

Slow-Release Nitrogen Better For Wet Soil, MU Researcher Reports

COLUMBIA, MO.

The farm landscape can significantly influence how crops respond to different types of nitrogen fertilizer, said Doug Ludwig, University of Missouri soil science graduate student.

Ludwig studied nitrogen-use efficiency in corn at the MU Greenley Memorial Research Center and found that slow-release fertilizers boosted yields in low-lying areas prone to pooling water, while conventional urea outperformed other fertilizers on well-drained farm soils.

With soaring fertilizer costs, maximizing nitrogen efficiency can add up to real savings for farmers, Ludwig said. He presented his research at the MU Greenley Research Center Field Day, Aug. 7, near Novelty, Mo.

“The main thing this study is trying to determine is how efficiently nitrogen is used by the corn itself,” Ludwig said. “Farmers want to know what they’re putting in and what they’re getting out financially, because that’s the biggest issue with all these rising costs.”

Ludwig compared how corn planted at various parts of the Greenley farm responded to four types of nitrogen fertilizer: conventional urea; urea with N-Serve, which inhibits denitrification; urea with a urease inhibitor, which reduces nitrogen lost to the air; and polymer-coated urea, a slow-release fertilizer.

“We looked at how these products performed in low-lying areas, sideslopes and summit areas,” Ludwig said. “The biggest differences were between conventional and polymer-coated urea. On the summit, it was more cost-effective to use conventional urea, whereas in low-lying areas it was more cost-effective to use the slow-release fertilizer.”

In low-lying areas, the slow-release fertilizer outperformed conventional urea by about 20 bushels per acre, he said. “We saw a huge response in lower-lying areas – upwards of \$80 per acre more in profit over the conventional urea.”

In well-drained areas, it was almost the reverse, Ludwig said. “Conventional urea out-yielded polymer-coated by up to \$50 bushels per acre because there was no loss to soil moisture.”

The results may help farmers develop more efficient fertilizer management plans. For instance, the initial cost of slow-release fertilizer makes some farmers think twice about using it, but selectively applying it in areas where it works better than other fertilizers will ultimately save money when corn yields are higher, Ludwig said.

“It costs more to apply, but it’s not something farmers are going to apply clear across the field as a blanket treatment. They would just apply it in certain areas where it works better,” he said. “For \$10 or \$12 per acre, farmers could go out with multi-bin spreader trucks and spread two to three products on the same field.”

Ludwig will repeat the study this year. He said the data eventually will help researchers develop a precision agriculture system using digital maps of farm fields and computer-based treatment recommendations that will help farmers maximize fertilizer efficiency.

“Understanding how these products differ cost-wise is important, so farmers aren’t spending money using products that aren’t needed,” Ludwig said. “They will be glad they spent the extra money at the beginning getting the right products, when it maximizes their profits in the end.”

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