

Research Background: Farming for Beetles, Bees and Biomass



If you've ever driven through farmland in the US, chances are you've seen cornfields. That's because corn is the number one crop grown in the US, measured by harvest. In fact, the US is the biggest producer of corn in the world. The US Department of Agriculture estimates that 94 million acres of farmland will be planted with corn in 2016. For comparison, that's about the same size of Montana, the fourth largest state. That's a lot of corn!

Corn is used for a wide range of products including foods, animal feed and biofuels. Between 35-40 percent of the corn grain harvest is used to make biofuel ethanol that is mixed with gasoline to power our cars. That means that about 37 million acres of land – the same size as the entire state of Florida – is needed to grow the corn used to make fuel for our cars.



Dr. Ben Werling

Although we can make a lot of food and fuel from all of this corn, some ecologists such as Dr. Ben Werling are concerned about the effects of growing so much corn on **biodiversity**: the variety of different organisms living in these agricultural landscapes. In particular, they want to measure the biodiversity of plants and beneficial insects found in cornfields compared to other potential biofuel crops, such as switchgrass and prairie. Beneficial insects provide valuable services to people. For example, bees pollinate fruit and seed crops. Predatory insects, such as ladybugs, can protect our crops by eating pest insects. Ben and his team also wanted to measure differences in these **ecosystem services** between different biofuel crops.

To compare biodiversity between crops, they counted and then compared the number of different species of plants, bees and predatory insects found in 115 corn, switchgrass and prairie fields in Michigan and Wisconsin over three years. They also measured and compared three ecological services between the crops: biomass production for biofuels, bee pollination rates, and pest egg predation. To measure biomass production, they harvested, dried and weighed the biomass (plant material) growing in each crop field. To measure bee pollination, they placed sunflowers next to corn and prairie fields for one week and then counted how many seeds were produced in each flower. To measure insect predation, they placed corn pest eggs in the crops and counted the number that were eaten.