



MIDWEST CROW KITS

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Midwest Grow Kits Mushroom Grow Guide Revision 2.1; 2012-2013

Mushroom Grow 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 growing experience!

*This guide includes the setup information for the simple kit.
The Ultimate and Mega kits have separate setup guides*

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.
- 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 75% colonized you can introduce light. Daylight from the window is always going to be the best source of light.
- You can grow different spore strains in the same kit, as long as they are a similar species that require the same growing temperatures.

Here is where you start! Follow this guide exactly!

Cleanliness Precautions

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, if not absolutely sterile, 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.

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.

1. Glove Box Method

A good way to accomplish this is to make a "glove box," an enclosed, semi-sealed box with holes for gloves to go through and a see-through top. A cheap, halfway decent one can be built for only a couple bucks worth of stuff. 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 top and cut two holes big enough for your arms in the sides. Disinfect the gloves and the inside of the box with Lysol spray disinfectant. A small gate can be cut into the side of the box for getting the syringe and jars into the box, or they can be put through one of the arm holes (if you choose not to attach the gloves to the holes). Once the interior is thoroughly sprayed with Lysol, let the air settle, stick your hands into the gloves and begin injecting your jars.

2. Oven door method (our easiest & preferred method for over 10 years)

The oven door inoculation technique is another way to inject spores into your jars. This method works on the principle of rising hot air will lift mold and contaminants away from the jars. First, spray Lysol disinfectant in the oven and around the work area. Turn off all household heat and AC, 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 first. After oven has pre-heated to 325 degrees for 20 minutes, lower heat to 250-275, wait 10 minutes and begin.

Pull out the lowest rack and place the jars on the rack. Remove the foil from the jars. Sterilize the syringe with a lighter or alcohol swabs. Inject each jar reaching into the oven. You will notice the heat rising in your face. Simply remove each jar from the oven as you go. 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. 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. You are using the hot rising air as your workspace. This method is tried and tested. We have been using it and recommending it for years and the success rate is over 99%.



Inoculation:

Begin carefully inoculating them with the syringe. It's a good idea to have a lighter handy as well to sterilize the needle as you go. Flame the needle until it gets very hot, 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. Putting a hot needle into the cake will get burnt-on rice flour all over the needle. You can also use the alcohol wipes included on the needle in between jars



Sterilizing the needle with flame

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. Carefully remove the cap over the syringe needle and slide the needle into the first hole in the jar lid. Push it all the way in so it passes through the $\frac{3}{4}$ inch top dry layer of vermiculite. Angle the needle toward the glass so you can see the end and verify a few drops of spore solution come 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. Also be careful of using too much spore solution as 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. We recommend flaming the needle in between each jar you do.

Once each jar is inoculated, it is ready for incubation. There is no need to put tape over the holes in the lid, because the dry vermiculite will keep out any contaminants.



Spore Injection examples

After Injecting, simply place the foil back on the jar not as tight, so to allow some gas exchange. Leave the foil this way for the entire incubating timeframe.



Mycelial Growth Phase

Incubation

The jars are now ready to be incubated at about 77-85 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 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 will probably not colonize.

Mycelial Growth

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.) This type of mushroom mycelium will always 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 of mold, is a sign of contamination. A contaminated cake will not recover and, except in very rare instances, will never produce mushrooms.



A colonizing cake displaying rhizomorphic mycelial growth



A completely colonized cake in a 1/2 pint jar



A cake, contaminated with a green mold, in a 1/2 pint jar

Fruiting Stage (Producing 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, and end up with a swamp of water and perlite that is very difficult to clean up, and will drown the cakes. Get enough perlite to make at least 1-2" (2.5 cm) thick layer on the bottom of the fruiting chamber, and 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, and 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 the cakes can be set on, and which 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 getting a little bit skunky smelling. 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 1-2" works perfectly.

Next place the fully colonized cakes into the growing chamber provided. Use the jar lids or cut a small piece of foil to keep the cakes from touching the perlite directly.

Light must be able to shine into the terrarium, it doesn't matter what direction it comes from. Indirect room light or window light is best, but if you must use the battery grow lights provided, place them anywhere you'd like. Light simply "triggers" the mushrooms to begin the growing process.

When using the simple grow kit, there is a method called the "shotgun" chamber where you drill 12-15 holes about 1" apart around the entire chamber to provide fresh air to the cakes. This is a good method if you are not going to be around to open up the lid and fan out the inside to allow fresh air in. (This is not needed on any kit that includes an air pump)

Our Ultimate and Mega growing kits use a "Forced Air" system which integrates an electric air pump and filter to provide the cakes the oxygen and gas exchange needed. No drilling of holes required.



Simple kit fruiting chamber

Birthing the Cakes

Once a cake is completely covered in white mycelium, wait at least 2-3 more days before taking the cake out of the jar. When you are ready, and in a fairly clean room, begin transferring the cakes from their jars into their fruiting chamber (described in the next step). Remove the lid of each jar, and dump out the dry vermiculite on top. Then, put the lid back over the top of 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. Take the jar off the top of the cake and then carefully pick up the cake and turn it over, so it is sitting right side up on the lid or piece of foil. Put them into the fruiting chamber. Once all the cakes have been transferred, you're ready to induce fruiting.



Cakes in terrarium seen from above

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 LED lights and fluorescent lights contain lots of blue light which work very well. Second, they need a fairly high humidity. 85-95% humidity is a good range for fruiting.

Lastly, it is a good idea to lower the temperature range a bit, to about 76-78 degrees F. Like the light, this signals the cakes to begin fruiting. However, most strains fruit so easily that lowering the temperature is not absolutely necessary.

This is the time where you can decide to dunk your cakes or go ahead and fruit the first batch. Dunking will yield more mushrooms for the first flush but will take them 7-10 days to recover and start pinning. So if time is not a concern we recommend dunking after birthing. See our section at the end on dunking for exactly how to do this properly.

Another popular method is after dunking, roll the cake in dry vermiculite and then mist the cake with clean water providing extra moisture. This is optional and does not require extra vermiculite. This method is called the "dunk and Roll". We have not seen much difference between just dunking and actually rolling them in dry vermiculite, so we leave this up to you to decide.

Pinning, Fruiting, and Harvesting

For the first week or two, 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.



Close up of pinheads and primordia growing from the top of a cake



A young mushroom with the edges of the cap pulled away from the stipe



Veil being torn with a knife



Underside of cap with veil torn away



Two cakes beginning to grow young mushrooms



Cakes with growing mushrooms and primordia



Very mature mushrooms fruiting from a cake. Note the upturned edges of the cap on older mushrooms.



Many cakes fruiting

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.



An abort at the
base of a cake

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,. It should also be noted that some people like the taste, and that the flavor of can vary 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, are heat-sensitive chemicals that will break down if exposed to heat. You can get away with drying them in the sun, but expect some loss in potency. Another common 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.



Photo of Drying Kit after 36 hours



A completely dried mushroom cap and stem

(Free drying method)

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 over a weeks time. 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 is by far the fastest way to dry mushrooms, but 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 a desiccant chamber 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. The little desiccant packets that come in vitamin bottles will work.

Tips, Tricks and Hints to get the most out of your Grow!

1. 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.

2. 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.
3. 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!
4. 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.
5. 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.
6. **Dunking Method** : After you "birth your cake" after 100% colonization, you will want to re-hydrate your cake. Place the cake into a zip lock bag, 1-quart size is perfect. Fill the bag with water (bottled water or filtered water is best) Place the cake in the bag, seal off any air in the bag and put the bag in the fridge for 18-22 hours. Do this for each cake in its own bag. This does 2 things: It triggers the cake to start producing mushrooms due to the cold temp. It re-hydrates the cake to produce many more mushrooms. 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 dunk after the first flush, if you can wait, do it after birth.
7. When drying your mushrooms, the easiest way is to just blow a fan on them. Any fan will work, just cut them down the center and blow a fan on them for 24 hours, they will dry out quickly and be ready to store.

8. Save the extra dry vermiculite 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. The mushroom cake will absorb the water slowly and help grow larger mushrooms. 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.

Need help? Questions?

Email us at support@midwestgrowkits.com

Live Grow help chat available!

New 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 right when the cap fully opens and before the cap drops spores. After the cap of the mushroom starts turning upwards 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 lose a little “Potency” or Flavor after this.

If you have one large mushroom growing and it is connected to smaller ones that are not fully grown, you will have to pick the entire bunch when the largest one is ready. This is fine and the smaller ones will usually not grow to maturity anyways.

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