Basic Backyard Gourmet Mushroom Gardening

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Vocabulary

Mycelium: fungal network of threadlike cells
Mushroom: the fruiting body of a fungus
Primordia: the mushroom at the earliest stages of growth
Stem butt: the bottom of the stem of the mushroom, which is connected to the mycelium
Substrate: straw, sawdust, compost, soil, or any organic material on which mushroom mycelium will grow
Inoculate: to colonize a substrate with mycelium
Spawn: any material impregnated with mycelium, the aggregation of which is used to inoculate more massive substrates
Spore: a reproductive seed of fungi

Basic Backyard Methods

Find those places in your yard which have dappled light and a **moist** microclimate. (Where do you observe mushrooms in nature? Although we often associate mushrooms with dark shade, most mushrooms prefer only partial shade-- a few will even enjoy full sun, but rarely will they fruit well without any sun. The sunlight passing over a mushroom patch also aids in fruiting, as a brief moment of evaporation wicks water upwards.)

The Mushroom Patch
Like many recipes, these are suggested ingredients in suggested amounts. The ultimate pattern is like a lasagna of whatever cardboard, wood chips, sawdust or other substrate we have nearby with mycelium mixed in at the right proportion.

1. I first clear the site of existing debris which may be hosting other fungi and mulch a nice tree with it. Lets imagine its a 3 x 6 foot space.
2. Cardboard is laid over the site and covered with moist sawdust or wood chips… 1-2 inches thick.
3. A bag of sawdust spawn (1 gallon?) is spread about.
4. Bits of ripped cardboard with the corrugation exposed are laid about randomly, with the corrugation facing the sawdust spawn. (The corrugation is easily exposed if the cardboard is soaked and pulled apart.)
5. More sawdust or woodchips ½ - 2 inches thick
6. More cardboard—with a goal of 80-90% coverage
7. More sawdust/woodchips—total coverage if possible

The time till fruiting depends on the type of mushroom.

Intercropping
Some mushrooms have been observed to coexist well in garden beds and agricultural fields with annual vegetable plants. The elm oyster and king stropharia, in particular, have been documented in intercropping and "companion planting", scenarios. Like the mushroom patch method above

For your fruit trees
Innoculate wood chip mulch under your fruit trees with the mycelium of the King Stropharia mushroom. This delicious mushroom grows well in full sun and will speed up nutrient cycling in the mulch layer of your orchard. The mycelium of this mushroom is rhizomorphic, which means it will easily colonize a new pile of mulch, but it will rarely fruit until the second year—be patient! It's a lovely edible addition to the orchard ecosystem and cousin to fungi which fight root rot.

Log culture

1. Logs 4-8 inches in diamteter of a wood which the desired mushroom is known to grow on are cut to the desired length--1-2 feet, or longer for stacking.
2. Check the ends of the log for white clouds to be sure the logs are not colonized by another mycelium yet.
3. Drill holes across the surface at roughly 5 inch spacing. I recommend drilling the holes deeper than the length of the dowels—this will give the mycelium a little "cave" to colonize. 5/18 inch bit should be what you need.
4. Insert inoculated dowels (a mallet is useful) and seal with wax. Optionally, log ends may be sealed with wax as well. The wax will keep moisture in, prevent other fungi from colonizing, and keep bugs from eating the mycelium.
5. Place logs in a moist location with dappled shade. Propping them on a pallet or rock may prevent competition from soil microbes – especially for shiitake. Logs are often stacked or sometimes places on drained garden pots with gravel.
6. Wait 6 months to 2 years, depending on the variety on mushroom and type of wood used for fruit. You will see white clouds on the log ends when they are colonized. Soaking logs in water for 24 hours may induce fruiting.

Recommended References

Stamets, Paul. 2005. Mycelium Running: how mushrooms can help save the world. Ten Speed Press, Berkeley.
Stamets

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Introduction to a few backyard favorites

Oyster, *Pleaurotus ostreatus*
Usually a white or creamy colored fan with gills that run from under the cap, down the stem, generally clustered. Reduces cholesterol, inhibits tumors.
Recommended backyards cultivation methods: patches, logs and intercrops
Preferred substrates: almost anything—paper, straw, wood, coffee, corn cobs, seeds, try it out…
Conditions: form mushrooms at temperatures between 40-75 degrees F. May fruit within a month on straw, longer on hardwood.

Elm oyster, *Hypsizygus ulmarius*
Grows to look like an oyster mushroom, often quite large and rare in the wild. Usually grows single, sometimes with one or two others.
Recommended backyard cultivation methods: intercrops, logs and patches
Preferred substrates: elm, cottonwood, beech, maple, willow, oak, and some other hardwoods.
Conditions: form mushrooms at temperatures between 50-70 degrees F. Grows fine in full sun or dappled shade. Fruits quickly, often after only a few months in a patch.

King Stropharia, *Stropharia rugoso annulata*
Often large, up to 5 pounds, brown-burgundy colored caps with brown gills and a white stem. Rhizomorphic and able to thrive in microbially rich conditions— well adapted to disturbance and grasses. Active against coliforms.
Recommended backyard cultivation methods: intercrops, logs and patches
Preferred substrates: woodchips, hardwoods
Conditions: form mushrooms at temperatures between 50-90 degrees F.

Shiitake, *Lentinula edodes*
Nutritious and prized medicinal mushroom—anti tumor, anti viral, immune system stimulant. Brown cap with white gills and white/creamy stem, bruises brown.
Recommended backyards cultivation methods: logs only
Preferred substrates: oak and hardwoods like poplar, cottonwood, alder, maple, ironwood, beech, birch, willow.
Conditions: form mushrooms at temperatures between 50-80 degrees F. Grows in very moist conditions with moderate shade. Wants to be elevated. 6 months – 2 years till fruit. Bark must remain on the log

Propagation for mycological culture

"There are old mushroom hunters, and there are bold mushroom hunters, but here are no old, bold mushroom hunters!"

Of course, get a positive ID on a mushroom before you eat or propagate it, *please!*

Collecting local cultures
Collect local cultures and grow them in your home landscape. Maitake, reishi, oyster, morel, pheasantback and more grow in the Vermont forests. When you harvest the mushroom, pull the stem butt along with it and cover the harvested area with fresh mulch to feed the mycelial network. Cut the butt from the mushroom body and place it in a bag with some mulch to keep it from drying out… you should be able to see mycelium at the base of the stem butt which can be used to inoculate substrates elsewhere.

Solar pasteurization
If I have some mycelium or a stem butt I want to propagate I place it in a sealed bag or container with a fresh substrate that has not been colonized by other potentially competitive cultures and let it grow there before introducing it to my yard. Sterilizing a substrate reduces the possibility of other cultures running in the substrate…. Many people use a pressure cooker to do this, but I've been pasteurizing moist sawdust and grass clippings in a garbage bag laid flat over the hood of a car. On a sunny day I measured 140 degrees in the bag. There's a window of too hot, and not hot enough to avoid certain competitive bacteria, and this method seems to work well.

Cardboard spawn
Mycelium love to run on the corrugated edges of cardboard. This is the easiest, and often most appropriate, way to propagate from a wild stem butt. Wet the cardboard and let it sit for a few minutes. When you come back to it the outer layers will peel away easily revealing the corrugated interior layer. Place a stem butt between moist layers of this corrugation, either in a tub in the shade or straight on the ground. Open the sandwich in a week to check the progress of the mycelium run. This is a source of spawn which is easily incorporated into mushroom patch installations.