



Nature Helping Science Restore the Natural Process of the Soil Food Web[®]

The Nuts and Bolts of Soil Secrets

“There is nothing in the whole of nature which is more important than or deserves as much attention as the soil. Truly, it is the soil which makes the world a friendly environment for mankind. It is the soil which nourishes and provides for the whole of nature; the whole creation depends on the soil which is the ultimate foundation of our existence”

Friedrich Albert Fallou

The Problem

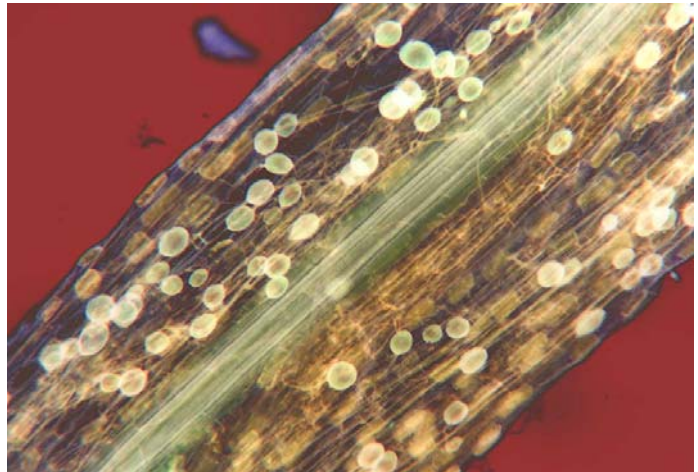
- 1. Cultivated and landscaped soils lack enough biology:** Research has supported the fact that almost without exception, cultivated or landscaped soils throughout the country lack the full benefit of the mutualistic microorganisms that are associated with the root systems of plants. This includes a category of mycorrhizae fungi and the associated helper bacteria. Together these two kingdoms of life work in orchestration with the Plant Kingdom in a mutualistic or symbiotic manner, helping the plant extract (sequester) water and nutrients from the soil. Over 95 percent of the plants on the planet have this dependency with these microorganisms and cannot adequately uptake water or nutrients from the soil without this association. In other words, the optimum health of the plants in your landscape cannot be achieved without this nutrient uptake relationship. Currently, there are over 50,000 papers from university and independent research that are published in peer review journals of science supporting this statement and the subsequent benefits of adding (also called inoculating) these microorganisms into landscapes, golf courses, farms and other sites of interest.
- 2. There is rarely enough Humus in the Soil:** A second issue of concern is more commonly found in the western states where the aridity of the region limits biomass production inhibiting the buildup of organic matter and consequently resulting in a low concentration of Humic substances (humus syn. humic acids). The same lack of humus will be found on constructed soils of landscapes where the original A- horizon of humus rich top soil has been removed, compacted or simply lost from erosion, regardless of the region of the country. According to a statement published in the Journal of Chemical Education, December 2001, Humic Acids are remarkable brown to black products of soil chemistry that are essential for healthy and productive soils.

How Soil Secrets deals with these two issues

Soil Secrets / Trees That Please is Licensed with the NMDA as both a Production Nursery and Farm and as a manufacture of Fertilizers and Soil Amendments. All products of Soil Secrets are properly registered and label approved by the New Mexico Department of Agriculture, where we pay both label registration fees annually and tonnage fees on a quarterly basis. Hundreds of thousands of plants are grown by us in our Greenhouses and farms and are used as host plants to harvest the **Mutualistic Plant Root Microorganisms**. These host plants are needed and sacrificed to collect the biology off the roots as there is no other way to propagate and produce these microorganisms used in inoculums. The research is clear and not refutable, that when you inoculate with the proper species specific mycorrhiza with the helper bacteria, the inoculation will give the landscape plants the ability to tolerate environmental stress better. This includes improved drought tolerable limits, disease prevention, nutrient uptake and the ability of the plant to sustain and perpetuate itself. *

What Soil Secrets does and why:

1. We grow dozens of species of Mycorrhizae useful to the majority of plants used in horticulture, farming and landscapes. **The image to the right shows the mycorrhizal vesicles in a carrot root that can be harvested.** We provide research institutions such as universities mycorrhizae vesicles or spores for research (see image). We also put these vesicles into carriers that allow users to easily disperse them onto landscapes. The carriers are bulking agents that make it easier for you to handle the material,



while also contributing a shelf life factor to the product. Some carriers work better than others for maintaining the biological viability of the mycorrhizae spores and helper bacteria endospores. At Soil Secrets we choose to use Humus as the primary carrier for these mutualistic inoculant organisms, since that's a material often needed in soils. **Soil Secrets with its NMDA licensed nursery and greenhouses is the only company in New Mexico (as of 07/01/06), the Southwest or the Four Corners Region that propagates, grows and harvests these mutualistic fungi and helper bacteria for the objective of producing commercially available mycorrhizal inoculant products!**

2. We grow the helper bacteria on the same roots and at the same time as the mycorrhizae are being grown.

3. **TerraPro®** we manufacture a living and biologically viable biomolecule product called humus which we feel is the best carrier for the mycorrhizae inoculum's and helper bacteria produced by Soil Secrets. This carrier combined with the mycorrhizae and helper bacteria is

called **TerraPro**[®] commercial name and **Earth Magic**[®] retail name in New Mexico. Like all the products made by Soil Secrets, our Humus is all natural and allowed on Organic Certified farms nationwide, made naturally using humus precursors including contract grown protein, enzymes and coenzymes. TerraPro is water soluble, its non corrosive to metal and can be applied in Hydroseeders, and it's useful for supplementing the soil with humus.

TerraPro and Earth Magic are not only super concentrated inoculums but are also a biologically viable humus material that is needed in many soils!

4. **Earth Nectar**[®] we make a liquid carrier product (minus the humus) for these same biological inoculums used in TerraPro and Earth Magic.

5. **Earth Ambrosia**[®] is a liquid humus companion product to Earth Nectar which can be used as a soil drench to rapidly move humic acids into the soil and it can be used as part of a hydroseeding and hydro mulching protocol to improve germination of seed. Earth Ambrosia is rich in enzymes and biostimulant growth factors that improve germination and growth of plants.

6. **Protein Crumbles**[®] We make an amino acid balanced protein called Protein Crumbles that is formulated from over 30 vegetable proteins to provide not only nutritional calories but to have the best ratios of amino acids. Amino Acids provide the best natural source of nutritional calories needed by the soils flora and fauna which in time provides a slow release of N-P-K major nutrients as the soils bacteria break it down. The interesting thing about this method is that protein is made up of Peptides and Peptides are made up of amino acids which are made up of N - P and K. As protein enters the food chain of the trophic levels of soil biology, you get a leakage or excess of N - P and K that is plant available in a slow release fashion. Research is clear that with too much fertilizer you can cause plants to lose the mycorrhizal relationship, making the plant dependent upon nutrients in a water solution and close to the roots in what is called the **depletion zone of the soil**. Once the nutrients are gone from this depletion zone the plant will become deficient. With our Protein Crumbles used at label rates the slow availability of N-P-K will improve the mycorrhizal relationship plants need help provide optimum nutrition.

7. **TTP Supreme Compost**[®] we make a fine screened high grade compost that is pure compost – no sand or other impurities are included. Our product is Greens Grade and is so clean and screened that it can be used in a Hydroseeding application or as a top dressing fertility program on turf. The compost is made in-vessel and from totally contract farm grown ingredients. **No animal manures or City Bio Solids are ever used in this product!** Because the product is made in-vessel, it never sits on the ground to get contaminated with weed seeds or dirt. After making it, we keep it in 1-ton super sacks to keep it clean.

Does our Compost need to have the U.S. Compost Council Seal?

No, while Soil Secrets and Michael Martin Melendrez are one of the few members of the US Composting Council in New Mexico, we do not use the seal of that entity because all the ingredients of **TTP Supreme Compost** are produced on farm for the objective of making our

compost. The U.S. Composting Council is promoting the recycling of organic waste for the objective of making compost and that's not what Soil Secrets does!

8. We make our own **Earthworm Castings**, one of nature's best products. **"Earthworm Castings are Nature's soil elixir that enormously benefits plant and soil life"** - Michael Martin Melendrez

Statement of organic & natural sources: In all cases Soil Secrets never uses animal manures (with the exception of our Earthworm Castings), City Bio-Solids, Yard Wastes such as grass clippings, prunings, or any material of unknown source. The only products that are being collected for recycling into our production system are Coffee Grounds collected from selected Albuquerque restaurants, organic debris from the Trees That Please farm and organic debris from our Research Arboretum. The protein used to make our humus products, our Protein Crumbles, food for our Worm Casting beds and for balancing our Carbon to Nitrogen ratios of our Compost system is all contract grown by New Mexico and West Texas farms. The course organic debris used to make our In-Vessel Compost is contract grown on farms and must not include GMO material to qualify for our contract grow program.

Organic Designation and Standards

Does Soil Secrets need to be OMRI listed? This is a question presented often and the answer is no! Soil Secrets LLC products are approved for use on all 'Organic Certified Farms' Nationwide by the USDA's NOP program which subordinates OMRI and all other private certifiers by an act of Congress under the 1990 Federal Organic Foods Production Act. The USDA NOP Certifying Agency that has approved Soil Secrets LLC is the New Mexico Organic Commodity Commission known as the NMOCC. The NMOCC was created by the New Mexico Organic Commodity Act of 1990 (76-22 NMSA 1978 as amended). The NMOCC has received accreditation from the USDA's National Organic Program (NOP) as an organic certifying agent, and is thereby authorized under the 1990 Federal Organic Foods Production Act. The NMOCC is also ISO-65 compliant.

The NMOCC is an independent agency of New Mexico State government, charged with regulation and promotion of organic agriculture. Regulation includes organic certification and registration, as well as oversight of enforcement and compliance with organic statutes. Promotional activities include workshops, conferences, speakers, informational tables and providing promotional materials as well as individual consultation with producers.

*** Research abstracts available on request.**