

NITROGEN MANAGEMENT

All crops require nitrogen and carbon for growth and maturity. Nature provides a mechanism for a perfect Carbon/Nitrogen balance. Crop residues are broken down in the soil by certain microbes that form humus, high carbon materials consisting of humin, humic acid and fulvic acid. These complex organic molecules perform the functions of providing organic fertility, improving water holding capacity, improving soil porosity and acting as a buffer to hold minerals in reserve in the soil. Most significantly, they promote the natural process of nitrogen fixation which converts atmospheric nitrogen into useable nitrogen for the plant. Nitrogen fixation takes place due to the nitrogen fixing bacteria Rhizobium and Azospirillum feeding on the humus. The nitrogen that is formed in the process would be lost by vaporization, however the naturally formed fulvic acid combines with the nitrogen to form a stable compound that can reside in the soil until the next growing cycle.

When excess nitrogen is applied to the soil, the nitrogen feeding microbes are over activated and they consume much of the humus which leads to the decaying dead microbes releasing carbon dioxide gas to the atmosphere. The reduced humus population results in reduced benefits of the humus, most importantly natural nitrogen fixation.

The efficient management of Nitrogen/Carbon can be accomplished in three ways:

1. Apply a microbe (Breakdown) with a humus product (ACE) to enhance the decomposition of plant residue and disk the crop residue into the soil after harvest. Research supports that the nitrogen in grain residue can supply 15% to 40% of the crops nitrogen requirement. This can vary due to variables such as the specific crop, soil moisture and soil condition. Cotton residues are very difficult to break down and the nitrogen recovery is very low for cotton.
2. Reduce synthetic nitrogen application to optimal level (average reduction would be 25%). Splitting the nitrogen application into pre plant and post plant along with 25% overall reduction would reduce the activity of the humus (carbon) consuming microbes.
3. Provide the PopUp formulation of ACE, Triple 6 and Zinc at planting and apply Ultra Trace and Triple 6 in three applications during the growing season as recommended.

The practice of over application of nitrogen to agricultural crops is long standing and the resulting economic loss cries for a new approach as profit margins continue to decline. Modern growers need to evaluate past practice and investigate new options.