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IRRIGATED CORN HIGHLY EFFICIENT

Contrary to conventional wisdom, irrigated corn in Nebraska is highly efficient in the use of energy, water and fertilizer. In a study by Ken Cassman and Patricio Grassini at UNL, they found the increased yields more than offset the energy cost of these inputs. In contrary to popular belief, high yield, irrigated corn production can be highly efficient and more than offset the cost of inputs.

This research has important ramifications for agriculture's efforts to meet increasing global needs for food, feed, fuel and fiber on existing farmland. One of the things Cassman talks about is if our goal is to simply reduce greenhouse gases or the have the highest possible energy efficiency, you would do that producing crops without any inputs at all or by getting rid of agriculture entirely. We can't go there so the challenge is how to produce enough food in a way that also protects the environment, conserves our natural resources, and minimizes greenhouse gas emissions from agriculture.

High input irrigated corn, though it uses more fossil fuels and generates more climate-change-causing greenhouse gases than dryland cropping, it also produces much higher crop yields. The widely held perception of irrigated agriculture as energy wasteful fails to take into account crop-management changes in recent decades that have increased yields without requiring more fertilizer or irrigation.

In fact, they found that irrigated corn had substantially larger net energy yield and less greenhouse gas emissions per unit of grain produced than corn from dryland systems with much smaller input levels and lower yields.

The findings are based on several years of field data collected from a large number of commercial production fields in Nebraska. Previous research used NASS data from producer surveys so this new study is better. Researchers could go back to the same field in 10 years and see how things have changed.

It's important to assess energy efficiency and GHG emissions of cropping systems on a yield basis. It would be possible to achieve a large decrease in GHG emissions in the three Nebraska counties included in this study by converting irrigated cropland into dryland agriculture, but to make up for the estimated 50 percent decrease in grain yield would require 308,000 additional acres of dryland corn production in Nebraska. Thus it is penny-wise and pound foolish to convert irrigated agriculture back to dryland production for the sake of reducing greenhouse gas emissions.

Continued progress can come with use of best management practices, including rotation of corn with soybeans rather than continuous corn, replacement of surface irrigation with pivot irrigation systems, use of conservation tillage practices and no-till rather than conventional tillage and fine-tuning applications of nitrogen fertilizer and irrigation water.

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