# BIRD ACTIVITY MITIGATION


## Summary

Birds can carry human pathogens, but studies consistently show low prevalence in agricultural settings (Karp, 2023). The risk to unharvested produce is generally low and increases primarily when birds interact with livestock, congregate on infrastructure over crops, or deposit feces directly onto harvestable portions of the crop (Smith, 2021; Varriano, 2025). Effective bird management should be risk-based, proportional, and focused on preventing fecal contamination, rather than eliminating bird presence entirely.


## Which human pathogens have been associated with birds?

Birds can carry human pathogens, but studies consistently show low prevalence in agricultural settings (Karp, 2023). The risk to unharvested produce is generally low and increases primarily when birds interact with livestock, congregate on infrastructure over crops, or deposit feces directly onto harvestable portions of the crop (Smith, 2021; Varriano, 2025). Effective bird management should be risk-based, proportional, and focused on preventing fecal contamination, rather than eliminating bird presence entirely.

Birds can be carriers of the following human pathogens (Clark, 2014):

1) Bacteria - *Campylobacter, Chlamydia, Escherichia coli (E. coli), Listeria*, and *Salmonella*
2) Parasites – *Cryptosporidium parvum, Microsporidians*, and *Toxoplasma gondii*
3) Fungi – *Aspergillus spp., Histoplasma capsultatum*, and *Cryptococcus neoformans*

## How much of a contamination risk do birds pose to unharvested produce crops?

Surveys of birds provide evidence that they can carry human pathogens but usually at a low prevalence. Some recent findings on human pathogen prevalence in birds include:

- A megastudy by Smith et al. (2021) conducted >11,000 tests in 139 bird species across the western U.S. and found *Campylobacter* to be the most prevalent human pathogen (8.0%) while *Salmonella* (0.46%) and STEC (0.22%) were rare.
- Of 60 avian species sampled in California agricultural land, 8 species (13.3%) including sparrows, icterids, geese, wrens, and kinglets were positive for at least one of the following foodborne pathogens – *Salmonella* spp., *E. coli* O157:H7, and non-O157 STEC. The detection of *Salmonella*, *E. coli* O157:H7, and non-O157 STEC in 583 individual bird feces samples was 0.5%, 0.34%, and 0.5%, respectively. Non-O157 STEC was detected on feet/feather samples of 2 in 401 birds (0.5%) (Navarro-Gonzalez, 2020).
- Fonseca et al. (2020) monitored the presence of birds near produce fields in the southwest U.S. for two years. Of 305 bird cloacal swabs tested, none tested positive for *E. coli* O157:H7 or *Salmonella*, but nearly 40% tested positive for non-pathogenic *E. coli*.

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## What factors contribute to increased risk from birds?

Study findings demonstrate that the likelihood of birds being infected with human pathogens increases when birds are co-localized with cattle/cows. The time of year and bird species may also play a role in the risk of human pathogen infection.

- Birds that live and feed close to cattle/cows are more likely to carry human pathogens and are more likely to enter fields and defecate on crops (Callaway, 2014; Navarro-Gonzalez, 2020; Pederson, 2006; Smith, 2021; Varriano, 2025).
- Pathogens of public health importance (such as *Salmonella* Newport, *E. coli* O157:H7, and STEC O103 and O26) were identified in bird fecal samples, and two birds carried STEC on their feet or feathers. Identical pathogen strains were shared episodically among birds and between wild geese and free-range cattle. This result suggests a common source of contamination in the environment and potential transmission between species (Navarro-Gonzalez, 2020).
- "Canopy-foraging, insect-eating bird species were less likely to deposit foodborne pathogens on crops…" (Smith, 2021).
- "Non-native birds were 4.1 times more likely to have *Campylobacter* spp. than native birds." (Smith, 2020)
- "*Campylobacter* spp. prevalence in feces from production areas increased with increasing mammalian livestock densities in the landscape but decreased with increasing amounts of natural habitat." (Smith, 2020)
- "In late summer and autumn, the same STEC subtype was episodically found in several individuals of the same and different avian species…" (Navarro-Gonzalez, 2020).
- A two-year study in the southwest U.S.: "…we observed significantly higher probability of incidence during October–December." (Fonseca, 2020)
- "…both fecal contamination [of crops] and bird damage did increase on farms with higher densities of fencing and wires, where birds often perch." (Olimpi, 2020)

## How do I choose a strategy to cost-effectively keep birds away from produce fields?

Choosing the best strategies to deter birds depends on: 1) The bird species, 2) their habitat requirements, 3) their feeding habits and patterns, and 4) the habitat surrounding the crop (Lukas, 2022). Using more than one strategy typically provides the best results.

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## What are methods that can help to keep birds away?

The primary method of mitigating bird activity near produce fields is use of deterrent measures. These measures generally function in one of three ways: physical barriers, auditory or visual disturbances that trigger fright responses, or taste/sensation that is unpleasant to the birds. See the table below for bird deterrent options.

Another mitigation measure is to provide habitat for natural predators. A study in Michigan found that installing nest boxes for the declining raptor, American kestrel, within or next to cherry orchards significantly reduced fruit-eating bird species (Shave, 2017).

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| Bird Deterrents | Description & Examples | Pros | Cons | Resources |
|---|---|---|---|---|
| **Automated sound / bioacoustics deterrents** | Devices that emit loud noises or broadcast predator or species-specific distress calls.<br>Examples:<br>Propane cannons – emit sonic blasts at designated intervals<br>Humming lines – vibrate at a frequency unpleasant to birds | Reuseable; automatic; one device covers a significant area; require minimal maintenance following setup; broad spectrum effect | Birds can become habituated with repeated exposure.<br>Noise nuisance for residential areas.<br>Requires a power source. | Cornell Cooperative Extension: Bird management on dairy farms article.indd<br>Nonlethal bird deterrent strategies: How to reduce fruit crop losses in Oregon \| OSU Extension Service<br>How do farmers keep birds away from blueberries? – The Institute for Environmental Research and Education<br>Inflatable dancers scare off birds - Fruit Growers News |
| **Chemical (taste aversion) repellents** | Agents that stimulates temporary pain in receptors associated with taste and smell rendering the food source unpalatable; usually applied to crops as fogs or sprays.<br>Examples:<br>Sucrose sprays – indigestible for birds<br>Grape flavored KoolAid<br>Methyl anthranilate | Relatively inexpensive; readily available; broad spectrum effect | Application needs to be made prior to birds finding food source.<br>Need to be reapplied at regular intervals and after rain.<br>May become more effective with repeated exposure (e.g., sucrose) | Rejex-It US EPA, Pesticide Product Label, REJEX-IT)<br>What chemical will keep birds away? - Birdful<br>Sugar sours birds on eating valuable cherry crops: Sweet revenge for bird control<br>Nonlethal bird deterrent strategies: How to reduce fruit crop losses in Oregon \| OSU Extension Service<br>Bird Protection for Blueberries and Other Fruit; Center for Agriculture, Food, and the Environment (CAFE) at UMass Amherst<br>Bird Damage: Management Options in Sweet Corn Production in New York<br>Cornell Cooperative Extension: Bird management on dairy farms article.indd |

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|---|---|---|---|---|
| **Laser deterrents** | Laser bird deterrents utilize a concentrated beam of light that birds instinctively recognize as potential danger. When the laser beam moves across their path, birds perceive it as a physical threat, prompting them to flee the area. | Reuseable & effective; quiet; not affected by adverse weather; area of impact is controllable<br>Works best on flocks of birds; broad spectrum effect. | Requires a power source.<br>Can be harmful to birds' and humans' vision. | Laser Scarecrows: A 21st Century Approach to Bird Control<br>Cornell Cooperative Extension: Bird management on dairy farms article.indd<br>AVIX Autonomic Automated Bird Repellent System \| Keep Birds Away 24/7 |
| **Exclusion barriers** | Mesh netting or plastic canopies covering crops or alongside of crops (e.g., orchards) | Highly effective if properly maintained | Labor intensive for application and retrieval; requires maintenance; not practical for all scales or types of crops | Bird Netting Guide: Availability and Uses in Agriculture<br>Tabor 2002 Netting applications for agricultural bird control Microsoft Word - 117_Taber.doc<br>How do farmers keep birds away from blueberries? – The Institute for Environmental Research and Education |
| **Visual deterrents** | Scares birds away by presenting a perceived threat (e.g., exhibiting a random movement or visual disturbance)<br>Examples:<br>Balloons or kites with hawk-eye / scare eye, reflective tape, air dancers, dead bird decoys, flashing lights, predator decoys (coyote, owl, hawks) | Inexpensive; quiet; broad spectrum effect | Birds may habituate with repeated exposure; limited coverage area - may require a large quantity; may require a power source | Bird Damage: Management Options in Sweet Corn Production in New York;<br>Nonlethal bird deterrent strategies: How to reduce fruit crop losses in Oregon \| OSU Extension Service<br>Cornell Cooperative Extension: Bird management on dairy farms article.indd |

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| Bird Deterrents | Description & Examples | Pros | Cons | Resources |
|---|---|---|---|---|
| **Alternative food sources** | Plant less valuable crops as a sacrificial crop (e.g., sunflowers or mulberries) to lure birds away from cash crop. | Environmentally friendly | Resource intensive (i.e., takes land out of production) | Trap Cropping vs. Sacrificial Planting: Key Differences in Companion Planting / gardendif.com |

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