

## Chapter 3:

# Spawn Ordering, Storage, and Handling

### Spawn Production

Shiitake reproduce in nature by spores produced by the mushroom and spread to other logs. However, in cultivation, reproduction by spores is unreliable. Instead, logs are inoculated with actively growing shiitake fungus. These active fungal cultures used as inoculum for mushroom cultivation are called spawn. The spawn is usually purchased from shiitake spawn dealers. A pure strain of mycelium is taken from a culture tube and multiplied. It is then transferred to sterilized grain and eventually to sawdust medium.

Shiitake mycelia digest lignin and cellulose, which are major constituents of wood. Shiitake is commercially cultivated on two different substrates – hardwood logs or particulate materials (ground corn cobs, cotton seed hulls, chopped wheat straw) usually including hardwood sawdust. Shiitake spawn is available in two forms, sawdust or dowel. Sawdust spawn is hardwood sawdust often supplemented with wheat bran, grain, or other plant derivatives and colonized by the shiitake fungus or mycelium. Dowel spawn is made from hardwood dowels that have been colonized by the shiitake fungus. Generally, grain spawn is used to inoculate sawdust blocks for production of shiitake. Spawn is incubated in a growing room before shipment to growers or used as a fruiting substrate. Healthy, actively growing shiitake spawn is moist, white, and fuzzy (Figure 8). The spawn should have white mycelium running throughout the spawn block. If you refrigerate your spawn before inoculation or if the mycelium is not apparent throughout the block, bring it to room temperature for at least 2 to 3 days prior to inoculation.

### Strains

Shiitake strain selection depends on the production environment, the wood type inoculated, and the general characteristics of the strain. To extend the harvest season, it is generally best if more than one strain is used in production.

#### Common strain characteristics are as follows:

- Time from inoculation to fruiting: Varies from 6 months to 2 years
- Temperature requirements for fruiting: Ranges from 41 to 86 degrees F
- Type of fruiting body: Size and shape of caps can be small and flat to large and rounded
- Color of cap: Tawny to dark brown
- Moisture requirements: Vary



**Figure 8.** Shiitake spawn should be white and fuzzy throughout the bag. If large brown areas of sawdust are visible, keep the bag at room temperature until all sawdust is white. Only completely white spawn should be used for inoculation.

For cold weather strains, time from inoculation to fruiting ranges from 6 to 18 months. Natural production is usually early to mid spring and late fall, when temperatures are between 55 and 65 degrees F during the day and 40-plus degrees F at night. On the other hand, warm-weather strains will fruit when temperatures are between 50 and 82 degrees F. First fruiting occurs between 6 and 14 months for most strains. The natural fruiting season is mid spring through mid fall depending on the summer temperatures. Wide range fruiting strains will fruit between 50 and 80 degrees F. They generally fruit between mid-spring and mid-fall, 6 months after inoculation.

Inoculate logs that will be placed in an indoor environment with several strains. When heating and cooling are used in the indoor environment, logs still respond to temperature and seasonal changes. This would typically occur when changing from cooling to heating in the fall and heating to cooling in late spring and summer. When outdoor temperatures are the same as fruiting temperatures, fans must be used to circulate air inside the fruiting room. Fans will dry out logs and mushrooms, so compensate moisture loss by increasing humidity with humidifiers or mist systems. Do not spray water directly on the logs or the mushrooms.

## **Ordering Spawn**

When ordering spawn, check the volume or weight of spawn or the number of logs a bag of spawn will inoculate. The cost of spawn varies greatly among vendors. Generally, the cost should be about \$1.00 or less per average size log. A 5-pound bag of spawn should inoculate about 14 20-pound logs or about 291 pounds of logs. Spawn more expensive than this may be overpriced. If you are buying 10 or more bags of spawn, ask for a volume discount. Prevent weed fungi and contaminants from affecting the shiitake spawn by not opening the spawn container until you are ready to use the contents. Keep spawn in dark storage and refrigerated at 34 to 40 degrees F. Do not freeze. Grain or sawdust spawn may be kept in

cold storage for 1 to 3 months. An excessive accumulation of brownish liquid in the bottom of the spawn bag indicates deterioration of quality. Don't use it for inoculation. Store spawn at about 70 degrees F to encourage active fungal growth 3 to 10 days before inoculation, depending on the growth quality of the mycelium.