

## Role of Fungi in Gardens

By Earl Hockin

When most people think of fungi they think of mushrooms. Mushrooms are simply the fruiting bodies analogous to apples on trees. They are the source of the fungal spores that are carried by wind and organisms to spread the fungus to new habitats. Fungi produce about fifty megatons of spores each year which is equivalent to the weight of five hundred thousand blue whales. These spores are the largest source of living particles in the air. They can be found in clouds where they influence weather by triggering formation of water droplets to form rain and ice crystals. We typically do not see most of the massively diverse number of fungi as the majority of fungi exists primarily as underground mycorrhiza. The reason we need to understand fungi is that more than ninety percent of plants depend on mycorrhizal fungi.

Mycorrhizal fungi form a partnership with the plants and promote nutrient and water absorption. They protect their host plants from fungal diseases and microorganisms and improve soil structure providing spaces for air and water. Strands of fungi link trees in shared networks, allowing nutrients and information to move from more mature trees to young trees which are typically shaded and thus get insufficient sunlight to fully support themselves. In return the fungi get nutrients. Fungi weave through the gaps between plant cells and help the plants defend against disease. No plants grown under normal conditions are without these fungi. They are as much a part of a plant as leaves and roots.

Unsustainable agricultural practices, including excessive tilling and fungicides, reduce the ability of plants to form relationships with the beneficial fungi on which they depend. Tilling, plowing and double digging will slice fungi into pieces. Topsoil removal during construction is devastating to fungi. Compaction and erosion are detrimental as well as. On a farm, there are usually more bacteria than fungi in terms of biomass (weight). In a forest, there are 5, 10, 100, even a 1000 times more fungal biomass than bacteria! The main reasons for this big difference are the lack of tilling/plowing, absence of compaction and erosion, lack of pesticides being sprayed, and the plant species growing there.

The widespread use of antifungal chemicals has promoted the rise in fungal variations that threaten both human and plant health. World-wide human trade has spread not just non-native insects and plants, but also fungal forms which can have negative impact on plants, animals, and humans.

There are several ways to help the beneficial fungi in your soil. First, you can purchase a mycorrhizal inoculant, a powder that contains an enormous number of spores. These inoculants can be applied whenever you plant seeds indoors or outdoors. A simple pinch of the powder is all that is needed for each plant. Once you have inoculated the soil you can support fungi and don't have to purchase inoculant every year. First, avoid applying too much phosphorous. Fungi can provide phosphorous. Insoluble rock phosphorous is okay because the fungi work to break it down. Overfertilizing in general can inhibit the fungi. Fertilize sparingly, preferably with organic fertilizer, splitting the recommended total amount and applying it 2-4 times a year. In addition to fungicides herbicides, insecticides and other pesticides can also harm fungi. Repeated applications of these can knock out an entire fungal population. Pesticides containing methyl bromide will also kill most of microbial soil life, and it should be avoided. In fact, it is not allowed in most other countries. Use organic additions to your soil, including compost and mulch of leaves, straw, or wood chips to provide habitat and food for the fungi. Wood chips are particularly useful around trees and shrubs. Be sure to keep the chips away from the trunk. Plant diversity is another way to help fungi, which is one reason for crop rotation.

To learn more, see "Role of Soil Fungus," at <https://ohioline.osu.edu/factsheet/anr-37> or "Common Fungi in Yards and Gardens," at <https://extension.umn.edu/lawn-care/common-fungi>.

This article was inspired by a book entitled “Entangled Life, How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures” by Merlin Sheldrake. While we cannot endorse commercial sales, you may find this book at your public library.

**FREE Presentation** Jessica Zander, a garden coach and consultant, will present a Zoom program entitled “Spring Cleanup and Amending the Soil.”

**April 1, 2024 6:30 PM EST**

Register at: [https://tennessee.zoom.us/meeting/register/tZcufuGvrDkiGNK9GKs6nIZJj\\_QIuqRMSXAx](https://tennessee.zoom.us/meeting/register/tZcufuGvrDkiGNK9GKs6nIZJj_QIuqRMSXAx)

**FREE Presentation** Dr. Doug Tallamy is the T. A. Baker Professor of Agriculture in the Department of Entomology and Wildlife Ecology at the University of Delaware. He is a leader in native plant horticulture. He will present “Learn more about nature gardening”.

**May 6, 2024, 6:30pm EST**

Register at:

<https://tennessee.zoom.us/meeting/register/tZ0uc-qspz0pHdSx0-0v-Xfo3sSWPDiT7hnx>

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