

## MUSHROOM SPAWN (SEED) PRODUCTION/PROCUREMENT

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- ✗ Importance & History
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### What is Spawn?

In dictionary term “spawn” actually refers to the fingerlings of fish, but here spawn means the vegetative mycelial network of a mushroom developed after the germination of one or more than one fungal spore (s) grown on a convenient medium. It comprises of the mycelial network along with a supporting medium which provides nutrition to the fungus for its growth and development.



Fig. 3.1 A close view of PP bag containing grain substrate kept for incubation just after inoculation from Master Culture.

Fig. 3.2 A close view of the completely spread spawn bag after 20 days of incubation – ready for use.

### SPAWN PRODUCTION OF MUSHROOMS

#### Raising or procurement of Pure culture of mushroom

As already discussed in the earlier lesson, the pure culture of a fungus can be raised either by the spore print technique or the tissue culture technique. Once pure culture of a particular mushroom is established or procured from some reliable source, the process of

production of mushroom spawn involves the following steps :

### **1. PREPARATION OF MASTER / STOCK CULTURE:**

Preparation of master culture or mother spawn is carried out under completely sterile conditions. Pure culture raised either from tissue or spores is inoculated in a suitable substratum (wheat, sorghum or rye) which provides food to the mycelium. Ten kg. of wheat grains are boiled in 15 litres of water for 20 minutes. Water is then drained off and the grains are put over the sieve or on a wire mesh tray for 8-10 hours to dry or remove excess of water. Grains are now mixed with gypsum (calcium sulphate) and chalk powder (calcium carbonate) at the rate of 2% and 0.5%, respectively on dry weight basis. 10 Kg of dry wheat grains will require about 200g gypsum and 50g chalk powder. This will help to check the pH of the medium and also prevent sticking of grains with one another. The grains are filled into half or one litre glucose bottles or PP bags which are plugged with non- absorbent cotton and sterilized at 22 lbp.s.ipressure for 1.5-2 hours. Sterilized bottles are allowed to cool down overnight. Next day bottles are inoculated with the bits of agar medium colonized with the mycelium of pure culture. Inoculated bottles are incubated at  $25 \pm 1^\circ\text{C}$ . After 7 days of inoculation, bottles are shaken vigorously so that mycelial threads are broken and become well mixed with the grains. Two week after inoculation, the bottles are ready as stock culture for further multiplication of spawn. One bottle of stock culture or master culture or mother spawn is sufficient to multiply 30-40 grain bottles or ppbags .

### **2. MULTIPLICATION OF SPAWN FROM STOCK / MASTER CULTURE**

Master spawn or master culture bottles / bags are further used for inoculation of large number of other grain bags / bottles prepared by the same technique and resultant is the commercial spawn. Generally few mycelial coated grains from one master culture bottle / bag will be inoculated into 30–40 grain bags aseptically in front of the HEPA ( High Efficiency Particulate Air ) filters of a Laminar flow and then incubated in a room at  $25 \pm 1^\circ\text{C}$  for 12-15 days. The commercial spawn thus prepared is used for inoculating the compost beds as seed.

## **Precautions, Characters and Storage of Spawn**

### **PRECAUTIONS TO BE OBSERVED:**

- Avoid overcooking of grains as it may lead to splitting of grains.
- Don't dry the cooked grains on the floor. Always dry over hessian cloth spread on a raised platform or on a wire mesh tray .
- Use only recommended dose of  $\text{CaCO}_3$  for mixing with the cooked grains. Mixing over dose reduces the fungal growth in the inoculated bags.
- Avoid further sub culturing of the second generation spawn. This leads to loss of vigour of the spawn which again leads to reduced yield. Repeated sub culturing leads to complete loss of vigour. In such cases the fungal growth may be noted in the compost beds but buttoning may be completely arrested.

**CHARACTERS OF GOOD SPAWN:**

- There should be proper coating of the mycelium around every grain used as substrate for spawn.
- The growth of the mycelium in the spawn bottles should not be cottony or fluffy type but it should be strandy .
- The growth of fresh spawn is more or less white. Brown coloration develops as spawn grows.
- There should not be any slimy growth in the spawn bottles which is an indication of bacterial contamination.
- There should not be any greenish or blackish spot in the spawn bottles. Such type of spots indicate that the spawn is contaminated with moulds.

**Precautions during transit of spawn:**

- Care must be taken during transit that spawn bottles are not exposed to bright sun light and a temperature higher than 30°C. To avoid such risks , spawn bottles are packed in thermocol boxes containing ice cubes or should be transported during night hours when it is cool.

**Storage of spawn:**

- Fresh spawn should always be used for seeding and its long time storage should generally be avoided. However, the spawn can be stored at 4-6°C for one month in case it is not used due to certain unavoidable circumstances.



Fig. 3.3 Workers busy in mixing and filling of substratum for spawn preparation



Fig. 3.4 & 3.5 Sterilized grain bags kept for incubation on shelves in an incubation room at  $25 \pm 1^{\circ}\text{C}$  after inoculation from the Master Culture bags



Fig. 3.6 A close view of PP bag containing grain substrate kept for incubation just after inoculation from Master Culture.

Fig. 3.7 A close view of the completely spread spawn bag after 20 days of incubation – ready for use.