



LOG MANAGEMENT FOLLOWING SPAWN RUN with emphasis on Shiitake

This information applies generally to Shiitake, Oyster, and Lion's Mane mushrooms but Oyster prefers warmer temperatures and higher humidity than Shiitake or Lion's Mane. Following the spawn run your inoculated logs will be ready to "fruit". Fruiting will likely begin the spring after inoculation – one year after inoculation. With proper handling and good management, the logs should give you 4 to 5 years of production depending on the hardness of the wood, the diameter of the logs, and the integrity of the bark. The logs will produce mushrooms outdoors from May to November and can be fruited in a greenhouse during the winter months or left stacked outdoors under the forest canopy. They can be covered with breathable materials such as cedar boughs or burlap.

Shiitake is a saprophytic mushroom that survives by absorbing nutrients from wood lignin which it breaks down with enzymes that it excretes. The mushroom organism – mycelium- that was introduced into the log last year has been busy establishing itself (the spawn run) in the sapwood under the bark of the log and will eventually digest the heartwood as well. You can often see the white ring of sapwood colonized with mycelium at the ends of logs. After the mycelium has established itself and has gathered enough nutrients, it will try to reproduce itself, given the proper environmental stimuli of temperature, humidity, and light. The mushrooms that the mycelium will produce are its means of reproduction - the fruiting bodies of the organism like the apples on a tree. If not harvested they will produce spores which will be released to the wind. The mushrooms must be harvested before they sporulate.

It is important to remember that the **mycelium** is adversely affected by lack of moisture inside the log and/or high temperature. The logs must be prevented from drying out inside and from overheating. This can be achieved by keeping them in the shade and watering/soaking when necessary. Shade can be natural, as under trees or bushes, or man-made, as under a deck or shade cloth where there is good ventilation. Dehydration can be avoided by exposure to average rainfall or by manually watering – soaking or sprinkling. During an extended drought, water the logs by sprinkling for 6 – 12 hours. However, sprinkling logs for short intervals on a regular basis (as for a garden) will result in de-barking and will shorten the life of the log. The ideal regime is to soak the logs thoroughly every 6 to 8 weeks to 'force' fruiting. This may be accomplished by natural rainfall or by manual soaking or extended sprinkling. The sprinkling/soaking protocols described below are management techniques that will protect the integrity of the bark and extend the life of the log.

NOTE: We advise customers to wait until one natural fruiting has occurred before '**forcing**' the log to fruit. A natural fruiting will generally occur in the early spring following an intensive rainfall event – length of daylight, temperature, and moisture are the 3 factors that interact to initiate fruiting.

The integrity of the bark must be maintained because it is the 'skin' of the log -- it keeps moisture in and other organisms out. The bark is negatively affected by UV rays and by constant wet/dampness. The outside of the log must be allowed to dry to prevent molds from growing on the bark. The log needs to be in a well-ventilated area and not in standing water such as a swamp. Ideally your log/s should be standing up, with one end on the ground and the other end leaning against a tree, or against a string, rope, or wire that you can string between two trees or posts. Logs can also be stacked against each other in various arrangements. This prevents the mushrooms from getting squashed or dirty as they emerge and allows the log to absorb some moisture from the ground. The logs should be handled with care as they age and the bark becomes more fragile.

Generally, an inoculated log will fruit spontaneously the following spring after rainfall, producing a few mushrooms. To get larger, predictable fruitings the logs must be "forced". This is achieved by adding moisture to the log. Soaking the whole log in cold water for 12 - 24 hours (older logs require less soaking as they are more porous) is the best way to accomplish this. However, irrigation with a sprinkler for 24-48 hours also works. The logs can also be physically "shocked". This can be achieved either by movement during the soaking process, or by dropping them to the ground when you turn them end over end, which you should do periodically if you sprinkle rather than soak. **It is worth repeating that the log must be soaked completely through to the sapwood and that the bark must then be allowed to dry out in a well-ventilated area and protected from prolonged periods of direct sunlight.** Dappled sunlight under the forest canopy is ideal.

Approximately a week after soaking or irrigation the logs will start to "flush" with mushrooms. From the time you see little mushroom 'pins' coming out, to maturity, depends on the ambient temperature and humidity. Spring and fall growth is usually slow but summer fruitings can mature in a couple of days. For Shiitake the mushrooms should be harvested shortly after the veil has broken under the cap revealing the gills. Oyster and Lion's Mane mature into clumps and should be harvested when clump shape is fully formed and still. Following harvesting the logs should be left alone so the mycelium can re-energize itself by digesting more wood lignan. This means six to eight weeks rest and then the soaking/sprinkling can be repeated. Using this management regime the logs can produce 3 to 4 harvests per season yielding up to a total of 1 Kilogram of mushrooms per year. Less frequent soakings, which allows time for

the mycelium to store more nutrients between harvests, will generally produce larger mushrooms. With proper care the logs will last an average of five years. Staggered soaking of groups of logs will spread production over your log population.

Check our website for diagrams and pictures showing various arrangements for your logs during the spawn run and then during the harvesting period.

If you are interested in more detailed information about log inoculation and management these books are excellent:

Growing Shiitake Mushrooms in a Continental Climate by Kozak, M. & J. Krawczyk

Shiitake Grower's Handbook by Przybylowicz, P & J. Donaghue

Growing Gourmet and Medicinal Mushrooms by Paul Stamets

These books may no longer be in print or may be difficult to obtain and are quite expensive. There are many sources of information online. The Stamets book can be seen online.

An excellent source for updated and detailed information about mushroom cultivation outdoors on hardwood logs is the Cornell University website. Go to the SARE.org website. Northeast USA. Search in Research and Education for Shiitake Cultivation

You can find a 56 page manual titled "Best Management Practices for Log-based Shiitake Cultivation in the Northeastern United States" that you can browse and download for free. Link follows:

[977907shiitake-bmp-3-11-final-for-print-hires.pdf \(sare.org\)](https://sare.org/977907shiitake-bmp-3-11-final-for-print-hires.pdf)

Mycosource website <https://mycosource.org>

Contact us at info@mycosource.org

Or call us 416-963-5520