

## Precision Ag and Profits



Two U of I researchers are betting farmers can increase their profits and protect the environment at the same time by using precision agriculture techniques in applying nitrogen fertilizer to their fields.

"This is a potential 'win-win' situation for everyone--farmers and the environment," said David Bullock, a professor of food and agricultural policy in the Department of Agricultural and Consumer Economics.

"It is in everybody's interest to do a better job of using nitrogen fertilizer," said Don Bullock, a professor of crop production and biometry in the Department of Crop Sciences.

The brothers are teaming up on a research project in the Decatur area to measure the impact of nitrogen application through global positioning system (GPS) technology and by monitoring yields and chemical run-off into Lake Decatur. Funding support for the project comes from the U.S. Environmental Protection Agency.

The Bullocks have done extensive research and publishing on precision agriculture, which involves the use of GPS systems to determine input application rates. However, both note that despite earlier predictions that this technology would be the next big thing in agriculture, it really hasn't had the anticipated impact.

Don Bullock said the key is combining information with the technology.

"In the past, farmers didn't know how to really use the new technology to make an impact on their profits. Our research has shown that its use, by itself, can mean pennies more per acre in profit," said Don Bullock. "However, when you combine the technology with information, it really becomes worth something."

Nitrogen fertilizer use presents an ideal opportunity to bring information and technology together. For years, farmers have relied on nitrogen fertilizer applica-

tion recommendations supplied by University of Illinois Extension and other state extension services.

"These are general recommendations and are exactly that--general," said David Bullock. "In other words, they are a 'one-size-fits-all' type of recommendation. If one takes profit and the impact on the environment into account, these recommendations can leave a lot to be desired."

Don Bullock noted, however, that the general recommendations were based on the best information available at the time--test-plot data extrapolated out. "Years ago, there wasn't a better way to develop recommendations. Now with precision ag tools, there is," he said.

The Bullocks will be working with farmers in the Lake Decatur watershed to track and measure nitrogen use beginning with the 2006 crop. They anticipate it will take two years for the data to emerge.

"There is no doubt that nitrogen fertilizer is being used excessively today," said Don Bullock. "We believe some farmers use excessive amounts of nitrogen as a form of insurance, but research shows that it doesn't work that way. The excess just flows into the ecosystem and the farmers pay for inputs that have no impact."

David Bullock said precision ag tools create exciting new opportunities for research, with farmers themselves in effect becoming the principal investigators.

"In years to come, farmers will be able to run experiments themselves on their own farms by using precision ag," he said. "And when you start adding up the results from many farmers on many types of soil, you're talking about acres and acres of experiments that will show farmers how to make more money."

"We'll know--not guess--what are the best things to do and the impact on profits of different rates of nitrogen application on different types of fields," said Don Bullock.

