

RESEARCH ARTICLE :

Constraints in adoption of recommended button mushroom cultivation techniques

■ GURDARSHAN SINGH AND GURMEET SINGH

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SUMMARY : Mushroom cultivation as a subsidiary occupation provides ample opportunities for sustaining rural livelihood. Krishi Vigyan Kendra, Faridkot is actively involved in conducting training programmes on button mushroom cultivation. Main objective of training programmes on mushroom production is to promote mushroom production as a self employment venture which can ultimately improve the socio-economic condition of the poor. It has also been observed that some of the people trained at KVK, Faridkot have adopted mushroom cultivation while some have not. It was found worthwhile to study the major bottlenecks in adoption of mushroom cultivation as an enterprise. With this objective, the present study on constraints in adoption of recommended button mushroom cultivation techniques was carried out at Krishi Vigyan Kendra, Faridkot from 2011-15. A total of 62 trainees trained by KVK Faridkot from Faridkot and Kotkapura blocks of district Faridkot were selected as respondents. The data revealed that issues related to price fixation (98 %) and lack of government support (93.6 %) along with non-availability of quality spawn in the local area (84.9 %), it's untimely supply (79.4 %) and lengthy and cumbersome method of compost preparation for button mushroom (80.3 %) are the major bottlenecks in adoption of this venture: In order to find out the relationship between ranks accorded by groups of respondents to different categories of constraints, rank order correlation was calculated. It was found that category of marketing constraints (82.70%) was the top ranked category as perceived by the growers engaged in mushroom production. This was followed by input constraints (75.85 %), technological constraints (72.00 %), general constraints (64.46 %) socio-cultural constraints (62.47 %) and crop management constraints (55.9 %).

KEY WORDS :

Constraints, Trainees, Training programme, Button mushroom

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Author for correspondence :

GURDARSHAN SINGH
Krishi Vigyan Kendra,
FARIDKOT (PUNJAB)
INDIA
Email:singhgurdarshan77@gmail.com

See end of the article for authors' affiliations

BACKGROUND AND OBJECTIVES

The cultivation of edible mushrooms is a biotechnological intervention for the conversion of various lignocelulosic agro-wastes into proteins. The concentrated areas of production in India are the temperate regions for the button mushroom, tropical and

sub-tropical regions for oyster, milky, paddy straw and other tropical mushrooms (Kaul and Dhar, 2007 and Upadhyay and Singh, 2010).

The commercial mushroom cultivation is an appropriate agribusiness, suiting the agro-climatic conditions of Punjab. Its cultivation involves low-cost eco-friendly technology

wherein locally available farm wastes are utilized as raw material. The temperate like climate conditions prevailing in Punjab in the months of October-March are quite conducive for mushroom cultivation.

Mushroom farming is such a component of farming system that not only imparts diversification but also helps in addressing the problems of quality food, health and environment related issues (Atkin, 1972). Its major role is in the conservation of natural resources as well as increasing the recycling of agro-wastes including agro industrial waste. Mushroom farming today is being practiced in more than 100 countries and its production is increasing at an annual rate of 6-7 per cent (Kumar *et al.*, 2013). Added advantage is that the venture is least dependent on electricity. Being a labour intensive indoor activity, mushroom cultivation generates sufficient employment for unemployed youth and provides support to women folk and other weaker sections of the society.

Mushrooms not only contribute in meeting the human food requirement but also have enormous medicinal and pharmaceutical value. Mushrooms are well-suited to supplement diets which lack proteins and in sense they are rightly called “vegetable meat”. Carbohydrate and fat contents of edible mushrooms are quite low. Owing to these attributes, these serve as low-caloric diet recommended to heart patients. The absence of starch in mushroom makes it an ideal food for diabetic patients and owing to its cholesterol-reducing property, mushrooms are ideal for the persons worried about their fattiness. The polysaccharides present in mushrooms have anti-tumour and immunological properties. The vitamin contents in mushrooms are comparable with most vegetables. Mineral contents in mushrooms are higher than fruits and vegetables. Mushrooms are prized for their exclusive flavor and deliciousness; they are rich in proteins, contains less fat, less carbohydrate and salt and rich in fibre. Edible mushrooms are well-known to possess fibre, essential oils, protein (including all the essential amino acids), vitamins, minerals, lectins, and pharmacologically important bioactive compounds. In recent years, mushrooms have also been seen as one of the most interesting subjects of the search for natural antimicrobial agents (Singh *et al.*, 2014). Chang (2012) reports that mushrooms provide many of the nutritional attributes of produce, as well as attributes more commonly found in meat, beans or grains. Mushrooms are low in calories, fat-free, cholesterol-free and very low in sodium.

Patel and Goyal (2013) reported that mushrooms act as anti-cancer compounds play crucial role as reactive oxygen species inducer, mitotic kinase inhibitor, anti-mitotic, angiogenesis inhibitor, topoisomerase inhibitor, leading to apoptosis, and eventually checking cancer proliferation. In advanced countries like USA, Japan and China a large number of medicines (mushroom nutraceuticals) are prepared from mushrooms in the form of tablets, capsules and extracts which fetch revenue worth billions of dollars. This second potential use of mushroom industry is expected to become a dominant segment as the trend to use mushrooms for medicinal use is on rise with wider consumer satisfactions and acceptability. These two segments of mushroom industry will not compete but will complement each other. About 2,000 species of macro fungi are reported to be prime edible mushrooms, but only about 80 species are grown experimentally, 40 cultivated economically, around 20 cultivated commercially and only 5 produced on an industrial scale.

Among the commercially cultivated mushrooms, white button mushroom (*Agaricus bisporus*) is extensively cultivated throughout the world and contributes more than 40 per cent of the total 4.0 million metric tonnes of mushrooms produced world-wide. The button mushroom, *Agaricus bisporus*, is still the most important commercially cultivated mushroom in the world. At the present, *A. bisporus*, accounts for 35 to 45 per cent of total worldwide production of edible mushrooms (Masoumi *et al.*, 2015).

India has a tremendous potential for the growth of agro-based industries and presently one of the focus-segment is mushroom production and processing. The demand for mushroom is growing, because the nutritive value of mushroom has been rediscovered and recognized as a richer source of protein. This industry has an ample scope as a subsidiary occupation for income as well as for creation of additional employment to the growers and their families, the retired persons and women both in rural and urban area of the state (Ahlawat, 2011; Oberoi and Chauhan, 1988; Kapoor *et al.*, 1987 and Chauhan and Sood, 1992).

Moreover, the diversity in soil and climatic conditions in India allows a production of variety of mushrooms in different parts of the country. This provides vast potential for the cultivation of mushrooms due to ample availability of raw materials and conducive climatic conditions.

Mushroom cultivation is highly profitable and sustainable enterprise for small and marginal; and agricultural laborers. Farmers who are not getting good returns from agriculture are also keen to adopt other agriculture related activities to enhance their income and mushroom cultivation is one of them, which provides extra income to the farmers other than field crops in two to three months duration. Since mushroom cultivation does not require big land and can be grown in the houses, small huts, people having limited or no land are also showing interest in starting mushroom cultivation as an venture of income generation. Mushroom cultivation is the most economic way of upgrading lingo cellulolytic waste and hence, is the way to increase the income of the farmers other than field crops, which ultimately increase the human resource directly or indirectly (Singh *et al.*, 2003).

Mushroom cultivation as a self employment venture is now being promoted by various Government Departments, State Agricultural Universities and National Research Centre for Mushroom (NRCM) and Punjab Agricultural University, Ludhiana is also actively involved in conducting training programmes on edible mushroom cultivation. Even, Krishi Vigyan Kendras (KVKs) at district level are imparting training programs for rural youth so that mushroom production can be adopted on a large scale. The training programmes of KVK are multipurpose one to cover not only the various needs of farmers but also the entire needs of village and community

However, it has also been observed that some of the people trained at KVKs have adopted mushroom cultivation and on other hand some have not. Thus it was found worthwhile to study the constraints faced by trainees in Mushroom cultivation to explore the reasons of adoption, rejection and continued adoption of mushroom cultivation as an enterprise.

RESOURCES AND METHODS

The present study was conducted at Krishi Vigyan Kendra, Faridkot from 2011-15. Interview schedule, case

study and observations were taken as a tool for data collection after pretesting. The total of 62 trainees trained by KVK Faridkot during 2011-15 from Faridkot and Kotkapura blocks of district Faridkot were selected as respondents. The data were collected with the help of interview schedule from October, 2015 to February, 2016. First of all, the respondents were questioned about the reasons for acquiring the training on mushroom cultivation and then constraints were conceptualized. In the present study, constraint was conceptualized as irresistible force that acts as hindrance in adoption of recommended mushroom growing techniques. A list of major constraints was prepared in consultation with extension scientist, available literature, field functionaries and progressive mushroom growers. Further, the major constraints were categorized into suitable sub-heads *viz.*, input, technical, socio-cultural, post-harvest and general constraints. The primary data were collected from the selected farmers with the help of interview schedule. The constraints as perceived by respondents were scored on the basis of magnitude of the problem as per Meena and Sisodia (2004). The scores of respondents were recorded and converted into mean per cent score and constraints were ranked as per Warde *et al.* (1991).

OBSERVATIONS AND ANALYSIS

As shown in the Table 1, 46.8 per cent respondents joined training course to adopt mushroom growing as an occupation, 21.0 per cent wanted to learn about mushroom growing techniques for self consumption and 24.2 per cent joined the training course just to get the certificate of training. Lesser participants showed their interest to acquire knowledge about mushroom growing and to teach fellow farmers about mushroom growing. Similar results were also reported by Suharban *et al.* (1991). It was evident that majority of respondents joined the training course to adopt mushroom growing as an enterprise.

The data presented in Table 2 depicted that issues

Table 1 : Reasons for participation in mushroom training course

Sr. No.	Reason	Number	Percentage
1	To adopt mushroom growing as an enterprise	29	46.80
2	To learn about mushroom growing techniques for self consumption	13	21.00
3	Just to know about mushroom growing	2	3.20
4	To get certificate of training course	15	24.20
5	To teach fellow farmers about mushroom growing	3	4.80

related to price fixation (98 %) and lack of government support (93.6 %) along with non-availability of quality spawn in the local area and lengthy and cumbersome method of compost preparation for button mushroom are the most serious bottlenecks in adoption of this venture. Amongst technological constraints, lengthy and cumbersome method of compost preparation for button mushroom (80.3 %) and limited post harvest processing options (79.4 %) were perceived as most serious constraints. Similar results were reported by Chang and Miles (1989). As far as input constraints were concerned,

non-availability of quality spawn (84.9 %), its limited availability at appropriate time (79.4 %) and non-availability of certain chemicals in local area (77 %) were the top ranked constraints as perceived by the trainees. This can be ascribed to the fact that mushroom growers have to traverse to Ludhiana and Patiala for procuring quality spawn produced by Department of microbiology, PAU and laboratory run by State Department of Horticulture, Patiala. Some of the progressive growers travel across Himachal and Haryana to get quality spawn. The long method of composting for button mushroom is

Table 2 : Perceived constraints in adoption of improved mushroom growing techniques

Sr. No.	Particulars	MPS	Rank
Technological constraints			
1.	Compost preparation is a lengthy and cumbersome task	80.30	I
2.	Limited post harvest processing options	79.40	II
3.	Lack of literature in simple language	56.30	III
	Overall	72.00	
Input constraints			
1.	Non-availability of quality spawn in local area	84.90	I
2.	Inadequate supply of spawn at appropriate time	79.40	II
3.	Unavailability of chemicals in nearby market	77.00	III
4.	Procurement of raw material is time consuming	62.10	IV
	Overall	75.85	
Marketing constraints			
1.	No control over price fixation	98.00	I
2.	Non-availability of proper agency to purchase mushroom	88.00	II
3.	Perishable commodity results in losses	84.70	III
4.	Erratic local demand for mushroom	60.10	IV
	Overall	82.70	
Constraints related to crop management			
1.	Frequent occurrence of diseases	61.30	I
2.	Poor and irregular production	54.80	II
3.	Unfavorable climatic conditions	51.60	III
	Overall	55.90	
Socio-cultural constraints			
1.	Lack of awareness about nutritional value of mushrooms	77.40	I
2.	Less taste for mushrooms	61.30	II
3.	Perception amongst people that they don't have enough leisure time to take up mushroom as subsidiary venture	48.70	III
	Overall	62.47	
General constraints			
1.	Lack of Government support in the form of loan and subsidy	93.60	I
2.	Less remunerative being a Seasonal activity	90.40	II
3.	Lack of sufficient space	41.60	III
4.	Experienced workers leave the unit after Sufficient exposure	46.70	IV
5.	Non-availability of skilled labourers	50.00	V
	Overall	64.46	

Table 3 : Rank order correlation of constraints in adoption of mushroom cultivation

Sr. No.	Particulars	MPS	Rank
1.	Marketing constraints	82.70	I
2.	Input constraints	75.85	II
3.	Technological constraints	72.00	III
4.	General constraints	64.46	IV
5.	Socio-cultural constraints	62.47	V
6.	Constraints related to crop management	55.90	VI

highly technical and it takes 26-30 days to prepare quality compost. Most of the trainees feel discouraged by this bottleneck. Being naïve in this profession, they cannot afford shorter method of composting in pasteurization tunnels right from the outset. As earlier stated, lack of spawning facility in the local area is the number 1 constraint amongst input constraints; the problem is further accentuated by inadequate supply of spawn at appropriate times. Despite placing spawn orders well in advance, there have been numerous instances, when spawn delivery was erratic. Sometimes spawn run is also inadequate making it a very risky venture. Unavailability of certain chemicals *viz.*, formalin, BHC and gypsum in the local market is another constraint. Although, procurement of raw materials *viz.*, wheat straw, and fertilizers e.g. urea, SSP, and MOP is not a big issue for trainees belonging to farming fraternity, still it was an issue for those belonging to non-farming families (62.10 %), as quite often they have to pay higher charges for purchase of wheat straw. Moreover, one has to procure properly stored wheat straw as poorly stored wheat straw and that lying in open is highly susceptible to increased disease incidence.

Marketing of mushrooms is the probably the biggest constraint. Lack of any price fixation followed by dearth of any specialized purchase agency were the major bottlenecks as perceived by 98 per cent and 88 per cent of the respondents. This is a serious issue as button mushroom being perishable in nature, its' uninsured marketing in time puts the growers at risk and they generally shy away from adopting it on commercial lines. Amongst socio-cultural constraints, limited knowledge about their nutritive value and less taste for mushrooms was considered as important constraints. Lack of government support followed by mushroom cultivation being a seasonal activity weans away the aspirants from adopting it commercially. Although crop management, especially, disease management (61.3 %), is an important issue, it wasn't perceived as a serious bottleneck. These

results are in conformity with the findings of Khurana and Sharma (1995) and Verma and Amardeep (2015).

In order to find out the relationship between ranks accorded by groups of respondents to different categories of constraints, rank order correlation was calculated (Table 3) It was found that category of marketing constraints (82.70%) was the top ranked category as perceived by the growers engaged in mushroom production. This was followed by input constraints (75.85 %), technological constraints (72.00 %), general constraints (64.46 %) socio-cultural constraints (62.47 %) and crop management constraints (55.9 %).

Conclusion :

This study concluded that marketing constraint was the most serious constraint in adoption of button mushroom cultivation. This is followed by input constraints, technological constraints, general constraints, socio-cultural constraints and crop management constraints. The study highlighted that issues related to price fixation and lack of government support in terms of soft loan and subsidy are the major bottlenecks in successful adoption of button mushroom cultivation. This issue needs to be addressed as being a perishable commodity, lack of ensured marketing puts the growers at risk. Non-availability of quality spawn in local area and its inadequate supply at appropriate time are hampering the progress of this venture. Compost preparation being a lengthy process and limited availability of skilled labourers also create hindrances in the way of rural youth in taking up this venture on commercial scale.

Authors' affiliations :

GURMEET SINGH, Krishi Vigyan Kendra, BATHINDA (PUNJAB) INDIA

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