



## American blueberry farmer increases revenue by 33% with lasers

<b>Location</b>	Jefferson, Oregon, USA
<b>Application context</b>	Blueberry farm (Vineyard & Orchard)
<b>Problem definition</b>	Crop loss due to bird damage in the blueberry farm
<b>Pest bird species</b>	Starlings ( <i>Sturnidae</i> ), Blackbirds ( <i>Turdidae</i> ), Robins ( <i>Turdidae</i> ), Swallows ( <i>Hirundinidae</i> )
<b>Time during the year of bird presence</b>	June - October
<b>Time during the day of bird presence</b>	From dusk to dawn
<b>Birds reduction after the Autonomics have been installed</b>	99.73 %
<b>Total laser projection area</b>	68.1 ha
<b>In use since</b>	June 1, 2017
<b>Number of systems</b>	6 x Autonomic 500
<b>Bird behavior</b>	Perching, landing on bushes

	Before Autonomic use	After Autonomic use
<b>Yearly production of the farm</b>	787,500 kg	1,050,000 kg
<b>Average yearly production per ha</b>	11,564 kg	15,419 kg
<b>Average price per kg</b>	0,38 USD	0,38 USD
<b>Yearly revenue excluding bird damage</b>	400,000 USD	400,000 USD
<b>Number of birds</b>	1,500	4
<b>Crop loss due to birds</b>	25 %	0,067 %
<b>Yearly bird damage to the farm</b>	100,000 USD	267 USD
<b>Yearly bird damage to the farm per ha</b>	1,468 USD	4 USD
<b>Actual yearly revenue after bird damage</b>	300,000 USD	399,733 USD
<b>Saved production as a result of the Autonomic use</b>		262,500 kg
<b>Yearly additional revenue</b>		99,733 USD
<b>Yearly additional revenue per ha</b>		1,465 USD

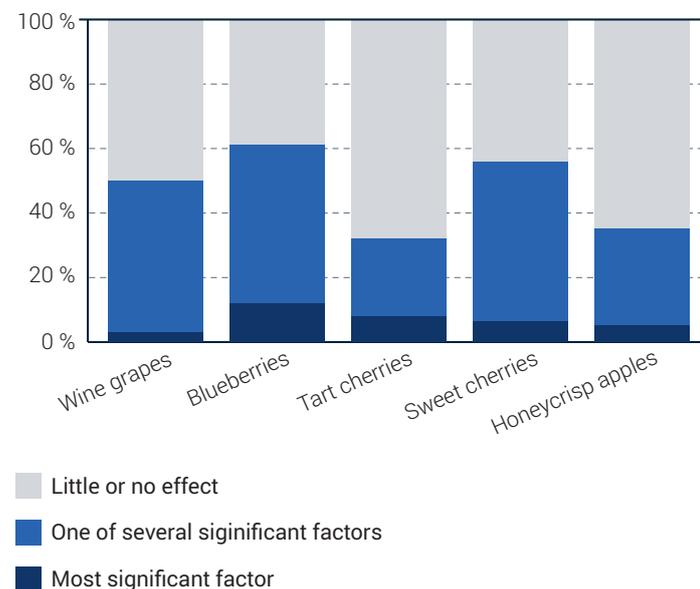
# Revolutionary lasers save \$100,000 per year on crop loss

## Fruit growing industry in the United States

Thirty eight states grow blueberries commercially. However, ten states account for more than 98 % of U.S. commercial production: California, Florida, Georgia, Indiana, Michigan, Mississippi, New Jersey, North Carolina, Oregon and Washington.<sup>1</sup>

The U.S. Department of Agriculture National Agricultural Statistics Service reports that American growers lose tens of millions of dollars each year as a result of bird nuisance and ineffective bird repelling methods (research was limited to two crops and seven states).<sup>2</sup> The research "Bird damage to select fruit crops: The cost of damage and the benefits of control in the following five states: California, Michigan, New York, Oregon and Washington."<sup>3</sup> estimated that the current bird damage costs per hectare ranged from 104 USD in Oregon tart cherries to 7,267 USD in Washington Honeycrisp apples.<sup>3</sup> The blueberry crops suffer most from the bird damage. The bar chart "Impact of bird damage on the profit of the farm" demonstrates the growers' qualitative assessment of the effects of bird damage on profit.

### Impact of bird damage on the profit of the farm



Oregon and Washington have the biggest blueberry crop damage caused by birds per hectare. The damage per hectare for blueberries equals to 4,571 USD for Oregon and is calculated at 11,238,095 USD for the entire state. The table "Bird damage per state" demonstrates the bird damage in fruit production per hectare and statewide.



### Bird damage per state

Bird damage in blueberries (USD)		
	per hectare	Statewide
California	2,036	2,649,875
Michigan	1,871	14,052,402
New York	1,609	585,753
Oregon	4,571	11,238,095
Washington	2,444	4,653,105

### Bird species responsible for crop damage

The birds that are responsible for damage to blueberry crops in the researched five states include American Robins, European Starlings and Blackbirds.

Top 3 birds responsible for blueberry damage
American Robin ( <i>Turdus migratorius</i> )
European Starling ( <i>Sturnus vulgaris</i> )
Blackbirds*

\* This category could include one of several bird species including the red-winged Blackbird, *Agelaius phoeniceus*, or potentially misidentified European Starlings.

The data illustrates the significant impact bird nuisance has on farming and, specifically, on fruit industry, which is an important sector of the U.S. economy. Many farmers have been unable to successfully resolve this problem, as they were relying on inefficient bird deterrence methods.

### Current yield-loss due to bird damage in fruit production

Bird damage in blueberries (%)	
California	3.8 %
Michigan	10.5 %
New York	11.7 %
Oregon	18.2 %
Washington	9.7 %

<sup>1</sup> U.S. Highbush Blueberry Council (2017). Where Blueberries Grow. Retrieved from: <http://www.blueberrycouncil.org/growing-blueberries/where-blueberries-grow/>

<sup>2</sup> SA - National Agricultural Statistics Service - Statistics by Subject (2011). United States Department of Agriculture. Retrieved from: [https://www.nass.us.gov/Statistics\\_by\\_Subject/index.php?sector=CROPS](https://www.nass.us.gov/Statistics_by_Subject/index.php?sector=CROPS)

<sup>3</sup> A.Anderson, C.A. Lindell, K.M. Moxcey, W.F. Siemer, G.M. Linz, P.D. Curtis, J.E. Carroll, C.L. Burrows, J.R. Boulanger, K.M.M. Steensma, S.A. Shwiff (2013). Crop Protection. Bird damage to select fruit crops: The cost of damage and the benefits of control in five states, 52, 103-109

## Laser bird deterrent and its benefits

Through innovative processes and strong customer, employee, and supplier relationships, Meduri Farms is committed to being the premier infused dried fruit producer in the world. Innovation is a very important aspect of any business and as such, Justin Meduri, Farm Operations Manager at Meduri Farms, is always on the lookout for innovative and cost-effective bird repellent solutions for their blueberry farm.

When Justin started looking for a more effective bird repelling solution, he discovered Bird Control Group. He was intrigued by the possibility of the automated laser bird deterrent system, and requested a demonstration of the Autonomic. During the demo, Justin immediately had great results and he went for a long term lease of 6 Autonomics. "It has been a success story ever since," he says.

Laser bird deterrent technology takes advantage of a bird's natural instincts. Birds perceive an approaching laser beam as a predator and take flight to seek safety. "This is so much better than scaring birds with falcons," says Justin Meduri. "We had to work so hard to keep the birds away. "Last year, it was one of the years with the

highest bird damage. We had a lot of birds in the farm; now with the Autonomics we don't even have to worry about it - we simply have no issue anymore."

### Crop damaging bird behavior

Justin Meduri noticed: "If it is one bird - the damage is not that big, but it is all about the numbers and volume. When a couple hundred birds perch on the fruit, you can throw a quarter of the fruit away because they are on the ground and thus, can't be sold."



First, birds land on the blueberry bushes which shakes the tree and makes the blueberries fall off.



Second, birds eat the blueberries and move around in the bushes causing more blueberries to fall on the ground.



Third, when birds take off, they shake the branches, causing more blueberries to fall off.

## Before and after analysis

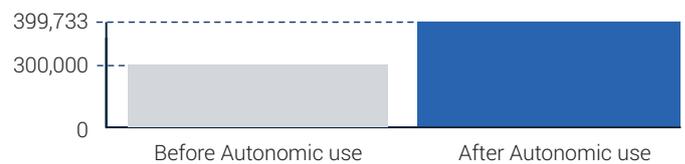
### Situation before Autonomic use

- Meduri Farms used falconry which cost 1,000 USD per day (approximately 90,000 USD per season of 3 months).
- The yearly loss to bird damage was equal to 100,000 USD.
- The actual revenue after bird damage was 300,000 USD per year.
- Number of birds perching in the trees before Autonomic use, was equal to 1,500.
- Yearly production of the farm before Autonomic use was equal to 787,500 kg.

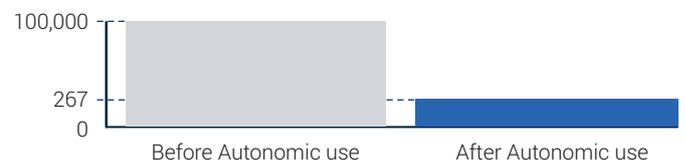
### Situation after Autonomic use

- Yearly loss due to bird damage has been reduced by 99.73 % to approximately 267 USD.
- Actual yearly revenue after bird damage increases by 33 % to 399,733 USD, which means Meduri Farms saves up to 99,733 USD each year.
- After the deployment of Autonomics, the number of birds at the farm decreases to just 4 birds.
- Yearly production of the farm after Autonomic use is equal to 1,050,000 kg.

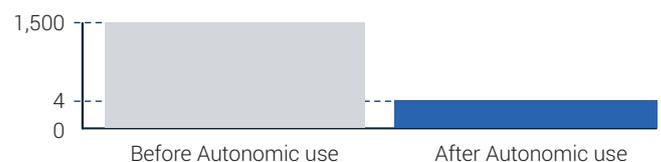
### Comparison of revenue (USD)



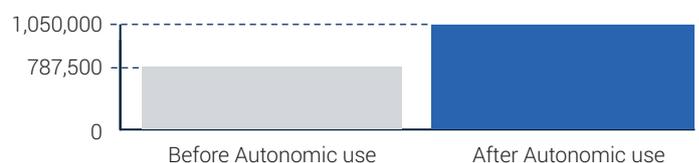
### Yearly loss to bird damage (USD)



### Number of birds at Meduri Farms



### Yearly production of the farm (kg)

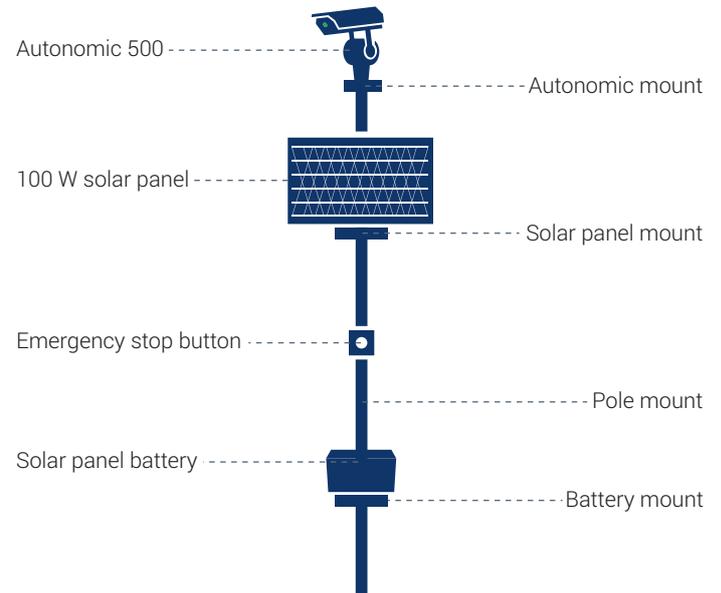




## Bird deterrent set up at Meduri Farms

The blueberry varieties produced at Meduri Farms are Aurora, Drapers, Liberty, Legacy. They all mature at a different time during the season. Therefore, the Meduri Farms' Autonomics are powered by solar energy and installed on a movable pole system. The adjustable pole mounting system allows for the repositioning of the laser devices throughout the farm. In this way, the Autonomics can be moved from the early ripening blueberries to the later ripening blueberries. This results in optimal bird deterrent based on the level of bird activity in various sectors of the farm.

Justin is very encouraged with the success realized at Meduri Farms, and is planning to place two more lasers into operation to cover additional areas of the farm.



“The future of the bird repellent technology is here. Lasers are going to be the predominant thing for every grower!”

**Justin Meduri** - Farm Operations Manager of Meduri Farms