

# A Simple Guide to Growing Mushrooms in Your Spawn Bag!

This is a quick and simple guide designed to get you started growing mushrooms using spawn bags. Easy to follow step-by-step instruction will guide you through everything you need to do from start to finish. It is important to read and understand all of the following information before inoculating your bags. **Happy growing!!**





## **Mycology:**

The word “mycology” is derived from the Greek word meaning "fungus." It is the branch of biology that deals with the study of fungi. A mycologist is a microbiologist who examines various aspects of the fungi kingdom including genetic and biochemical properties, taxonomy, and behavior, as well as uses to humans as sources for tinder, medicinal drugs (i.e. penicillin), food (i.e. beer, wine, cheese, edible mushrooms) and entheogens. They also observe the possible dangers of certain cultures that may lead to poisoning or infection.

## **Contamination:**

*As a mycologist, it is critical to fight contamination. Any organism that attempts to get a foothold on your substrate is a contaminant!*

To properly incubate your mycelium it must remain at a constant temperature between 70 and 90 degrees depending on what species you are growing. This temperature is also ideal for countless number of other molds and bacteria. In mycology, all growers will experience contamination of one kind or another, it is almost inevitable. Even experienced growers, in laboratories will encounter an occasional contamination, but if you practice sterile technique, it will greatly reduce your chances of a contamination occurring, ensuring bountiful yield for years to come.

## **Sterile technique...not just “clean”:**

Some of the procedures you do at home require sterile technique. The purpose of ensuring sterile technique is to prevent infection. The word sterile means, “free from germs.” It is up to you as the mycologist to ensure your work area is as clean and as disinfected as it possibly can be. If you take the proper steps you can greatly reduce the chance of contamination to your product, ultimately producing far larger yields. A few rules for sterile technique to keep in mind are listed below:

## **Rules for sterile technique:**

- Always wash your hands before and after doing any sterile procedure. Short fingernails are important.
- Practice good oral hygiene. Brush teeth, floss and use mouthwash.
- Wear clean and freshly laundered clothes, scrubs or a lab coat if possible.
- Wear rubber gloves, Tyvek wrist and arm sleeves, a facemask, hair net, goggles, and even shoe covers when possible.
- Sterile supplies must be kept dry. If the outer wrapper is not sealed, the kit is not sterile.
- Prepare a work area by washing the counter or table with a disinfectant spray, bleach or soap and water. Make sure the surface is dry before you put your sterile supplies down.
- The use of a HEPA (high efficiency particulate air) filter, air purifier or laminar flow hood can reduce up to 99.997% of airborne particulates and microbes.
- Special care must be taken when you handle supplies to keep them sterile. Touch only the outside wrapper; only touch the sterile supplies with gloved hands.
- Do not sneeze or cough on the supplies or in the area in which you will be working.
- Try not to reach over the sterile supplies when doing the procedure. It may be best to have your work surface off to your side.

## **Sterile field:**

In mycology, the space in which sterile objects may interact undisrupted by non-sterile objects is a sterile field. An important point to bear in mind is that a person or thing will have only a particular portion of its surface designated as sterile (and therefore within a sterile field). Every other surface is considered non-sterile, and any non-sterile surface may contaminate a sterile surface. Remember, good sterile technique is the first and most important step in ensuring consistent results.

Now, with all of that being said, we can proceed to inoculate your spawn bag!

### **How to inoculate and cultivate your spawn bags:**

All work should be done in front of a laminar flow hood or glove box in the cleanest environment possible. Following sterile technique will greatly reduce the chance of contamination.

1. Make sure your hands are clean, and you are wearing clean, freshly laundered clothes
2. Clean your work area thoroughly with a disinfectant such as bleach or Lysol. Wipe the bag and your work area down with rubbing alcohol and spray an air sanitizing spray like Oust or Nutra-air. Leave your work area for a few minutes to let the disinfectant settle.
3. Put on your gloves and wipe them with rubbing alcohol.
4. Carefully tear open the shrink-wrap that your spawn bags came in. avoid cutting directly into it, thus you might cut the spawn bags themselves.
5. Wipe the spawn bag down with a damp amount of rubbing alcohol removing any excess moisture that may have accumulated on the outside of the bag during the sterilization process.
6. Make sure you shake your spore or liquid culture syringe to disperse the medium.
7. Wipe the injection point with alcohol.
8. You will need to flame sterilize your needle then wipe the needle with an alcohol wipe. This will cool it down immediately as well as keep it sterile. Now, poke the needle through the tape at the injection point.
9. You will only need to use 2-4 ml of your 10 or 12 ml syringe. Have another piece of tape handy to cover the injection hole as you withdraw the needle. Wipe the tape with alcohol one more time for good measure.
10. Shake the bag gently to disperse the spores or liquid culture.
11. Place your bag in an incubator or storage bag in a dark, clean place like a clean box inside a closet. Mycelium will incubate anywhere from 70-86 degrees Fahrenheit depending on the specific strain.
12. You may want to mix up the contents of the bag after about 5-8 days or until around 30% to 40% is colonized. Be careful not to disturb the bags too much. I have found in my experience that shaking the bags too often will kill or slow mycelium growth.
13. Allow the bag to fully colonize (turn completely white). This should take 10-14 days at warmer temperatures, or 16-21 days at temperatures around 70 degrees. Please research the specific species of mushroom you are cultivating in order to incubate at correct temperature.
14. Once fully colonized and consolidated there are many ways to get your grain spawn to fruit into actual mushrooms. Some mushrooms will fruit right in the bag with no additional help, others have to be mixed with a bulk substrate like compost, straw, mulch or wood chips. Some require a casing layer or protective barrier like casing or vermiculite. Once again it is important to research the specific species you are cultivating because different mushroom prefer different growing mediums and climates.

### **Grain transfer from colonized grain spawn to sterilized compost or bulk substrate:**

This next section will guide you through the process of taking your colonized spawn bag and adding it to a bulk substrate such as compost or hardwood mulch. While doing a grain transfer it is important to perform the procedure in and adhere to the same sterile conditions and techniques as described in the previous section.

1. Once your work area, tools, substrates and self are clean carefully remove the shrink-wrap from the compost and unroll the bag.

2. Open the bag of compost by cutting slightly below the line where the bag was sealed. If you are working with a small bag of spawn of small mason jars it might be easier to only cut the bag halfway as not to expose too much of the compost to outside conditions.
3. Gently break up the compost and mix the contents of the bag around. In order to ship large bags of compost and to keep them fresh longer they have to be compressed into blocks. Breaking up the blocks before inoculating them with the grain spawn will help aeration and make it easier to mix in the grain.
4. Break up your bag or jar of spawn and add it to the bag of compost.
5. Without removing too much air, seal the bag of compost with an impulse sealer. Masking or packing tape works well in the absence of a sealer. You can also simply fold the top and hold it shut with paperclips.
6. Mix the compost and grain spawn thoroughly to create an even mixture that is well aerated. Remember mushrooms and mycelium need oxygen to grow.
7. Incubate the compost at the proper temperature depending on what species you are cultivating. Storing the bags in complete darkness and in the cleanest environment possible will ensure healthy growth.

#### **Fruiting mycelium in your spawn bags:**

There are numerous types of fruiting techniques. The Internet is full of instructions of different methods. It is up to you to find out the best way that will work for you. One simple and easy way to fruit your mycelium is to do it directly in the bags.

1. Mushrooms need a cooler temperature to fruit, so if you incubated your bags at a warmer temperature, like 80-90 degrees put the bags in an environment from 65- 76 degrees.
2. The bag will also need to be in a place where it will receive a few hours of indirect sunlight each day.
3. If the inside of the bag appears to be too dry you can cut the top off the bag and using a spray bottle spray a small amount of distilled, or spring water in the bag. It is best to spray the walls of the bag and not the mycelium itself. Be careful not to spray too much water as it can harm the mycelium as well as promote mold growth. You can fold the bag shut, and hold it shut with a paper clip.
4. Stand the bag upright to let it breathe, and to give the mushroom fruit bodies room to grow.
5. You should see water droplets forming on the inside of the bag. Placing a hydrometer inside the bag for the first few days to make sure you have the humidity right can be a good idea.
6. You must keep the humidity above 85%, but the closer to 100% the better.
7. After 14-16 days you should start to see the beginning of fruit bodies growing. They will usually appear as small “pins” depending on what kind of species you are growing.
8. When the mushrooms are fully-grown, pick them by cutting them at the base with a small paring knife. You do not want to pull the mushrooms off of the cake because you will damage the mycelium network and future fruit bodies may not grow. More mushrooms should continue to grow in the bag for the next couple of weeks before the substrate is spent.
9. Now you have finished your first harvest! Enjoy and good luck!

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