Mushrooming income f

Photo: S Kumar

The mushroom house can be any room, shed or hut with a fair amount of ventilation. It can be built of cereal straw while the shelves are built of bamboo sticks or any other wood grown in the area.

Photo: S Kumar

As a post-harvest technology, the women learned how to make mushroom pickles that could be sold on the market.

Women in India, especially in the rural areas, are regarded as workers within the home and around it. Moving away from the vicinity of home gives them the image of having an undesirable character. In the past few years, this one-sided norm is being challenged and women are demonstrating that they too have a major role to play in the development process. However, there is still a gap between the position and roles women have according to Indian law and the roles imposed upon them by social traditions. The Institute of Home Economics started a project to narrow this gap, by means of an income-generating activity which could be carried out around the house: mushroom cultivation.

Shashi Kumar and Ulka Mashruwala

Since our 'clients' belong to the group of rural farmers who are around the poverty line, the challenge was to develop a technology with the available rural resources. Abundance of raw materials like paddy and wheat straw as well as suitable climatic conditions make the hills of Uttar Pradesh ideal for mushroom cultivation. The women farmers of Haryana had been growing button mushrooms (*Agaricus bisporus*) for a long time. They used a traditional method of composting, which does not involve any mechanisation and therefore less financial burden on the grower. However, this entirely outdoor method of composting is rather time consuming. It takes about 3-4 weeks altogether.

The fieldworkers of the Institute of Home Economics then introduced a shorter method of composting (SMC). A package of know-how was presented to the women, from spawning to harvesting, to post-harvest technologies and marketing. There was personal interaction through visits to the farms, and demonstrations were also held.

Growing mushrooms

There are three main stages in mushroom cultivation: spawning (seeding), composting (the basic substrate) and casing. Spawn is another name for seed. It is merely the vegetative mycelium of the selected strain and is grown in a convenient medium, usually wheat grain. The grain (wheat, rye or sorghum) is washed thoroughly and soaked overnight. The next day, after having removed the dead seeds, the seeds are washed again and then boiled in water till slightly expanded (at least 10-15 minutes). Then the seeds are cooled while draining and packed loosely in bottles that can withstand intense heat. Two thirds of the bottles are filled with grain and the rest is plugged with cotton. The bottles are sterilised in a pressure cooker for about 1 hour at 16 lbs pressure. A good alternative is steaming for 2 hours in a big cast-iron casserole. The bottles should be cooled down before inoculation with the previously prepared mushroom spawn.

Compost is the basic 'substrate' on which the mushroom is cultivated. Mushrooms have the capacity to convert nutritionally valueless substances, like cereal straw (agricultural wastes) into food matter. The newly introduced SMC technology

or women

involves pasteurisation of the compost to kill microorganisms. A boiler is needed to blow steam through the compost heap and raise the temperature up to 52-54°C. After this, fresh air is let in to establish aerobic fermentation. Free circulation for moist air is ensured. Fresh air circulation is essential to equalise the temperature and to supply oxegen to every part of the compost.

Sowing the spawn

Trays made of bamboo, which is easily available, are filled with the compost. There are several methods to sow the grain spawn. It can, for instance, be scattered uniformly all over the compost surface in the tray, which is then covered with a thin layer of compost. Another method is to mix the grain thoroughly with the compost and then fill the trays. Each trainee choses the method most suited to her. After spawning, the compost surface is covered with old newspaper sheets which are wetted by sprinkling water to provide the humidity, but no water is added directly to the compost during spawn running, which is the next stage.

The room should be maintained at about 25°C. The humidity should be built up by frequently watering the floor and walls. The room may be kept closed, as no fresh air is needed during the spawn running. White cottony mycelium spreads and permeates through the compost. Eventually the compost surface gets covered with the mycelium. It takes 12-15 days for complete spawn run.

Buttons pop up

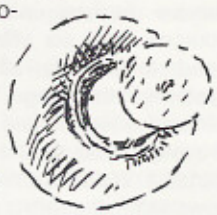
Covering the compost with a thin layer of soil after the spawn has spread is called casing. Once spawn-runned trays are covered with casing soil, the crop can be expected after 5 to 20 days. Mushrooms mostly appear in 'flushes' and at a temperature of 15°C. It generally takes 7-8 days to come to the button stage from the first appearance of the formation of a pinhead. There is an interval of 8-10 days between the flushes. After a few flushes, one will find that the mushrooms are becoming lighter. This shows that the nutrients are getting exhausted. Therefore, a 6-week crop is considered to be economical.

Women adapt technology

To pasteurise the compost in the Short Method of Composting, as introduced by the project, a boiler is needed. Some

women farmers could afford to buy one, but those who could not tried to integrate SMC in their existing cultivation pattern. They prepared a compost heap in the traditional way, but after the third turning on the eighth day, the turned compost is kept in a closed chamber. They achieved a temperature of about 50°C by microbial fermentations in the compost heap by using a blower for air circulation. The air inside is returned to the blower's inlet by forced circulation continuously till the temperature reaches 58°C after 12 hours, which remains that way for 6 hours. Then they introduced fresh air till 52°C temperature is reached, which is maintained for 48 hours and then reduced to 48°C (48 hrs), then cooled to 25°C. The whole process takes about 12-14 days.

This method is comparable to SMC as far as the time factor is concerned and achieves a temperature which is high enough to rid the compost of undesirable microorganisms. Besides, it does away with the cost of the boiler, which the growers had to buy after we withdrew the inputs at the end of the training period.



More income

Mrs Omvati of the village Bhadana is a pioneer in mushroom cultivation. With the introduction of SMC she got a better yield. Mushroom production increased from 6 kg/m² to 12-15 kg/m². Post-harvest technology enabled her to make good use of the harvest, and she has expanded her venture. This farming system thus brings about an efficient recycling of agro-waste into fibre-rich protein which, besides being nutritive, also brings more income.

Further Reading

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A recipee for mushroom pickle

Apart from methods to cultivate mushrooms, the women farmers also learned post-harvest technologies to be able to store and sell a better harvest. Here's a recipe for making mushroom pickle.

Ingredients: 1 kg chopped mushrooms, 3 t(easpoons) of cumin seeds, 3 t fenugreek seeds, 3 t coriander seeds, 4 t turmeric powder, 3 t mostard seeds, 12 green chillies, 350 ml vinegar, 50 g salt and 350 ml sesame oil.

Method: Cook the prepared mushrooms in 150 ml sesame oil with salt sprinkled over it in a covered stainless steel pan on a simmering flame for 20-30 minutes and keep aside. Roast the cumin, fenugreek and coriander seeds in an open pan, powder it an mix with ground mustard seeds and turmeric powder. Slit the green chillies lengthwise and lightly fry in about 100 ml oil. Then add the cooked mushrooms and mix all the spices thoroughly. Finally add vinegar, heat to boiling and fill hot in bottles, after removing the pickle from the flame. Heat the rest of the oil and let it cool down. Pour the cooled-down oil into each bottle to cover the pickle completely. Close the bottles.

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