

# The Economic Impact of Bird Damage to Sweet Cherries

Funding provided by USDA's Specialty Crop Research Initiative

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Cherries damaged by birds.

## Economic Impact of Bird Damage

- Study results indicate that if sweet cherry growers in all five states make no attempt to manage bird damage, they will lose an estimated 37% of production.
- The annual benefit of managing bird damage was estimated. Bird management prevents between \$113 million and \$143 million in losses to sweet cherry grower revenue in five states.
- Bird damage management also prevents employment loss across the economy. Unmanaged bird damage to sweet cherries would cause a \$188 million dollar loss in the combined output of the five states and result in 2,900 lost jobs.
- Average current damage per acre ranges from \$302 in OR and MI to \$2,103 in NY. Per acre management benefits range from \$532 in MI to \$3,032 in WA.

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.



Cherries are a high-value crop in the US.

Objectives of the economic analysis of bird damage were to:

- Survey fruit growers to assess current bird damage levels and the effectiveness of management techniques.
- Calculate the monetary value of yield lost to bird damage and the benefits of management techniques.
- 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 of bird damage to sweet cherries in MI, NY, OR, WA, and CA was \$85 million with a loss of almost 1,300 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 impact of bird damage to sweet cherries and economic benefits of management.

	California	Michigan	New York	Oregon	Washington
<b>Current Damage</b>	-\$12,378,205	-\$2,090,723	-\$1,188,371	-\$3,253,311	-\$31,974,215
<b>Benefit (low estimate)</b>	\$19,043,392	\$3,678,415	\$1,067,263	\$9,692,216	\$79,755,908
<b>Benefit (high estimate)</b>	\$26,422,707	\$4,244,325	\$1,347,325	\$12,132,214	\$99,155,994



Robins were reported as the most damaging bird for sweet cherries.

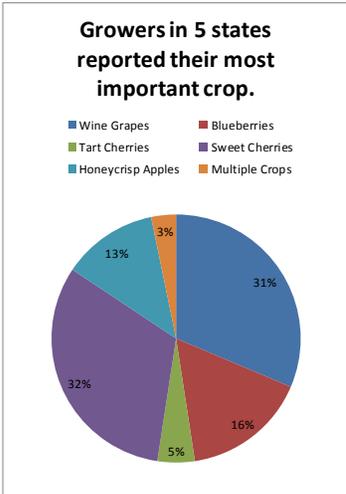
### Destructive Birds

Sweet cherry growers were asked which bird species cause damage.

**#1: Robins**

**#2: Starlings**

**#3: Crows**

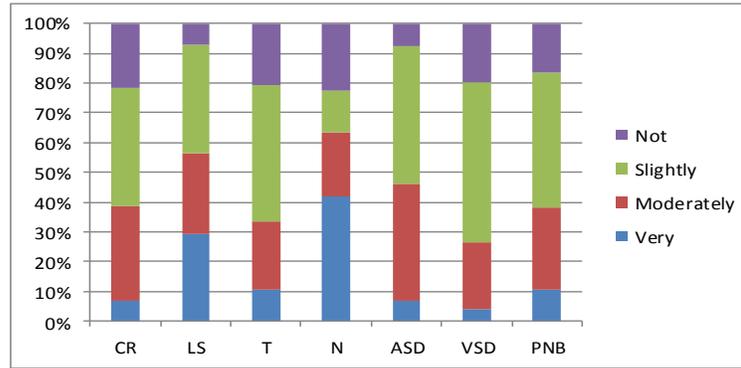


- Research Affiliates:**
- Michigan State University
  - Cornell University
  - Trinity Western University
  - Washington State University
  - Oregon State University
  - USDA/APHIS/WS National Wildlife Research Center

## 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 management techniques as reported by growers whose most important crop was sweet cherries.**



- CR = Chemical Repellents
- LS = Lethal Shooting
- T = Trapping
- N = Netting the Crop
- ASD = Auditory Scare Devices
- VSD = Visual Scare Devices
- PNB = Predator Nest Boxes

## Data Collected from Growers to Estimate Damage

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, grower's experiences with bird damage, which bird management techniques they were using, and how effective they believe the techniques 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.
- 41% of those respondents grew sweet cherries, and 32% said sweet cherries were their most important crop.
- The average farm grew 39 acres of sweet cherries yielding 5 tons per acre.

### Bird Damage to Sweet Cherries

- On average, 13% of the crop was lost to birds.
- Sweet cherry yield loss varied by state and was between 5% and 32%.
- Without management, growers expected birds to damage up to 67% of their crop.
- Bird management costs per acre ranged from \$380 in MI to \$2,300 in CA.

**Table 2. Survey results from sweet cherry growers in five states.**

State	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)
California	37%	4.81	\$2,328	5%	13%	16%
Michigan	34%	3.98	\$380	13%	37%	40%
New York	22%	3.40	\$692	31%	60%	67%
Oregon	91%	5.11	\$1,069	5%	19%	23%
Washington	64%	6.73	\$2,056	9%	31%	37%

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

\*Yield measured in tons

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