

Objective 4: BMSB Management Survey

Jayson K. Harper

Professor of Agricultural Economics

The Pennsylvania State University



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

- Survey gauging economic impact of BMSB and the management practices used by commercial producers has been on-line since June 2018
- Assessing the value of different sources of BMSB management information
- Estimating 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 growers

- 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 is being used to determine the perceived value and potential acceptance of biological control by affected farmers and growers

Survey Responses to date

- 295 total survey responses
- ~110 to 190 usable responses depending on the question

- Commercial Growers-- 50% (29.5 years of experience)
- Part-time/Small farmers-- 39% (23.4 years of experience)
- Crop consultants-- 11% (12.6 years of experience)

Survey Responses to date

- Conventional growers-- 57%
- Organic producers-- 16%
- Both-- 27%

- Annual Value of Sales
 - \$0-\$50,000 48%
 - \$50,000-\$250,000 15%
 - \$250,000-\$500,000 10%
 - \$500,000-\$1 million 11%
 - \$1 million + 16%

Types of Crops Grown/Managed

- Field crops 18%
- Tree fruits 59%
- Small fruits 38%
- Vegetables 38%
- Nursery 13%
- Nuts 18%
- Grapes 1%
- Other 14%

When did BMSB become a problem on your operation?

- 2010 or before- 6%
- 2011- 3%
- 2012- 5%
- 2013- 2%
- 2014- 6%
- 2015- 6%
- 2016- 16%
- 2017- 11%
- 2018- 12%
- After 2018 or not yet a problem- 33%

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

- Less concerned- 11%
- About the same- 19%
- More concerned- 41%
- Uncertain/not enough experience- 28%

How has the BMSB impacted the profitability of your operation?

	Severe Impact	Moderate Impact	Slight Impact	No Impact
<u>BMSB impact:</u>				
Reduced yield	10%	12%	29%	50%
Reduced quality	13%	18%	26%	42%
Increased spray cost	14%	21%	18%	47%
Increased harvest and grading costs	11%	10%	21%	58%
Increased monitoring costs	9%	10%	21%	58%
Secondary pest outbreaks	9%	16%	28%	47%

Perceived value of BMSB management information

		High	Moderate	Slight	No	No
<u>Source</u>		<u>Value</u>	<u>Value</u>	<u>Value</u>	<u>Value</u>	<u>Opinion</u>
Local extension		47%	15%	12%	12%	15%
Extension Newsletters		32%	27%	12%	13%	17%
Extension websites		34%	27%	12%	13%	17%
Researchers		49%	18%	8%	6%	19%
StopBMSB.org		15%	20%	11%	13%	42%
Other farmers		23%	24%	20%	9%	24%
Crop consultants		24%	18%	12%	12%	35%

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	14%	30%	27%	20%	9%
Attract and kill	7%	15%	29%	34%	15%
Trap crops	3%	11%	23%	26%	37%
Repellents	3%	13%	34%	25%	26%
Netting and barriers	2%	8%	5%	26%	59%
Border sprays	7%	13%	32%	21%	26%
Promote natural enemies	8%	36%	28%	15%	13%

Biological Control with *Trissolcus japonicus*

- Would you want to see it released in your area? **88% 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? **71% 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		\$177.16	\$ 50.00
90% effective		\$ 73.67	\$ 40.00
75% effective		\$ 53.94	\$ 25.00
50% effective		\$ 29.70	\$ 10.00
Level of control needed to eliminate insecticide applications		84%	90%

Who should pay for bio-control?

- Agricultural producers pay for release on their own operation and adjoining lands 18%
- All landowners in an affected area pay an assessment to cover program costs 9%
- Agricultural producers and government share the cost of the program 54%
- Affected growers pay through a commodity check off program 1%
- Would rather use other tactics to manage BMSB on my operation 10%
- Government pays all costs 8%

Future evaluations of survey data

- Use various econometric and regression techniques to assess the impact of grower attributes on potential adoption of management tactics (ordinal scale data requires use of multinomial logit models)
- Estimate biocontrol willingness to pay:
 $WTP = f(\text{efficacy level, crop, grower type, grower location, BMSB experience, attitude towards use of other management tactics, attitude to use of biocontrols, who pays})$