

## Into the Underworld of Trees - Part 2

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So why does all this dirty talk matter?

Everyone who loves the natural world is concerned with global warming and its unpredictable effect on our's and our children's lives. But it often seems as if it is out of our hands as individuals. It turns out, however, that **carbon** is the currency of the underworld, even in our own backyard. Let me explain.

Plants of most types, including trees, shrubs, perennial and annual flowers, grasses and vegetables all bribe mycorrhizal fungi and their bacterial buddies with carbon sugar. In return

these soil microorganisms supply 100 times more root contact for these plants within the soil for water and nutrient uptake. They also search out, break down and digest formerly unavailable forms of essential plant nutrients into soluble, available nutrients. This makes the plants more healthy and productive so the carbon investment the plant has made to the mycorrhizae is paid back many times in interest. On top of that benefit the mycorrhizae strengthen the plants immune system so the plants will continue to feed the mycorrhizae's carbon sugar habit.

A healthy plant community doesn't just compete for resources it **shares** resources and redistributes carbon sugar, water, and essential minerals to those plants, even different species of plants, in need. They not only share resources they share information such as, *"Look out for bugs or diseases that are attacking in the East sector and protect yourselves."* (It sounds like our world leaders could learn a few things from fungus.) With the nutrients that the mycorrhizae provide, the plants are able to make compounds that protect themselves. Ever heard of polyphenols or anthocyanins that protect us against cancer? They start out as plant protectants. All of the different plant species are all connected by...guess what? You got it, in a healthy, undisturbed community they're all connected by **mycorrhizal fungus**.

So what is the currency of the plant underworld? It's **carbon**, the global warming culprit. Actually the culprit is us, but we don't like to admit it. And guess what the underworld is doing with carbon? It is sequestering it or tying it up in plants, microorganisms and the soil in the form of humus (that lovely black stuff that signifies a healthy soil). Consider this: **there can be as much as 300 miles of mycorrhiza beneath a single footprint**. Of course the carbon in that mycorrhizae is being used as part of a dynamic web of living organisms that always captures carbon from the air, if, *and only if*, it is healthy. So here is the good news, if we are taking care of the soil and its microorganisms we are sequestering carbon and counteracting global warming in a big way...right in our **own back yard**.

## Here's how to do it:

1. **Plant a variety of plants, trees, shrubs, perennials, prairie grasses, and annual flowers.** This biological diversity promotes a strong, flexible community above and below ground to respond to changes and build carbon storage. **Keep away from monocultures if you can.**

2. **Protect the soil with mulch.** Mulch is the perfect imitation of a forest soil. It allows natural cycling of nutrients and healthy soil microorganisms which use and store carbon underground. Bare soil is inhospitable to microorganisms.

3. **Take more joy from dandelions and clover.** Herbicides used to kill weeds in the lawn also kill mycorrhizae and the plants that support them. If you hate dandelions that much then use only spot treatment which uses 95% less herbicide than broadcast or spreader weed and feed. You could also send your kids out into the yard to pull weeds.



This is a monarch butterfly on a milk weed in our lawn.

4. **Save money by increasing prairie gardens and forest gardens and decreasing grass.**

Spend less time mowing and more time enjoying the migration of birds, butterflies and bunnies that prairie gardens attract. Also let it be known that **healthy prairie soils sequester carbon more effectively than tropical rainforests!**

5. **Fertilize with liquid Biochar and Mycorrhizal inoculants (essentially seeds of fungus).** Arborsmith is now using these as part of our healthy tree fertilization program.

*Much of this information is taken from a ground breaking and intriguing book called **Mycorrhizal Planet** by Michael Phillips. It's a great read for those of you who love the natural world.*

