

Nitrogen, how you put it on affects yields

NEWARK, Dela. — Properly used, nitrogen ranks next to irrigation in its effect on corn yields. But this is one nutrient farmers have to apply without benefit of a soil test.

"Many attempts have been made to measure available N or predict the supplying power of a soil, but the level is always changing and an accurate measure involves hitting a moving target," says University of Delaware Agronomist William Mitchell. "As N becomes more expensive and concerns grow about the fate of N in our soils, we'll have to make better wing shots or pay more attention to the actual response we're getting from field applications."

At the present time, he doesn't think people are following either course successfully.

"Our recommendations for this nutrient are based on the fuzzy notion that 1.0 to 1.2 pounds of N are needed to produce a bushel of

corn. This is a very crude guide and, more often than not, it's wrong," he says.

To illustrate, he points to corn yield data obtained last year in field trials at the Delaware Agricultural Experiment Station's research farm in Newark.

Without irrigation and N, the yield was 33 bushels an acre. Broadcasting 100 pounds of N as ammonium nitrate before plowing increased the dry land yield to 83 bushels. This was a 50-bushel increase for 100 pounds of N, or two pounds of N per bushel of corn. When the broadcast N was increased to 200 pounds, the yield went up 12 bushels, but for this increase it took 8.3 pounds of N per bushel.

Irrigation raised yields and decreased the amount of N needed to produce a bushel of corn, though in all cases it took eight to nine pounds of N per bushel when the second 100 pounds was applied as a broadcast treatment.

Of special treatment was the improved efficiency when N was added through the irrigation system. In this case the yield went up from 39 bushels without N, to 163 bushels with 100 pounds of N. This represented a 124-bushel increase with only 0.8 pound N per bushel of corn.

"With the pounds of applied N per bushel of corn produced ranging from 0.8 to 9.1 on these

plots, it's obvious that the one pound/one bushel rule has limitations," says the agronomist. "The timing and method of application of N can change this ratio as well as the rate of applied N. Of course, manure applications, legume cover crops and tillage practices will influence the total N supply and must be considered as part of the nitrogen rate picture."

With nitrogen selling for 25 cents

a pound, the N cost per bushel in this study ranged from 20 cents to \$2.27, depending on whether it took 0.8 or 9.1 pounds to produce each bushel. "To achieve this cost advantage," says Mitchell, "you should avoid heavy broadcast applications, carefully assess the N contribution of animal wastes and legume cover crops, and sidedress or fertigate as much of your N as possible."



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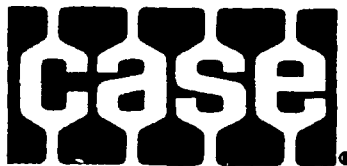
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