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Adoption of innovative button mushroom grower: A success story of entrepreneurs

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Abstract

Krishi Vigyan Kendra is mandated to provide innovative ideas to farmers, farm women, rural youth, and entrepreneurs for their income generation or self-employment creation. Because of keeping this in mind, the KVK, Dholpur has been organized the training program on mushroom growers sponsored by the Agriculture Skill Council of India, New Delhi for a duration of 200 hr (25 days). A total of twenty participant's innovative rural youth & entrepreneurs were selected on the need-based first cum first serve from different places of Dholpur district in the training. This training was conducted during February 2020 at KVK, Dholpur entitled "mushroom grower". Out of twenty participants, Sh. Shalendra Kumar Jain who had a cold storage entitled was a Rishabh Ice & cold store at Baretha, Maniya, Dholpur (Rajasthan) owner. He was started potato cold storage in Dholpur district & adjoining Agra district (UP) during 2016-17. The potato rate fluctuated year to year. When the potato rate falls down the farmers has big loss and they did not come to take their potato from the cold store. KVK scientist was suggested & motivated him to start a business of mushroom cultivation instead of potato storage. Currently, Sh. Jain has become a successful entrepreneur engaged with button mushroom cultivation. On average, the daily production of button mushrooms from his unit is around 1200-1800 kg per day, which is sold between Rs. 90 to Rs. 250 per kg.

Keywords: Innovative Technology, mushroom grower, training.

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Background Information

Agricultural wastes disposal is of foremost concern in today's world because they are rich in nutrients and their disposal without any kind of pre-treatment can cause leaching infield, which can give rise to environmental pollution. To overcome this problem, mushroom cultivation on these agricultural wastes is the most eco-friendly method to reduce the level of nutrients at an acceptable range to be used as manure. Mushroom cultivation as a prominent biological process for the valorization of agricultural residues. Mushroom cultivation has been in craze for almost 300 years. Edible mushrooms are among the most popular and nutrition food accepted by the world and increased consumer demand over past few years has made its production increase in large proportions. Mushroom cultivation are one of the most important and effective bio-convergent of agriculture wastes into proteinases mass used as food. Out of 2000 edible mushrooms known about 290 species are known to be found in India. However, commercial growth in India has started only recently. Mainly four types of edible mushrooms are cultivated in India on a commercial basis. These are oyster mushroom (*Pleurotus sajor-kanju*), white button mushroom (*Agaricus biosporus*), milky mushroom (*Calocybe indica*) and paddy straw mushrooms (*Volvarcella volvacea*). Cultivation mushroom under controlled condition is of recent origin. Today mushroom cultivation has been taken up in many states likewise Punjab, Haryana, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Rajasthan, etc. during winter months besides earlier it was confined to Himachal Pradesh, J&K and Hilly areas. Small-scale oyster mushroom cultivation has been taken state like Bihar, Chhattisgarh, and Odisha and so on. Mushroom is an excellent source of protein, vitamins, minerals, folic acid and also a good source of iron for anaemic patient. Out of these, button mushroom is the most popular (72 percent) one as market point of view but oyster mushroom is easy to grow and also give the confidence to adopt the new innovative idea among the farmers. Button mushroom requires 20-280C for vegetative growth and 12-180C for reproductive growth *i.e.*, for formation of fruit body. Relative humidity of 80-90% and ventilation during cropping is also a needed. It is grown in environment-controlled cropping houses. Its popularity is growing and it has become a business, which is export-oriented. Mushroom cultivation may help in doubling farmer's income and is a source for self-employment of rural youth, unemployed school, entrepreneurs and college dropouts.

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Production of Button mushroom technology

Cultivation process-

It can be divided in following steps-

- Mushroom spawn production
- Preparation of compost
- Spawning
- Casing soil
- Cropping and Harvesting

Let us understand this process step by step-

1. Mushroom spawn production

In the spawn production, mycelium from the mushroom breed is placed onto steam-sterilized grain and in time, mycelium completely grows through the grain. This mixture (grain-mycelium) is called spawn and this spawn is then sent for further process of composting. Spawn can be produced in the labs or can be purchased from other sources.

2. Preparation of compost

Compost is an artificially prepared means for the growth of spawn. It is the mixture made by adding plant wastes, salts, other supplements, and water.

Short method adopted

Compost prepared by this method is convenient for high yielding mushroom production and require more resources and capital and gives high-quality mushroom with fewer chances of infection. In the first phase of composting *i.e.*, Outdoor composting, wheat straw is mixed with chicken manure and then water is mixed. Start first turning on day 4 and create a 5 feet high heap. Start second turning on day seven, add wheat bran, urea, and gypsum, mix properly, and maintain compost inside mixture 70-750C. Start third turning on day 8 and then on day 10, transfer compost into pasteurization tunnel and here we start our second phase of composting, *i.e.*, Indoor composting, the compost prepared needs to be pasteurized to kill undesirable microbes and to convert ammonia into microbial protein. The process is carried out in a steaming tunnel where the temperature of the air is maintained at 600C for 4 hours. Finally, the compost obtained must have 7.5-pH granular structure with 70% moisture content and be free from insects. After the completion of the process, compost is cooled down to 250C.

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3. Spawning

In this, Spawn is evenly mixed with the compost and this can be done in three ways, Spot spawning, in which lumps of compost are formed and spawn is mixed. Surface spawning, in which spawn is spread over the compost and then spread compost on the upper surface up to 3-5 cm. Layer spawning, 3-4 layers of spawn and compost are a prepared and final upper layer of compost.

4. Casing soil

The importance of casing soil is to maintain the moisture content inside the compost for proper growth of mycelium and exchange of pollutants. Garden loam soil and sand in the ratio of 4:1 can be used for casing soil. The casing material should have high porosity, water holding capacity and pH of 7-7.5. Casing soil is treated with 4% formalin solution (at least 15 days before casing) and stacked on the ground and pasteurization of casing soil is done for better results. Casing soil is spread thickly (4-5 cm) on the compost.

5. Cropping and Harvesting

Mushroom starts to grow after 10-12 days and mushroom crops can be harvested in 50-60 days. Mushrooms should be harvested by light twisting without distressing the casing soil and fill the gap on the soil bed with fresh casing material and spray water.

Post-harvest management

Post-harvest management should be done properly. After washing with KMS solution, Pack mushrooms in polythene bags as per depending upon the market.

The role of KVK:

The role of Krishi Vigyan Kendra, Dholpur (Rajasthan) functioning under the administrative control of Sri Karan Narendra Agriculture University, Jobner (Jaipur) is to transfer the mushroom growing technology among the farmers, rural youth & entrepreneurs through skill training (On & Off-campus), demonstration, exposure visit, film show, etc. Sh. Shalendra Kumar Jain had a Rishabh Ice & cold store, Baretha, Maniya, Dholpur (Rajasthan) owner. He was started potato cold store in Dholpur district & adjoining Agra district (UP) during 2016-17. The potato rate fluctuated year to year. When potato rate falls down the farmers has big loss and they did not come to take back their potato from cold store. Therefore, cold storage owner faced big loss during these kind situations. Sh. Jain faced these situations and his loss increase year after year. Then he was come in contact with the scientists of KVK, Dholpur.

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KVK scientist was suggested & motivated him business sifted potato cold storage to button mushroom production in with infrastructure. Thought of getting self-employed & creation job by producing mushroom. He was taken up mushroom grower training 200 Hr (25 days) under ASCI, New Delhi at the KVK, Dholpur. After complete training, he was visited at Murthal (Haryana) mushroom production farmhouse. He was visited Azad Mandi Delhi for mushroom marketing. He was decided to start his mushroom production unit with a positive mind set. The button mushroom is totally a new concept in Dholpur district of Rajasthan state. In June 2020, he started his own mushroom unit near Maniya site, Dholpur along with few locals unemployed rural youths, who were trained by him. Because mushroom rate is depended on demand & production. In India, button mushroom is traditionally cultivated in areas of Punjab, Haryana, Himachal Pradesh & Uttrakhand from October to mid-February therefore rates of mushroom goes down. Non-traditional area (cold storage) mushroom are grown whole year and can gain high rates. He has planned to increase and modified his infrastructure for increasing benefit. He was made mushroom compost yard, in the first phase of composting (*i.e.*, Outdoor composting) & second phase of composting (*i.e.*, Indoor composting), it is automatic electrical, casing preparation plate form, etc. Sh. Jain brought mushroom spawn (seed) from Panipath (Haryana) & coco peat from Dholpur. Currently, He has become a successful entrepreneur engaged with button mushroom cultivation.

Intervention / Institutional Intervention

Before training Challenges faced by rural youth & emerging entrepreneurs

- Lack of knowledge mushroom compost preparation
- Lack of awareness about the use of mushroom.
- High cost of Infrastructure
- Highly perishable produce
- Mushroom self-life are short as compared other products
- Farmers only know that it grown naturally in open areas and having no use.
- Lack of knowledge of farm enterprises.
- Lack of support from family members due to fear of failure.
- How to cook mushroom
- Major problem are marketing of mushroom

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• People do not procure mushrooms from market due to lack of knowledge about the nutritional value of mushroom.

• Unavailability of credit facilities.

In February 2020, he took 25-days (200 hr) "mushroom grower" training from the KVK, Dholpur. During the training program, button, oyster, milky & shiitake were covered with theoretical and practical aspects. It is also covered preparation of spawn production techniques & mushroom farm make design. Detail studies of different insects, pest & diseases and their management. For practical purposes, rural youth & entrepreneurs were exposed to live mushroom production units, where they showed different activities such as soaking of straw, pasteurization, compost preparation (long term & short-term methods), spawning, bag packing, and casing soil preparation. Finally how to run mushroom mycelium in compost after spawning (mixing the mushroom spawn in compost) maintaining the temperature and relative humidity etc. inside the production room. He was convinced to start the cultivation of mushroom after having personal discussion and group meeting with him following which the regular visit of KVK scientist to his mushroom production unit in order to keep an eye of its congenial environmental conditions.

Some method demonstrations were also conducted at KVK.

• Preparation of locally made Shed of size 15 × 10 ×15 cu. feet for oyster mushroom

• Locally make beds for kept oyster, milky & Button mushroom bag

• Wheat straw sterilization for oyster mushroom

• Preparation of polythene bag mushroom

• Compost preparation for button mushroom

• Fumigation of old house for cropping room

• Spawning of compost for button mushroom

• Preparation of casing mixture (soil and FYM) and casing of mushroom beds

Results / Success Points

Mr. Shalendra Kumar Jain planned and started button mushroom production just after completion of his training at KVK Dholpur. He prepared compost through a short method (First phase of composting (*i.e.*, Outdoor composting) & second phase of composting (*i.e.*, Indoor composting)) Figure 1: the spawning of the sterilized wheat straw method of composting and soaked the wheat straw 60 tons. From this, 180 tons of compost were

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prepared after the 28 days. Before this, a cold store six-level flower was made. One flower 3600 beg capacity one time kept (3600 × 6=21600 begs) was fumigated with formalin and spraying with Malathion for 36 hrs. After that, compost was spawning and putted in cultivation production chamber in controlled condition. After 30-35 DAS (the day after spawning) button mushrooms have started the production on an average, daily production of fresh button mushroom from his unit was around 1200-1800 kg per day, which is sold between Rs. 90 to Rs. 250 per kg. The total yield of fresh button mushroom was obtained 2.5 kg per beg. Therefore total 21600 beg × 2.5kg =54000 Kg mushroom production one crop. Total income are obtained 54000 kg × 140.00 = 75,60,000. He is sent fresh button mushroom for sold per day our unit to Delhi, Agra, Kanpur & Gorakhpur. Average cost of mushroom production is Rs 55 to 85.00. Therefore total cost of cultivation was 54000×Rs. 70.00 =37,80,000 and net income generated Rs. 37,80,000.00. He is given employment per day 40 to 50 workers, among worker are 30 to 35 women. Sri Karan Narendra Agriculture University, Jobner appreciated Sh. Jain for his work and assured him that the government will take an initiative to increase his infrastructure. Sh. Jain also tried to take an initiative to aware people through media about the benefit of mushrooms. Which is a good source of protein and helps in curing several diseases. Sh Jain realized that "button mushroom cultivation is boosting the income of an educated youth in state and is encouraging more". After his success as a cultivator, Sh Jain is now planning to open his spawn production center in the near future so that others can also cultivate mushrooms and earn a livelihood through diversification of traditional farming. Sh Jain proudly said this year the button mushroom produced by Sh. Jain has been sent to Delhi, Agra, Kanpur & Gorakhpur. Dr. L P Balai, Asst. Professor, Plant Pathology of KVK, Dholpur (known his working College of Agriculture, Kishangarh-Bas) also appreciated his work and assured him to help at every step.

Conclusion

Krishi Vigyan Kendra has the mandate to provide the training to rural youths who are dropped out of school, students, and also the farmers and farm women to increase their farm income and provide a livelihood. In this context, Mushroom cultivation is one of the means to which farmers and rural youth can adopt and may increase their farm income or can double it. They may also be self-employed creation by establishing mushroom enterprises.

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Action photos of different activities

Fig 1- Sh. Shailendra Kr Jain Training at KVK, Dholpur

Fig-2: Sh. Jain First phase of composting *i.e.*, Outdoor composting

Fig-3: Sh. Jain construct second phase of composting *i.e.*, Indoor composting

Fig-4: Sh jain compost and Spawing in polythen beg

Fig-5 Sh. Jain Prepared casin

Fig-6: Sh Jain production unit pin head

Fig-7: Button mushroom packing for sale and trend other youth