



# HOW TO INOCULATE MYCELIUM PLUGS ON LOGS AND STUMPS

The mushroom we eat is the fruiting body of fungi mycelium. Cultivated species feed by decomposing organic matter around them, for example dead trees. Under proper conditions (temperature, humidity, woody substrate), mycelium inserted in freshly cut logs will gradually colonize the wood and produce mushrooms (fruit).

## Mushroom cultivation on logs: basic conditions for popular species

Species	Colonization	Tree Types (except fruit trees)	Fruiting temperature range
Chicken of the Woods <i>Laetiporus sulphureus</i>	Intermediate Up to 2 years	Oak, ash	All Summer 16 - 27°C
Elm Pleurotus <i>Hypsizygos ulmarius</i>	Easy 1 year	Deciduous: oak, beech, chestnut, elm, maple, poplar	Late Summer 13 - 18°C
Hen of the woods <i>Grifola frondosa</i>	Difficult Up to 3 years	Deciduous: oak, beech, chestnut - partially bury the logs	Late Summer 10 - 18°C
Lion's Mane <i>Hericium erinaceus</i>	Intermediate Up to 2 years	Deciduous: oak, beech, elm, maple, poplar	Late Summer 16 - 24°C
Nameko <i>Pholiota nameko</i>	Easy 1 year	Oak, beech, poplar, alder, maple – partially bury the logs	Spring and fall 13 - 18°C
Oyster Pleurotus white <i>Pleurotus ostreatus</i>	Easy 6 -12 months	Deciduous: birch, elm, oak, beech, ash, maple, alder, poplar, willow	Spring, late Summer 7 - 22°C
Oyster Pleurotus blue <i>Pleurotus ostreatus</i>	Easy 6 -12 months	Deciduous: birch, elm, oak, beech, ash, maple, alder, poplar, willow	Spring, late Summer 7 - 18°C
Phoenix Pleurotus <i>Pleurotus pulmonarius</i>	Easy 1 year	Deciduous: birch, oak, maple, beech, ash, elm, poplar, fir	All Summer 16 - 24°C
Reishi <i>Ganoderma lucidum</i>	Difficult Up to 2 years	Some deciduous (oak, beech, chestnut, elm, maple, poplar) and hemlock - partially bury the logs	All Summer 21 -27°C
Shiitake <i>Lentinula edodes</i>	Easy 1 year	Deciduous: especially oak, beech, sugar maple, musclewood; not so good with ironwood, red maple, ash, alder, poplar not recommended	Spring, late Summer 10 - 27°C
Turkey tail <i>Trametes versicolor</i>	Easy 6 -12 months	Everything except cedar	Spring, late Summer 10 - 24°C

**Preparation:** The mycelium is on grooved dowels contained in plastic bags. To preserve sterility, these bags should not be opened before log inoculation. The dowels are ready for inoculation when the grooves are filled with white mycelium. Once a bag is opened, limit manipulations and proceed to insertion in the logs ASAP.

**Wood:** The tree used as substrate must be healthy, freshly cut and free from other fungi in order to avoid competition. Late winter and early spring is the best period for cutting because trees contain the most sugars. Trees that break easily or whose bark is fragile are more likely to dry and therefore less recommendable. Logs with a length of 1 m and a diameter of 15 to 25 cm are usually easy to handle and more convenient. If the substrate is a stump rather than a log, remove 5 cm of the bark at the tip to avoid regrowth: the colonization time is generally longer on stumps but production may also last longer.

**Mycelium conservation:** Mycelium can be stored for up to 1 month at room temperature and up to 6 months in the fridge. If refrigerated, expose it to room temperature 24 hours before use. During storage at room temperature, mycelium expands, and fruiting can occur: eliminate the excess that would impede insertion.

**Log inoculation:** After cutting, allow at least 2 weeks before inoculation for the antifungal agents of the living trees to dissipate. Preferably, inoculate less than 2 months after cutting, excluding frost periods. Do not wait more than 6 months to avoid contamination. Fruiting won't occur until colonization is complete: for a given species, it will be longer, the harder is the wood and the greater the diameter of the log, but production will also be greater and more extensive: the extension could be about 3 months per added cm of diameter.

Avoid inoculating outdoors when the temperature is below the freezing point: instead, temporarily place the logs in a shelter (garage, shed) until thaw.

Drill the logs with a 8 to 10 mm (~ 5/16 ") drill bit matching the diameter of the dowels. The holes must be 5 cm deep, and at the most 10 cm apart. With a hammer, insert the dowels into the holes through the bark. A log one meter long and 20 cm in diameter should receive at least 25 dowels. To protect the mycelium, the holes should be sealed with tempered wax (about 500g of sealant per 1000 holes), preferably of food grade (soybeans, bees) or another suitable pore block. It is also desirable to seal one and only one tip. Logs should be lifted above the ground for at least 2 weeks before being put directly on the ground. The chosen place must be shaded, wet (under a forest cover or under shaded by a wall exposed to the north for example). In the absence of rain, the logs can be watered about ten minutes 1 or 2 times a week until the first frost. Hen of the woods (maitake) and reishi logs are preferably laid horizontally on the ground and partially buried.

**Fruiting:** To measure progress, bark surrounding a hole can be removed: white mycelium should be accumulating. When the log's tips are marbled by the whitish mycelium, colonization is sufficiently established for fruiting. Then the logs can be watered or submerged for a period of 24 hours (chlorinated water is to be avoided). A pouring rain will suffice. Afterward, in the absence of rain, water 2 to 3 times a day for a week. Mushrooms should pop out within 2 to 3 weeks. Ripening time varies with species from less than one week to more than one month: in general, when caps are fully opened, it's time to harvest.

Between fruiting periods, a pause of 2 to 8 weeks is generally observed. To revive fruiting, water abundantly.

**Caution:** Even on your own cultivated logs, only eat mushrooms you should expect and you are sure of. Have fun!