

# Mushroom Cultivation

Assessment of mycelium yield from coffee grounds or spent brewer's grain.

## PROJECT LEADERS

Lauren McCalister  
Ab Scherschel

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## BACKGROUND

In pursuit of a no-waste system of food production, mushroom cultivation provides soil amendment opportunities with composting after harvesting. Coffee beans are seeds that contain nitrogen-rich proteins needed for germination and growth. Protein comprises over 10% of coffee grounds. In fact, the carbon-to-nitrogen ratio of coffee grounds can be an ideal ratio for plant and soil nutrition (as low as 11:1) Additionally, an opportunity to decrease in the amount of coffee grounds accumulated in the dump is obtainable.

## INQUIRY

Can mushrooms can be harvested from coffee grounds and/or spent grain.

## HYPOTHESIS

Coffee grounds will yield higher mycelium than spent brewer's grain.

## MATERIALS & INGREDIENTS

1. Coffee
2. French Press
3. Alcohol
4. Lighter
5. 10cc of Mushroom inoculate
6. Clean towel
7. Mason Jars, lids and bands
8. Cotton Balls
9. Mushroom Growing Jar Lids\*
10. Fine Mesh Strainer



## PROCEDURE

### COLLECTION AND STERILIZATION

#### PREPARE THE JARS AND BOIL- REPEAT PROCESS FOR EACH BATCH

- Gather coffee grounds OR Collect spent brewer's grain from local beer producer
- Brew coffee grounds and cool
- Sterilize jars and bands with pressure cooker or rubbing alcohol
- Fill Jars with substrate
- Use cotton balls or Growing Jar lids

### PREPARE THE MUSHROOM SYRINGE

- Use lighter to heat up syringe with mushroom inoculate (avoid melting the plastic)
- Insert needle into port on Growing Jar or directly in the jar if covering with cotton balls
- Empty 5 cc for every 8 oz syringe into jar and safely dispose of sharps needle

### INCUBATION

- Leave inoculated jars in a warm and dark place (ideal 65 - 70 F)
- Check every few days to see the white mycelium starting to grow across the coffee
- After 14 days jars will be fully colonised and bright white and fluffy

### PREPARE THE FRUTING CONTAINER

- Clean with alcohol. Add white spawn. Break down clumps. Add 1:1 ratio coffee grounds and spawn.

## RESULTS

Batch 1: Brewer's Grain

Batch 2: Coffee Grounds

Batch 3: Brewer's Grain and Coffee Grounds (1:1)

#### **Batch 1: Lion's Mane and Oyster**

**Lion's Mane harvested large (<2 inch) snowball**

**Oyster harvested large caps and long stalks**

#### **Batch 2: Oyster**

**Oyster harvested large caps and long stalks**

**Lion's Mane harvested small (>2 inch) snowball**

#### **Batch 3: Lion's Mane and Oyster**

**Lion's Mane harvested small (>2 inch) snowball**

**Oyster harvested large caps and long stalks**

## CONCLUSION

Inoculated spent coffee grounds produced larger and longer oyster mushrooms than brewer's grain. However, both substrates produced healthy spawn and viable mushroom compost.



Oyster mushroom mycelium colonising coffee ground substrate.

## SCALING UP

MONTH YIELD INDIVIDUAL--EMERGING--ESTABLISHED--GROWER

- Individual Grower : 7 cups of coffee per week = 32 oz inoculated coffee grounds= 2-3 pounds mushrooms per flush
- 1 Month = 1 gallons of mushroom compost
- Emerging Farmer: 32 oz of coffee per week = 128 oz inoculated coffee grounds = 12-15 pounds mushrooms per flush
- 1 Month = 4 gallons of mushroom compost
- Established Mushroom Farmer: 5 Gallons coffee per week = 640 oz inoculated coffee grounds = 60-75 pounds mushrooms
- 1 Month = 20 gallons of mushroom compost
- Mushroom Grower: Trash Can (30 gallons) of coffee per week = 3840 oz inoculated coffee grounds = 250+ pounds mushrooms
- 1 Month = 120 gallons of mushroom compost

## Scaling Continued

**Sealed Room for large scale incubation and fruiting:**

- **Cleaning Supplies**  
White Vinegar  
Sponge
- **Space Requirements**  
At least 200 sq/ft
- **Equipment total \$1241.00**  
House of Hydro  
Vivo Sun



Oyster mushroom mycelium colonising spent grain and coffee mix substrate.

## References

1. <https://extension.arizona.edu/using-coffee-grounds-garden>
2. [FrontierMycology](#)
3. <https://balkangreenenergynews.com/coffee-grounds-waste-emerging-as-powerful-heating-fuel-fertilizer/>
4. <https://safeneedledisposal.org/>
5. The Mushroom Cultivator by Paul Stamets
6. [Step by Step Spawn incorporating](#)

