Diversifying Farmlands Supports Bird Conservation and Reduces Bird Pest Damage

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Abstract

A goal of much of agricultural diversification is to improve habitat quality for wildlife throughout farmlands. However, many argue that diversified practices promote pest species, including some species of birds that eat crop fruits. Indeed, many farmers remove natural features from farms to reduce the abundance of pest bird species. Contrary to farmers' intent, maintaining natural features on farms and in surrounding landscapes could reduce the abundance of pest species by limiting their resource availability and increasing the abundance of their natural enemies. Further, although some bird species damage crop plants, other species consume arthropod pests and thereby may benefit farmers. To shed light on this controversy, we set up 18 pairs of bird exclosure and control (open to bird access) plots on 6 organic strawberry ranches in the Central Coast of California.

Additionally, we surveyed bird species abundance and strawberry damage across 27 strawberry ranches to understand how diversification modified the bird community. Our bird exclosure experiment revealed that bird damage was minor compared with arthropod pest damage and that birds also benefited farmers by reducing arthropod pest damage to berries. Interestingly, the number of berries damaged by birds roughly equaled the number of berries that birds saved from arthropod damage. We also found that bird diversity increased with farmland diversification and therefore benefited the conservation of bird biodiversity. Simultaneously, the abundance of pest birds and some measurements of bird damage to strawberries decreased with farmland diversification. Together, these results suggest that although birds cause some economic damage to strawberries, they also provide some pest control services that roughly equate to their costs. We concluded that farmland diversification promotes bird conservation and transforms the bird community from one dominated by pest species in simplified landscapes to one dominated by insectivorous birds in diversified landscapes.

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