

## **Monitoring Brown Marmorated Stink Bug (BMSB) on Small Farms and Large Commercial Farms: 2014-2016**

The identification of the two-component aggregation pheromone of the Brown Marmorated Stink Bug (BMSB), has greatly improved the ability to accurately monitor the presence and relative abundance of this pest. In 2014, a multistate project (Delaware, Maryland, North Carolina, Pennsylvania and Virginia) was established to evaluate the use of visually-attractive black pyramid traps baited with lures containing the two-component aggregation pheromone on vegetable farms and fields in the Mid-Atlantic U.S. Specifically, we wanted to determine if trap catch of BMSB correlates with observed densities of the bug on various vegetables, and if trap catch can be used to alert vegetable growers of the presence of this pest on their farms for IPM decision making.

### **(I) Small Farm Monitoring:**

In all 3 years, traps were placed on vegetable farms to monitor for stink bug populations from June through harvest. In Delaware, two to four 4ft Dead-Inn black pyramid traps were placed on the corners of each field. Each of the traps was baited using the BMSB pheromone in combination with the MDT lure. Lures were replaced every two weeks to ensure maximum effectiveness over time. Traps were monitored weekly for BMSB adults and nymphs. Additionally, two to three minute visual counts were conducted within each field on peppers, tomatoes, and eggplant and the number of BMSB adults and nymphs present were recorded. Fruit was also evaluated for damage.

As a region, we were able to identify when seasonal peak trap catch occurred for each location and were able to show a positive correlation between mean BMSB trap catch and the mean number of BMSB found on vegetables in 2014. In 2014, BMSB was found in 75% of the 36 fields sampled. Peak trap catch or density occurred anywhere from June 14 to September 10 depending on location, suggesting the need for summer long monitoring of this insect in vegetables. Peak trap catch ranged from 1 to 216 bugs per trap per week and exceeded 10 BMSB per trap per week during peak movement in 39% of fields sampled.

In 2014, on the organic vegetable farms and community gardens, there was a positive relationship between trap catch and density of BMSB on vegetables sampled ( $R^2 = 0.4409$ ). Our findings indicate that using pyramid traps baited with the combination of lures and placed on the perimeter of fields could be an effective tool to alert vegetable growers to the activity and relative density of BMSB on their farms so that management decisions can be made in a timely manner.

**(II) Commercial Farms:**

In commercial lima beans fields in Delaware in 2015 and 2016 and commercial sweet corn fields in 2015 in Delaware, traps were placed along the perimeter of fields near woods edges. Lima bean fields were sampled on a weekly basis for BMSB adults and nymphs using a standard sweep net method. At harvest, fruit was sampled for BMSB damage. Over two seasons of monitoring, very few BMSB were encountered in these two important Mid-Atlantic vegetable crops. This validates previous studies showing a reduced incidence of BMSB in coastal areas compared with higher elevations in the region. It should be noted that the predominant stink bug species encountered were native brown and native green stinkbugs.

**Small Farm Trapping Results – 2014 – 2016**

<b>BMSB Trapping on Small Farms - 2014 Total Number of Adults and Nymphs</b>			
	<b>Location # 1 ( 4 traps)</b>	<b>Location # 2 ( 2 traps)</b>	<b>Location # 3 ( 2 traps)</b>
<b>Week#</b>	<b>BMSB</b>	<b>BMSB</b>	<b>BMSB</b>
<b>1</b>	<b>3</b>	<b>--</b>	<b>--</b>
<b>2</b>	<b>1</b>	<b>--</b>	<b>--</b>
<b>3</b>	<b>0</b>	<b>--</b>	<b>--</b>
<b>4</b>	<b>1</b>	<b>4</b>	<b>3</b>
<b>5</b>	<b>9</b>	<b>2</b>	<b>0</b>
<b>6</b>	<b>4</b>	<b>3</b>	<b>0</b>
<b>7</b>	<b>10</b>	<b>8</b>	<b>0</b>
<b>8</b>	<b>8</b>	<b>25</b>	<b>2</b>
<b>9</b>	<b>24</b>	<b>41</b>	<b>5</b>
<b>10</b>	<b>30</b>	<b>4</b>	<b>4</b>

**BMSB Trapping on Small Farms - 2015**  
**Total Number of Adults and Nymphs**

	Location # 1 ( 2 traps)			Location # 2 ( 2 traps)			Location # 3 ( 2 traps)			Location # 4(4 traps)			Location # 5 (4 traps)		
Week#	BMSB	Brown	Green	BMSB	Brown	Green	BMSB	Brown	Green	BMSB	Brown	Green	BMSB	Brown	Green
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	3	1	1	0	1	0
3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4	0	2	2	0	0	0	1	0	0	0	2	0	1	2	0
5	0	0	0	0	0	0	0	1	0	0	3	0	0	5	0
6	0	1	0	1	0	0	0	1	0	2	4	0	0	0	0
7	0	0	0	0	0	0	0	0	0	1	0	1	1	2	0
8	1	0	0	0	0	0	0	1	0	3	1	0	3	4	0
9	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0
10	0	2	0	0	1	0	0	0	0	21	8	1	14	0	0
11	0	1	1	0	0	0	0	0	0	43	6	0	19	0	0
12	2	0	0	11	3	0	0	0	0	29	8	0	29	0	0
13	--	--	--	3	1	0	2	2	0	99	0	0	50	0	0

**BMSB Trapping on Small Farms - 2016**  
**Total Number of Adults and Nymphs – 4 traps per locatin**

	Location # 1			Location # 2			Location # 3			Location # 4			Location # 5		
Week#	BMSB	Brown	Green												
1	4	0	0	0	0	0	0	0	0	2	1	0	0	0	0
2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	1	0	0	2	0	0	1	0	2	3	1	0	0	0
10	0	0	0	0	0	0	0	3	0	1	3	0	0	0	0