

### Potential problems for Florida producers

There are still a number of questions regarding the potential for growing shiitake mushrooms in Florida that need to be answered:

- We have little or no information as to whether hardwood species in Florida will serve as suitable substrates for this particular fungus.
- There are numerous strains of shiitake "spawn" or inoculum available and which of these is best for Florida's climate and hardwood species is unknown.
- How our climatic conditions affect the growth of shiitake and whether or not insects or "weed fungi" will interfere with mushroom production remains to be investigated.
- Mushrooms that degrade wood fall into two general categories: white rot and brown rot species. Shiitake is a white rot fungus and may degrade lignin, while brown rot fungi effectively degrade cellulose. There are numerous indigenous white and brown rot fungi that could be extremely detrimental to shiitake production because they may actively invade and degrade the substrate.

### SPAWN

Actively growing fungal cultures intended for use in mushroom cultivation are called "spawn". High-quality spawn may be obtained from a variety of reputable firms. Prior to ordering, it is a good idea to contact prospective suppliers to inquire about which spawn types or strains of shiitake might perform best in the Florida climate. Some of these suppliers are listed at the end of this publication.

If you are a novice at mushroom growing, purchasing contaminant-free, viable shiitake inoculum assures you of high-quality spawn. Much time and money are lost when poor-quality inoculum is used as the eventual crop will largely depend on the type and vigor of the shiitake strain used.

### SELECTING WOOD

Trees suited for shiitake mushroom cultivation are usually deciduous hardwoods and in Florida water oak, southern red oak, laurel oak, and turkey oak are considered the best hosts. Other species of oaks should do well and growers in northern areas of the United

States report high levels of shiitake production on chestnut, hickory, willow, maple, birch, beech, alder and hornbeam. Logs should be free of internal decay symptoms and should be cut from living hardwood trees during the winter, as trees felled during the colder months appear to retain bark better, aiding in moisture retention and reducing the likelihood that contaminating fungi or bacteria will invade the logs. Low temperatures also may reduce the population of competitive fungi normally present at other times of the year. Moisture levels in freshly cut logs are ideal for fungal growth so logs should be inoculated as soon as possible after cutting. Logs that have aged more than 15 days after felling should not be used for shiitake production as they will have dried to an unacceptably low internal moisture content. Damaging the bark on the logs should be avoided as this may increase internal moisture loss and allow for entry of contaminating microorganisms. Logs may be of any size but generally 3 1/2 to 4 feet in length and 4 to 8 inches in diameter are about the maximum sizes for easily handling.

### INOCULATION

Inoculation is the placement of living fungal inoculum into the sapwood of the log. Shiitake spawn comes in two forms, 1) sawdust and 2) wooden plugs or dowels that have been colonized by the shiitake fungus. High-quality spawn is characterized by a brownish-white, fuzzy appearance and should not smell mildey or moldy which would indicate that the spawn is too old or contaminated. Spawn should be kept away from direct sunlight and extremes of temperature and once a container of spawn is opened, the entire contents must be used to prevent subsequent contamination. Spawn stored in a refrigerator may remain viable for several months but must never be frozen.

During log inoculation, spawn is placed into half-inch diameter holes 3/4 to 1 1/4 inches deep and then sealed with a styrofoam plug or wax to retain moisture. Wax is used as a sealant in Japan in areas with low relative humidity for maximum conservation of log moisture. A typical log (5 inches in diameter and 4 feet long) may have 30 to 40 holes (inoculation sites), spaced longitudinally and radially over the log (Figure 1). Inoculate in a shaded area to avoid direct exposure of spawn to ultraviolet light.