Illinois Agrinews
April 20, 2001

Sulfur boosts productivity on eroded soils

Adding sulfur to corn boosted yields on eroded ground by up to 31 bushels per acre in a recent study conducted by South Dakota State University.

The study was conducted last year on no-till corn ground near Garretson, South Dakota, on a rolling landscape that is typical of southeast South Dakota, southwest Minnesota, northwestern Iowa, and northeastern Nebraska.

"This area is characterized by silt loam soils that were formed from loess parent material," explained Howard J. Woodard, SDSU agronomist and coordinator of the study. "The shoulders and backslopes are usually eroded and have low organic matter levels compared to the footslopes."

Corn yields tend to be lower in the eroded areas, and leaf striping has been fairly common, notes Woodard. "The striping has been attributed to iron or manganese deficiencies; but in fact, we believe it's a result of sulfur deficiency," he says.

In the study, Woodard and research associate Anthony Bly compared UAN application with and without 25 pounds per acre of sulfur at planting time. The sulfur treatment alleviated leaf striping and increased yields by an average of 19 bushels per acre.

The greatest yield increases occurred on the backslopes, where sulfur increased corn yield by 31 bushels per acre, from 119.4 to 150.6 bushels per acre. On the shoulders, sulfur increased corn yield by 25 bushels per acre, from 103.1 to 128.5 bushels per acre.

Woodard attributes the sulfur responses to low organic matter levels and cooler soil temperatures at planting.

Sulfur is stored in the organic matter and released when soil temperatures warm up, he explains. As the organic matter level goes down, so does the level of potentially available sulfur.

"In our study, the greatest yield increases occurred where the organic matter levels ranged from 1.7 to 2.4 percent," says Woodard. There were no yield increases from sulfur on the footslopes, where the organic matter measured 3.0 percent and higher.

In addition to low organic matter levels, Woodard says no-till farming can aggravate sulfur shortages on eroded ground. "No-till soils are significantly cooler than conventionally tilled soils, and that can slow down the release of sulfur from the organic matter," he explains.