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## Rescue fertilization following losses of nitrogen

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# Rescue fertilization following losses of nitrogen

## **Abstract**

Precision farming studies are revealing that substantial amounts of fertilizer nitrogen (N) often are lost soon after application. In a surprising number of fields, most of the fertilizer N is lost before it is needed by the crop. Figure 1 (right) shows aerial photographs from a portion of such a field. This field received 125 lb of N/acre as anhydrous ammonia in the fall of 1997. The late spring test indicated that soil nitrate concentrations were less than 10 ppm at the end of May 1998. The aerial photograph (top) taken in early July showed streaks of light-and-dark green plants. The streaks were caused by nonuniform applications of anhydrous ammonia between knives. Most of the plants in the field, however, had run out of N when they needed it most.

## **Keywords**

Agronomy

## **Disciplines**

Agricultural Science | Agriculture | Agronomy and Crop Sciences



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Figure 1 (right) shows aerial photographs from a portion of such a field. This field received 125 lb of N/acre as anhydrous ammonia in the fall of 1997. The late spring test indicated that soil nitrate concentrations were less than 10 ppm at the end of May 1998.

The aerial photograph (top) taken in early July showed streaks of light-and-dark green plants. The streaks were caused by nonuniform applications of anhydrous ammonia between knives. Most of the plants in the field, however, had run out of N when they needed it most.

Fertilizer-N was applied in 12-row strips on July 10, which was shortly after tasseling. The fertilizer was a 28 percent urea ammonium nitrate solution dribbled on the surface at a rate of 100 lb of N/acre. Nonfertilized strips were left between the fertilized strips.

The fertilized strips became greener within a few days after application. The strips were clearly visible by the time the bottom photo in Figure 1 was taken. Differences in color between the strips could be clearly seen from the edge of the field.

Yields were 95 bu/acre without the extra N and 135 bu/acre with the extra N. Because the crop showed severe N deficiency symptoms early in June, application of extra N at the beginning of June undoubtedly would have resulted in much higher yields. It is impossible to undo the effects of a long period of severe N deficiency.

Precision farming technologies that enable producers to detect and correct N deficiencies after losses of fertilizer N should help producers increase their average yields. Such technologies also have the potential for substantially reducing average rates of N fertilization by reducing the need for applying extra N as insurance against low yields in fields where N losses occur.

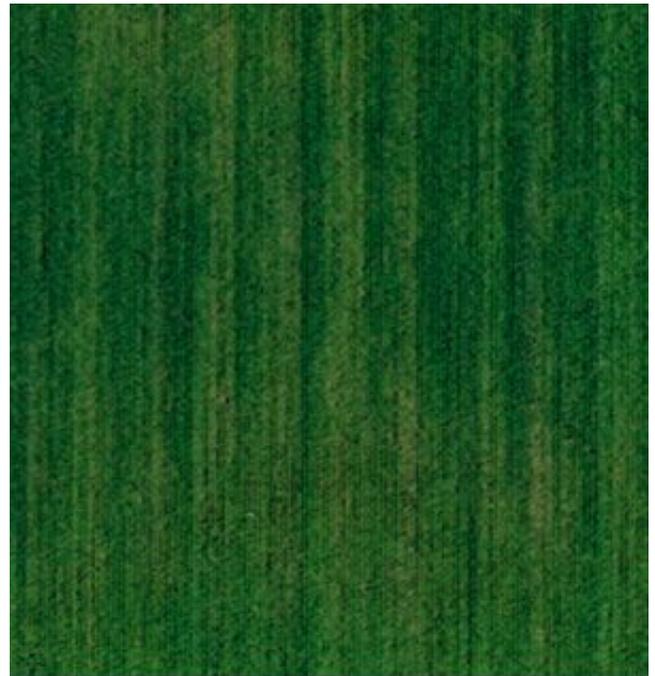
New technologies for rapidly detecting and correcting N deficiencies should help producers increase their profits while decreasing environmental degradation associated with the use of N fertilizers during crop production.

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