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Growing Gold: The Oyster Mushroom Production Process

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Mushroom cultivation has become one of the fastest-growing branches of agriculture, valued for turning low-cost agricultural waste into a nutritious, high-demand food crop within weeks rather than months. Unlike conventional crops, mushrooms require no soil, sunlight, or large farmland, and can be grown indoors under simple, controlled conditions, making cultivation accessible to small farmers, students, and urban growers alike. Among the many cultivated species, the oyster mushroom (*Pleurotus* spp.) stands out as one of the easiest and most beginner-friendly to grow. It tolerates a wide range of temperatures, grows on inexpensive substrates such as straw and sawdust, and gives a fast turnaround from spawning to first harvest. This article walks through the complete oyster mushroom production process, explaining each stage from spore selection to harvesting, along with its practical use at every step.

Keywords: Oyster Mushroom, Pleurotus, Spawn, Substrate, Mushroom Cultivation

Spore Selection and Spawn Preparation

Cultivation begins with a healthy, disease-free oyster mushroom spore culture, which is first developed on nutrient agar in a petri dish under sterile laboratory conditions. Once the mycelium has grown well on the agar, it is transferred onto sterilized grain such as wheat, sorghum, or millet, where it multiplies further to produce what is known as spawn — essentially the 'seed' used to inoculate the growing substrate. This step is repeated across mother spawn, multiplication spawn, and finally planting spawn to build up enough quantity for commercial-scale production. Clean, vigorous, and contaminant-free spawn is critical, since weak or contaminated spawn is one of the most common causes of poor colonization and crop failure (Singhal et al., 2018).

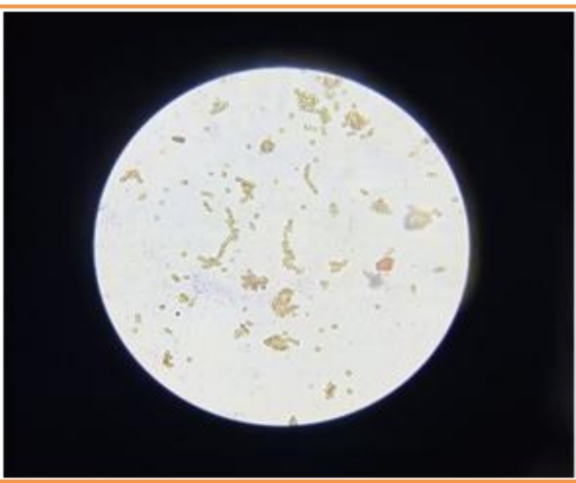

Figure 1: Oyster Mushroom spores

Figure 2 : Tissue Culture of Mushrooms

Substrate Preparation

Figure 3: Preparation of Substrate

Wheat straw, paddy straw, or sawdust is chosen as the growing substrate because these materials are cheap, widely available, and rich enough in cellulose and lignin to support mycelial growth. The straw is chopped into short pieces, thoroughly soaked in water, and then pasteurized using hot water or steam treatment to soften the material and reduce competing fungi and bacteria while keeping its nutrients intact. The substrate is then drained and cooled to room temperature before spawning. Correct moisture content, cleanliness, and particle size at this stage directly determine how quickly and completely the mycelium colonizes the bags later on, and ultimately affect the final yield (Malakar et al., 2025).

3. Spawning and Incubation

Once the substrate has cooled, spawn is mixed in layers with the substrate and packed tightly into perforated polythene bags, a step called spawning or inoculation. These bags are then moved to a dark, humid incubation room maintained at a steady temperature suited to oyster mushroom, generally between 22 and 28 degrees Celsius. Over the course of 12 to 18 days, the white mycelium spreads outward from the grain spawn and gradually colonizes the entire substrate, turning the bag fully white. This incubation period requires no light and minimal handling, but consistent temperature and humidity are essential for even colonization.

Figure 4: Incubation in Dark Room

Figure 5: Spawning of Mushroom

Fruiting and Harvesting

After the substrate is fully colonized, the bags are shifted to a cooler, well-ventilated, and more humid cropping room, and small holes or slits are cut into the bags to allow mushrooms to emerge. Lowering the temperature slightly, increasing humidity, and providing fresh air and indirect light trigger the formation of tiny pinheads, which develop into full-sized clusters of oyster mushrooms within three to five days. Mushrooms are harvested by gently twisting the entire cluster away from the bag rather than cutting it, which keeps the remaining substrate intact for further flushes. A single bag typically yields two to three flushes over several weeks before the substrate is exhausted (Badoni & Siddiqui, 2025).

Figure 6: Fruiting and Harvesting of Mushroom

Figure 7: Complete Workflow of Oyster Mushroom Production

Uses and Importance

Beyond fresh consumption, oyster mushrooms are valued for their high protein content, low fat, and dietary fiber, making them a popular addition to soups, stir-fries, and vegetarian dishes. Surplus harvest can be dried, powdered, or processed into pickles and snacks to extend shelf life and open new market channels. Even the spent substrate left after the final flush is not wasted — it is commonly reused as organic manure, animal feed, or vermicompost input, supporting a low-waste, circular model of farming (Jayaraman et al., 2024).

Conclusion

From spore selection to final harvest, oyster mushroom production is a short, low-investment cycle that makes it an ideal entry point into mushroom farming. With minimal infrastructure and readily available farm waste as raw material, it offers a fast, nutritious, and profitable crop for growers at any scale. Each stage, from aseptic culture preparation to substrate handling and fruiting, builds directly on the one before it, so consistent care at every step is what ultimately determines a healthy, high-yielding crop. Because the entire cycle can be completed in a matter of weeks, growers are able to plan multiple production batches within a single season, steadily building both skill and income. As demand for nutritious, locally grown food continues to rise, oyster mushroom cultivation stands out as a practical, low-risk way to diversify farm income while putting agricultural waste to productive use.

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