

Nitrogen applied

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Combating soil erosion is a primary concern for agricultural producers in the United States, and many have incorporated conservation tillage systems in their effort to maintain a profitable crop output.

Cover crops are an important tool in this cycle, and while it is known that using nitrogen fertilizers can increase these crops biomass, the resulting levels of nitrogen for the following cash crops have been unknown.

Researchers found that areas that did have fertilizer applied to their cover crops had less biomass output for soil protection, while plots that did use fertilizer had greater biomass along with an increased amount of nitrogen available for the cash crop. Results from the study were published in the September-October 2008 issue of the *Soil Science Society of America Journal*.

"Use of high-residue cover crops is imperative to prevent soil erosion, to bank leftover nutrients during the winter for summer cash crops, and to improve soil quality," said Mark Reiter, lead author of the study. "From this data we see that we can increase cover crop biomass by using nitrogen fertilizer and that the nitrogen will later be available to our cash crop. It is a win-win situation."

The study was conducted by USDA-ARS scientists with the Conservation Systems Research Team in Auburn, AL and the J. Phil Campbell Senior Natural Resource Conservation Center in Watkinsville, GA, in cooperation with Auburn University. Scientists investigated the effects of using nitrogen fertilization on rye cover crops, as well as the subsequent fertilizer availability to cotton.

The focus of the study was on plots in the Tennessee Valley Region of northern Alabama, which is a highly productive region in the nation's Cotton Belt. To study the effects of fertilizer, rye cover crops were varied in the amount of nitrogen used.

After the rye had dried up, cotton was planted in the same soils and fertilized with different amounts of nitrogen. Researchers collected the plant and soil samples and determined how much nitrogen had been integrated into the plant and soil systems. A nitrogen isotope was used to trace the nitrogen used in the fertilizer, as opposed to nitrogen that is native to those soils.

While the results of the study are positive to understanding conservation tillage, further research is still needed before establishing new fertility management guidelines in all crops using high-residue cereal cover crops. In applying this research, it is expected that soil quality, along with management of the nutrients in the soil, will improve the success of American agricultural producers.

Source: Soil Science Society of America

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