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BASIC
ENGLISH

MUSHROOM GROW KIT BASIC – MANUAL

INTRODUCTION

This grow kit will introduce you to the basics of home mushroom cultivation. In four steps you will learn more about the rice flour cake method (or PF Tek) with some minor adjustments. Once you have mastered these techniques, you can experiment further. Before you know it, you are a pro!

If you are new to home cultivation, you might want to learn more about the life cycle and growing conditions for mushrooms. Before you start, make sure you start with the 'life cycle' and 'sterility' chapters, at the end of this manual.

CONTENTS:

- 900 ml vermiculite
- 220 g rice flour
- 4 cultivation boxes (300 ml) with air filter
- 2 grow bags with air filter
- 1 pair of sterile gloves
- 1 mouth mask
- 1 syringe (filled with 10 ml spore suspension)
- 4 paper clips



OTHER REQUIREMENTS:

- (Duct) tape
- Alcohol (or any disinfectant)
- Lighter or torch
- Aluminum foil
- Spray bottle
- Safety pin or nail
- Pressure cooker or normal cooking pan with a lid that closes well (read why in step 2)

STEP 1 – PREPARING THE CULTIVATION BOXES

1. MAKE HOLES IN THE LIDS

Use the safety pin or nail to make 4 small holes in the lid of each cultivation box. These holes are later used to inject spores into the substrate (growth medium).



2. FILL UP THE CULTIVATION BOXES

Mix 2/3 of the vermiculite (600 ml) with 220 g rice flour (* – see TIPS on last pages). Add 300 ml of water and mix thoroughly. Loosely fill up the cultivation boxes until 1 cm from the top of the box. Wipe the upper edge clean and fill the boxes with a 0.5-0.75 cm layer of the remaining vermiculite.



Close the lids but keep one side of the lid slightly open so the pressure can escape. Should you not do this, then chances are the boxes will deform during heating.

Fully wrap the boxes in a double layer of aluminum foil.



KEEP ¼ SIDE OPEN

STEP 2 – STERILIZING THE SUBSTRATE

Next step is heating the cultivation boxes in a pressure cooker to kill bacteria. You can also use a normal cooking pan, provided it has a lid that closes well. However, a pressure cooker is preferred as it is guaranteed to kill all bacteria, which is not always the case when using a normal cooking pan.

1. STERILIZE

Fill the pressure cooker with a few centimeters of water and place the boxes on the bottom. The boxes should not be in direct contact with the bottom or they might crack (**). They should also not float. Sterilize the boxes for 60 minutes at 121°C. During sterilization, the cooker needs constant pressure. Sterilization times are measured from the moment there is a constant flow of steam escaping from the safety pin. Lower the heat



of the stove once the pressure in the cooker has built up. This prevents the cooker from running dry. When using a normal cooking pan, increase the cooking time to 90 minutes or longer. Due to vaporization you may have to add water during the process.

2. COOLING DOWN

Once sterilized, the boxes need a few hours to cool down. Try not to be impatient – a warm substrate can kill the mushroom spores. When the boxes have cooled down to room temperature they can be removed from the pan. Fully close the lids. Do not remove the aluminum foil. Do not wait too long before proceeding to the next step.

STEP 3 – INJECTING THE SPORES

It is now of utmost importance to work clean and sterile. A clean bathroom is suitable. Use the provided gloves and mouth mask and spray the area you work in with some disinfectant. When touching a non-sterile part, wipe your hands clean with some alcohol before you proceed.

1. HEAT THE NEEDLE

Shake the spore syringe really well for 5-10 seconds for even distribution of the spores. Take off the protective cap and heat the needle of the syringe until it is red hot. Then let it cool for 15-20 seconds.



2. INJECT

Remove the aluminum foil and inject a total of 2-3 ml of the spore suspension into the 4 holes you made earlier. Be aware that this is a crucial step in the process. After injecting, seal the holes with some tape.



3. INCUBATE

Put the cultivation boxes in a warm, dark place (***) . A temperature of 20°C is acceptable, but if possible aim for a temperature around 28°C. Lower temperatures can slow the growth process. Temperatures of 15°C and below will halt the growth of mycelium. After two to four weeks all kernels are covered with white mycelium; it is time for the next step. Your job is done for now. The spores need time to grow into mycelium (****).



STEP 4 – GROWTH OF THE MUSHROOMS

When the substrate is covered in white mycelium, the mycelium can be exposed to light and fresh air. The top layer of vermiculite will now serve as a water reservoir. This layer should be moist, but not soaking wet. Never allow the top layer to dry out. As well as having sufficient water, the humidity inside the bag is also of importance. If you notice condensation on the inside of the bag the humidity is generally high enough. It is hard to give exact guidelines on the amount of water you should add. This takes some practice and feel, but in the end that is what makes home cultivation so much fun – experimenting with growth parameters to aim for optimal results.

1. WATERING

Remove the lids and mist the top once (*****). Put the cultivation boxes in the grow bags and moderately mist the inside of the bags. Fold the top of the bag and attach the paper clips to keep it closed. Put the bags in a warm spot (20-25°C) in the light, not in the sun or above a radiator. Temperatures of around 25°C will allow for faster growth of the mushrooms. Check daily and mist the top layer and inside of the bags when necessary. The first mushrooms will appear



after approximately 14 days. These will mature in about 7 days.

2. HARVESTING

Mushrooms do not appear continuously but in so called 'flushes'. Preferably pick them when the veil on the underside of the cap begins to torn. If you wait too long, the caps will open and the mushrooms will drop their spores. These



will colour the mushrooms and the inside of the bag black/purple. This is just a cosmetic problem however. Pick all mushrooms at once, except when one or two are growing much faster than their brothers (*****).

Small mushrooms between the substrate and the side of the box are best left undisturbed.

3. NEXT FLUSH

Directly after harvesting the substrate needs to be watered again. Remove all mushrooms that failed to grow out, but try to keep the substrate intact. Mist the top layer of vermiculite and the inside of the bags again and put the cultivation boxes back into the bags. The cycle of watering, growing and harvesting can be repeated until the substrate is depleted. Often this is only after 3 or more flushes.

TIPS

(*) You can also start with 1 or 2 boxes at first. This way, it is easier to get an insight in the process, and you can learn from any mistakes. Evenly distribute the (dry) vermiculite and rice flour and store the leftovers in a dry place. The spore syringe can be kept (put the cap back on after use) in the ziplock bag.

(**) If the pressure cooker you are using does not come with a metal rack, you can use a (heat proof) coaster. Also do this when using a regular cooking pan.

(***) A good place to store the culture boxes would be the cupboard above the refrigerator. The heat produced by the refrigerator rises and increases the temperature by a few degrees. Heat pads can also be used, but never place the boxes directly onto a heat source – this causes the substrate to dry out.

(****) If the substrate shows any other colour than white, it is probably contaminated, and cannot be saved. Never open a contaminated box, discard it.

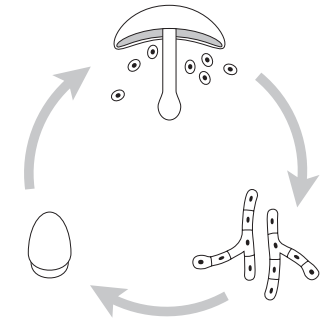
(****) Once fully colonized, the mycelium is less sensitive to contaminations. However, it is important to work clean at all times. Always wash your hands before opening the grow bag and open the bag as little as possible.

(*****) Before harvesting, carefully wash your hands with soap. Open the bag and take out the box. Harvest the mushrooms by grabbing the stem at the base and perform a twisting motion while lifting it upwards, out of the substrate. Touch the substrate as little as possible.

LIFE CYCLE

The life cycle of the mushroom is best understood when compared to that of a plant. The spores are the seed, the underground mycelium is the plant, and the mushrooms are the fruit. The (white) mycelium reproduces by forming mushrooms. When the mushrooms are mature they release their spores. These will later germinate and grow into mycelium again, thus completing the circle of life.

By injecting a spore suspension into a substrate (growth medium) of rice flour and vermiculite, we simulate part of this process. The spores will develop into mycelium, using the nutrients present in the rice flour. Exposing the mycelium to fresh air and light will then trigger mushroom formation.



STERILITY

A perfectly sterile environment is crucial for the growth of the mycelium. For that reason, the substrate always needs to be heated in a cooker before use, to kill all bacteria. After sterilization, a clean work environment and sterile working conditions are very important.



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