

# Fungi are Fascinating

Hooray for the eaters of the dead, says Paul Stamets in “Mycelium Running: How Mushrooms Can Help Save the World” (356 pp, Ten Speed Press, 2005).

“I contend,” he says, “that the planet’s health actually depends on our respect for fungi.” They are “the grand recyclers of our planet, the interface organism between life and death Without fungi, all ecosystems would fail.”

He gives practical advice for starting, growing and using mycelia, and surveys selected species, including saprophytes (feeders on dead matter), mycorrhizae (cooperators with plant roots) and endophytes (invaders of tissue, somewhere between the first two and including hallucinogenic mushrooms).

Fungi in forests and on our lawns shed spores that germinate and can grow into vast mycelial mats, the cobwebby stuff we see under damp rocks. In feeding themselves, these mats prepare plant debris to be digested by other organisms, meanwhile gathering energy to send up spore-laden mushrooms — the fungi’s fruiting bodies (thus completing the cycle).

“Mycelium is, in essence, a digestive cellular membrane, a fusion between a stomach and a brain, a nutritional and informational sharing network,” Stamets says.

Mushrooms are often the first visible life after disasters. Insects, birds and mammals thrive on the food chain begun by them, and then carry their spores elsewhere. Spotted owls, for example, eat truffle-fed voles and flying squirrels, and disperse the spores in their scat.

Although they’re single-celled, mycelia are nonetheless vast. A single mat may be the world’s largest organism. There are more species of fungi, bacteria and protozoa in a single scoop of soil “than there are plants and vertebrate animals in all of North America.” . One cubic inch of soil can harbor eight miles of mycelium, an organism so fecund that “in the course of a day, the average human accumulates between ten and one hundred million fungal spores on his or her body and clothes.”

“We are all,” Stamets says, “Johnny [Appleseed] mushroom spores, in the service of the fungal kingdom.”

To put this single-celled marvel in perspective, it launches spores at a force approximately 10,000 times that experienced by astronauts escaping Earth’s gravitational pull.

“Mushrooms are mycological geysers spewing spores by the billions and, it’s likely,” says Stamets, “the Earth is inoculating the Heavens.”

Mycorrhizal (root-cooperating) fungi may even share nutrients among different species and respond to stress by robbing the rich to pay the poor. Such fungi can help fruits and vegetables grow dramatically better and increase plants’ heat tolerance and drought resistance.

“Gardeners and farmers using the no-till method can select crop-enhancing fungi that have antinematodal, pesticidal and antiblight properties.”

Mushrooms can be “taught” to eat petroleum or pure poison — even nerve gas. Fungi laid down in mats can catch industrial and mine runoff to render it biologically degradable.

“Gardeners and farmers are biological orchestra conductors,” Stamets says. “This book adds more musicians to the stage by showing the importance of integrating fungi.”

He writes that “the neural nets of microbes and mycelia may be deeply intelligent,” and one day we may communicate with them and thus learn vast lessons about nature.

As I read this fascinating book, I had fantasies of turning my own yard into a heaven of mycelia purchased from Fungi Perfecti, Stamets’ Washington-based business. But an article in *Mastergardener* magazine by Washington State University Science Editor Linda Chalker-Scott has given me pause. She says: “Healthy soils naturally contain indigenous mycorrhizae. Adding packaged mycorrhizae to such soils is a waste of money and resource. If the soil is impaired to the point where indigenous mycorrhizal species can’t survive, mycorrhizal amendments alone won’t help.”

So for now I’ll try to make the soil as welcoming to my amazing tiny local helpers as I can, and be content.

Bill Keep is a Redding Shasta Master Gardener.

