



Selecting forms of nitrogen fertilizer Tri-state Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa ,Extension Bulletin E- 2567 (New), July 1995

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The common N fertilizers are anhydrous ammonia (82 percent N), urea (46 percent N), solutions (28 to 32 percent N), ammonium sulfate (21 percent N) and ammonium nitrate (34 percent N). Anhydrous ammonia (82 percent) is the slowest of all N fertilizer forms to convert to nitrate N. Therefore, it would have the least chance of N loss due to leaching or denitrification. It must be injected into the soil; therefore, it would have no loss due to surface volatilization. The disadvantage of anhydrous ammonia is that it is hazardous to handle. It must be injected into the soil, and on steep slopes erosion can be a problem. Urea (46 percent) converts to nitrate N fairly quickly, usually in less than two weeks in the spring. Denitrification on wet or compacted soils can be serious. Leaching can be a problem in coarse soils. In no-till situations, surface volatilization can be a problem if the urea is not placed in contact with the soil and the weather is dry for several days after spreading.

UAN solutions (28 to 32 percent N) are usually made up of urea and ammonium nitrate. The nitrate in this product is subject to leaching and denitrification from the time it is placed in the field. The urea components are subject to the same loss mechanisms as urea. Nitrogen solutions can be banded on the soil surface easily by dribbling. This method of application minimizes the amount that sticks to the residue and, therefore, minimizes surface volatilization but may not eliminate it. Ammonium sulfate (21 percent) is a nitrogen source with little or no surface volatilization loss when applied to most soils. Ammonium sulfate is a good source of sulfur when it is needed. Its disadvantage is that it is the most acidifying form of N fertilizer—it requires approximately 2 to 3 times as much lime to neutralize the same amount of acidity as formed by other common N carriers.

Ammonium nitrate (34 percent) is 50 percent ammonium N and 50 percent nitrate N when added to the soil. The ammonium N quickly converts to nitrate N. For soils subject to leaching or denitrification, ammonium nitrate would not be preferred. Ammonium nitrate has no urea in it; therefore, it would be a good choice for surface application where ammonia volatilization is expected.

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