



Why We Do, What We Do!

by Michael Martin Meléndrez

While Soil Secrets manufactures several products, our three flagship products are the foundation of what we do and what we focus on. These include the **Mycorrhizal** products and benefits (EndoMaxima), the **Humic substance** products and benefits (TerraPro & Earth Magic), and the **Protein** products and benefits (Protein Crumbles). Individually and combined these products provide the primary benefits we are after, which includes better nutrition for the plant, better water management for the whole landscape or farm and the building of soil (Pedogenesis). In the past few years, there's been a huge surge and interest in utilizing soil microbiology on farms, many farmers declaring that they are "biological farmers" beyond being just organic. The same is happening in many other venues such as mine reclamation, landscape design/construction and in urban gardens. For this reason, Soil Secrets will thrive in coming years!

What about Soil Microbes and Mycorrhizal Fungus?

This new paradigm is perfect for helping us and our clients, but let's be more specific and accurate as to how it really works and the rest will fall into place as far as soil improvement and better plant nutrition. It's all about the Mycorrhizal relationship that most plants thrive on and the powerful chemical of nature called **Supramolecular Humic substances**, a fancy term of science that we common people call **Humus**. If a plant has a relationship with this amazing fungus called Mycorrhizae, it will get better mineral and water nutrition from the soil. The Mycorrhizae are doing this uptake of water and minerals for the plants benefit. The size of the mycorrhizal root system called Hyphae is known to be tenfold larger than that of the plants own roots. This allows the Mycorrhizae to search much further, deeper and wider than what the plant can do on its own, plus the Mycorrhizae can solubilize minerals from a soil using chemistry that the plant root does not have the ability to perform. **Therefore more water and more minerals get into the plant if it has help from the mycorrhizal relationship!** This in turn helps the plant become healthier and when healthier it's also more efficient at making glucose (liquid carbon) from photosynthesis. When it's more efficient at making glucose, it will deliver more of this liquid energy drink to the bacteria that are living around the actively growing roots of the plant, called the **Rhizosphere**. This glucose drink is called 'root exudates', which is leaking sugary water into the soil, food for the bacteria. Most of the bacteria that live in this zone of influence are there for the Glucose and can only use that type of sugar for energy because it's a monosaccharide that does not require chemistry to break any chemical bonds. This stands to reason, as plant exudates are never sucrose (table sugar) which is a disaccharide molecule composed of glucose and fructose linked together with a very strong chemical bond called a **glycosidic bond**. That type of bond requires special enzymes called **glycosidases** that can perform **Glycoside hydrolysis**, in order to break the glycosidic bond and separate the glucose from the fructose. *Oh man, way too much brain strain on that one.* Oh, and I almost forgot that the Mycorrhizae, also must be fed the same glucose provided by the plant. Anyway, when we feed the plant the plant will feed the bacteria and the Mycorrhizae and everybody is healthy and happy. **This results in the building of soil slowly over time.**

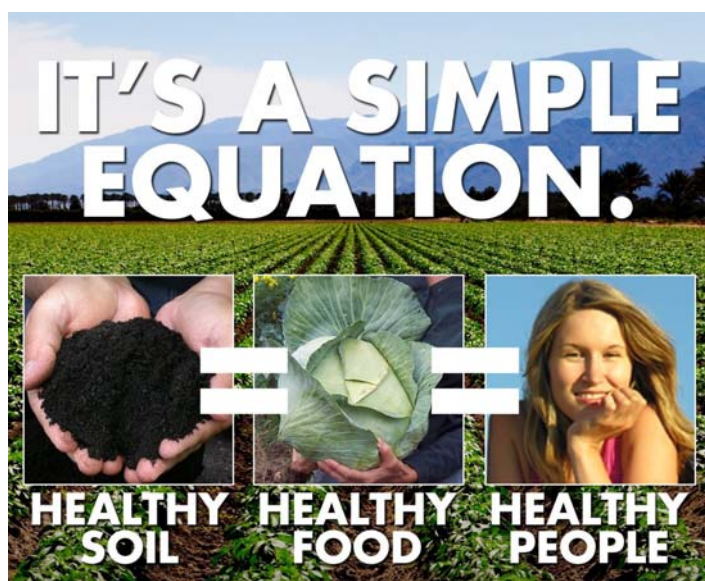
What about Humus?

Yes, the Humus, the stuff soil scientists and chemists call **Humic substances**. These are chemicals of nature that persist in a soil for hundreds if not thousands of years and they are involved with hundreds if not thousands of very important chemical processes that keep everything in check and in balance. They are very dark in color, the reason why a soil when rich with a high concentration of them will also have that dark top soil appearance, along with the wonderful aroma of healthy soil. It can be said, that the definition of a top soil is the presence and the concentration of these substances, which then helps the soil be a healthier soil. They improve the structure, drainage, porosity, chemistry and the biology of soil. They are also complex molecules rich in carbon, that unlike carbon found in compost or mulch, will not rapidly cycle back into the air as a greenhouse gas. **If you really want to build a top soil, these are the substance that must be added and encouraged to grow in the soil! Making your plants mycorrhizal will help your soil accumulate Humic substances!**

What about Protein?

Protein Crumbles is the product that provides us with the means of providing Nitrogen while using an organic material, therefore not contraindicating the biological environment we are attempting to establish. That's the exudate eating bacteria and the Mycorrhizae, which modern fertilizer chemistry and soil management practices of farming and landscaping have damaged! Remember, we are simply copying the Natural Process of soil biology by using protein, much like the reason we eat protein, which is for the Nitrogen value. It's true, that even we humans need to be fed Nitrogen, but not from a bag of fertilizer, as protein is nature's way of accomplishing that objective. We eat protein to make protein such as muscles, tendons, ligaments, etc., and plants need Nitrogen in small amounts as well, so that they can grow and do the things that they need to do. Protein is the answer as it's a better way of providing Nitrogen than by using a volatile, quick to disappear, chemical fertilizer. Protein is not as volatile as a chemical source N, and can provide a steady and slow supply of Nitrogen to all concerned in the soil and in the landscape.

It's all about building a healthier soil, that can provide a better growing environment for plants, resulting in a healthier plant.



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