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Biofuels and Water Quality in the Eastern United States

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Abstract Text:

The boom in biofuel production, primarily ethanol, has largely occurred in the Midwest but the need to transport by truck or rail is increasing production on the East Coast. Currently about ten ethanol facilities are under construction or have permits in the East and more than 20 others are being proposed. The East is already a grain deficit area with large quantities of corn shipped into the area for poultry and livestock production. Importing more corn will increase the waste nutrients from the grain that must be managed. Dried distiller's grains (DDGs) from ethanol production, at levels currently fed in dairy rations, will increase manure phosphorus (P) levels and may cause nitrogen (N) increases. Work to increase the DDGs that can be fed to poultry and swine would also increase their waste P. Feed management programs in the East have reduced P, and to a lesser extent N, in animal wastes but this will be reversed if DDGs are added to rations in substantial amounts. New eastern ethanol facilities increase the likelihood that DDGs will be added to animal feeds. The increase in grain prices due to ethanol production increased corn production in the East in 2007. Most of the new corn acreage came from soybeans or cotton, both of which usually lose less N to water during production than corn. Substantial acreage of hay, pasture and idle land was also converted to corn which resulted in a major increase in N, and probably P, losses. The East may be well suited to perennial grass production for cellulosic ethanol but that technology and the supporting infrastructure are likely a decade away. For the next several years, high prices will likely increase production corn as well as wheat and soybeans in the East. This will put additional pressure to convert hay, pasture and idle lands to these higher nutrient loss crops. Enhanced conservation is needed quickly to reduce the impact of expanded row crop production on water quality. Efforts to accelerate cellulosic production from perennial grasses or woody materials are needed so that new facilities in the East can be built to handle these materials that can offer multiple environmental benefits and potentially additional farmer income through the sale of ecological services.

Impact Statement:

Understanding the potential positive or negative water quality impacts of expanded biofuel/ethanol production is necessary to accurately evaluate the cost of production. It also is needed to assess how conservation efforts must be increased and/or focused to minimize possible increases in nutrient losses. Understanding the different impacts of different biofuel feedstocks can also help inform energy policy and research investments.