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More ethanol, more corn, more nitrogen - and bigger dead zone in the gulf

By Dennis Keeney*

This summer, the USDA announced that U.S. farmers have planted a post-World War II record amount of land with corn to meet the growing demand driven largely by increased ethanol production. A few weeks later, researchers from Louisiana State University reported an all-time record for the size of the dead (hypoxic) zone in the Gulf of Mexico. Is there a connection?

We know the amount of algal growth leading to low oxygen levels and subsequent fish and shrimp decline in the Gulf of Mexico is directly related to the amount of nitrogen going down the Mississippi River. And we know that much of this nitrogen comes from the fertile farmland in Minnesota, Iowa and Illinois, the heart of the Corn Belt.

Corn prices reached as high as \$4 a bushel this spring, and are at about \$3.27 a bushel now, still a profitable margin. The anticipation of continued high corn prices has increased the incentive to move land into corn.

This year, the amount of land planted in corn has increased a whopping 18.5 percent, from 78.3 million to 92.9 million acres. Minnesota farmers planted about 900,000 more acres of corn this year, compared with last year's 7.3 million. Iowa is up nearly 1.7 million corn acres. These acres come from soybean, Conservation Reserve Land and grasslands. More often than ever, corn is being planted on the same land each year, eliminating the time-proven rotations of the past and requiring more nitrogen use.

This shift toward greater corn acres will greatly enhance nitrogen loss into the Mississippi River. Yet Gulf Coast and Midwest scientists who have been studying the causes of hypoxia and developing models to predict its behavior in the gulf have called for a 50 percent reduction in nitrogen runoff - in order to reduce the dead zone to the level it was about 20 years ago. Clearly, current biofuel policies are pushing the gulf in the wrong direction.

It is possible that a perfect storm of farming practices and climate change-driven events have caused the record level of hypoxia this year. Last winter was warm and wet, causing nitrogen in crop residues, animal manures and applied fertilizer to be more rapidly converted to the soluble nitrate form. Many farmers applied their nitrogen in the fall in anticipation of greater corn acres. And heavy spring

rains accelerated its leaching into the Mississippi River and the gulf. This was reflected in the high levels of nitrate in Midwest rivers this spring.

Farmers believe the increased ethanol demand will keep corn prices high for the foreseeable future. So, unless there are major policy changes, it is likely we will see increased corn land and higher use of nitrogen fertilizer for the foreseeable future.

The fertilizer needs for a corn-based ethanol system undercut some of the potential energy gains. That is because nitrogen fertilizer, made from natural gas, requires a lot of energy - up to 29 percent of the energy use in agriculture. Since most corn crops are fertilized with about 150 to 200 pounds per acre of nitrogen fertilizer, it takes between 30 and 40 gallons of diesel fuel equivalent just to fertilize the crop.

There are good alternatives, such as organic farming or long-term rotations, to reduce the use of nitrogen fertilizer for growing high yields of corn. But right now these more eco-friendly options do not provide the vast amounts of corn needed to fill the increased demand of the ethanol boom.

We need policies to encourage a new world of energy-producing cellulose crops as an alternative to corn. These perennial crops could provide feedstock for biofuels, clean water and healthy soils. Congress must look at biofuel issues as it finishes writing the 2007 farm bill. If incentives for growing corn are reduced, cellulosic ethanol support is enhanced and support for more sustainable forms of agriculture is provided, we could assure a healthy landscape and rural economy - and a healthy Gulf of Mexico.

Vive la shrimp.▣

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