A o E FIELD CROPS TEAM

AGROTAIN†

Donald R. Christenson

AGROTAIN is a urease inhibitor which is designed to be used where urea or UAN (28 percent) are broadcast on high residue situations.

Some understanding of the transformation of urea in soils would be helpful when discussing the use of agrotain. Urea has the chemical formula $CO(NH_2)_2$. When applied to soil in the presence of moisture, urea undergoes the following reaction:

$$CO(NH_2)_2 + H+2NH_4HC0_3$$

$$NH_4HCO_3 \text{ ——- } > NH_3 + H_2O + CO_2$$

Urease is an enzyme present in the soil. The ammonia can be lost to the atmosphere. This loss usually increases as the pH increases. If urea is incorporated by tillage or dissolves in precipitation and moves into the soil before being acted upon by urease, loss is prevented.

Agrotain has been researched by several universities and is a very effective urease inhibitor. It blocks the activity of urease for up to 14 days. By delaying the conversion of urea to ammonium, nitrogen loss is prevented if there is no physical incorporation or rainfall in that period of time. If

Agrotain is used and there is no incorporation within 14 days, some nitrogen may then be lost due to inactivation of the product.

Potential for widespread use, however is limited to cases where urea or UAN are broadcast on high residue (no-till corn production) or topdressed on small grains in late spring. Farmers who incorporate these N fertilizers or surface apply them during cool wet periods of the year (topdress wheat) will not likely see any benefit from the use of the product.

†Adapted from: Rehm, G. 1999, Minnesota Crop News. 1: (31). University of Minnesota.