

Natural habitat around farms a win for strawberry growers, birds and consumers

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A barn swallow perches on a hand by boxes for strawberries. Barn swallows tend to swoop over the centers of strawberry farms to eat pests and other insects. Credit: Elissa Olimpi/UC Davis



Conserving natural habitat around strawberry fields can help protect growers' yields, their bottom line and the environment with no detectable threat to food safety, indicates a study led by the University of California, Davis.

In the study, published in the journal *Ecological Applications*, researchers conducted grower surveys and experiments at 20 strawberry farms stretching between Santa Cruz, Watsonville, and Salinas on California's Central Coast—a region that produces 43 percent of the nation's strawberries.

"Our results indicate that strawberry farmers are better off with <u>natural</u> <u>habitat</u> around their farms than without it," said lead author Elissa Olimpi, a postdoctoral researcher in the lab of Daniel Karp, assistant professor with the UC Davis Wildlife, Fish and Conservation Biology department.

Conserving habitat saves growers money

The study's models indicate that adding natural <u>habitat</u> can decrease crop damage costs by 23 percent. Removing natural habitat can increase costs up to a whopping 76 percent.

Critically, farms with more natural habitat showed no evidence of higher fecal contamination on or surrounding strawberry plants. Also, while bird feces were regularly encountered on the ground, only 2 of 10,000 berries examined showed signs of direct fecal contamination. Those berries would be removed from <u>food</u> production during the hand-harvesting process.

"We found no evidence that conserving habitat presented a <u>food safety</u> risk," Olimpi said.





UC Davis researchers set up exclosure experiments on strawberry farms of varying habitats. They compared insect communities and berry damage between open areas and those inaccessible to wild birds. Credit: Victoria Glynn

Food safety and natural habitat

The results run contrary to market-driven <u>farm</u> management practices that encourage habitat removal to decrease bird fecal contamination and crop damage. Natural habitat includes forests, grasslands, wetlands, and shrubs.

Those measures were developed in response to a deadly outbreak of E. coli in 2006 that was traced to spinach grown in the region. Since then,



private food safety protocols and public regulations were designed to help avert further foodborne illness crises. Yet some requirements may compromise environmental and social sustainability, as a <u>2019 study by</u> <u>Olimpi</u> describes.

Between 2006 and 2009, roughly 13 percent of the riparian habitat along the Salinas River was removed in response to food safety reforms, notes a 2013 study.

Muting the negative

The study notes that <u>wild birds</u> did create crop damage in some cases, particularly at the edges of farms. And while they help control insects, some of those are beneficial insects. But overall, the presence of natural habitat muted the effects of birds on farms and associated damage costs.





A yellow warbler is held by a researcher. A study shows natural habitat around farms can mute the effects of birds on crops. Credit: Daniel Karp/UC Davis

In other words, says Olimpi: "No matter your <u>crop damage</u>, birds will be more beneficial when you have natural habitat. We think the natural habitat is providing what they need, so the <u>strawberry</u> field isn't this oasis for them."

The work is part of a larger research goal to explore how agricultural landscapes can both support and benefit from biodiversity and ecological communities.



"The future of many species hinges on them being able to survive in working landscapes," Olimpi said. "If we can find those opportunities in agriculture where we can enhance biodiversity and production, that's the golden ticket."

More information: E.M. Olimpi et al, Shifts in species interactions and farming contexts mediate net effects of birds in agroecosystems, *Ecological Applications* (2020). DOI: 10.1002/eap.2115

Provided by UC Davis

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