

applied as NO_3 or NH_4 . This would be expected if the ^{15}N was mainly in the same form (NO_3) with similar positional availability between V3 and V8.

In addition to increasing plant uptake, DCD also enabled more fertilizer ^{15}N to be taken up by the microbial biomass (Table 3), probably by maintaining fertilizer N in the NH_4 form.

Conclusions

Efficient use of starter fertilizer N by young plants is dependent upon keeping the N positionally available. Nitrate-N in starter fertilizer can be readily leached out of the rooting zone of permeable soils before it can be utilized by young plants, although it may be recovered later by

older plants. Application of starter N as NH_4 without a nitrification inhibitor only slightly improved plant N uptake. For the soils used in this study, nitrification of NH_4 followed by leaching was a greater barrier than microbial immobilization to the efficient use of starter NH_4 .

DCD significantly increased crop utilization and microbial immobilization of starter NH_4 . This is probably related to DCD maintaining more starter fertilizer N in the NH_4 form and maintaining positional availability. Under moderate leaching conditions, it may be advantageous to add a nitrification inhibitor to starters to ensure that fertilizer N remains positionally available to young corn plants. ■

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HISTORIC agronomic practices have been developed with the farm or field as the area of management. The advent of soil conservation began to focus soil management on topographic and soil specific features. Even so, agronomic practices and recommendations have largely been made on a field basis rather than on soil specific properties that might influence tillage, seeding, fertilizing and weed control practices. The near completion of detailed soil surveys nationwide, particularly in the intensive agricultural areas, has provided a database of great magnitude. The advent of computer processed spatial data together with geostatistical analysis enables the display of those soil, hydrologic and micro-climate features relevant to agronomic practices. With the further development of positioning systems suitable to on-site application, the capability now exists, or can be feasibly developed, to deliver real-time, real-space changes in almost any agronomic procedures.

This Soil Specific Crop Management workshop consisted of invited papers on the topics of soil resources variability, managing variability, engineering technology, profitability, environment and technology transfer. They were followed by several invited presentations detailing current research and development in each of the six areas.

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