

The Dirt on Dirt

Have you ever wished for a partner to help in your garden? Not just someone to dig and haul, or even to design and plant. But someone to do things you could never do. Things chemical and biological. Things underground. Well, you can have such a partner. And you may already have him, if you haven't inadvertently run him off. Here's his resume:

Experience: 450 million year association with terrestrial plants. Symbiotic relationship enabled plants to move from water to land.

Logistical capability: Produces filaments (mycelium, hyphae) that act as extensions of plant roots, reaching several yards beyond the root zone and enabling plants to capture water and nutrients outside the root zone. Think conveyor belt.

Transformational capability: Changes the chemical formulation of nutrients in the soil. Sometimes nutrients are present in the soil, but in a form the plant cannot absorb. Changing the structure of the nutrient (iron, calcium, sulfur, magnesium, zinc and phosphorus) makes it available to the plant.

Manufacturing capability: Produces nitrogen in plant absorbable form, right in the root zone.

Soil structure repair capability: Aggregates and aerates the soil. Produces gums and gels that create spaces for air and water and enables soil to resist compaction. Soil aggregated by these gums and gels does not erode in heavy rain.

Medical capability: Suppresses soil pathogens including anthracnose, fusarium wilt, damping-off disease and nematodes.

Sound too good to be true? Well, in this case, it's not too good to be true. And it's also not a product that you buy at the store. This perfect garden partner is the army of beneficial soil organisms found naturally in healthy soil. This partner didn't pad his resume; these organisms really did develop a symbiotic relationship with plants 450 million years ago that enabled plants to move from water to land. And, if we don't kill them off, these soil organisms will do everything this partner lists on his resume.

So how do we put this partner to work in our gardens? It's a very straightforward, two step process.

1. Quit killing your soil organisms: We inadvertently kill our soil organisms. We kill them with chemicals, like the fungicides that destroy beneficial fungi. We kill nitrifying bacteria when we apply insecticides and herbicides. The salt compounds in synthetic fertilizers put osmotic stress on microbes—think salt on a slug. We

over-fertilize with phosphorus and reduce fungal establishment around roots. We destroy fungal hyphae (the fungal filaments that bring water and nutrients into the root zone) by tilling and double digging. Finally, when we rake the leaves every fall and send them to the curb, we take away a year's worth of accumulated organic matter. We steal their lunch.

2. Start feeding your soil organisms: Restore the cycle that returns organic matter to the soil. Microbial life requires an *ongoing* supply of organic matter. Regularly top-dress lawns and mulch trees, shrubs and perennials. Keep your soil inoculated with microbes by covering it with organic matter (wood chips, mulch, compost). Don't ever leave the soil bare. Feed your microbes, not just your plants, by using organic nitrogen sources.

If this still sounds too simple, let me close with a compelling description from Linda Chalker-Scott's book, [The Informed Gardener](#). Ms Chalker-Scott is extension horticulturist and associate professor at Washington State University. Her landscape restoration classes often spread wood chips on a site to allow soil recovery before they install new plants. In Chalker-Scott's words, *"One particular site, a small lot near a bus stop, consisted of weeds, bare soil and a few existing trees and shrubs. When we tried to take a soil core, the corer bent! We had eight to ten inches of wood chips spread over the whole site. A month later, we moved aside part of the mulch and dug out a shovelful of rich, loamy soil. Had I not seen it for myself, I'm not sure I would have believed these stunning results. The addition of the wood chips allowed the site to retain soil moisture and reduced the impact from foot traffic, thus enabling the soil to regain its structure."*

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