

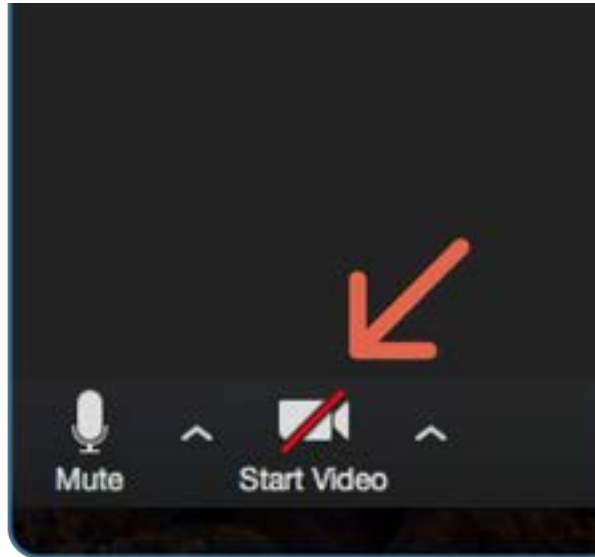


Cultivation and Cooking: At-home Oyster Mushrooms

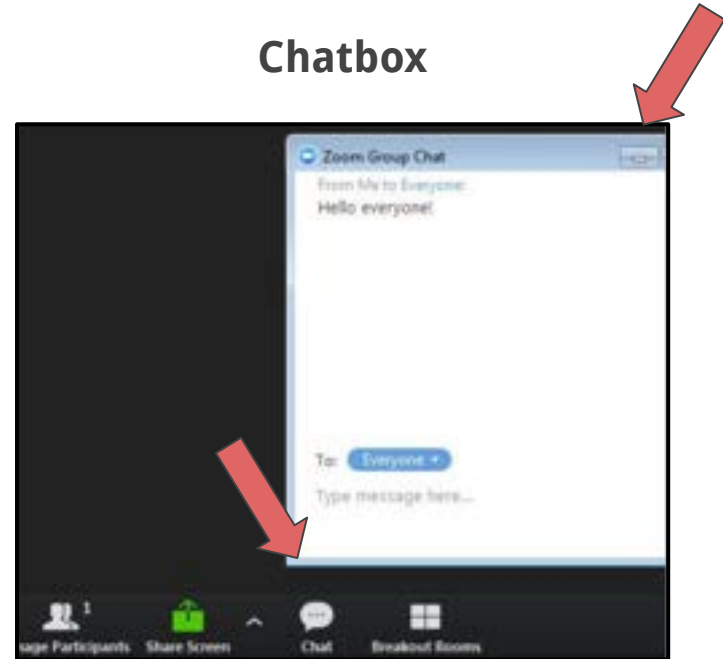
Adirondack Experience

Using Zoom

Controls

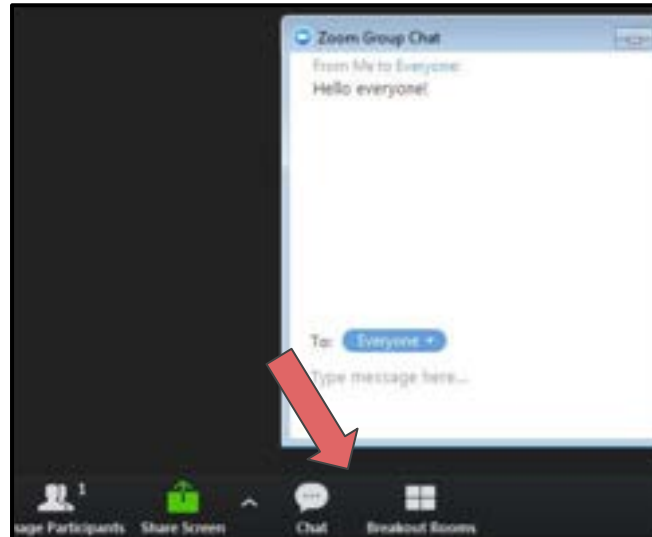


Chatbox



Using Zoom

Q & A



Using Zoom

Screen View





Presenter: John Michelotti

- *Founder and Mycologist, Catskill Fungi*
- *Former President, Mid-Hudson Mycological Association*
- *Steward of the Catskills, Catskills Center*
- *Mushroom Advisory Panel, Certified Naturally Grown*
- *Mushroom Identification Consultant, North American Mycological Association (NAMA) & NYC Poison Control Center*
- *Chair of Medicinal Mushroom Committee , NAMA*

Schedule

- Life Cycle, Functions, Uses & Health Benefits of Oyster Mushrooms
- Cultivation Overview
- Indoor Oyster Cultivation
- Other Mushroom Growing Methods
- Q & A





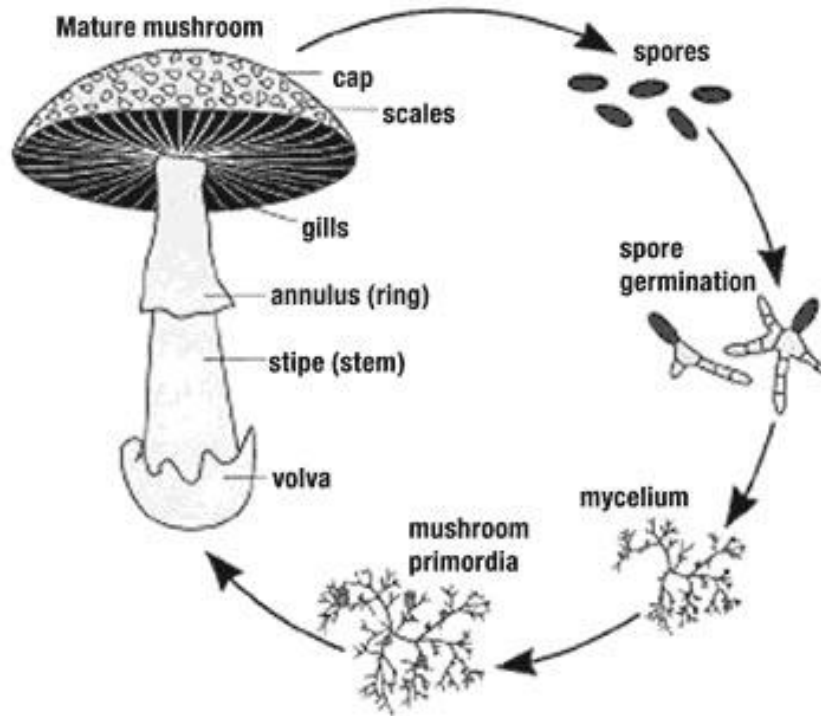


Fungal Kingdom / Queendom

- Recognized as 5th Kingdom in 1969 because they absorb nutrients from their environment.
- 2 to 10 million species.
- Only ~150,000 scientifically described species.
- Essential for life as we know it.
- Are the answer to many global problems.



Life Cycle: Basidiomycota



Mycelium secrete digestive enzymes from their hyphal tips which externally metabolize complex organic compounds.

They absorb the soluble nutrients such as simple sugars, nitrates, and phosphates from their environment.

Mycelium can grow on and bind together:
Agricultural waste: corn/rice husks, manure
Household waste: coffee grounds, cardboard
Industrial waste: wood, sawdust
And much more

Spores



- Dispersal
- 1 mil per cubic meter
- 1-30 Microns in size

Where?

Everywhere!

Spores





Mycelium

Each square inch of soil contains:

1-8 Miles of mycelium

Purpose:

Digests wood, stone, plants, insects,
contaminants, etc.



Oyster
Mycelium





Oyster
Mycelium



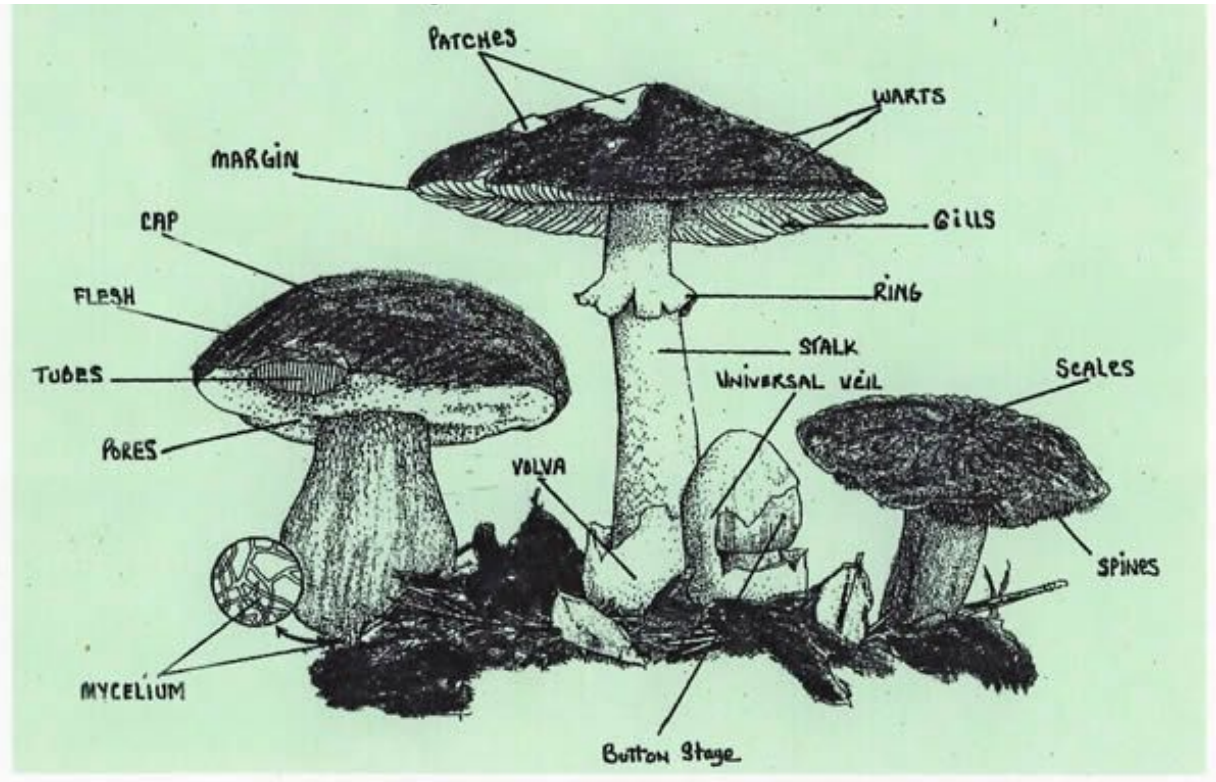
Mushroom Growth Overview



- Primordia form / “Pinning”
- Double in size every day
- 90% Water
- Decompose quickly
- Seasonal
- Appear in same place year after year



Learn the Parts of a Mushroom



Mushrooms



Mushrooms



Mushrooms



Oyster Mushroom Varieties

White

Pluerotus
ostreatus



Yellow

Pluerotus
citrinopileatus



Blue

Pluerotus
columbinus



Pink

Pluerotus djamor
complex



Four Ecological Functions

1. Saprophytic
2. Parasitic
3. Mycorrhizal
4. Endophytic



Four Ecological Functions

1. **Saprophytic**
2. Parasitic
3. Mycorrhizal
4. Endophytic



Saprophytes are the *decomposers* of dead material.

Break down lignin, cellulose, & hemicellulose to make healthy soil.

Usually growing on Wood/Dung

Four Ecological Functions

1. Saprophytic
- 2. Parasitic**
3. Mycorrhizal
4. Endophytic



Parasites can grow on plants, insects, and other mushrooms.



Four Ecological Functions

1. Saprophytic
2. Parasitic
- 3. Mycorrhizal**
4. Endophytic



Myco = fungi

Rhizal = root

Root Symbionts

93% plant species

Many grow from
the ground

Four Ecological Functions

1. Saprophytic
2. Parasitic
3. Mycorrhizal
4. **Endophytic**



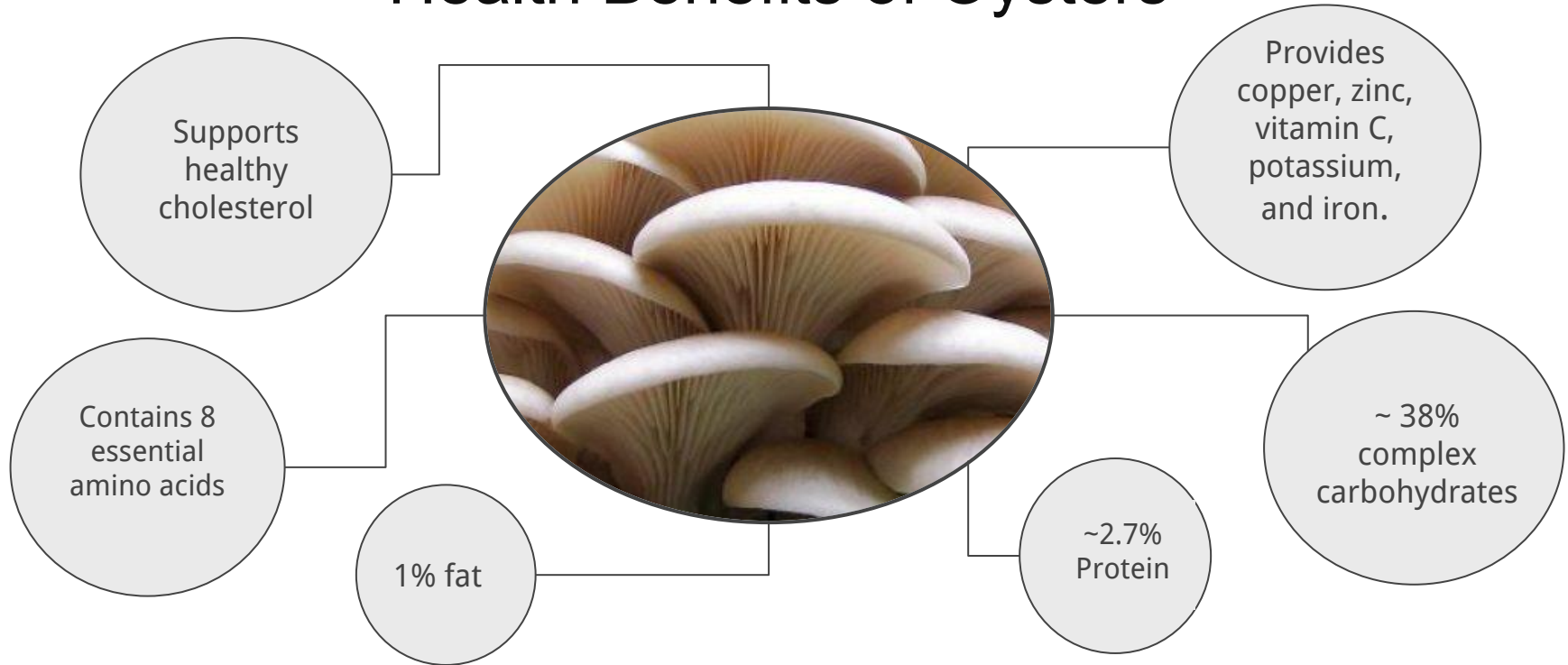
Endo = Inside

Phyto = Plants

100% of plants have fungi living within their tissue.

Don't produce mushrooms

Health Benefits of Oysters



Attributes & Abilities



Grows easily on varied substrates



Mycoremediation

Myco Materials



Cooking: Dry Fry



Dry saute with salt for
10 - 15 minutes until most
of the water evaporates
from the mushrooms,
then add oil and/or butter.

Cooking Oysters: Dry Fry



- Black Chanterelle
- Black Saddle
- Blewit
- Boletes
- Candy Cap
- Chanterelle
- Common Store
- Ear Mushrooms
- Enoki
- Fairy Ring Mushroom
- Hedgehog Mushroom
- Honey Mushroom
- Matsutake
- Milky Caps
- Morels
- Nameko
- Oyster Mushroom
- Puffballs
- Shaggy Mane
- Shaggy Parasol
- Shiitake
- Snow Mushroom
- Straw Mushroom
- Truffles

Black Chanterelle
Black Saddle
Blewit
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Oyster Mushroom
Puffballs
Shaggy Mane
Shaggy Parasol
Shiitake
Snow Mushroom
Stem Mushroom
Truffles

Puffball Piccata

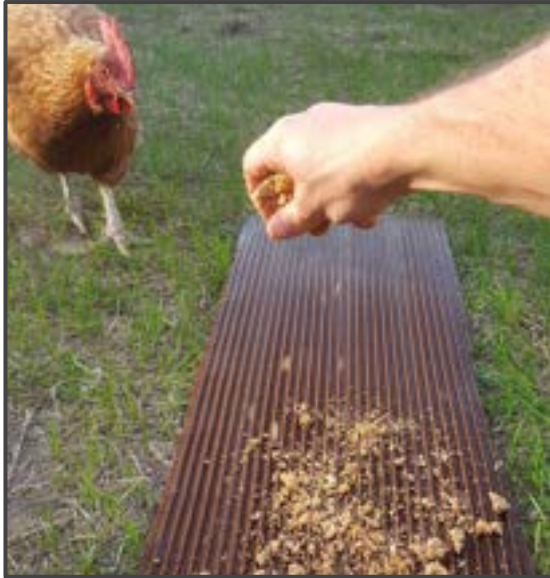


Growing Mycelium that Produces Mushrooms



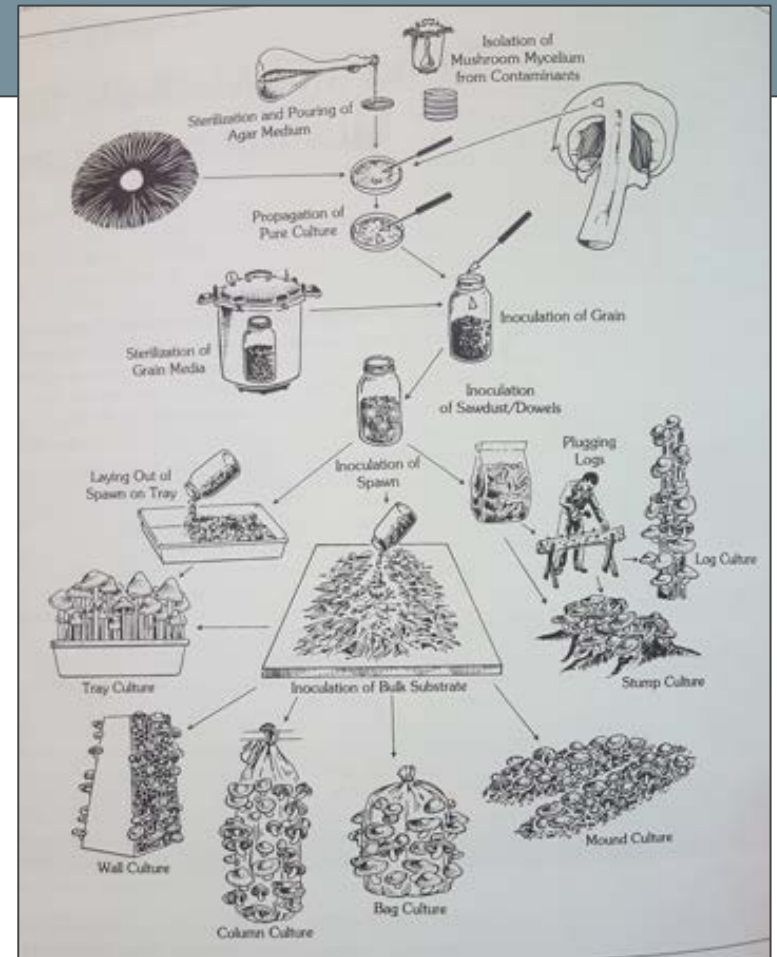
- Definition: **Spawn**
 - Material that has mycelium growing on it which is used to inoculate a substrate
- Oyster Spawn **Types:**
 - Mushrooms (condensed mycelium) with optional supplement (gypsum/grain)
 - “Block” from mushroom grower (See emailed material list for local spawn producers)

Growing Mycelium that Produces Mushrooms



- Definition: **Substrate**
 - Pasteurized or sterilized organic material where mycelium will grow given the right conditions
- Oyster Substrate **Types**:
 - Plant based materials: wood, cardboard, burlap, hydrocarbons, pasteurized coffee grounds

Mushroom Cultivation Overview

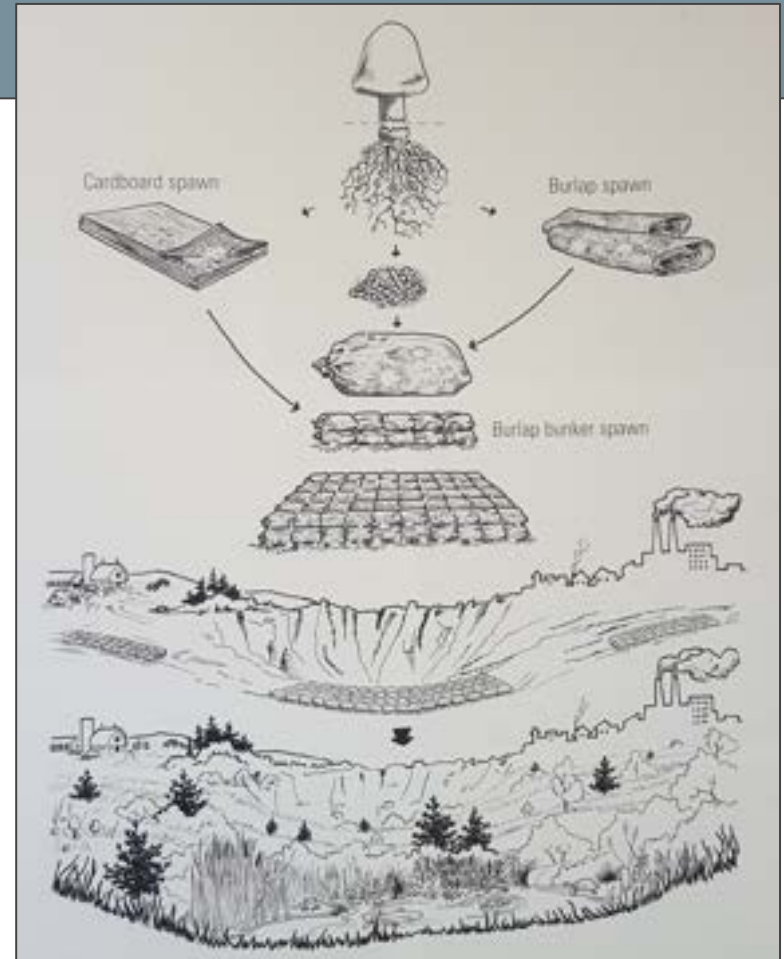


Sources: [Growing Gourmet and Medicinal Mushrooms](#) Paul Stamets Ten Speed Press 2000

Mushroom Cultivation Overview



Sources: [Growing Gourmet and Medicinal Mushrooms](#) Paul Stamets Ten Speed Press 2000



Mushroom Growing Methods

- 1. Grow Kits**
- 2. Oyster Mushrooms on Coffee Grounds / Cat Litter**
 - a. Using Spawn
 - b. Using Mushrooms
- 3. Log Inoculation**
- 4. Cardboard**
- 5. Slurry**
- 6. Mulch Inoculation**

Growing Method: Grow Kits



- Mycelium on sawdust with nutrients (gypsum & hydrated grain) grown in sterile bag
- Leave out of direct sunlight and mist
- Fruit 4 times with few weeks rest between

Grow Kit / Fruiting Block / GIY Kit



Spawn Block / Fruiting Block / GIY Kit



Oysters on Coffee: Prepare Your Substrate

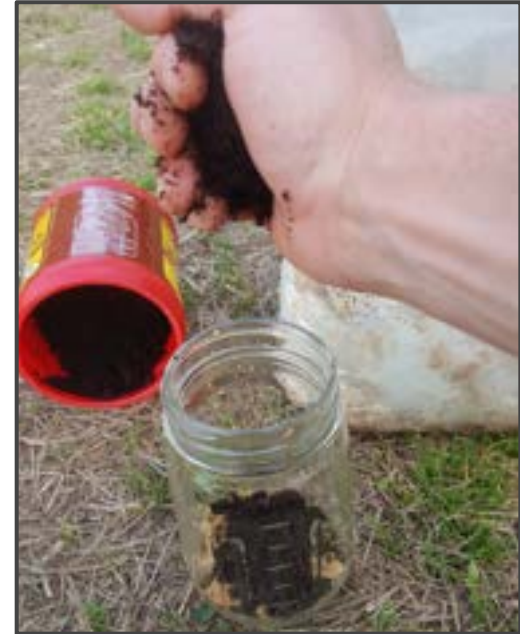


Coffee Grounds: hot water = pasteurization

- Make coffee or....
- Save and freeze daily grounds, thaw, and pour boiling water over them.
- Consistency: medium grounds are a good
- Coffee filters can be added. Recommend tearing them into smaller pieces.
- Moisture: when squeezed, grounds should drip a bit. Avoid standing water.

Directions: Oysters on Coffee

1. In a clean container, **layer** ½" - 1" oyster spawn and 1" coffee grounds. First layer should be spawn. 30+% spawn to 70% coffee
2. **Pack down** levels as you add materials to fill gaps.
3. **No standing water** on bottom of jar. If there is, make hole or turn upside down to drain.
4. **Condensation** on the inside of jar is ideal throughout the growing process.



Directions: Oysters on Coffee

1. **Fill materials** ½ inch from top. Last layer should be spawn.
2. **Cover** loosely with lid to retain moisture but still allow for air exchange.
3. **Label** with date and contents.
4. **Store** out of direct sunlight where you see it daily. Kitchens are recommended.



Caring For Your Oyster Mushrooms is Easy!



- Mist with water (non-chlorinated) to maintain condensation but no standing water. About every other day.
- Watch mycelium grow and turn the container white

Growth Stages: Pinning



Pins form after about 3 weeks! Take the lid off & mist 3-5 times per day.

Growth Stages: Mushrooms Forming

Watch them double in size every day!



When to Harvest?

Harvest mushrooms once they stop growing & before they dry out.



Cook,
Eat,
&
Enjoy!



After Harvest

- Let the jar rest out of direct sunlight for about 2 weeks.
- Mist every few days to keep from drying out.
- In a few weeks you will start to see pins form again. Mist 3 - 5 times per day.
- Harvest, Cook, & Eat.
- Repeat!
- After repeating this for 2 to 3 flushes, the food source of the mycelium will be spent and will be ready to be moved outside or composted.

Demonstration

Let's Grow! Watch and ask questions.



Oyster Pinning to Fruiting

2 - 4 days depending on temperature

After harvest. The block rests for 2 weeks.



Troubleshooting

It is time to relocate your grow operation outside or compost if:

- Flies or larvae appear
- Blue, green, or pink colors start to grow

Frequently Asked Questions

- **How frequently should I water?** Once every 2 days (more details in directions).
- **Is all the white stuff normal?** Yes! It's Mycelium!
- **After I get 2 flushes of mushrooms can I use my mycelium as spawn?**
 - You can try but mycelium slows after it produces mushrooms. It will grow slowly.
- **Can I add other things to the container?** -Yes! Cardboard or burlap are great too.
- **What's with the fruit flies?**
 - Maybe time to put it outside but keep an eye out. You may see more mushrooms.
- **Green mold?** -Trichoderma. Small amount is ok.

Other Ways to Grow Fungi:

Log Inoculation



Cardboard Roll-ups



Cardboard Roll-ups



Cardboard Roll-ups



Cardboard Roll-ups



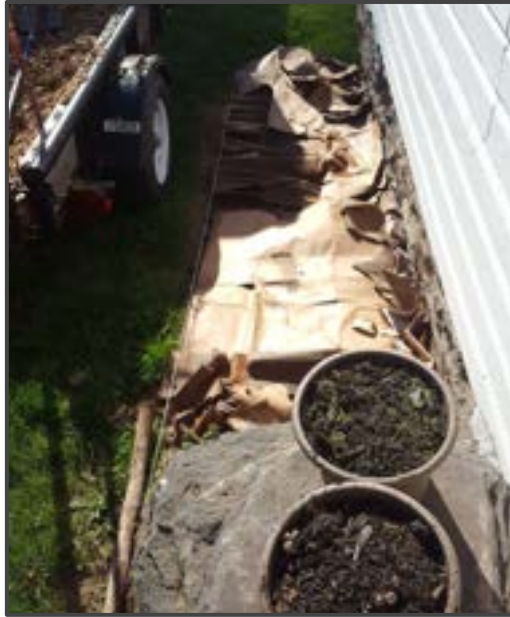
Cardboard - Indoor or Outdoor



Slurry



Wine-Cap in Mulch



Wine-Cap in Mulch



Wine-Cap in Mulch





Yeasts & Alcohols

Cultivate native, beneficial fungi to preserve food and improve microbiome.

Growing for your own needs breeds resilient communities.

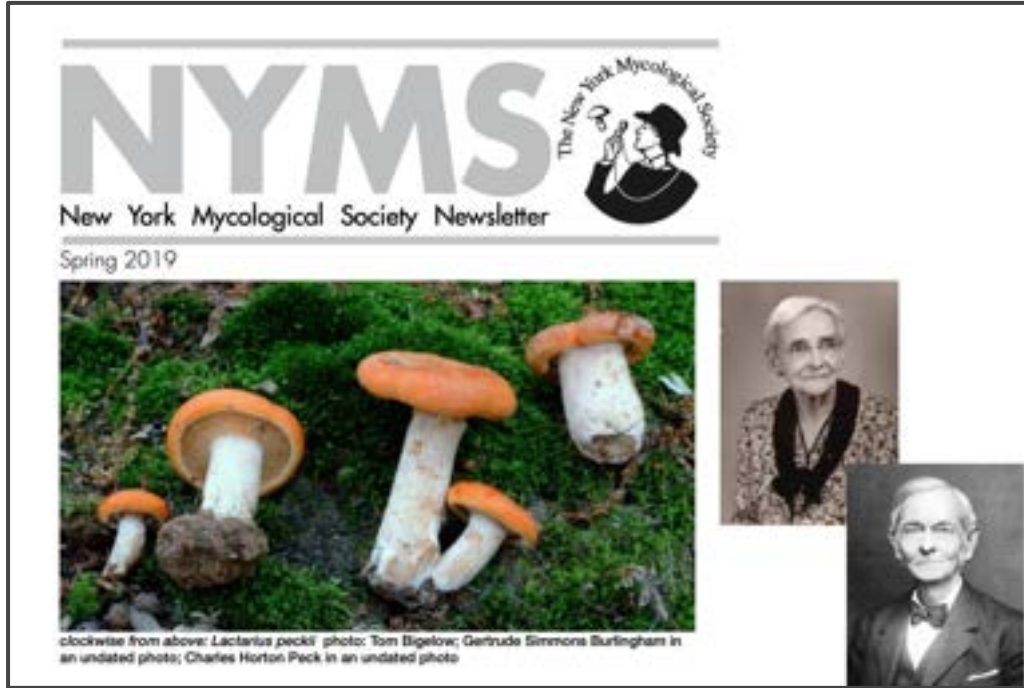


Turn the home from a unit of consumption back to a unit of production.

Share with your Community.



NY State Mushroom: *Lactarius peckii*, Peck's Milk Mushroom



Additional Resources

Books

- The Complete Mushroom Hunter Revised by Gary Lincoff
- Farming the Woods by Steve Gabriel & Ken Mudge
- Mycelium Running by Paul Stamets
- Organic Mushroom Farming & Mycoremediation by Tradd Cotter
- DIY Mushroom Cultivation by Willoughby Arevalo
- Growing Gourmet and Medicinal Mushrooms by Paul Stamets

Other Resources

- Fungi Magazine
- New York Mycological Society, <http://newyorkmyc.org/>
- North American Mycological Association, <https://namyco.org/>
- Cornell College of Ag. & Life Sciences, <https://smallfarms.cornell.edu/projects/mushrooms/>
- Mid Hudson Mycological Association, www.midhudsonmyco.org/

Thank You!



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Questions & Answers