

Mycorrhizal Fungi – The Friendly Fungi Revisited

By Emily Chase, Master Gardener

Early this summer, while on a tour of various nurseries in the Portland area, I became interested in mycorrhizal fungi. It was mentioned as providing some very good results when transplanting larger plants or trees. My husband and I have a giant sequoia that we need to move, so I listened carefully and decided to research it.

There is evidence of mycorrhizal fungi living in the root systems of about 90% of plant species. However, due to the use of pesticides and fungicides, overuse of nitrogen, pollution, and drought, urban soils often lack this essential fungus.

Below the soil surface, plants face many natural stresses. There are infertile soils, diseases, extreme temperatures, competition, drought, and wind. To survive, plants adapt strategies to overcome the physical, biological, and chemical stresses that surround them. The relationship between plants and mycorrhizal fungi has allowed plants to adapt to the harsh conditions of life. Mycorrhizal fungal filaments in the soil are extensions of root systems and more effective in nutrient and water absorption than the roots themselves.

Mycorrhizal fungi function through a network of tiny filaments or threads. At one end the threads attach to and enter the root tissue, and the plant and fungus exchange essential materials.

- Plants receive minerals, nutrients, and water.
- The fungus receives essential sugars and compounds to fuel its own growth.

On the other end, fungal threads as individuals (hyphae) or in clusters (mycelium) fan out and exponentially expand the amount of soil that the roots may explore for raw materials. In essence, the mycorrhizal fungi stimulate the plant to produce additional roots.

There are several benefits of this relationship between the plant and the fungus, in that the mycorrhizal fungi attack pathogens or diseases entering the root zone. They also improve the soil structure by producing humic compounds and organic "glues" which bind soils into aggregates and improve porosity.

Adding mycorrhizal spores to the soil may help trees which are stressed by compacted or poor soils, transplant shock, root injury, or a limited growth area such as a planter or near a sidewalk.

There are many different mycorrhizal fungi, and each may have different capacities and tolerances. Those needed to assist seedlings in establishing themselves on difficult sites may differ from those that sustain productivity and plant health in a landscape. The diversity of mycorrhizal fungi formed by a given plant will increase its ability to survive and thrive over a range of physical and chemical conditions.

Homeowners have at least four options to inoculate with mycorrhizal fungi:

1. Incorporate granular mycorrhizae at the time of planting. You can add it to potting soil or beneath the plant before placing it into the planting hole.
2. Create a soil drench by dissolving granular mycorrhizae and using a sprayer, or injecting the solution into the soil. It is essential that the fungi reach the vicinity of the roots themselves.
3. Purchase plant stock that has been pre-inoculated with mycorrhizae. The difference in performance of pre-inoculated vs. uninoculated plant stock can be dramatic.
4. Inoculate with a mycorrhizal root dip gel during planting. Root gels are used by many landscapers as a means of increasing speed of establishment. The grower dips small potted plants or bare root plants into a slurry. The slurry contains a blend of mycorrhizal spores/biostimulants/water holding gel. A root gel treatment is often a very good way to reduce transplant losses and is economical.

If you use mycorrhizal products, which can be purchased at your local nursery, it is recommended that you reduce fertilizer application by 25%.

References

[Mycorrhizal Treatments for Trees](#). TREEHELP.com.

[Stressed Trees Need Mycorrhizal Fungi](#). The Weedpatch Gazette.