

## Mushroom Cultivation: A Tool for Doubling Farming Income

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### SUMMARY

In India, major mushroom producing state are Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka and Andhra Pradesh. The major problem in mushroom production is practically oriented training programme because if farmers having technical knowledge of mushroom production they can sustain production and resolve technical issues during production. In India there are various Government & NGO organizations which provide mushroom cultivation training. However, NRCM is national institute provides training. Now a day, our Indian government also promoting mushroom cultivation hence they give subsidy under a different scheme like National horticulture board, Ministry of food processing, APEDA.

### INTRODUCTION

Mushroom has unique flavor and exotic taste. It is a rich source of quality proteins (20-35% on dry weight basis), which is higher than the protein content of vegetables and fruits. Have a high percentage of all the nine essential amino acids and are rich in lysine and tryptophan, the two deficient in cereals. They are almost free from fat except for linoleic acid, but are richer in water soluble vitamins ; B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic) acid and B12, also contain vitamin C (ascorbic acid), vitamin K and of course vitamin A, D and E appear to be present in low amounts. They are good source of minerals (P, K, Fe, Na, Ca and Mg). However, Na and P level decreases as the mushroom matures. K: Na ratio is very high. Low starch content, low in calories with trace of sugar and no cholesterol. Mushrooms are probiotic. They help in keeping our body healthy and ward off diseases by strengthening the immune system, having antibiotic activities, anticancer, hypocholesteremic and anti-hypertension effects. Mushroom cultivation is easy and simple. Mushrooms have a short crop cycle. It is a good enterprise for farm women. About 80% of the work force engaged in mushroom cultivation worldwide constitute of ladies. Farm wastes are recycled to produce additional food in the form of mushrooms. In the process environmental pollution is contained. Absence of crop competition in mushroom. Water productivity can be scaled up through mushroom cultivation. Huge potential of export, as mushrooms are potential foreign exchange earner. The spent mushroom substrate (SMS) can be utilized for manuring, fertilizing the horticultural crops and feed for animals.

### Factors for Successful Commercial Mushroom Production

- Mushroom unit should be closer to the house of the farmer for successful participation and monitoring purpose
- Availability of water
- Raw materials easily available
- Availability of labor at affordable prices.
- Availability of power at competitive prices, as electricity is a significant input in mushroom cultivation
- The farm should be free from industrial pollutants such as chemical fumes,
- There should be provision for sewage disposal
- There should be provision for future growth in the farm.

### Types of Mushrooms

There is various type of edible mushroom available in the world but in India mostly four type mushroom cultivated.

- White Button Mushroom
- Volvariella Mushroom

- Oyster Mushroom
- Paddy Straw Mushroom

### **Oyster Mushroom:**

Oyster mushroom as referred in India is a basidiomycetes and belongs to the genus 'Pleurotus'. It is lignocellulolytic fungus that grows naturally in the temperate and tropical forest on dead, decaying wooden logs, sometimes on drying trunks of deciduous or coniferous woods. It can also grow on decaying organic matter. The fruit bodies of this mushroom are distinctly shell, fan or spatula shaped with different shades of white, cream, grey, yellow, pink or light brown depending upon the species. However, the colour of the sporophores is extremely variable character influenced by the temperature, light intensity and nutrients present in the substrate. The name Pleurotus has its origin from Greek word, 'Pleuro' means formed laterally or lateral position of the stalk or stem. The oyster mushroom is one of the most suitable fungal organisms for producing protein rich food from various agro-wastes without composting. This mushroom is cultivated in about 25 countries of far-east Asia, Europe and America. It is the 3rd largest cultivated mushroom in the world. The major producing countries are China, South Korea, Japan, Italy, Taiwan, Thailand and Philippines. At present, India produces annually 10,000 tonnes of this mushroom.

**Climate:** 'Oyster mushroom' or 'Dhingri' is grown where the climatic conditions are not good for the button mushrooms. It is the simplest to grow and most delicious to eat. Being very low in fat content it is usually suggested for controlling obesity and also to patients suffering from diabetes, and blood pressure. Oyster mushroom can grow at moderate temperature that ranges from 20 - 30° C and humidity 55-70 percent for a period of 6 - 8 months in a year. It can also be cultivated in summer season by providing the extra humidity needed for its growth. In hilly areas, the best growing season is during March or April to September or October while in the lower regions it is from September or October to March or April.

### **The procedure for oyster mushroom cultivation can be divided into following four steps:**

- Preparation or procurement of spawn.
- Substrate preparation.
- Spawning of substrate
- Crop management.

**Preparation or procurement of spawn:** One should have a pure culture of Pleurotus spp. for inoculation on sterilized wheat grain. It takes 10-15 days for mycelia growth on grains. It has been reported that Jowar and Bajragrains are superior over wheat grains. The mycelium of oyster mushroom grows very fast on wheat grains and 25-30 days old spawn starts forming fruit bodies in the bottle itself. It is therefore, suggested that the schedule for spawn preparation or spawn procurement should be planned accordingly. Sometimes the mushroom farmers are using active mycelium growing on substrate for spawning fresh new oyster mushroom bags. This method can be used on a small scale. There are always chances of spread of contamination through infested straw by active mycelium spawning method so it is not advisable on large scale commercial cultivation.

**Substrate preparation:** A large number of agricultural, forest and agro-industrial by-products including straws of wheat, paddy and ragi, stalks and leaves of maize, jowar, bajra and cotton, sugarcane bagasse, jute and cotton waste, de-hulled corncobs, pea nut shells, dried grasses, sunflower stalks, used tea leaf waste, discarded waste paper, paper mill sludges, coffee byproducts, tobacco waste, apple pomace and synthetic compost of button mushroom which are rich in cellulose, lignin and hemicellulose useful for growing oyster mushroom. However, yield of oyster mushroom largely depends on the nutrition and nature of the substrate. The substrate should be fresh, dry, free from mould infestation and properly stored. Cellulose rich substrates like cotton waste give better yields as it helps in more enzyme production, which is correlated, with higher yield.

**Spawning of substrate:** Freshly prepared (20-30 days old) grain spawn is best for spawning. The spawning should be done in a pre-fumigated room (48 h with 2% formaldehyde). The spawn should be mixed @ 2 to 3% of the

wet weight of the substrate. One spawn bottle of 200 g is sufficient for 8 kg of wet substrate or 2 kg dry substrate. Spawn can be mixed thoroughly or mixed in layers. Spawned substrates can be filled in polythene bags (80 x 40 cm) of 125- 150 gauze thickness. Ten to 15 small holes (0.5- 1.0 cm dia) should be made on all sides especially two to four holes in the bottom for draining excess water. Perforated bags give higher and early crop (4-6 days) than non-perforated bags. One can also use empty fruit packing cartons or boxes for filling substrate. We can also make a block of the substrate by using compression machine. Polythene sheets of 200-300 gauze thickness of 1.25 x 1.25 m are spread in rectangular wooden or metal box. Spawned substrate is filled and the polythene sheet is folded from all the four sides and compressed to make a compact rectangular block. It is taken out of the box and tied with a nylon rope. The block is incubated as such and after mycelium growth polythene sheet is removed.

**Crop management:** The spawned bags or blocks are kept in incubation room for mycelial growth at desirable temperature. Some of the *Pleurotus* species fruit at low temperature around 15°C whereas other species fruit between 20-30°C. However, the incubation temperature is around 25°C for most of the species. a. Incubation: Spawn bags can be kept on a raised platform or shelves or can be hanged in cropping room for mycelial colonization of the substrate. Higher temperature (more than 30°C) in the

#### **Constraints:**

- Non availability of suitable raw materials at the door step of the farmers such as quality substrate, spawn and organic supplements.
- Dissemination of mushroom production technology is at a slower rate.
- Mushroom spawn production is highly scientific and require more investment.
- People of rural India possess indifferent attitude towards mushroom.
- Mushroom is highly perishable, i.e. shelf life is shorter.
- Environmental fluctuations create problem in successful cultivation of mushroom.
- Problems associated with post-harvest handling, drying, pickling and canning

#### **CONCLUSION**

Mushroom cultivation fits in very well in sustainable farming and doubling farmer's income. In this we utilized agricultural waste products and getting high production per surface area. After mushroom picking, the spent substrate is still a good soil conditioner.

#### **REFERENCES**

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