Jerry Faulring

Mycorrhizae

"Mycor" – "rhiza" literally means "fungus" – "root" and defines the mutually beneficial relationship between the plant and root fungus.

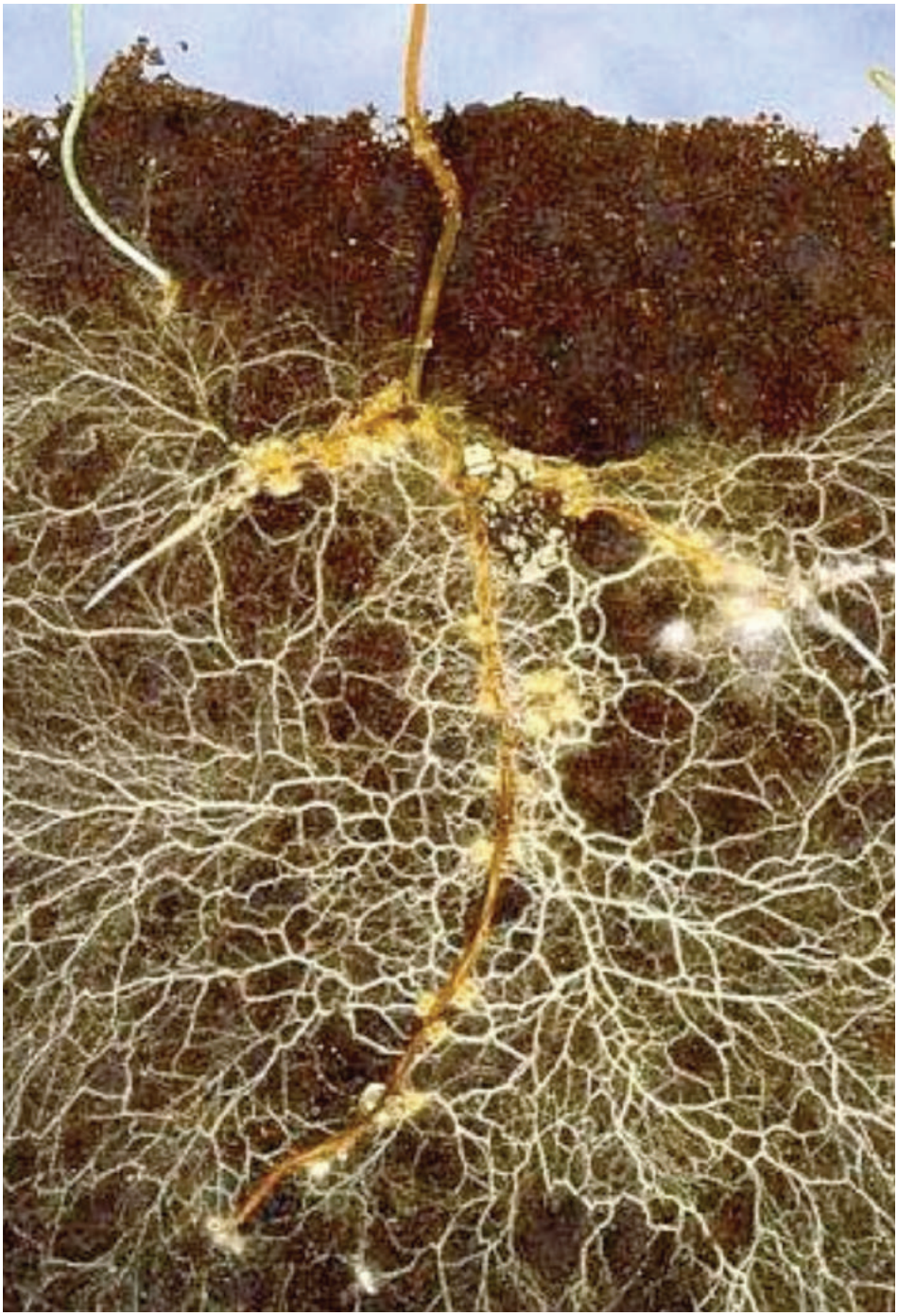
These specialized fungi colonize plant roots and extend far into the soil. Mycorrhizal fungal filaments in the soil are truly extensions of root systems and are more effective in nutrient and water absorption than the roots themselves. More than 90 percent of plant species in natural areas form a symbiotic relationship with the beneficial mycorrhizal fungi.

There are major classes of mycorrhizae and many types within the classes. There is voluminous information on the internet and I see no real benefit to confuse the reader by delving into this. It makes my head hurt to try to get through it all and then come away with a recollection of what I read.

Researchers have long known that significant plant benefits exist when mycorrhizae are present in the soil. However, at least some researchers will state that the more they know the more research is required to truly understand this phenomenal development of nature.

For years I have wanted to 'do the work', that is research this topic to determine what we might be missing related to inoculating soils with mycorrhizae fungi when planting liners.

My research indicates that we should be cautious primarily for two reasons: first the production and delivery of live mycorrhizae products is challenging, and second, research shows that consistent, repeatable soil



inoculation is even more challenging. Further, efficacy may not be obvious.

Benefits of Mycorrhiza:[1]
- Enhanced plant efficiency in absorbing water and nutrients from the soil.
- Reducing fertility and irrigation requirements.
- Increased drought resistance
- Increased pathogen resistance/ protection.
- Enhancing plant health and vigor, and minimizing stress.
- Enhanced seedling growth.
- Enhanced rooting of cuttings.
- Enhanced plant transplant establishment.
- Improved phytoremediation of petroleum and heavy metal contaminated sites.

Advantages of Mycorrhiza:[1]
- Produce more stress resistant plants during production and for landscape.
- Potentially less pesticide usage.
- Plants are more drought and nutrient tolerant in the landscape.
- Potentially higher transplanting success and faster establishment.
- Value added: Marketing landscape plants with greater stress tolerance.

What we need to know before getting started with mycorrhizae.[2]

Facts:
- Not all plants are mycorrhizal; lists are available on the internet
- Most plants will grow and survive without mycorrhizae
- If one inoculates plants with mycorrhizae, don't assume benefit; several other soil conditions may result in robust growth conditions
- From the previous fact proof of benefit does not always translate to all production or landscape situations
- The expense of inoculation may exceed the benefits and one should evaluate the use of mycorrhizae just as one would evaluate any other production input
- Application of mycorrhizae does not guarantee inoculation which can usually be verified only by microscopic or DNA evaluation
- If mycorrhizal inoculation is the goal, one must prove successful inoculation occurs before continuing
- Once plants become mycorrhizal there is no guarantee they will remain so
- Benefits incurred in a production system does not guarantee transfer to the landscape
- Changes in environmental and cultural factors can alter mycorrhizal status in the plant
- Mycorrhizae success in early plant development may not continue as a plant matures

> "More than 90 percent of plant species in natural areas form a symbiotic relationship with the beneficial mycorrhizal fungi."

Does this all sound a bit confusing and contradictory? The benefits and advantages cited by Davies would encourage me to jump right in. Yet the facts listed by Scagel and Lindeman cause me to proceed with extreme caution. Most of us are not in a position to prove that we have successfully inoculated the plants. Unlike soil amendments with fertilizer or compost which usually produce near-term visual proof of efficacy, it appears that we may have difficulty assuring success with mycorrhizal inoculation.

It is not my intention to discourage the use of mycorrhizae. For me, based on the facts, I would be very cautious before spending money for product and labor to achieve a potentially elusive, verifiable benefit. I would be pleased to hear from anyone who believes they have seen provable benefit.

References:
1. Dr. Fred Davies, Texas A&M University
2. Carolyn Scagel and Robert Linderman, USDA-ARS Horticultural Crops Laboratory, Corvalis, Oregon

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