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Production and Profitability Analysis of Oyster Mushroom (*Pleurotus sajorcaju*)

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ABSTRACT

Demand of mushroom for consumers has been increasing day by day in India due to its flavor, taste, nutritive value and medicinal properties. Mushroom cultivation can reduce poverty and provide livelihoods through generating a reliable source of income. In order to meet the demand of mushroom for large population, it is necessary to grow mushroom commercially. Thresefore, students were provided enterpreneurial skills and knowledge through hands on experience on oyster mushroom cultivation and motivated to grow oyster mushroom. This training helped the students to build up confidence to start oyster mushroom cultivation as a business which will generate additional or alternative source of income in future. During the present investigation cost of production was analyzed, profit was estimated and also benefit cost ratio was calculated. It was observed that oyster mushroom production is a profitable enterprise.

Keywords Oyster mushroom, Cost, Profit.

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INTRODUCTION

Mushrooms are fruiting bodies of fleshy fungi. Fruiting bodies are umbrella like structure. Mushrooms are also known as white vegetables or boneless vegettarian meat. Demand of mushroom for consumers is escalating day by day throughout the world due to population explosion, market expansion and changing of consumer behavior. Of the 2000 known edible species of mushrooms, only few are commercially cultivated. Oyster mushroom (*Pleurotus* species) is a popular edible mushroom which stands third position after the white button and shiitake among commercially produced mushrooms in the world (Gyorfi and Hajdu 2007). It is popularly called as Dhingri in India which growns as saprophytes on dead branches of trees. Among different species of *Pleurotus, P. sajorcaju* is an important edible mushroom which is grown commercially all over the world. Oyster mushrooms gaining popularity in India bcause of its hoigh yield potential, excellent taste, flavor, texture and longer shelf life. It can be grown within a temperature range of 20^{o}C–30^{o}C. It can fruit and form bigger mushroom at 25^{o}C. It is cultivated in tropical and subtropical regions of the world.

Mushrooms are good source of vitamin C, B-complex such as thiamine, niacin, riboflavin, nicotinic acid, biotin and pantothenic acid. Mushroom also supply important minerals such as potassium and iron (Caglarirmak 2007). Thus mushrooms are excellent source of foods which help in overcoming problem of

malnutrition in India. Health supporitive benefits of mushroom asfood items have been reported against many diseases such as heart disease and diabetes as it contains low lipid and high fiber (Randive 2012) Medicinal value of mushroom extracts for diabetics and in cancer therapy were also reported Sivrikaya et al (2002).

Oyster mushroom can convertlocally available unused lignocellulosic agro wastes to edible protein rich food of high market value. Oyster mushroom can be grown on different lignocellulosic materials which are rich in lignin, cellulose and hemicellulose. The lignocellulosic materials are agriculral, forestry or industrial wastes which include corn cobs, various grasses and leaves, rich and wheat straw, paper, wood sawdust and chips, coffee pulp, cotton seed hulls, peanut shells, sunflower seed hulls, sugarcane and tequila bagasse (Pandey et al. 2008, Nurudeen et al. 2013).

The major objective of a business is to make a profit, hence economic analysis is necessary to find out its potential profitability before undertaking it. The present investigation was carried out to cultivat oyster mushroom (*P. sajorcaju*) commercially, analyzing costs involved in mushroom production, calculate the profitability of mushroom production determining benefit cost ratio so that students can build up confidnce to become a successful enterpreneur for oyster mushroom production.

MATERIALS AND METHODS

The present study was conducted in a temporary mushroom production unit, Department of Plant Parthology, College of Agriculture, Chiplima, Sambalpur during January to April, 2018. Twelve Nos. of students under Experimental Learning Program (ELP) were involved in carrying out the present work. Mushroom spawn (about 60% of total requirement) was purchased from private agency. The rest amount (about 40% of total requirment) was prepared in the laboratory of Plant Pathology, College of Agriculture, Chiplima, Sambalpur by the method given below.

Spawn preparation

Healthy wheat grains were collected and washed thoroughly in tap water and soaked overnight in water till they become soft. Then grains were bolied, drained off excess water and mixed with calcium carbonate at the rate of 2% on dry weight basis of the grains. The grains were filled into glucose bottle, plugged with non-absorbent cotton and sterilized in autoclave at 121^{o}C for 30 min. Grains were then inoculated with actively growing mycelium of *Pleurotus sajorcaju* maintaind on potato dextrose agar slants at 4^{o}C and incubated at 25^{o}C for mycelial growth until the mycelium fully covered the grains (Micha et al. 2011).

Mushroom bed preparation

Disease free paddy straw was collected and used as cultivation substrate.The straw was chopped into 2-3 cm pieces. The chopped straw was soakd in 100 liters of water in a 200 liter G. I. drum for 12 hours; 10 g of carbendazim was mixed with water. After soaking straw was taken out and excess water was drained. The straw was spread as thin layer on cemented floor and shade dried to get 60% moisture. The beds were prepared by using polythene bags of 35 × 45cm. One and half kg of dry substrate was used to fill up in each bag. Spawing was done in five layers. The inoculated bags were kept in the spawn running room in dark at room temprature (20 to 28^{o}C) . When the substrate was completely covered by the white cottony mycelia growth, the bags were shifited to cropping room in the thatched shed. Water was sprayed on the bed from second day of opening using an atomizer. The watering was with held aday before harvesting. Yield upto four flushes was recorded.

Economic analysis of mushroom production

The cost items in the mushroom production includes different types of fixed costs and variable costs.

Fixed costs

Fixed cost include costs of items whose ecnomic life is more than one year. They include mushroom production shed, sprayer, chaff cutter, weighting balance.

Variable costs

They include costof mushroom spawn, polythene bags, wheat grains, packaging materials.

Depreciation on fixed capital

The depreciation rates for different farm assets were taken as @ 10% per annum.

Net profit

Net profit = Total revenue–total expenditure for one crop

$$\text{Benefit cost ratio (BCR)} = \frac{\text{Total revenue}}{\text{Total cost}}$$

RESULTS AND DISCUSSION

In order to known whether temperature and relative humidity havany influence in mushroom yield, mushrooms were harvested, weighted and recorded for three consecutive months from February to April, 2018 and data are presented in Fig. 1. Maximum yield of mushroom was obtained in the month of February (51 kg) followed by March (40.50 kg). Highest yield was obtained in the month of February when optimum temperature (between 25°C to 30°C) and relative humidity prevailed. Lowest yield (30 kg) was obtained in the month of April due to high temperature (about 40°C) and low relative humidity. Due to high temperature mushrooms dried up before reaching to maturity which contributed to less yield. From our observation it is clear that mushroom yield is highly influenced by temperature and relative humidity. Similar results were also obtained by Chira et al. (2018) who reported that high temperature and low humidity resulted in low yield of oyster mushroom in Tiruchirrapalli.

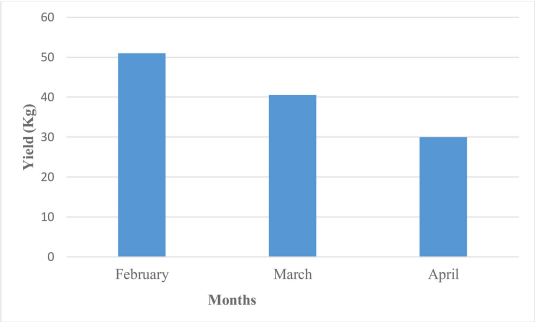

Fig. 1. Yield of oyster mushroom for three months.

Table 1. Economic analysis ofoyster mushroom production.

Particulars	Price (rupees)
I. Non-Recurring expenditure	
Cost for temporary mushroom production shed	Rs 8,000
Sprayer (1 No.)	Rs 2,000
Straw sterilization tank (1 No.)	Rs 4, 000
Straw Chaffer (1 No.)	Rs 2, 000
Weighing balace (1 No.)	Rs 1, 700
Total	Rs 17,700
II. Recurring expenditure	
Paddy straw 700 bundles @ Rs 2 per bundle	Rs1, 400
Cost of spawn 70 bottles @ Rs 12 per bottle	Rs 840
Polythene bags 2 kgs @ Rs 160 per kg	Rs 320
Carbendazim	Rs 270
Packaging materials	Rs 200
Miscellaneous costs	Rs 300
Total	Rs 3,330
Depreciation (Non-Recurring expenditure) @ 10% for one year	Rs 1,770
Total expenditure	Rs 5,100
Revenue	
From 121.50 kg mushroom@Rs 150 per kg	Rs 18,225
Net profit	Rs 13,125

In order to know whether mushroom cultivation is a profitable business or not, economic analysis of mushroom production was done andpresented in Table 1. The total expenditure for mushroom production was estimated to Rs 5,100. Total mushroom production was recorded 121.50 kg from 130 Nos. of bags. Mushroom was sold @ Rs 150 per kg of mushroom. The total revenue of the production of 121.50 kg mushroom was worked out to Rs 18, 225. Net Profit was found to be Rs 13, 125. Benefit cost ratio was calculatd to know the economic viability of mushroom production. Benefit cost raio was found to be 3.57. This indicates that cultivation of oyster mushroom is a profitable business. Mushroom culti-

vation technology is simple and cost is also less. It is an indoor crop. It requires little space for cultivation. Raw materials used for mushroom cultivation areeasily available locally at low cost. Spent materials used for mushroom cultivation can also be used asorganic manure. In this paper we have demonstrated that investing little capital for mushroom cultivation can generate high profit. So, the farmers can be motivated to go for oyster mushroom cultivation which can give them additional or alternative source of income.

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