

## Improved trapping for the Ohio stink bug monitoring network

Report to the Ohio Vegetable & Small Fruit Research & Development Program, 1/4/2016

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The brown marmorated stink bug is a devastating new invasive pest that has been moving into Ohio from the east over the past few years. It has a broad host range, with sweet corn, peppers, and raspberries among its preferred hosts. Its distribution within Ohio is patchy; crop infestations are known in Columbus, Youngstown, and Cincinnati, but in many counties this stink bug has been reported only in homes in the winter, and not yet infesting crops. Infestations of the brown marmorated stink bug have been severe for the past 3 years at our research farm in Columbus, on sweet corn as well as on field corn, soybeans, apples, and peaches. We began a stink bug monitoring program with pheromone traps in 2011 at 30 Ohio locations. During the first three years, we made good progress in establishing a network of cooperators, but the number of stink bugs trapped has been quite low at most sites, partly due to the lack of efficacy of the only lures that were available at that time. Starting in 2014, we used a greatly improved lure that became commercially available. In 2013 and 2014, we began experimenting with some alternative traps made of PVC pipe, which are showing in preliminary tests to be cheaper, easier to make, and more effective than the standard pyramid trap. We have used two different internet-based trap reporting systems so that trap counts can be accessed by any growers, but both of the systems that we have used have been unsatisfactory. In 2015, we wanted to improve the monitoring program by expanding the use of PVC traps and using a new reporting system that is more simple and more reliable than the previous systems. The objectives of this project were to continue to determine the expanding distribution of the brown marmorated stink bug in Ohio, to compare the catch of brown marmorated stink bug in conventional black pyramid traps and experimental yellow PVC net-covered traps in sweet corn and raspberry plantings, and to evaluate a new on-line spreadsheet for reporting trap catch.

**Materials and Methods:** Traps were deployed at 28 locations in 18 Ohio counties by 16 cooperators. Crops used were sweet corn (9 sites), raspberries (5 sites), blackberries (2 sites), grapes (3 sites), tomato (1 site), mixed vegetable (2 sites), blueberry/bramble (1 site), elderberry/bramble (1 site), raspberry/apple (1 site), bramble/peach (1 site), and apple (1 site). At most sites, two traps were deployed: one black pyramid trap and one yellow PVC pipe trap. Traps were checked once per week at most sites. Pheromone lures were replaced every 4 weeks. Data recorded were the number of brown marmorated stink bugs, both adults and nymphs, and the number of stink bugs of other species. Most traps were deployed by late June but some as early as mid-May. Traps were taken down between mid-August and early October. Cooperators entered the number of BMSB on an on-line spreadsheet. The link to the reporting site (<https://docs.google.com/spreadsheets/d/1DHwdnoiU-sRuwPbgUHycnBdfWafXugfjMp22gWCNQ/edit#gid=0>) was shared with growers via several articles in the VegNet newsletter.

**Results:** Brown marmorated stink bug (BMSB) populations ranged from non-existent in some counties to high in other counties. As shown in Table 1, no BMSB were detected in traps in Ashtabula or Geauga Counties, which are both in northeastern Ohio (Figure 1). In 10 counties, BMSB was found in traps, but at very low density, with seasonal totals of one to three stink bugs per site; these were Wayne, Cuyahoga, Sandusky, Ashland, Huron, and Mahoning Counties in northeastern Ohio, and Harrison, Monroe, Morgan, and Belmont Counties in southeastern Ohio. In four counties, BMSB was found at moderate density: Meigs in southeastern Ohio, Lorain in northeastern Ohio, and Clinton and Greene, both in southwestern Ohio. Much higher density of BMSB was detected in two counties: Warren in southwestern Ohio, and Franklin in central Ohio. At sites with the heaviest populations, BMSB was found throughout July, and reached peak density from late August until mid-September. The on-line trap reporting system was an improvement over our previous system, but would be improved by more consistent report formatting if more than one type of trap is used.

**Conclusions:** The low number of brown marmorated stink bugs caught at many Ohio sites confirms that we are still at an early stage of the invasion of this new stink bug into Ohio, compared to the mid-Atlantic region, but larger numbers of BMSB detected at some sites show that the population is increasing. We know that this species has the potential to become a major pest in Ohio's vegetable and fruit crops. We need to continue to monitor BMSB populations so that growers can be better informed about the need for management action. The availability of cooperators who are trained to use traps and identify this new species of stink bug is helpful to growers around Ohio. At sites where the brown marmorated stink bug is already known to occur, traps are helpful in determining exactly when during the season the bugs move into vegetable and fruit crops. At sites where this pest has not yet been known to occur, traps are extremely important as an early warning for growers to take management action.

**Acknowledgements:** We greatly appreciate the participation of trap cooperators in maintaining traps and collecting data. We appreciate matching funding from OSU's IPM Program.

Table 1. Summary of total capture of brown marmorated stink bug in pheromone traps at Ohio vegetable and fruit farms, June through September 2015.

BMSB relative density	County	Cooperator	Crop	Number of weeks traps checked	Total number of BMSB trapped			
					Yellow PVC pipe	Black pyramid	Black PVC pipe	Sum
None	Ashtabula	Dave Scurlock	Grape	15	0	0	-	0
	Geauga	Erik Draper	Blueberry/bramble	11	0	0	-	0
	Geauga	Erik Draper	Raspberry/apple	11	0	0	-	0
Low (total 1-3)	Wayne	Rory Lewandowski	Raspberry	9	0	1	-	1
	Wayne	Rory Lewandowski	Tomato	9	0	0	-	0
	Wayne	Dave Scurlock	Grape	15	0	0	-	0
	Cuyahoga	Jacqueline Kowalski	Mixed vegetable	10			-	1
	Sandusky	Allen Gahler	Sweet corn	15	2	0	-	2
	Sandusky	Allen Gahler	Raspberry	15	0	0	-	0
	Harrison	Sarah Cross	Sweet corn	12			-	1
	Monroe	Mark Landefeld	Raspberry	13	1	0	-	1
	Monroe	Mark Landefeld	Sweet corn	7	0	0	-	0
	Morgan	Chris Penrose	Sweet corn	7			-	1
	Belmont	Dan Lima	Sweet corn	4			-	2
	Belmont	Dan Lima	Sweet corn	4			-	2
	Ashland	Tim Malinich	Elderberry/bramble	12			-	2
	Huron	Bob Filbrun	Sweet corn	11	2	1	-	3
	Mahoning	Eric Barrett	Pepper/apple?	?			-	1
Moderate (10-70)	Meigs	Marcus McCartney	Blackberry	10			-	11
	Meigs	Marcus McCartney	Sweet corn	7			-	3
	Lorain	Tim Malinich	Bramble/peach	12			-	26
	Clinton	Jim Jasinski	Red raspberry	17	13	-	8	21
	Clinton	Jim Jasinski	Black raspberry	17	6	-	13	19
	Greene	Jim Jasinski	Blackberry/blueberry	17	33	-	24	57
	Greene	Mary Griffith	Sweet corn	2			-	1
High (>200)	Warren	Jim Jasinski	Grape	17	124	-	217	341
	Franklin	James Radl	Apple (mean of 3)	22	219	-	-	219
	Franklin	James Radl	Sweet corn (x of 3)	14	61	-	-	61

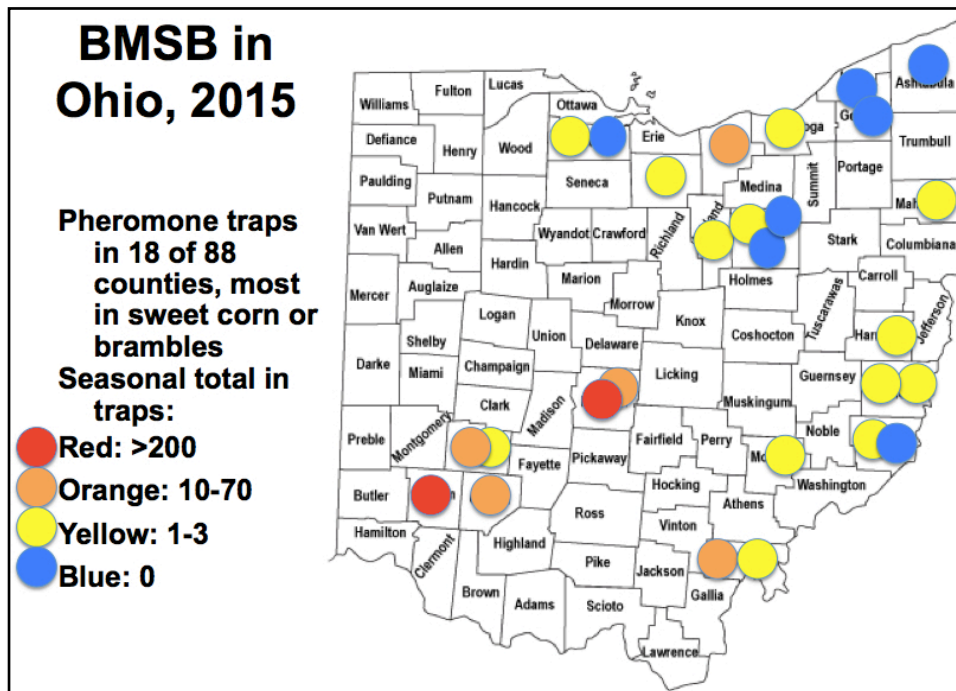


Figure 1. Distribution of sites used in stink bug trapping project in Ohio, 2015.