



Soil OUR GREATEST ASSET

Importance of Microbes in Our Soils: When plants emerge and begin to develop a root system, they must first form mycorrhizae (fungal growth) on the outside of the roots. These are fungi that attach to and feed off of the roots themselves. Their presence improves the efficiency of plant roots to take in nutrients and water. Also, certain enzymes, produced by bacteria, must be present for nutrients to be converted to available forms that the plant can utilize. A simple example: the conversion of urea to ammonia requires an enzyme called urease. Without urease, our applied nitrogen would NEVER become available to our crops. Phosphorylase converts polyphosphates to orthophosphates. We could list many examples. All nutrients and micronutrients have a specific enzyme that must be present for the metabolism of that nutrient. Microbes living in our soils are necessary to digest and breakdown old plant residue, add oxygen to our soils, improve aeration, thus reducing compaction and increasing the water holding capacity of our soils. Without microbes, plants might live, but they will not thrive. A healthy soil is critical to healthy plant life and production. Take microbes out of our soils and what we have is “Dead Dirt” that will not grow anything!

Think of a 50 year old acorn tree in the forest. The old leaves, twigs, stems and other plant matter that fall from the tree annually break down and compost into mulch. This mulch becomes organic matter, then humus, which releases nutrients, improves moisture, feeds the microbes in this soil and fertilizes the tree. These microbes also produce the enzymes necessary for the tree to continue to take in available nutrients. So, in essence, this cycle of reprocessing nutrients from organic compost actually feeds the tree. This Soil Cycle keeps it going through droughts, storms, extreme winters, insect attacks and disease for many years.

However, when we cultivate fields for agriculture, we break that cycle and slow the process of composting. Tillage, herbicides, insecticides, fungicides and even fertilization, are practices that chronically hurt the growth of these microbes that are so necessary for good soil health. Low numbers of microbes, with little activity, results in tight, compacted, poorly aerated soils and poor residue digestion. The result is lower water retention, less oxygen, less nutrient availability and reduced yields. Even though bacteria are as much as 80% of the composting process, all soil microbes play some role in the composting and resulting soil aeration process that is so necessary to maintaining healthy plant life.

Nitrogen: This critical composting process requires a certain amount of nitrogen in the initial stages or it will be a very slow process. Some experts say this process requires at least 30 units of nitrogen per acre. In many row-crop situations there may be enough nitrogen for this process. A good example would be 30 to 40 units of residual nitrogen remaining from a high yielding legume crop. However, in some cases, like corn following corn, there may not be enough nitrogen to ‘kickstart’ this composting process. *It is important to remember that when we are composting, we are increasing our need for nitrogen. However, at some point later in the composting process, additional nitrogen is released and available for plant growth.*

DeltAg’s Soil Solution is designed to help improve the activity and growth of these soil microorganisms. **Soil Solution** does not apply more bacteria to your soils! This formulation improves the metabolic processes, hence, growth and reproduction of the microbes that are already present in your soils. The foundation of the **DeltAg** approach is to take advantage of the concept of “Survival of the Fittest”, by creating an aid for the microorganisms that have already survived all of our cultural practices.

NOTE: To improve microbial activity is actually to increase their numbers, not their size or actual growth.

What is Soil Solution? This is a low analysis micronutrient solution in combination with **DeltAg’s BTS** for the soil. The ingredients in **Soil Solution** attack and breakdown crop residue, while the **BTS** helps to increase microbial activity. The small amount of sulfate-based micronutrients present in this formula, will assure healthy and sustained growth of your microbes.

Soil Solution Impacts the Soil in Three Ways:

1. Chemically with needed sulfate based micronutrients for microbial growth.
2. Biologically with the **DeltAg BioTransport System** to improve microbial activity.
3. Physically with a natural plant extract that functions as a wetting agent to aid penetration of these **BTS** ingredients.

This increased microbial activity is what creates the long term benefits of a healthier soil..... **Soil Solution!**

Summary: By stimulating the activity of existing microbes, **Soil Solution** improves the microbial activity occurring in the soil, which speeds up the composting process resulting in a better aerated soil that will hold more moisture and release more nutrients. **Soil Solution** does NOT apply more bacteria to your soils.

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