

# Mushrooms and Mycorrhizal Relationships



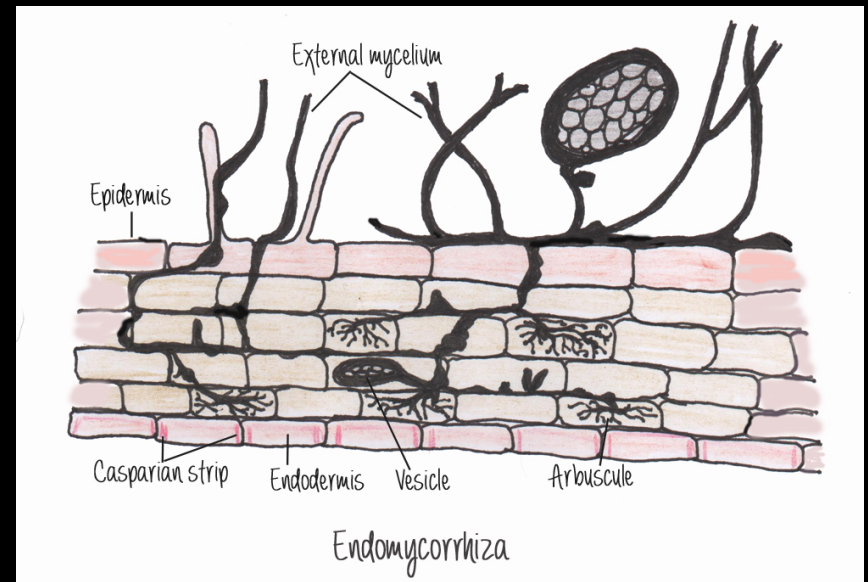
# The Importance of Mycorrhiza

- Approximately 95% of plant species require association with mycorrhiza for maximum performance



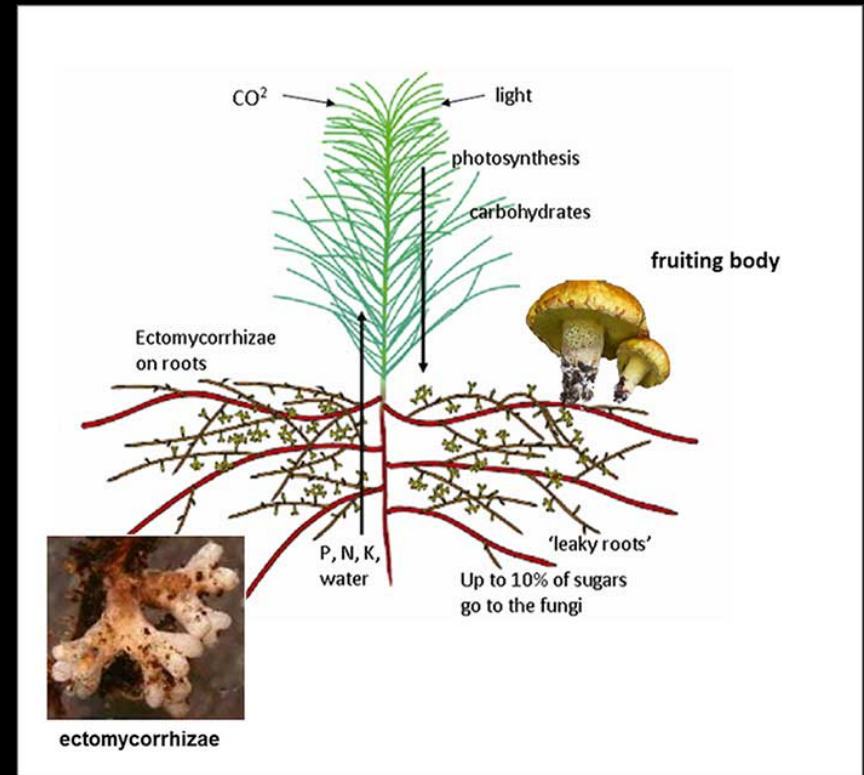
# Endomycorrhizae

- The origins of Endomycorrhizae date back 350-460 million years and helped colonize the land with vascular plants



# Ectomycorrhizae

- Ectomycorrhizae are associated with mostly conifers and a few deciduous trees



# How does mycorrhizal fungi work?

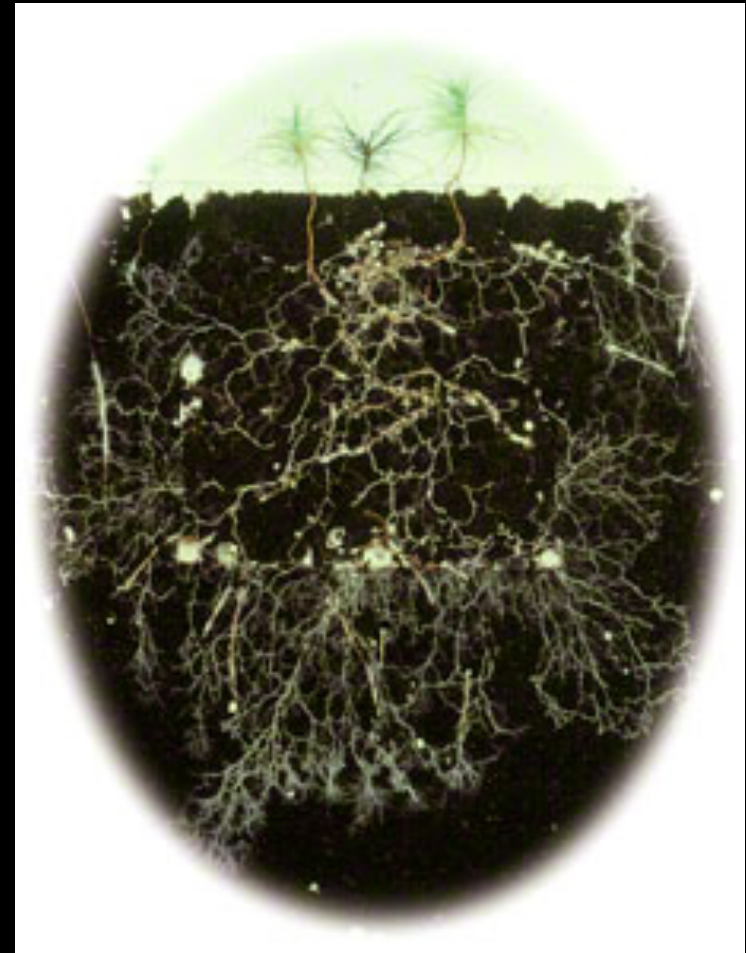
- Increases the absorptive area of roots 10-1000 times
- Mycorrhizal fungi absorb and transfer all of the 15 major macro and micro nutrients needed for plant growth
- Releases chemicals into the soil that dissolve nutrients that are hard to capture
- Helps with disease and pathogen suppression
- Improves soil structure and porosity by promoting aeration

# What affects mycorrhizal fungi?

- Tillage
- Fertilization
- Removal of topsoil
- Erosion
- Site preparation
- Road and home construction
- Fumigation
- Invasion of non-natives
- Leaving soil bare

# What can you do?

- Sprinkle mycorrhizal inoculant on roots during transplanting, work into seed beds, blend into potting soils
- Generally easy, inexpensive
- Maintain diversity of fungi



# What can you do?

- Sawdust/Woodchip Cultivation
- Drilled Hole Inoculation of Logs
- Log and Bag Method Indoors and Outdoors
- Refer to Paul Stamets' book *Growing Gourmet and Medicinal Mushrooms*



## Example of Technique for Outdoor Mushroom Cultivation



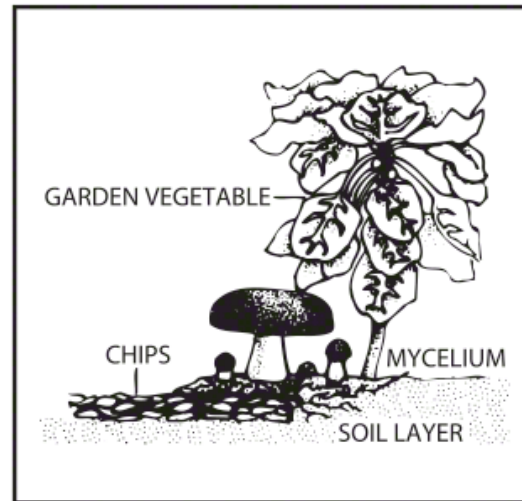
Arrange a layer of moist wood chips, mulch or yard debris in a 4' x 4' or 4' x 8' bed



Sprinkle spawn over the surface of the bed



Cover the spawn with an additional 2-4" of wood chips, mulch, yard debris or loose straw



Cross-section of mushroom bed showing mycelium spread and mushroom growth

# Stropharia rugosoannulata, King Stropharia



- Cap and stem are edible
- Texture like portobello
- Great mycoremediator for cleaning water and soil
- Can easily perennialize in garden soil

# Ganoderma lucidum/oregonense, Reishi



- Prefers to grow on deciduous trees
- Considered the mushroom of immortality
- Stimulates the mind and body
- Best if regularly consumed

# Ganoderma lucidum/oregonense, Reishi

- Immune-enhancing
- Anti-tumor (best for prevention)
- Cholesterol reducing
- Anti-allergy
- Anti-hypertension
- Hypoglycemic
- Enhances lung function
- Reduces effects of caffeine and relaxes muscles
- Anti-HIV

# Grifola frondosa, Maitake

- Prefers to grow on oak and other hardwoods
- Also called Hen of the Woods
- Immune support
- Glucose-modulating
- Anti-HIV (inhibits ability to kill T cells)
- Hepatoprotective



# Lentinula edodes, Shiitake



- Favors any deciduous wood, but thick-barked Oak is probably best
- Well-known for culinary and medicinal benefits
- Very effective when eaten
- Lowers cholesterol
- Suppresses tumors
- Anti-cancer