



MIDWEST GROW KITS

Midwest Grow Kits Mushroom Grow Guide Revision 5.2; 2018

Mushroom Growing Guide

Thanks for purchasing one of the easiest kits to grow mushrooms!

Please read this guide a few times! Don't forget the last page that has tips and tricks to get the most out of your grow!

*****This guide includes the setup information for the simple kit.***

*****We have separate setup guides for the Mega Kit, Ultimate kit, Bulk Casing Kits and Spawn Bags that you will receive the link for in the box upon delivery*****

Some frequently asked things to know before you get started:

- ◆ Each jar requires approximately 1 cc of spore solution divided up evenly between each of the 4 holes.
- ◆ All of our Jars and Spawn bags are shipped fresh and should be used within 4-6 weeks of arrival. To store them longer, they should be kept in the fridge. Do not freeze.
- ◆ Spore syringes should be stored at room temperature. They should be stored in a dark, dry area. They can last up to 6 months or longer.
- ◆ Mushrooms grow at night and during the day. Mushrooms are not like plants which need an abundance of light to grow. Light is a trigger mechanism to tell them to start producing mushrooms. During the first stage where they are colonizing, you generally want to keep them in the dark. Once they are around 65-75% colonized you can introduce light. Daylight from the window is always an ideal lighting source!
- ◆ You can grow different spore strains in the same kit, as long as they are a similar species that require the same growing temperatures and parameters.
- ◆ Spore prints will not work with our jars or spawn bags. You must use a spore syringe .



Preparing your workspace

Inoculating your jars is the main step where contamination is possible, and thus must be done in as clean of an environment as possible. If the room you're working in is clean enough, (most are not) you can get away with inoculating them in open air. The needle of the syringe can carry bacteria and spores from other molds into your cake, contaminating and ruining the cake. The open air of your home is filled with millions of microscopic mold spores and bacteria, so even one of these falling on the needle of your spore syringe can infect a jar. For this reason, absolute sterility of your needle is extremely important.

Wash your hands and face with antibacterial soap. Wear clean clothes. Anything in the area of the syringe and jars could contaminate your cakes if it is not clean. There are two methods of injecting your spores that help eliminate any possible air contaminants. We highly recommend using one of the two methods listed. 99% of the time people fail is because they "thought" the space they were using was clean and did not use a sterile spore injection method. Turn off all air conditioning or heating. The least amount of moving air in your workspace the better.

Method 1– The Oven Door (Our easiest & most preferred method for over 12 years and counting)

The oven door inoculation technique is one way to inject spores into your jars. This method works on the principle of rising heat lifting mold and contaminates away from the jars. First, spray Lysol disinfectant in the oven and around the work area.



Turn off all household heat and AC and close all windows. Make sure the air is very still in the kitchen. Pre-heat the oven to 325 degrees. This will pre-sterilize your oven. Once oven has reached 325 degrees, leave it at that temperature for 20 minutes, then lower the temp to 250-275 degrees. After 10 minutes at this temperature, you can begin the inoculating process.



Pull out the lowest rack and place a small piece of cardboard or something solid that you can work on. Next place the jars on the rack or next to the oven on the floor in reach. Remove the foil from the jars.



Sterilize the syringe with a lighter and alcohol swabs. Make sure you flame the syringe after every few jars, just for a second or two. Use the alcohol swabs to remove any debris stuck to the needle.



Inject each jar reaching into the oven. Once done with the jar, replace the foil loosely and set aside, outside the oven.

This method works very well in all our testing and is very simple compared to the glove box method. If you have a friend to help, you can use that person to hand the jars to after you inject them and re-cover with the foil. Do not let the jars get very hot sitting in the oven. (This method is tried and tested. We have been using it and recommending it for years and the success rate is over 99%.)

Method 2– The Glove Box

Another recommended inoculation technique is to make a "glove box". An enclosed, semi-sealed box with holes for gloves to go through and a clear top. A cheap, halfway decent one can be built for only few dollars. All you need is a large cardboard box, (or plastic container) some tape and saran wrap to go over the top of the box, and a pair of new, unused dishwashing gloves.



Tape saran wrap over the open top of the box or container. Next, cut two holes in the sides, big enough for your arms to fit through. Tape gloves to the two holes, making sure the holes are completely sealed so no "outside" air is getting into the box. A small flap can be cut into the side of the box for getting the syringe and jars into and out of the box.



Disinfect the gloves and inside of the box with Lysol disinfectant spray. Once the interior is thoroughly sprayed with Lysol, let the air settle for 10 minutes, stick your hands into the gloves and begin injecting your jars.

Method 3– Open Air Method

The last method of injecting your jars that we want to mention is to sterilize a small closet or fully clean a small bathroom. We have heard of people using this method of inoculating their jars. The success rate is extremely varied because every space can have a different level of mold and bacteria present in the air. When using an "open-air" spore injection technique, the key to success is using an alcohol lamp or butane lighter and constantly flaming the needle before the needle goes into every hole.

Inoculation

Begin carefully inoculating your jars with the syringe. It's a good idea to have a lighter or alcohol lamp handy as well to sterilize the needle as you go. Flame the needle until there is a faint red glow, then carefully squirt a little bit of spore solution (if you can spare it) to cool down the needle before sticking it in the cake, usually 3-4 seconds. Putting a hot needle into the cake will get burnt-on rice flour all over the needle and also potentially kill the spores! Use the alcohol wipes included on the needle in between each jar you do.



Spore Injection

Once you're ready to inoculate, shake up the spore syringe to get as many spores as possible off the sides of the syringe and into the water. After you sterilize your needle, carefully remove the cap over the syringe needle. Slide the needle into the first hole in the jar lid. Push it all the way in so it passes through the ¼ inch top dry layer of vermiculite. Angle the needle toward the glass so you can see the end and verify that a few drops of spore solution came out. Gently squeeze out a few drops in each hole. You will end up injecting 1-1.5 cc of spore solution into each jar, splitting up the amount you inject between 4 holes. Be careful that nothing but the jar and substrate touch the needle, and re-cap it immediately after using it to avoid contaminating the needle. We recommend flaming the needle in between each jar you do. Also, be careful of using too much spore solution. Using more than you need is simply wasting. With spore syringes, it can be easy to accidentally push the plunger on the syringe too forcefully and dump out way too much solution.



Angle the needle so you can see spore solution come out when injecting.



****SPORE TIPS**** Some spore vendors use much higher concentration of spores than others. This can lead to large amounts of spores clumping together which can potentially clog the needle. Make sure you spend a few minutes shaking vigorously to help break up these clumps.

If you are having problems with your syringe clogging, instead of pushing harder to clear the clog use a small mallet or similar object to tap the end of the plunger in short quick blows. Start with light taps and then increase the force until the clog clears. Doing this prevents accidentally injecting a large amount of solution into the jar.



After injecting, place the foil back on the jar but make a little dome. This will allow some gas exchange. We recommend leaving the foil this way throughout the incubation timeframe.

During incubation the jars need minimal gas exchange. Opening the incubation chamber and fanning it out once or twice a week is plenty.

Mycelial Growth Phase— Incubation Period

The jars are now ready to be incubated at about 77-81 degrees F for several weeks. If you have the Ultimate or Mega Kit, this is a good place to read the setup guide to get your incubator ready. If you have the Simple Kit or just the jars you will need to find a warm room or some other source of heat to keep them in that temperature range. Be careful not to use any heat source that could cause fires; if they get too cold, their growth will slow considerably, and if they get too hot, they will lose water and eventually die. (They will usually die if they ever get above 105 degrees F) Mushrooms will colonize at lower temps but very slowly. Any temps less than 68 degrees, they will probably not colonize. There are some bacteria that thrive in temperatures over 82 degrees so the rule of thumb is to strive for 77-81 degrees. We find this the perfect temperature for speed of growing and lowest chance of contamination.

Mycelial Growth Phase

The first signs of mycelial growth should appear within 5-9 days. If none appear within two weeks, something went wrong. (Perhaps the heat killed the spores, or the spores simply did not make it into the cake.) Most types of mushroom mycelium will be a brilliant white fuzz, often growing in ropy strands. This ropy type of growth is called rhizomorphic growth, and is a sign that the mycelium will probably fruit very well. Any other color is usually mold and a sign of contamination. A contaminated cake will not recover and, except in very rare instances, will never produce mushrooms. ** Please note that certain strains of mushrooms can have a bluish tint to them and is normal.



Colonizing jar showing
rhizomorphic growth



100% completely colonized
1/2 pint jar



A contaminated jar with
purple & yellow mold

Birthing the Cakes

Once a cake is completely covered in white mycelium usually around 4-5 weeks, wait at least 2-3 more days before taking the cake out of the jar. This allows any unseen mycelium to finish colonizing.

When you are ready, and in a fairly clean room, begin transferring the cakes from their jars into their fruiting chamber. Remove the band from the jar, slowly turn the jar upside down, so that the cake is resting on the jar lid. You may need to gently tap the jar to knock the cake loose. Sometimes a rubber mallet is needed to lightly tap the bottom of the jar to dislodge stubborn cakes.

Take the cake out of the jar and then carefully pick up the cake and turn it over so it is sitting right side up on the lid or small piece of aluminum foil. We usually recommend wearing gloves when handling the cakes, although once a cake is fully colonized they have their own immune system and are very resistant to molds and bacteria.



Dunking

-After you “birth your cake” you will want to re-hydrate your cake. Place the cake into a slider zip lock bag, 1-quart size is perfect. Fill the bag with water (bottled spring water or filtered water is best) Place the cake in the bag, seal off any air in the bag by slowly zip-ping the bag closed and removing air as you go. Do this for each cake in its own bag. We recommend placing the bags into a big bowl or pot to avoid any leakage issues.



-Next you want to let them soak for 18-23 hours. Do this after every Flush. Do not exceed 23 hours in the water. Place back in fruiting chamber. Within 3-5 days it will start pinning and producing more mushrooms. Some people like to dunk right after they birth them, but others like to wait until after the first flush of mushrooms. This is up to you! If you want a batch of mushrooms right away then dunk after the first flush. If you can wait, we recommend dunking right after birth. When dunking for the second or third time a great tip is to place the bags in the fridge for the dunking process. This cold shock can help trigger stubborn cakes to re-start the mushroom producing cycle again without any harm to the cakes.



-If you have extra vermiculite we recommend a trick called the **“Dunk and Roll”**. After removing the cake from the bag, simply roll the cake in dry vermiculite until completely covered. When you put the cake in the fruiting chamber, spray it with water to moisten the vermiculite. This will help the cake fruit quicker and absorb water from the vermiculite. You can also sprinkle a 1cm layer of vermiculite underneath the cake and on top. Mist with a spray bottle to keep the vermiculite moist every few days.

Fruiting Your Mushrooms - The Fruiting Chamber (Terrarium)

Line the bottom of the fruiting chamber with damp perlite. A common mistake is to get the perlite too wet. This will end up turning into a swamp of water and perlite. Not only is this hard to clean up, but will also drown your cakes. Get enough perlite to make at least 1.5”-3” (2.5-4.5 cm) thick layer on the bottom of the fruiting chamber. Put it into a colander, strainer, or cloth enclosure (pillow case) that it can’t slip out of. Wet it thoroughly with normal tap water. Let the water drain out. Then, move the perlite into the fruiting chamber and smooth out the surface. You now have a layer of damp perlite that will keep the humidity in the chamber high enough for the cakes to fruit. By the time your cakes have stopped producing mushrooms, the perlite might start having a skunk-like smell. If you want to reuse it, put it in a baking pan and cook it at 350 degrees in your oven until it is dry. Let it cool, and it’s ready to be used again. You can also add some Hydrogen Peroxide to the wet perlite to help it stay clean a bit longer. You will need to add water every week to the perlite to keep it moist. Some people recommend 4” of perlite but we have tested this and 1.5”-2” works perfectly.



Inducing Fruiting (Producing Mushrooms)

In order to initiate fruiting, three main conditions must be met for the cakes;

First, they need light. Room light, indirect sunlight is best but daylight spectrum LED lights and fluorescent lights contain lots of blue light which work very well. The plug in dual spectrum light in our kits has the ideal spectrums to induce mushroom pinning and encourage growth. They also need a very high humidity environment. 85-99% humidity. Lastly, it is a good idea to lower the temperature range 2 degrees lower than your incubating temperature. (If possible) to about 75-77 degrees F. Like the light, this signals the cakes to begin fruiting. However, most popular strains fruit so easily that lowering the temperature is not absolutely necessary. Many types of gourmet mushrooms like fruiting in lower temperatures. Brown Beech, Black Poplar, and King Stropharia prefer temps around 68-72 degrees for fruiting.

Pinning, Fruiting, and Harvesting

For the first week to 10 days, the cakes will generally not do anything. Then, very small bumps, called "pins," "pinheads," or "primordia" will begin to grow out of the surface of the cake. These are the beginnings of mushrooms. Many will never grow any larger. However, some will grow until they are full-grown mushrooms. A mushroom is ready to be picked when the edge of the cap tears away from the "stem" (the stem of a mushroom is called the **stipe**). Often, there will be a thin veil between the cap and stipe. If this is present, you can wait until the veil tears before picking the mushroom. To pick a mushroom, grasp it near the base where it is joined to the cake, and gently twist it until it comes off. Immediately begin the process of preserving it, either by refrigerating it or by drying it. Mushrooms will begin to rot immediately. Each cake will produce about 1-3 waves or "flushes" of mushrooms, normally with 2-5 days of dormancy between flushes. After about a month or so of fruiting, most cakes will be spent, and will not produce any more mushrooms unless rehydrated by dunking underwater for 18-23 hours. If they turn dark blue or green, this means they are done growing and should be thrown out.

Pinheads forming on cake



Young mushroom



Veil being torn by knife



Underside of cap with veil torn



Cake with growing mushrooms



Two cakes with many pinheads forming



Mushrooms will grow at many different speeds. They love to grow close together and grow around each other. Some cakes will grow faster than others. This is completely normal!



Aborts

Some of the pinheads will begin to grow, then suddenly stop before they become full-grown mushrooms. These are known as aborts (aborted mushrooms). Aborts are just as good for eating as full-grown mushrooms, but they must be picked before they begin to rot. **A mushroom that has mold growing on it or which has black goo in the center of the stem is rotten and is not safe to eat.** It is often difficult for beginners to identify an aborted mushroom before it begins to decompose. Early warning signs include a halt in growth of the mushroom, and a greenish tinge around the dark colored tip of the primordia that will eventually become the cap of the mushroom. Always completely remove aborts from the cake, even if they are too rotten to eat, because they can get moldy and cause the cake to get infected.



Preservation Methods

Refrigeration

If you will be consuming your mushrooms fairly soon after picking them, you can keep them in your refrigerator, in a paper bag. Don't use a plastic bag to store fresh mushrooms, this will cause them to mold. Fresh mushrooms are reportedly stronger than dried ones, but can be more difficult to measure or dose. Also, a fresh mushroom can have a varied taste depending on which strain was used and under what conditions it was grown.

Drying

The best way to preserve mushrooms is to dry them as soon as possible after picking. It is very important when drying that the mushrooms never be exposed to heat, or heat-sensitive chemicals that will break down if exposed to heat. The best method of drying is to put the mushrooms in an enclosed container, like a covered bowl, that also contains some desiccant. We offer a drying kit that includes the needed materials for this method.



Completely dried mushroom



(Slow drying methods)

Another way to dry mushrooms is with the use of moving air. Simply place them in front of a fan (**not** a heater), and the moving air will dry them in about a week. An even easier way to air-dry mushrooms is with a food dehydrator. If the dehydrator doesn't have a switch for turning off the heat, you will need to take it apart and disconnect the heating element, making sure to take any necessary safety precautions. Air-drying will not always remove all of the water from the mushrooms. The drying process can be accelerated substantially by slicing the mushrooms lengthwise into halves or quarters, thus increasing the surface area of each mushroom.

The best overall method for drying mushrooms is to first dry them using moving air, then, if necessary, put them into the drying kit to remove the last little bit of moisture that remains in the mushrooms. You want your mushrooms to be bone dry and brittle. If they feel flexible, they are probably not totally dry. Store the dried mushrooms in a sealed container with small desiccant packs, away from heat and light. For long term storage we recommend our **Hygrolid** Mushroom Drying system.

Tips, Tricks and things not to forget to get the most out of your grow!

- ⇒ Inoculation: When injecting the spore solution into the jars, make sure the area you are working in is as clean as possible. Spray Lysol Disinfectant Spray all over your area first. Make sure there is as little air movement as possible. Turn off all fans and A/C units. UV-C light is another great way to inoculate your jars with to provide another layer of protection.
- ⇒ Angle the needle toward the glass so you can see the liquid from the syringe come out, this ensures you got spores in each hole.
- ⇒ Sterilize the syringe needle with a lighter for a few seconds before injecting the spores. Do this every few jars. Shake the spore syringe every few jars to mix up the microscopic spores. Use the alcohol wipes if you end up with vermiculite on your needle. Try and break up the clumps of spores by shaking!
- ⇒ Incubation period: Make sure the jars are at 77-82 degrees. This speeds up the Jar growth period. The first signs of growth in the jar should come at 4-9 days. If you have the simple kit place the jars in an area where it's at least 76-78 degrees. Lower temps are ok too, but it will slow the growth.
- ⇒ Daylight or roomlight is best! Indirect light is all that is needed for mushrooms to grow. Use the lights provided if growing in a dark closet or an area that will not get room light or daylight.
- ⇒ *The Double End Casing*. This trick is for after dunking your jars and is one of our favorites. After removing the jars from dunking, and you are placing your cake into the fruiting chamber spread a 1 cm layer of dry vermiculite on either the jar lid or piece of foil. Use a spray bottle to dampen the vermiculite so its very wet but not where water is running out. Place the cake firmly into this layer. Do this on the top as well. Sprinkle dry vermiculite on the top of the cake and use a spray bottle to moisten. You can then spray the vermiculite every few days to keep it moist. The cake will absorb more water this way and your mushrooms will grow bigger! If you don't have extra vermiculite, save the extra that comes out of the jars when you remove them. After placing all your jars in the fruiting chamber, sprinkle a layer on top of your cake and drip some water on the vermiculite. This is why you see a lot of pictures with the cakes having a brown top layer while in the growing chamber. It's a little added moisture for the mushrooms to feed off. The cakes do not like getting wet, they absorb moisture from the air or other substances. So be careful not to pour too much water on the vermiculite.

FAQ Section

Q: Why are some jars colonizing faster than others?

A: This is common! Each mushroom jar is unique! Some will colonize faster than others. You can wait until they all reach 100% colonized before removing them from the jars or take them out as they become ready. Jars can sit fully colonized for weeks! You can even fruit and incubate at the same time! Just place the glass jars in with the fruiting cakes and put them on separate sides of the chamber. If you have some jars less than 75% colonized, you can block them from light by wrapping them in foil!

Q: I see some white cotton like fuzz growing on the cakes, what is that?

A: This is a normal reaction the mushroom cakes go through after dunking. This will subside within 2-3 days and you should start to see little pinhead mushrooms forming soon. If you did not dunk and see this fuzz, check your humidity levels. This also can occur when humidity levels exceed 99%. If you are using the Mega or Ultimate kit, adjust your air pump to go on more often until the white fuzz goes away.

Q: When is the best time to pick the mushrooms?

A: The best time to pick is when the cap fully opens, but before the cap drops spores. If the cap of the mushroom starts turning upwards, it usually means it has dropped the spores. You may see a fine black powder covering your perlite or the actual cake itself. There is no harm in letting this happen, but some say the mushrooms loose a little "potency" or flavor after this.