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Fungi can act as friend to your garden in many ways

By SONOMA COUNTY MASTER GARDENERS

FOR THE PRESS DEMOCRAT



Some fungi, like these, help to break down organic matter, recycling the nutrients

Photo by Stephen Nett

Question: In a recent *Advice to Grow By* column you wrote about wood decay fungi and the damage they cause in gardens. Aren't some fungi beneficial to the garden?

Answer: We appreciate the question. You're right, fungi benefit your garden in many ways.

First, a few basic facts about fungi. There are more than 150,000 named species of fungi known to science and approximately 2.5 million species that have not yet been named.

You may already be familiar with mushrooms, rust, mildew, bracket fungus, and puffballs. What you see above the ground are typically the reproductive parts of the

fungi. The majority of the fungus exists as an extensive network of fine filaments (hyphae) that live beneath the soil surface, in compost and mulch, or in or on living plant tissues. This network has a vital role in nourishing plants and protecting them from stress and disease.



Parts of Trione-Annadel State Park were severely burned by October's fires, like this section of oaks on a ridge near Buick Meadow. But burn maps show other sections had more moderate burn damage. This patchwork of fire intensity allows some fungi in the soil to survive, and to reestablish their forest Photo by Stephen Nett

In contrast to plants, which produce their own food through photosynthesis, fungi obtain their nutrition from external sources. In the garden, fungi obtain their nutrients in three ways. Fungal pathogens such as wood decay fungi consume living organic matter. Saprotrophs consume decomposing dead organic matter.

Mycorrhizae develop mutually beneficial associations with plant roots. While fungal pathogens injure or kill plants, saprotrophs and mycorrhizae provide benefits in the garden.

Fungal saprotrophs are a primary decay agent in the soil food web. They use enzymes to digest lignin and cellulose, the compounds in wood that contribute to its strength. Along with bacteria and other microscopic organisms, they decompose organic matter into carbohydrates for their own nutrition.

When saprotrophic fungi die, the nutrients in their bodies are released. Nitrogen, in the forms of ammonium and nitrate, become available for uptake by plant roots.

Another benefit is the system of microscopic tunnels left behind as the saprotrophs themselves decompose. Air and water can flow through these tunnels, to improve the aggregation and tilth of the soil and support plant growth.

The relationship between plants and mycorrhizae occurs when fungal hyphae form a network, or "mycelium," that grows into or around plant roots and acts as an extension of the root system. This "symbiotic" relationship benefits both fungus and plants.

Plants supply the mycorrhizae with carbohydrates produced through photosynthesis. In exchange, the mycorrhizae provide nutrients, in particular nitrogen and phosphorus, and water to the plants.

Approximately 70 to 90% of all plant species function in a symbiotic association with mycorrhizal fungi.

Another benefit the symbiotic relationship provides plants is enhanced drought tolerance. The mycelial network can withdraw water that is tightly bound to soil from very dry soils more effectively than plant roots so plants are able to withstand dryer soil conditions. Overall, the association of plant roots with mycelium creates a resilient plant root system.

By competing with other fungi for nutrients, mycorrhizae limit or prevent the activities of pathogens in the root zone.

As a result, the plant is healthier and more resilient to both drought and disease.

Mycorrhizal fungi products are regularly advertised on the internet and are locally available in stores. Although these products claim to increase plant vigor and health, the research on this topic is inconclusive.

If your garden is already growing plants, your soils are already hosting local strains of mycorrhizal fungi. You don't need to augment what is already there.

Instead, you can improve conditions for existing mycorrhizal fungi by increasing organic matter in the soil.

Add compost or aged manure, avoid intense soil disturbances such as tillage, and avoid using chemical fertilizers and fungicides.

Send your gardening questions to scmgpd@gmail.com. You will receive answers to your questions either in this newspaper or from our Information Desk. You can contact the Information Desk directly at 707565-2608 or mgsonoma@ucanr.edu.



Fungi growing in West County Photo by: Nancy Haiston/Forestville