

Update on Objective 4: Managing the Economic Consequences of BMSB Damage

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Objectives & Expected Outcomes

- Assess the economic potential of biological control as a long-term strategy for managing BMSB populations (Objective 2)
- Develop estimates of the cost and benefits of specific management practices for BMSB (Objective 3)
- Assist with development of program evaluation tools (Objective 5)

Economic analyses help encourage adoption of both landscape scale management strategies and farm-level management practices for the BMSB

Update on Management Survey, including assessment of the economic potential of biological control of BMSB

- Developed a survey gauging economic impact of BMSB and the management practices used by commercial producers
- Assessing the economic value of biological control. This is a complicated undertaking, especially for a pest that attacks a wide range of crops over a broad geographic area

Gauging the value of biological control

Successful biological control would lower pest management costs, increase yields, and improve quality for farmers and grower

- Assess potential acceptance and value:
 - Contingent valuation method
 - Commonly used to value public goods (parks), externalities (pollution), and existence values (endangered species or unique landmarks)
 - For BMSB, the survey will be used to determine the perceived value and potential acceptance of biological control by affected farmers and growers
 - Generate a benefit-cost ratio that expresses value of biological control to effected population stemming from public investment in biological control tactics

Survey Response to date

- 143 survey responses
- 66 usable responses
- States:

AL 2	MI 2	NC 2	VA 1
CT 2	MO 1	OH 1	WA 1
IN 1	NH 1	OR 21	WV 1
ME 1	NJ 1	PA 5	WI 3
MD 6	NY 6	UT 6	unknown 1

Types of respondents

- Commercial Growers-- 60%
 - Part-time/Small farmers-- 30%
 - Contract Growers-- 5%
 - Crop consultants-- 5%
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- Conventional growers-- 61%
 - Organic producers-- 12%
 - Both-- 27%

When did BMSB become a problem on your operation?

- 2010 or before- 6%
- 2011- 6%
- 2012- 6%
- 2013- 5%
- 2014- 11%
- 2015- 5%
- 2016- 11%
- 2017- 15%
- 2018- 6%
- Not a problem yet- 30%

How concerned are you about the BMSB now than when you first found them on your farm?

- Less concerned- 18%
- About the same- 21%
- More concerned- 38%
- Uncertain/not enough experience- 23%

How has the BMSB impacted the profitability of your operation?

	Severe <u>Impact</u>	Moderate <u>Impact</u>	Slight <u>Impact</u>	No <u>Impact</u>
<u>BMSB impact:</u>				
Reduced yield	9%	11%	25%	55%
Reduced quality	14%	19%	19%	47%
Increased spray cost	14%	14%	20%	52%
Increased harvest and grading costs	11%	7%	17%	65%
Increased monitoring costs	9%	11%	26%	53%
Secondary pest outbreaks	4%	10%	13%	73%

Perceived value of BMSB management information

<u>Source</u>	<u>High Value</u>	<u>Moderate Value</u>	<u>Slight Value</u>	<u>No Value</u>	<u>No Opinion</u>
Local extension	41%	15%	17%	15%	12%
Extension Newsletters	30%	23%	19%	16%	12%
Extension websites	31%	28%	11%	17%	13%
Researchers	47%	20%	13%	9%	11%
StopBMSB.org	9%	22%	13%	22%	35%
Other farmers	18%	21%	30%	13%	18%
Crop consultants	24%	15%	15%	15%	33%

Potential use of BMSB management tactics

<u>Management tactic</u>	<u>Already use</u>	<u>Definitely will use</u>	<u>Likely to use</u>	<u>Might use</u>	<u>Unlikely to use</u>
Improved monitoring	17%	26%	37%	11%	9%
Attract and kill	8%	12%	32%	38%	10%
Trap crops	2%	6%	27%	23%	42%
Repellents	4%	13%	33%	27%	23%
Netting and barriers	2%	10%	6%	21%	60%
Border sprays	6%	16%	32%	20%	26%
Promote natural enemies	12%	37%	35%	12%	6%

Biological Control with *Trissolcus japonicus*

- Would you want to see it released in your area? **89% said yes**
- Would you be willing to have it released on your operation? **86% said yes**
- Would you have concerns about how they may affect other insects? **72% said yes**

Willingness to Pay for Biological Control (ONE-TIME BASIS)

<u>Efficacy of Bio-control</u>		<u>Average</u>	<u>Median</u>
100% effective		\$231.62	\$ 50.00
90% effective		\$ 80.86	\$ 40.00
75% effective		\$ 60.29	\$ 25.00
50% effective		\$ 39.57	\$ 13.50
Level of control needed to eliminate insecticide applications		81%	85%

Who should pay for bio-control?

- Agricultural producers pay for release on their own operation and adjoining lands 54%
- All landowners in an affected area pay an assessment to cover program costs 8%
- Agricultural producers and government share the cost of the program 13%
- Affected growers pay through a commodity check off program 0%
- Would rather use other tactics to manage BMSB on my operation 17%
- Other (government pays all costs) 8%

Future efforts: Develop estimates of the cost and benefits of specific management practices for BMSB

Some potential evaluations:

- estimating the cost of lures, traps, and labor inputs associated with monitoring BMSB populations to make threshold based management decisions.
- comparing the cost of crop damage in threshold-based IPM programs versus conventionally managed systems that require multiple insecticide sprays.
- determining the cost and benefits of using sustainable management tools like trap crops, insectary strips, border sprays, and attract-and-kill strategies for various specialty crops.
- evaluating the cost of reduced risk options to replace broad spectrum pyrethroid and neonicotinoid insecticides