

Mushroom Cultivation

Mushroom cultivation is an easy, low-cost, additional livelihood option for farmers. It is especially suitable for small, marginal, and landless farmers, women-based self-help groups (SHGs), and rural youth who have limited or no land available for farming. Mushrooms are rich in vitamins and protein and have considerable market demand. Further, mushroom cultivation does not require a large land area or excessive water, and any crop residue, such as paddy or rice straw, can be used. In India, button and oyster mushrooms are the most grown species, followed by other varieties such as paddy straw mushroom and milky mushroom. White button mushrooms account for 85% of the country's mushroom production.

Odisha's humid climate and the availability of paddy straw make it highly suitable for mushroom cultivation, with the state contributing to about 11% of India's mushroom production. Within Odisha, paddy straw mushroom cultivation accounts for nearly 67% of total mushroom production, followed by oyster mushroom (32%) and button mushroom (1%). Button mushroom production is capital- and technology-intensive, while oyster and paddy straw mushrooms can be produced with a simple set-up at the household level. Paddy straw mushrooms and oyster mushrooms are widely promoted by institutions such as the krishi Vigyan Kendras (KVKs) under the Odisha University of Agriculture and Technology (OUAT) and Indian Council of Agricultural Research – Central Institute of Women in Agriculture (CIWA; especially for women farmers and rural households).

A step-by-step guide to mushroom cultivation



Erection of mushroom sheds or huts

Select a clean, shaded, and well-ventilated area for mushroom cultivation. Low-cost mushroom huts made from mud and straw (kutcha structures) can be constructed using locally available materials to help maintain suitable temperature and humidity levels naturally.



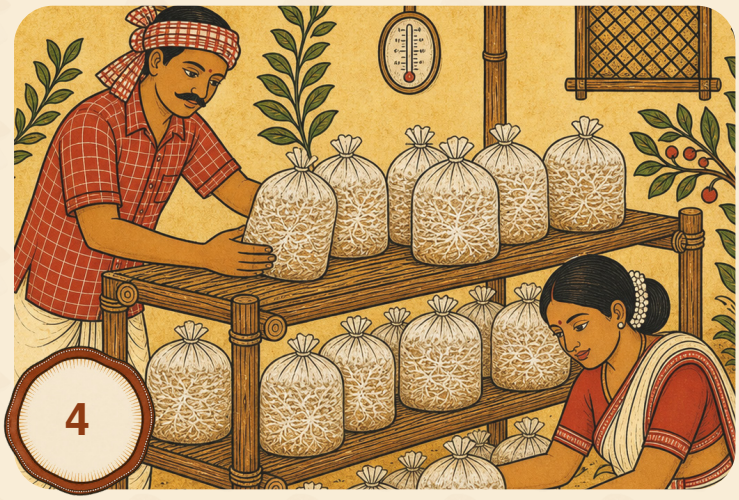
Substrate preparation

Use crop residues such as paddy straw as the growing medium (substrate), as paddy is the main crop in Odisha, and straw is available easily everywhere. Treat the straw with hot water (70–80 °C) or steam to remove microbial contamination. This prevents infections and unwanted fungal growth while softening the straw to increase nutrient uptake, thereby ensuring uniform mushroom development. Paddy straw mushrooms and oyster mushrooms are commonly grown on paddy straw substrate, while button mushrooms are cultivated on specially prepared compost-based substrate under controlled conditions.



Spawn procurement and mixing with substrate

Procure fresh and high-quality spawn (mushroom seeds containing living fungal thread-like roots or mycelium) of the mushroom species to be cultivated from a certified and reliable source to ensure optimal germination, mycelium growth, and no contamination. Spread the spawn uniformly over the prepared substrate in layers. Generally, about 30–50 g of spawn per kg of dry straw is required, ensuring even distribution for faster mycelial growth and higher mushroom yield. In paddy straw mushroom cultivation, spawn is usually mixed in layers within straw bundles or beds rather than in polypropylene (PP) bags.



Incubation and mycelium growth

Pack the spawn-mixed substrate in low-cost PP bags and arrange them on racks. Maintain a dark, well-ventilated environment with a temperature of 20–28 °C and humidity levels of 80%–85%. Within 15–20 days, the mycelium (thread-like roots) spreads throughout the substrate, forming a white layer that indicates healthy growth.



Fruiting and crop management

After 15–20 days, small pinhead-like structures will appear on the bags and gradually develop into mature mushrooms. Maintain consistent temperature, humidity, and ventilation during this stage. Light water spraying may be required to maintain humidity levels. Clean surroundings help reduce contamination risks and improve yield.



Harvesting

Harvest mushrooms when the buds/caps are fully developed but firm, usually occurring after 30–45 days after mixing the spawn. About 1–2 kg of paddy straw mushrooms can be harvested from 10 kg of paddy straw substrate per cycle; oyster mushrooms yield about 0.6–1 kg per kg of dry straw, while button mushrooms can produce nearly 15–20 kg from 100 kg of compost under controlled conditions.



Processing and value addition

Clean and grade the produce before marketing. Fresh mushrooms can be packed and marketed or dried during periods of excess production or low demand. Use a solar dryer to dry harvested mushrooms or process them into value-added products such as pickles and mushroom powder. In Odisha, mushrooms are commonly marketed through local vegetable markets, SHGs, farmer producer organisations, cooperative outlets, and institutional buyers such as hotels, restaurants, and supermarkets in urban centres.

Benefits of mushroom cultivation

Quick harvest cycle: Short production cycle of 30–45 days enables faster returns on investment.

Efficient use of crop residues: Makes productive use of crop residues.

Year-round income opportunity: Can be cultivated throughout the year under controlled conditions, generating income throughout the year.

Low initial investment: Requires minimal capital and limited space, making it suitable for small and marginal farmers, women, and landless households.

Climate-resilient production: Indoor cultivation protects the crop from weather uncertainties such as heavy rain, extreme heat, and cold.

Strong market demand: Mushrooms have a growing consumer demand and offer attractive market prices, enhancing profitability.

Investment, support, and profitability

Initial cost

Estimated setup cost: INR 2,821 for a unit based on 100 kg of compost, covering permanent infrastructure (INR 1,963) and interest and depreciation (INR 858)

Government schemes

Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana (RKVY), Pradhan Mantri Formalisation of Micro Food Processing Enterprise (PMFME), Scheme of Fund for Regeneration of Traditional Industries (SFURTI), Odisha Horticulture Mission, Odisha Mushroom Mission, and state mushroom promotion programmes

Return on investment

Approximately 45.5% (for button mushroom cultivation [per 100 kg of compost/substrate batch])

Cost of preparing 100 kg compost: INR 1,443

Yield from 100 kg compost: 30 kg

Selling price: INR 70/kg

Gross revenue: INR 2,100

Net profit: INR 657 (revenue - operating cost)

Institutional support

ICAR – Directorate of Mushroom Research for national training; OUAT for training and spawn; local KVKs and the State Horticulture Department for schemes (ICAR DMR, Solan).



**AI tools were used to optimise images.*