

Farming for improved ecosystem services seen as economically feasible

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By changing row-crop management practices in economically and environmentally stable ways, US farms could contribute to improved water quality, biological diversity, pest suppression, and soil fertility while helping to stabilize the climate, according to an article in the May issue of *BioScience*. The article, based on research conducted over 25 years at the Kellogg Biological Station in southwest Michigan, further reports that Midwest farmers, especially those with large farms, appear willing to change their farming practices to provide these ecosystem services in exchange for payments. And a previously published survey showed that citizens are willing to make such payments for environmental services such as cleaner lakes.

The article is by G. Philip Robertson and six coauthors associated with the Kellogg Biological Station, which is part of the Long Term Ecological Research Network. The research analyzed by Robertson and colleagues investigated the yields and the environmental benefits achievable by growing corn, soybean, and winter wheat under regimes that use one third of the usual amount of fertilizer—or none at all—with "cover crops" fertilizing the fields in winter. The research also examined "no-till" techniques. The regime that used fewer chemicals resulted in more than 50 percent reductions in the amount of nitrogen that escaped into groundwater and rivers, with crop yields close to those of standard management. Nitrogen pollution is a major problem in inland waterways and coastal regions, where it contributes to the formation of "dead zones."

The no-till and reduced chemical regimes also mitigated greenhouse warming by taking up [greenhouse gases](#) from the atmosphere, in contrast to standard management, which produces significant greenhouse warming by emitting nitrous oxide. The zero-chemical regime mitigated [greenhouse warming](#) enough to compensate for the emissions produced under standard management. All three regimes also led to more fertile soil compared with conventional management.

The environmentally improved [farming practices](#) that Robertson and his colleagues studied are more complex than conventional ones. But the authors found that although sustained profitability is generally farmers' overriding concern, substantial proportions would accept payments to adopt such practices, especially those with large farms. And a 2009 survey in Michigan found that members of the public indicated they were willing to pay higher taxes so that land managers could participate in stewardship programs to benefit lakes; a smaller number were willing to pay for a reduction in [greenhouse gas emissions](#).

Robertson and his colleagues argue that in coming decades, human population and income growth will drive agriculture to ever-higher intensities. The danger is that it will become more vulnerable to climate extremes and pest outbreaks. "Now is the time to guide this intensification in a way that enhances the delivery of ecosystem services that are not currently marketed," they conclude.

Provided by American Institute of Biological Sciences

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