soil building and MICROBIALS

The soil contains a vast array of life forms ranging from submicroscopic, to earthworms, to large burrowing animals such as gophers and ground squirrels. Microscopic life forms in the soil are generally called the "soil microflora" and the larger animals are called macrofauna.
Soil animals, especially, the earthworms and some insects tend to affect the soil favorably through their burrowing and feeding activities which tend to improve aeration and drainage through structural modifications of the soil. In general, they affect soil chemical properties to a lesser extent though their actions indirectly enhance microbial activities due to creation of a more favorable soil environment.

The microbes digest and degrade many forms of salt and chemical residues in the soil. By doing this, they change the soil's Ph and the charge of soil particles from positive to negative and negative to positive freeing many nutrients which were previously tied up to soil particles unavailable in the soil solution for plant uptake. The life cycle of the microbes in the soil will begin to add organic matter (humus).

The benefits of using microbes as part of a soil building program or fertilization program are as follows:

The broad and diverse population of soil microorganisms will immediately begin to build an aerobic zone in the soil. The aerobic zone is the top portion of the soil that supports plant life. A healthy soil will normally have an aerobic zone 8-12 inches deep. Most soils today have an organic matter content of less than 1% and usually have very shallow aerobic zones. One of the main causes of this is the lack of diverse population of beneficial soil microbes. Soil that have low organic matter and shallow aerobic zones also have a very low water holding capacity, are compacted, and have very low oxygen content. These conditions are very adverse to good root development by turf or plant and usually indicate very low microbial activity. When you apply microbes, you will see conditions in your soil begin to change quickly. Usually the first change in the soil is a reduction in cladding and crusting which leads to a mellow and well-aerated soil surface that has a nice earthy smell. The reduction of the thick crusting and cladding will allow for a quicker more uniform plant stand. This reduces the need for replanting in most cases.

As the diversity of the microbial population in the soil is improved, the characteristics of the soil will begin to change. The life cycle of the microbes in the soil will begin to add organic matter (humus) from their bodies as they reproduce and die. The microbes digest and degrade many forms of salt and chemical residues in the soil. By doing this, they change the soil's Ph and the charge of soil particles from positive to negative and negative to positive freeing many nutrients which were previously tied up to soil particles unavailable in the soil solution for plant uptake. All soil

WHAT DOES MICROBIAL BACTERIA DO?

- Mother Nature's little engines that are hard at work
- Transports nutrients to plant
- Increased oxygen and water penetration in the soil
- Reduces fertilizer inputs
- Better movement of nutrients in the rhizosphere
- Increases soil organic matter
- Increases water retention capability
- Digests agricultural chemical residues that have built up in the soil causing hardpan and soil compaction
- Moves pH toward neutral
- Increases seed germination
- Microbes are the frontline of defense

nutrients must be degraded/digested by microorganisms from either an organic or inorganic source before these nutrients can become a part of the soil solution for plant use.

Another benefit to your soil from the life cycle of microbes in our products is the rapid building of soil humus. The soil humus is the storehouse of nutrients in the soil for plants. These nutrients are in readily available forms for the plants to use, as they are needed for plant growth and health., A healthy active microbial population will add about 3000 pounds of humus material to the soil per acre, per year. This humus material is almost pure protein from the bodies of the microbes that have died as a result of their reproduction cycles. This humus material provides about 40 to 50 pounds of pure nitrogen, which is stored in the humus fraction of the soil readily available to plants through the soil solution for each 1% of organic matter (humus) that the soil contains.

At this stage the soil begins to aggregate and the tilth of the soil is greatly improved. This means that your soil will hold nutrients and water much better as you improve the organic matter content of your soil.

The ability of the soil profile to store moisture, allows the plant to endure greater stress periods before going into a wilting point. In a test conducted by the Texas Plant and Soil Laboratory at Edinburgh, Texas, it was found that crops grown in soils with very high amounts of minerals, phosphorous, calcium, magnesium, potassium, and sulfur, were actually very deficient on mineral uptake. This was shown with the plant tissue and petiole test. The plants had only 20% of the necessary mineral uptake for good plant growth and health. After applications of microbes, the new plant tissue and petiole test ran showed the plant mineral uptake had increased 60% to 80% over the pre-treatment test. This was done by the microbes' ability to digest (solubilize) the minerals in the soil into the soil solution making them available for uptake by the plant as needed for growth.

In conclusion, benefits of using microbes are: Digest agricultural chemical residues that have built up in the soil causing hardpan and soil compaction. Move the pH toward neutral whether the soil is acidic or alkaline.

PRIMARY DECOMPOSERS

Bacteria dominate the early process in compost and probably will make up 80 to 90 % of compost microbes. Most bacteria found in soils and in compost are decomposers. A teaspoon of fertile soil can contain anywhere from 100 million to a billion bacteria with representatives from 10,000 species. Compost might have ten times that number of bacteria in its teaspoon.
Bacteria feed on simple, easy to metabolize, carbon compounds such