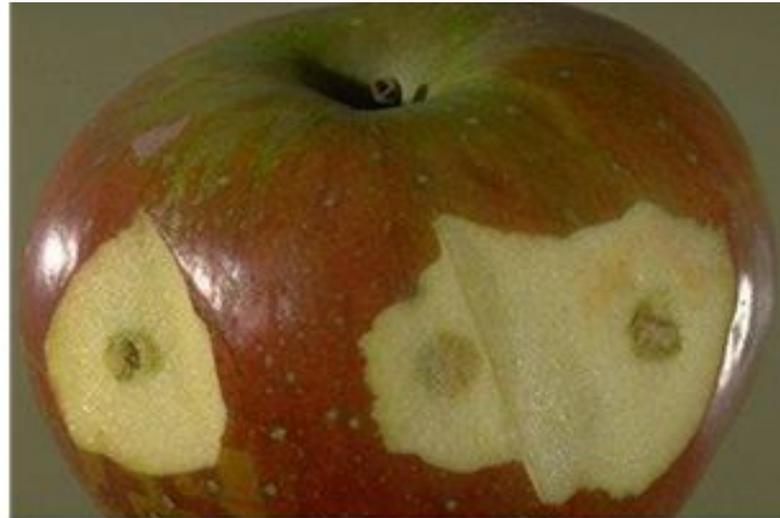


Bitter pit symptoms in Honeycrisp apple. Univ. of Maine Cooperative Extension



Left: BMSB injury. Right: Bitter pit damage.

Photo credit: Tracy Leskey and Torri Hancock



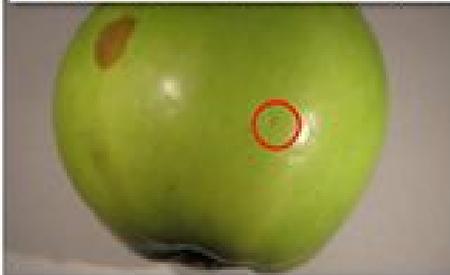
Bitter pit: When peel is removed, corky tissue can be observed under the spot.

Stink bug injury: Characteristic symptoms of late-season feeding injury by stink bugs on apple are:

- The edge of the depression on the fruit surface from stink bug feeding is gradual
- The corky flesh is always immediately beneath the skin in stink bug damage
- There is always a puncture site from stink bug feeding
- Feeding damage can occur anywhere on the apple or may be most common around the shoulder.

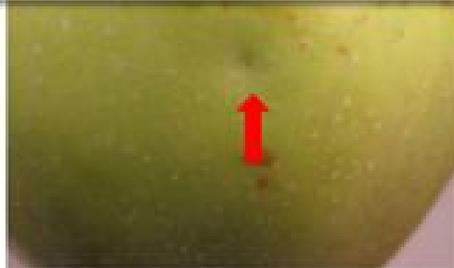
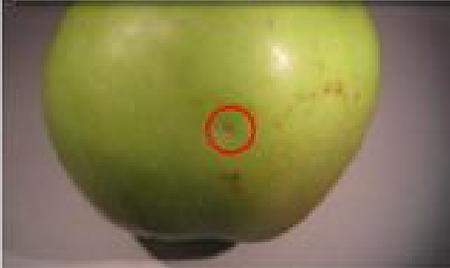
Early Season Superficial Injury

Early season feeding results in nominal injury with discolored dot and feeding sheath beneath



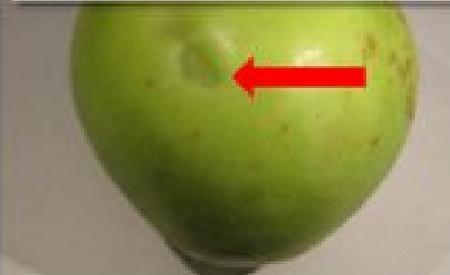
Mid-Season Economic Injury

Mid season feeding results in possible discolored depressions and flesh surrounding feeding sheath appearing corky



Mid-Late Season Economic Injury

Mid-late season feeding results in discolored depressions with larger, corky areas in flesh



STINK BUG INJURY

As they feed, stink bugs secrete saliva that is toxic to plant tissue. The saliva forms a protein tube (sheath) around the feeding structure at the feeding site.

The sheath forms the seal for the stink bug to ingest the partially digested tissues.

Once secreted it rapidly hardens and remains on the plant after the insect is done feeding.

The presence of the feeding sheath is key to confirm that fruit injury is caused by stink bugs.

LATE SEASON DAMAGE BY STINK BUGS ON PINK LADY

External Injury

Extensive Discolored Depressions



Internal Injury

Corky Tissue Extending Deep
Into Flesh





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