Bird damage to blueberries.

Economic Impact of Bird Damage

- Study results indicate that annually, MI loses an average of $38 million due to bird damage to the five fruit crops in the study, with a corresponding employment loss of about 800 jobs.
- Managing bird damage prevents between $53 million and $65 million in annual losses to grower revenue in MI.
- Bird damage management also prevents employment loss across the economy. In MI, unmanaged bird damage would cause a $102 million dollar loss in output and result in over 2,000 lost jobs.
- Average current damage per acre ranges from $91 in tart cherries to $763 in Honeycrisp apples. Per acre management benefits range from $144 in tart cherries to $2,162 in blueberries.

The Economic Impact of Bird Damage to Select Fruit Crops in Michigan

Funding provided by USDA's Specialty Crop Research Initiative

Summer 2014

Bird damage is a persistent problem faced by fruit growers. The economic impact of bird damage and the value of bird management are poorly understood, particularly for fruit crops. In 2012, funding was provided by USDA's Specialty Crop Research Initiative to perform an interdisciplinary research study of bird damage to 'Honeycrisp' apples, wine grapes, blueberries, and tart and sweet cherries in five states: California, Michigan, New York, Oregon, and Washington.

Bird damage to apples, a high-value crop.

Objectives of the economic analysis of bird damage were to:

- Survey fruit growers to assess current bird damage levels and the effectiveness of their management techniques.
- Calculate the monetary value of crops lost to birds and the benefits of management.
- Estimate the economic impact of bird damage to the regional economy in each state in terms of changes in output and employment.

The average annual economic impact to Michigan from bird damage to the study crops is $38 million with the loss of 800 jobs.

Fruit growers estimated their 1) yield loss in 2011, 2) yield loss if they did not use any bird management techniques, and 3) yield loss if they and their neighbors did not use bird management. These estimates were used to calculate the value of crops lost to birds, and a low and high estimate of the economic benefits of current bird management. Additionally, impacts to the broader economy from damage to crops and the savings associated with bird management were estimated using a model of the regional economy that predicts how a change in one industry can affect revenue and employment throughout the economy. These results illustrate how crop loss affects the region's economy.

Table 1. Annual revenue impact of bird damage and the benefits of bird management in MI.

	Blueberries	Wine Grapes	Honeycrisp Apples	Sweet Cherries	Tart Cherries
Current Damage	-$14,052,402	-$2,472,268	-$1,498,906	-$2,090,723	-$2,251,261
Benefit (low estimate)	$33,056,603	$8,411,087	$3,897,156	$3,678,415	$3,564,496
Benefit (high estimate)	$40,149,721	$9,163,517	$6,166,929	$4,244,325	$5,206,040

Grapes hanging behind bird netting.

Research Background

This study is a multi-state research project focusing on the biological, economic, and consumer impacts of bird damage to fruit crops. Taking place in Michigan, New York, Oregon, Washington, & Northern California, the initiative focuses on blueberries, cherries, wine grapes, and Honeycrisp apples. The objectives are to identify which birds are fruit pests, the best methods to manage bird damage, and how bird damage management could influence marketing. Detailed economic analysis reveals the significant economic impact bird damage has on fruit farms, consumers, and the regional economy.

Research Affiliates:

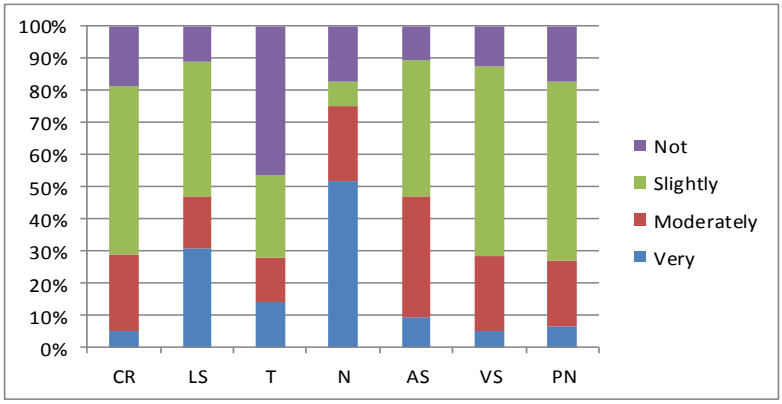
- Michigan State University
- Cornell University
- Trinity Western University
- Washington State University
- Oregon State University
- USDA/APHIS/WS National Wildlife Research Center

For more information, visit birddamagetofruitcrops.info

Bird Damage Management Techniques and Their Perceived Effectiveness

Growers use a variety of bird management tactics to combat crop loss. The use of a given management technique is dependent on the crop, region, and depredating species and may change over time.

Figure 1. Effectiveness of bird management techniques as reported by growers in Michigan.



Data Collected from Michigan Fruit Growers

A survey administered by Cornell University's Human Dimensions Research Unit queried growers to collect data on the five crops in the study within MI, NY, OR, WA and CA, with results reported separately for each crop. Questions asked for demographic information, growers' experiences with bird damage, which bird management techniques they were using, and how effective they believe the methods are. Table 2 displays select survey results.

General Survey Results

- 1,590 survey respondents grew at least one of the five crops in the study. Of those, 443 (28%) were in MI.
- 60% of MI respondents reported taking some action to manage bird damage.
- Most survey respondents in MI said blueberries (26%) or wine grapes (25%) were their most important crop.

Bird Damage in Michigan

- The cost of bird management was highest for wine grapes followed by blueberries and sweet cherries.
- Reported crop loss due to birds was between about 3% (Honeycrisp apples) and 13% (sweet cherries).
- Without management, MI growers expected birds to damage up to 43% of their crop.

Table 2. Survey results from Michigan fruit growers.

Crop	Percent Respondents Growing Crop	Yield per Acre*	Annual Bird Management Costs	Percent Lost to Bird Damage		
				Current	No Management (Low estimate)	No Management (High estimate)
Wine Grapes	20%	3.73	$1,300	9%	40%	43%
Blueberries	30%	7,741	$800	10%	35%	40%
Tart Cherries	35%	8,676	$263	5%	12%	16%
Sweet Cherries	34%	3.98	$380	13%	37%	40%
HC Apples	30%	673	$341	3%	13%	18%

Note that outliers have been removed for percent lost to bird damage and yield per acre in this table.

*Yield per acre units: grapes = tons, blueberries = lbs, tart cherries = lbs, sweet cherries = tons, apples = bushels