Extension Folder No. 4
1992

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CULTIVATION TECHNOLOGY FOR OYSTER MUSHROOM

ICAR RESEARCH COMPLEX FOR GOA
ELA, OLD GOA - 403 402.

CULTIVATION TECHNOLOGY FOR OYSTER MUSHROOM

INTRODUCTION

The mushroom is a simple form of life known as fungus. It lacks chorophyll, so it cannot produce its own food and depends upon other living or dead plants and organic matters. Commonly, mushrooms are in the form of an umbrella like structure or a cap with stalk. However, there is a lot of variation in fruiting structure with different shapes, size and with or without stock. Some varieties even produce fruiting bodies underground. There are large number of species growing wild in nature, while many are edible, some are mild to deadly poisonous.

Mushrooms are popular for their delicacy and flavoured food value. It is well established fact that they are excellent sources of vitamins and minerals. They also contain appreciable amounts of vitamins like Niacin and Pantothenic acid, minerals such as calcium, phosphorus and potassium and a fair quantity of iron. Folic acid which is of vital importance for treating anaemic condition in the human body is available in large quantity. Their protein may be considered intermediate to that of animal and vegetables. Fresh mushrooms contain about 80-95% moisture, 3% protein, 0.3 - 0.4% fat and 1% minerals and vitamins. With the low carbohydrate and fat contents they constitute an ideal dish for diabetic patients.

TYPES OF MUSHROOMS SUITABLE FOR ARTIFICAL CULTIVATION

Although a great many species of mushrooms are edible, very few have been artifically cultivated. The most popular among these are European or White button mushroom *(Agaricus bisporus)*, Paddy straw mushroom (*Volvariella spp.*), Oyster mushroom (*Pleurotus spp.*) and Shiitake (*Lentinus edodes*). European mushroom is more specific in its temperature requirement which ranges between 14-20° C (Optimum 16 ±2° C) during cropping. Paddy straw mushroom can be successfully grown at places where temperature range is 28-38° C. Oyster mushroom can be grown in temperature range of 20-33° C. Due to its easy way of cultivation in a wide range of temperature and high yielding performance, it is becoming more popular in many parts of the country. Under the Goa weather conditions, Oyster mushroom can be grown successfully through out the year.

OYSTER MUSHROOM CULTIVATION

There are several Pleurotus spp., viz., *P. ostreatus*, *P. flabellatus*, *P. sajor caju*, *P. florida* etc., well known for their delicacy and flavour. There species grow wild in the forests which can be cultivated in thatched, polythene, brick or stone houses.

Substrate preparation

Oyster mushroom can be grown on various substrates viz., paddy straw, maize stalks/cobs, vegetable plant residues etc. Since paddy straw is easily available and cheap, it is widely used. Paddystraw, should be fresh and well dried.

Soaking

Chop paddy straw into 3-5 cm pieces and soak in fresh water for 8-16 hours. If maize stalks/cobs are used, soaking period should be 24-48 hours. Drain off excess water from straw by spreading on raised wire mesh frame.

Heat Treatment

Heat treatment of substrate results in minimizing contamination problem and gives higher and almost constant yields. It can be done in two ways i.e. by pasteurization and sterilization by chemicals.

(i) Pasteurization

Boil water in a wide mouth container such as tub or drum. Fill the wet substrate in gunny bag or basket and close the opening. Dip the filled bag in hot water of 80-85 ° C for about 10-15 minutes. To avoid floating, press it with some heavy material or with the help of a wodden piece. After pasteurization, excess hot water should be drained off from container so that it can be reused for other sets. Care should be taken to maintain hot water temperature at 80-85° C for all sets to acheive pasteurization.

(ii) Chemical sterilisation technique

Take 90 litres of water in a drum of 200 litre capacity. Slowly steep 10 kg of chopped paddy straw in the water. Mix 125ml of formaldehyde (37-40 percent) and 7 g of Bavistin dissolved in 10 litres of water in another container and pour the solution slowly into the drum. Straw should be pressed and drum should be covered with a polythene sheet. Take out the straw after 12 hrs.

Spread the pasteurized or chemically sterilised straw on neat and clean cement flooring or on raised wire mesh frame, inside the chamber where bag filling and spawning are to be done.

Spawning

When the pasteurized substrate has cooled down to room temperature, it is ready for filling and spawning. At this stage, substrate moisture content should be about 70%. Polythene bags (35 x 50 cm, 150 gauge) or polypropylene bags (35 x 50 cm, 80 gauge) may be used for its cultivation. One 500 ml bottle spawn (200-250 g) can be used for 10-12 kg wet straw (3 bags). Spawning can be done in layer spawning or through spawning.

In case of layer spawning, fill the substrate in bag, press it to a depth of 8-10 cm and broadcost a handful of spawn above it. Similarly, 2nd and 3rd layers of substrate should be put and simultaneously after spawning, the bags should be closed. In through spawning, pasteurized straw is mixed with 2% spawn and filled in bags. After gently pressing, close the bags for spawn running (development).

Spawned bags should be stacked in racks in neat and clean place, in closed position. Temperature at 25 $\pm$ 5° C and humidity at 70-85% should be maintained by spraying water twice a day on walls and floor. It takes 20-22 days when bags will be fully covered with white mycelium.

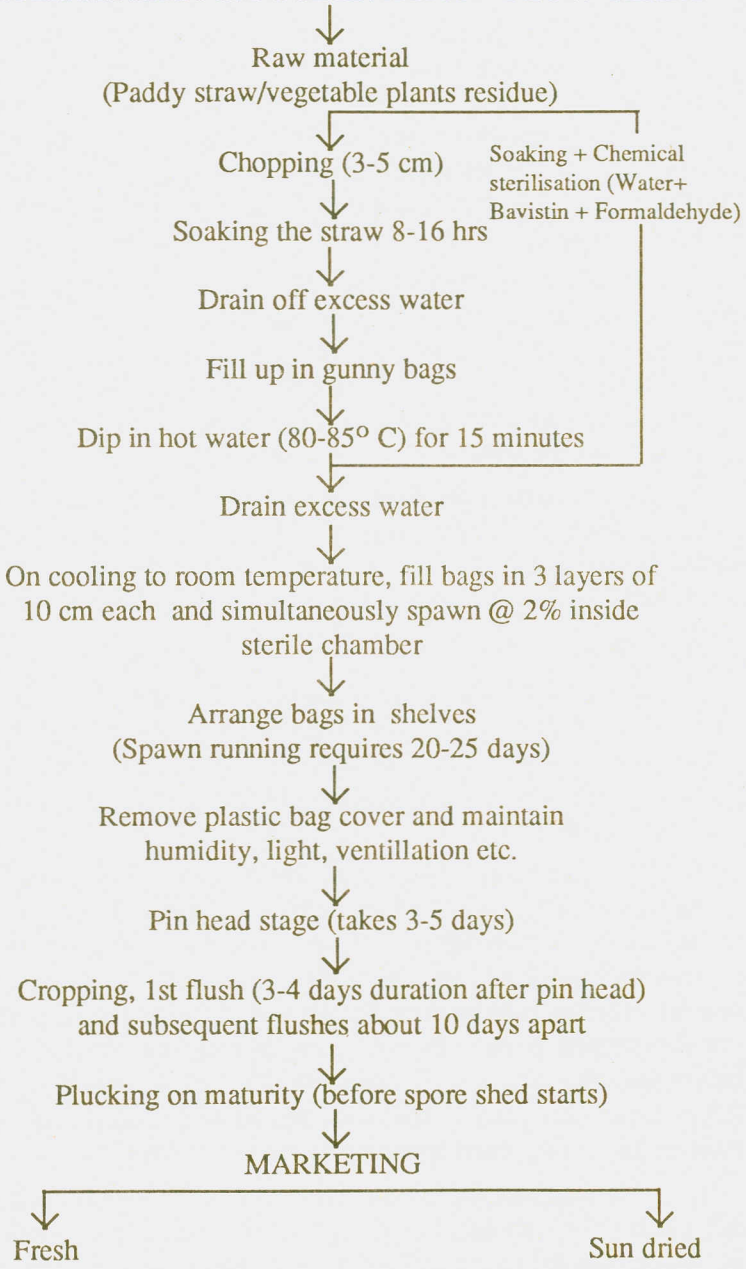
Cropping and harvest

After 20-22 days, when bags are fully impregnated with white mycelium, transfer the bags into cropping room and remove polythene/ polypropylene covers . The open blocks should be kept in racks about 20 cm apart. Rack should be 60 cm wide with gap of 50-60 cm between two shelves. Mushrooms grow in a temperature range of 20°-33° C.

Relative humidity is maintained by spraying water twice a day on the walls and floor of the room. Spraying of blocks should be avoided for the first 2-3 days. A light mist spray of water is given on blocks as soon as the small pin heads appear. Once pinheads are 2-3 cm big a little heavier watering is to be done on blocks and futher watering of blocks is to be stopped to allow them to grow. Mushrooms should be plucked before they shed spores to maintain quality. After 1st flush of harvest, 0.5 to 1 cm outer layer of the block should be scrapped. This helps to intitiate 2nd flush which appears after about 10 days.

After harvest, the lower portion of the stalk must be cleaned with dry cloth. They should be packed in perforated (5-6 small holes) polythene bags to keep them fresh. It looses freshness after about 6 hours, which can be enhanced by keeping them in refrigerator. Oyster mushroom can be sundried for 2 days and dried product marketed in polythene bags. Dried mushrooms should be soaked in water for 10 minutes before use.

OYSTER MUSHROOM CULTIVATION - FLOW CHART



Schedule of hygiene

1. Keep the surrounding areas neat and clean. Put fine wire mesh on the ventilators to check flies.
2. In the rooms where bags are filled and kept for spawn run, Nuvan/Nuvacron. (1 ml/litre of water) and formaldehyde solution (50 ml/litre of water i.e 5%) should be sprayed 48 hours earlier.
3. Repeat Nuvan/Nuvacron spray at weekly interval and formaldehyde 2% twice a week during spawn run.
4. Cropping rooms should be sprayed with Nuvan/Nuvacron and formaldehyde (5%) 24 hours before bags are shifted inside.
5. Between two flushes, use Dichlorvos twice a week after harvesting. Avoid direct spray on beds.
6. If any weed moulds noticed, treat the spot with cotton soaked in formaldehyde solution (4%).
7. Once crop is over, spray Nuvan/Nuvacron and formaldehyde (5%) and remove spent substrate after 24 hours of the treatment, which can be used as manure for crops.

Ventilation

During spawn run, ventilation is not important. However during cropping, fresh air is required. Hence, cropping rooms should be provided with proper ventilation.

Note: For further details and supply of spawn bottles, contact or write to the 'Officer on Special Duty', ICAR Research Complex for Goa, Ela, Old Goa - 403 402. Spawn bottle costs Rs. 4.00 each and on replacement of empty bottle, it costs Rs. 3.50 only.
Short term training courses will be conducted by Krishi Vigyan Kendra of ICAR Research Complex, Ela, Old Goa.

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Published by
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ICAR Research Complex For Goa, Ela,
Old Goa - 403 402.

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Printed by Rahul Offset Printer, Merces - Goa.