

Diverse landscapes are better: Policymakers urged to think broadly about biofuel crops

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A ladybird beetle, or ladybug. Credit: Kurt Stepnitz, Michigan State University

Diversity is valuable socially, economically and now environmentally. Research by Michigan State University scientists has found that growing more corn to produce ethanol – creating less diverse landscapes – reduces the ability of beneficial insects to control pests, a loss valued at about \$58 million per year in the four states studied (Michigan, Iowa, Minnesota and Wisconsin).

"Corn is a less favorable habitat for many ladybird beetles (ladybugs)

and other beneficial insects that feed on pests such as the soybean aphid," said Doug Landis, MSU professor of entomology. "As we plant more corn, we reduce the ability of that landscape to supply beneficial predators to control pests in soybeans and other crops. This results in increased pesticide use and yield losses. This research estimates the value of this biological pest control service in soybeans (in the four states) to be about \$240 million each year."

The research was published in the current issue of the *Proceedings of the National Academy of Sciences*.

From 2006 to 2007, corn acreage increased by 19 percent in the United States, reducing landscape diversity in many areas, according to the scientists.

"Over-reliance on any one crop is likely to reduce the value of natural control of pest insects by beneficial insects," said Scott Swinton, MSU professor of agricultural, food and resource economics and paper co-author. "If we look at farmers who grow only corn and soybeans, increasing corn acreage and reducing soybean acreage will probably mean higher costs for soybean pest control. Beneficial insects help control pests so growers have lower pest control costs."

Both Landis and Swinton are members of the Great Lakes Bioenergy Research Center, a partnership between Michigan State and the University of Wisconsin-Madison funded by the U.S. Department of Energy to conduct basic research aimed at solving complex problems in converting natural materials to energy.

The researchers say achieving the biofuel production levels mandated by Congress will take millions of acres to provide the necessary raw materials and will change agricultural landscapes. Understanding how these landscape changes affect the sustainability of biofuel production is

the overall goal of the research.

"Ultimately, we hope this helps policymakers think about which and how much of any biofuel crop, as well as the location of the crop, makes sense for a particular landscape," Landis said. "We could choose to create monocultures of a single biofuel crop or have diverse mixtures of many biomass sources including perennial trees and grasses as well as corn. Diverse landscapes often support higher levels of vital ecosystems services such as pest suppression and pollination. Our goal is to provide information so people can make more informed decisions."

Source: Michigan State University

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