Journal of Agricultural Development and Policy
Volume 25 No. 2 (2015): 81-91

Economic Viability of Button Mushroom Cultivation in Himachal Pradesh

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ABSTRACT

The study shows that nearly one-half of the mushroom growers had more than 5 years of experience and nearly one-forth were the new adopters and confined to both middle and aged group with formal primary, matriculation and graduation level education. The business principles like know-how and training with regard to new enterprise prior to its adoption followed by a market survey, etc were given due consideration and nearly 53 per cent of them adopted enterprise with low scale of 50 or even less number of spawned compost bags each weighing 20 kg with average unit investment of ₹22, 306. Majority (91%) of sample units confined to a single crop with average yield of 3.05 kg per spawned compost bag which increased with the size of unit from 3.10 kg on small to 3.40 kg on medium units. The financial test ratios revealed the economic feasibility and profitability of mushroom cultivation on large scale. Inadequate supply of spawned compost bags, lack of remunerative prices and incidence of diseases were reported the major constraints requiring immediate attention of policy makers. For improving productivity, the study recommends the adequate supply of spawned compost bags at the doorsteps of growers at appropriate time and reasonable rates in addition to encouraging them to grow at least two crops per year.

Key words: Button mushroom, Growth rate, Costs and returns, Financial test ratios
JEL Classification: D24, O13, Q12, Q14

INTRODUCTION

India has a tremendous potential for the growth of agro-based industries and presently one of the focus-segment is mushroom production. At present, India is roughly producing about 20,000 tonnes of button mushroom (B.M). The demand for mushroom is increasing, because the nutritive value of mushroom has been rediscovered and recognized as a richer source of protein. Himachal Pradesh is a state of valleys and hills where under controlled conditions of temperature and humidity, mushroom could be grown anywhere and throughout the year. This industry is developing fast 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

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area of the state (Oberoi and Chauhan, 1988; Kapoor *et al.*, 1987 and Chauhan and Sood, 1992). Kangra district of Himachal Pradesh has achieved reasonable progress in the horizontal expansion of mushroom farming due to favourable climate at one hand and the concerted efforts of Indo-Dutch Mushroom Project, Palampur and the State Agricultural University, Palampur on the other. Keeping this in view, a study was undertaken to work out growth rates in mushroom production, the costs and returns from mushroom cultivation and problems being faced by growers.

METHODOLOGY

The study was carried out in Himachal Pradesh because National Mushroom Research Centre for Mushroom, Solan, now named as Directorate of Mushroom Research (DMR), Solan, established through ICAR; The Indo-Dutch Mushroom Project, Palampur functioning under the state Directorate of Horticulture and located within the State Agricultural University, Palampur are supplying spawn compost to mushroom growers in different districts. Besides, many private spawn mix compost supplying units have come up in the state over the last many years. To carry out the study, a complete list of registered mushroom growers was prepared in consultation with above stated public and private institutions in all the major mushroom growing districts. From this list, a random sample of 200 mushroom growers was selected through proportional allocation in five major mushroom growing districts. These selected units were categorised as small (68), medium (60) and large (72) based on number of compost bags each weighing 20 kg placed on their farms viz. small up to 50 bags, medium 51-100 bags and large more than 100 bags. Survey schedules were designed for collection of detailed data which was got pre-tested in the nearby area during 2013-14 to examine the relevance of structured questions on different aspects of mushroom cultivation. The cost of cultivation was computed in terms of fixed cost which included interest and depreciation on buildings used as mushroom units. The variable cost included expenditure on spawned compost bags, human labour, chemicals (formalin, bavistin, nuvan, etc.), interest on working capital, etc. The effects of different factors on the output of mushroom were studied through input-output relationship. Koutsoyiannis (1979) defined production function as a physical/technical relationship between factor inputs and output. The functional form employed in this study was the Cobb Douglas which gave the best fit and the lead equation selected for further analysis was the double log based on the value of coefficient of multiple determinations (R^2), the appropriateness of the signs of the regression coefficients and the significance of the t-test. The Cobb Douglas function for the four (4) variable input is specified as:

$$M = b_0 X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} e^U$$

where,

M = Mushroom yield in kg per 100 spawned compost bags

X_1 = No. of spawned compost bags

X_2 = Labour used in man days per 100 spawned compost bags

X_3 = Working capital in rupees per 100 spawned compost bags which included transportation charges, chemicals used,

packing material, etc

X_4 = Management index which included four parameters viz; maintaining temperature, relative humidity, sanitation and spraying formalin. Each variable was assigned score out of 100 points based on physical observation of the units. The total score value arrived at by summing up of individual score was divided by 400 to compute the average management index.

b_0 = Constant

b_is (i=1, 2,3,4)= Output elasticity of factors

U = Error / Random term

Growth rate

To examine the annual growth rate in mushroom production, following growth model was used:

$Y_t = A\, e^{bt}$ ..... (1)

where,

Y_t = Production of mushroom in t^{th} year

A = constant

t = Time variable (1, 2, ———, n, for each period)

Log transformation of the above model is:

$\text{Ln } Y_t = \text{Ln } A + bt$ .....(2)

Compound growth rate (%) = b*100 .... (3)

RESULTS AND DISCUSSION

Initiatives on Mushroom Production

In estimating the costs and returns structure from commercial technical activity it is equally important to examine the initiatives undertaken by the adopters. The mushroom production activity in fact is low investment indoor activity but requiring high skill knowledge and innovation. With this view, an attempt was made to show (Table 1) the preliminary initiatives undertaken by growers in the study area. It can be seen from the table that 89.50 per cent sample growers had acquired training on mushroom cultivation prior to adopting the profession on commercial lines. Before starting any enterprise, market assessment is a pre-requisite and in this activity in particular, about 35 per cent growers in medium and large category had conducted a market survey to know in advance the potential demand for their mushrooms. Over one-half (53 %) of the sample growers started this venture initially with upto 50 spawned compost bags whereas 47 per cent growers placed more than 50. Quality of the produce ultimately determines the shape of business growth curve of any activity. In this enterprise, at the overall level, the feedback about the quality of their first crop was of highly satisfactory level. Better market price and increasing consumers' acceptability for the produce forced particularly the large growers to raise second crop of mushrooms. As far as the home consumption of mushroom is concerned, more than 70 per cent growers consumed weekly and 29 per cent consumed only once in a month.

It can also be viewed from the table that at overall level, the investment on major and minor items was ₹22,306 per unit. In all the categories, iron racks accounted for highest (28.74) percentage of farm investment which varied from 6.26 per cent on small to 15.19 per cent on medium to 34.14 per cent on large units. Air-conditioner, cooler, blower, etc. were the other important items of investment.

Distribution of Mushroom Growers

The distribution of mushroom growers under different category based on raising

TABLE 1: INITIATIVES UNDERTAKEN BY GROWERS IN MUSHROOM PRODUCTION ACTIVITIES

Particulars	Unit size							
	Small		Medium		Large		All units	
	No.	%	No.	%	No.	%	No.	%
Training prior mushroom cultivation	61	89.71	56	93.33	62	86.11	179	89.5
Market survey for demand	-	-	21	35	14	19.44	35	17.5
Production started with upto 50 compost bags	68	100	29	48.33	8	11.11	105	52.5
Production started with more than 50 compost bags	-	-	31	51.67	64	88.89	95	47.5
Feedback about quality of mushroom								
a) Excellent	20	29.41	13	21.67	23	31.94	56	28
b) Very good	32	47.06	23	38.33	32	44.44	87	43.5
c) Fair	16	23.53	24	40	14	19.44	54	27
High level of satisfaction	49	72.06	48	80	62	86.11	159	79.5
What tempted you to grow second crop?								
a) Better marketability	24	35.29	19	31.67	28	38.89	71	35.5
b) Better price	23	33.82	44	73.33	55	76.39	122	61
c) High social status	45	66.18	23	38.33	49	68.06	117	58.5
Frequency of mushroom consumption at home								
a) Weekly	47	69.11	48	80	47	65.28	142	71
b) Monthly	21	30.88	12	20	25	34.72	58	29
Getting regular advice from mushroom experts	54	79.41	40	66.67	56	77.78	150	75
Investment (₹/unit)	-	5883	-	12178	-	46259	-	22306

number of mushroom crops including *Dhingri* in a year is presented in Table 2. The table shows that at the overall level, majority (91%) of growers raised one crop of button mushroom in a year while 5.50 per cent could grow two crops of button mushroom and just 2.00 per cent resorted to one crop of *Dhingri* with one crop of button mushroom. As many as 98.53 per cent of small growers raised one crop of button mushroom and 1.47 per cent raised two crops whereas none of the small units could take *Dhingri* cultivation. In large category, 87.50 per cent of growers raised one crop of button mushroom followed by 9.72 per cent raising 2 crops of button mushroom and 10 per cent raising *Dhingri* crop along with two crops of button mushroom. The analysis of whole table clearly reveals that of the total, 91 per cent sample growers raised only one crop of mushroom and only 5.50 per cent growers mostly of large sized units could raise two crops of mushrooms. Remaining 3.50 per cent growers could grow one or two crops of mushroom along with *Dhingri*.

Compost Bags Utilization, Mushroom Production and Productivity

The yield of mushroom is highly variable and depends upon the quality of compost, the stain of the spawn used and the proper

TABLE 2: DISTRIBUTION OF MUSHROOM GROWERS BASED ON RAISING NUMBER OF MUSHROOM CROPS

(No. /Annum)

Particulars	Small (n=68)	Medium (n=60)	Large (n=72)	All units (n=200)
One crop	67	52	63	182
	(98.53)	(86.67)	(87.50)	(91.00)
Two crops	1	3	7	11
	(1.47)	(5.00)	(9.72)	(5.50)
One crop of B.M	-	4	-	4
and one of *Dhingri*		(6.67)		(2.00)
Two crops of B.M	-	1	2	3
one crop of *Dhingri*		(1.66)	(2.78)	(1.50)

Note: Figures in parentheses are percentages of total.

TABLE 3: COMPOST BAGS, MUSHROOM PRODUCTION AND PRODUCTIVITY

Particulars	Small (n=68)	Medium (n=60)	Large (n=72)	All units (n=200)
Composed bags (no./unit)				
Crop I	39.19	93.08	520.63	228.68
Crop II	0.74	12.5	32.98	15.87
Two crops	39.93	105.58	553.61	244.55
Production (kg/unit)				
Crop I	12.351	316.3	1557.58	696.9
Crop II	2.94	40.67	101.74	49.82
Two crops	124.29	356.97	1659.32	746.45
Productivity (kg/bag)				
Crop I	3.10	3.40	3.00	3.05
Crop II	4.00	3.25	3.08	3.14
Two crops	3.11	3.38	3.00	3.05

management of the crop. Table 3 shows use of spawned compost bags, mushroom production and yield realized per unit of spawned compost bag on sample mushroom units raising only single and double crop in a year. It is evident from the table that the average yield per spawned compost bag was the highest of 3.40 kg on medium units taking a single crop followed by 3.10 kg on the small units. For crop-II, the highest average yield was 4.00 kg on small units and showed declining trend with the size of holding. The table clearly shows that the average yield of mushroom was found increasing with the size of units from small to medium for crop-I grown in main season might be due to better use of technology within their reach like maintaining relative humidity, the temperature, proper ventilation, heating, cooling, proper spacing between bags, timely spraying and proper application of casing soil. Slight decline in average yield from medium to large for crop-I might be due to managerial factors. However, the overall average yield of button mushroom varied from 3 kg on small farm to 3.40 kg on medium farm per compost bag.

Costs and Returns from Mushroom Production

To have a clear picture of the cost and returns of button mushroom, the calculations were also made on per hundred spawned compost bags basis the results of which are given in Table 4. It can be seen from the table that total production for a single crop of button mushroom in a year was 305 kg per hundred spawned compost bags on overall units. The net returns over total cost and variable cost per hundred spawned compost bags were estimated at ₹14,962 and ₹22,052, respectively for a single crop of button mushrooms. However, the gross returns per hundred spawned compost bag were highest of ₹40,800 on medium size units. Again examining the gross returns and net returns per 100 spawned compost bags and the size of mushroom units, the study observed an increasing relationship while moving from small to medium due to scale economies.

TABLE 4: COSTS AND RETURNS FROM BUTTON MUSHROOM PRODUCTION

(₹/100 bags)

Particulars	Units	Small	Medium	Large	All units
Total production	kg/100 bags	310	340	300	305
Gross returns/selling price	₹/kg	120	120	120	120
Gross returns	₹/100 bags	37200	40800	36000	36600
Variable cost	₹/100 bags	23115	17624	13477	14548
Variable cost	₹/bag	231.15	176.24	134.77	145.48
Variable cost	₹/kg	74.56	51.84	44.92	47.7
Total cost	₹/100 bags	45006	29668	18647	21638
Total cost	₹/ bag	450.06	296.68	186.47	216.38
Total cost	₹/kg	145.18	87.26	62.16	70.94
Net returns over total cost	₹/100 bags	-7806	11132	17353	14962
Net returns over total cost	₹/ bag	-78.06	111.32	173.53	149.62
Net returns over total cost	₹/ kg	-25.18	32.74	57.84	49.06
Net returns over variable cost	₹/100 bags	14085	23176	22523	22052
Net returns over variable cost	₹/bag	140.85	231.76	225.23	220.52
Net returns over variable cost	₹/kg	45.44	68.16	75.08	72.3

Similar results with respect to size of units and gross returns were reported by Singh *et al.* (2010).

While comparing the costs and returns structure of mushroom and considering the number of crops raised during year by different category of growers, the study concluded that button mushroom cultivation twice a year was more beneficial on the basis of net returns per compost bag and net returns per kg mushroom basis. However, the net returns over total cost and variable cost from button mushroom cultivation for single crop were ₹149.06 and ₹220.52 per bag at overall level. Similarly, net returns per kg over total cost and variable cost for single crop were ₹49.06 and ₹72.30 at overall level.

Table 5 details out the cost of cultivation per 100 spawned compost bags on units raising single and double crop of button mushroom. It can be noticed from the table that variable cost component was the highest (nearly 67 %) than fixed cost of about 33 per cent at overall level. Among variable cost component, the expenditure made on spawn mix compost and casing material including gunny/polythene bags was the highest of 49.46 per cent followed by transportation charges worked out to the extent of 2.48 per cent of total cost. Maintaining temperature (15°C to 24°C) and relative humidity (85%) within prescribed range is highly essential in this enterprise, for which use of electricity and coal was necessary particularly during winter when temperature falls below 15°C. The variable cost on power accounted for 0.57 per cent of total cost at the overall level. Since the crop is susceptible to various diseases, therefore, to prevent the crop from disease and insect-pest attack, Bavistin, Formalin and Nuvan were mainly used as crop protection material. The charges borne on these items were 0.46 per cent of the total cost at overall level. Human labour is also

TABLE 5: COST OF CULTIVATION FOR SINGLE CROP OF BUTTON MUSHROOM

(₹/100 bags)

Particulars	Small	Medium	Large	All units
Fixed cost	21891	12044	5170	7090
	(48.64)	(40.60)	(27.73)	(32.77)
Interest on fixed capital (@ 8% p.a.)	16553	8588	3425	4891
	(36.78)	(28.95)	(18.37)	(22.60)
Depreciation: Building @ 2% p.a	3838	2147	856	1223
	(8.53)	(7.24)	(4.59)	(5.65)
Tools @ 10% p.a.	1500	1309	889	976
	(3.33)	(4.41)	(4.77)	(4.51)
Variable cost	23115	17624	13477	14548
	(51.36)	(59.40)	(72.27)	(67.23)
Spawn compost bags and casing material	7219	8347	11302	10703
	(16.04)	(28.13)	(60.61)	(49.46)
Transportation charges for loading/unloading compost bags	1840	1283	333	537
	(4.09)	(4.32)	(1.79)	(2.48)

Note: Figures in parentheses are percentages of total.

important component of variable cost though the crop is raised under protected environment avoiding frequent visits and adhering to safety measures at the time of outside visitors' exposure trips. The labour charges comprising family and hired labour were just 12.20 per cent of the total cost at the overall level and these were found to decline from 28.27 per cent on small units to 6.91 per cent on large units. The Table further reveals that total cost of mushroom cultivation per unit of 100 compost bags was ₹21,638 which declined from Rs 45,006 on small to ₹18, 647 on large units mainly due to economies of scale. The in-depth analysis further reveals that costs incurred on account of transportation charges, the crop protection, the labour charges, crop wash material, the power charges and host of other items included under miscellaneous category declined with size of units due to economies of scale.

Financial Test Ratios

To evaluate the economic viability of mushroom for different size of units, the financial test ratios have been worked out. Table 6 presents the various economic ratios for one crop of button mushroom indicating the economic viability for different units. The capital turnover ratio was 2.48, 3.12, 4.04 and 3.75 on small, medium, large and overall units, respectively indicating the favourable total returns per unit of rupee invested on fixed assets. This was highest (4.04) for large mushroom units followed by 3.12 for medium and 2.48 for small category. The gross ratio were found to be 1.21, 0.73, 0.52 and 0.59 for one crop of button mushroom in small, medium, large and overall units and showed the total cost per units of the total return. It was observed that the medium and large growers were more economized since the total cost per unit was the lowest of 0.73 and 0.52, respectively. The operating ratio which was worked out by dividing operating cost by total returns was found to be more

TABLE 6: FINANCIAL TEST RATIOS FOR ONE CROP OF BUTTON MUSHROOM

(₹/100 bags)

Particulars	Small	Medium	Large	All units
Capital turnover ratio	2.48	3.12	4.04	3.75
Gross ratio	1.21	0.73	0.52	0.59
Operating ratio	0.62	0.43	0.38	0.4
Rate of return on capital	0.52	0.85	1.94	1.53

favourable on large units due to low value of 0.38 than the medium (0.43) and small unit (0.62). Lastly, the rate of return on capital was also found with higher magnitude of 1.94 on large units than 0.85 on medium and 0.52 on small units. At the overall level, the rate of return on capital was found to be 1.53. In nutshell, it can be concluded that in all the cases, large sized mushroom units showed capital turnover ratio and rate of return on capital of highly desirable values greater than one in the class of other categories. Similarly, the gross ratio and operating ratio were of lowest desirable values below one for large units in comparison to other revealing their economies of scale.

Break-Even Analysis

The results of break-even analysis for a single crop of mushroom production have been presented in Table 7. Break-even level of one crop of button mushroom per annum for small, medium and large units given in the table reveals that if small units obtain 481.76 kg mushroom production valued at ₹57811.20 then these units would have been at no profit, no loss situation under given input cost and output structure. The medium units would have achieved this target just at 176.70 kg of mushrooms due to their low variable cost of production of ₹51.84 per kg. Similarly, the large units may have achieved their break-even output by producing 68.86 kg of mushroom due to their lowest variable cost of production of ₹44.92 per kg. At the overall level the break- even output in physical terms was achieved at 98.06 kg of mushroom production. The break- even analysis shown in physical terms reveals that small, medium and large units would be at no profit, no loss situation if they place at least 155, 52 and 23 compost bags at their units respectively. However, at the overall level, the number of compost bag to be placed giving no profit no loss was 32 only. Now the growers who resorted to raising two crops of mushroom in year their break-even point may be obtained at lower level of compost bags.

TABLE 7: BREAK-EVEN ANALYSIS FOR ONE CROP OF BUTTON MUSHROOM

(₹/100 bags)

Particulars	Small	Medium	Large	All units
Total fixed cost	21891	12044	5170	7090
Total variable cost	23115	17624	13477	14548
Average variable cost (₹/ kg)	74.56	51.84	44.92	47.70
Selling price (₹/ kg)	120.00	120.00	120	120.00
Break-even output (mushroom in kg)	481.76	176.7	68.86	98.06
Break-even point (Number of compost bags)	155.00	52.00	23.00	32.00
Margin of safety in (kg)	-171.76	163.3	231.14	206.94
Percentage of margin of safety	155.4	51.97	22.95	32.15

Another interesting feature of this table shows that medium size units were operating their business at 51.97 per cent margin of safety, thus leaving 48.03 per cent as their net share. Similarly, large units were safe by producing 22.95 per cent in comparison to their production. At the overall level, the per cent margin of safety was obtained at 32.15 per cent. Thus, to conclude it can be said that the break-even point of mushroom units in the study area was estimated at 98.06 kg mushroom production obtained from 32 compost bags thus giving 32.15 per cent margin of safety. However, the small units were operating below their break-even point.

Production Function Analysis

In order to determine the efficiency of factors in production, more information on the specific contribution of input factors is necessary. Therefore, an attempt was made to derive more precise measure of efficiency in resource allocation in mushroom production function analysis. Cobb-Douglas type of production function having multiple advantages over other production functions like direct measure of elasticity of production, greater number of degrees of freedom, etc. was used by taking yield of mushroom as dependent variable and number of compost bags (X_1), human labour (X_2), working capital (X_3) and management index (X_4) as independent variables. The results of regression analysis giving estimates of coefficients, their standard errors and coefficient of multiple determination (R^2) are given in Table 8 which indicates that 95.59 per cent of the variation in mushroom yield in this study was accounted for the use of different variables described above. The production elasticity attributed to the coefficient for number of compost bags (X_1) being 0.8624 shows per cent increase in yield

TABLE 8: RESULTS OF REGRESSION ANALYSIS: COBB DOUGLAS PRODUCTION FUNCTION

Particulars	Regression coefficient	Small	Medium	Large	All units
Constant term	b_0	0.4543	-2.52 94**	0.2404	-0.0242
		(0.3800)	(0.3412)	(0.3607)	(0.1793)
Compost bags (X_1)	b_1	0.8744**	0.5730**	0.9511**	0.8624**
		(0.1157)	(0.0982)	(0.0643)	(0.0280)
Labour (X_2)	b_2	-0.2192	2.1173**	-0.0993	0.2450 *
		(0.3539)	(0.2536)	(0.2782)	(0.1405)
Working capital (X_3)	b_3	0.1017**	0.1722**	0.1459**	0.1330**
		(0.0354)	(0.0432)	(0.0574)	(0.0258)
Management index (X_4)	b_4	0.3698	0.1214	0.0995	0.1868
		(0.2770)	(0.1139)	(0.3649)	(0.1596)
Coefficient of multiple determination	R^2	0.8167	0.8478	0.9037	0.9559
		(81.67)	(84.78)	(90.37)	(95.59)
Degrees of freedom	DF	63	55	67	195

Note: Figures in parentheses are standard errors.

**Significant at 5% level of significance.*

***Significant at 1% level of significance.*

for one per cent increase in number of compost bags. Similarly, if human labour is increased working capital and management index by one per cent, the yield will increase significantly, on an average, by 0.2450 and 0.1330 per cent, respectively.

From the estimated equation, it was also found that mushroom growers were operating in first zone of production function as the sum of elasticity coefficients was more than one. Among all the variables, number of compost bags variable had highest significant value of associated coefficient of elasticity production being 0.8624 at the overall level followed by labour. The coefficient of multiple determination shows that 76 per cent variation in mushroom yield is attributed to the considered variables at the overall level and this was found to increase from 81.67 per cent on small units to 90.37 per cent on large units. The perusal of table shows that compost bags, human labour and working capital were the important significant factors affecting mushroom yield in the study area.

Problems Encountered in Mushroom Production

Mushroom growers in general face problems in the field of production as well as marketing. Growers were interviewed and the results regarding problems faced by growers are presented in Table 9. The data incorporated in the table reveal that non availability of compost bags at appropriate time was perceived by the growers as the major constraint (44 %). Similar results were reported by Paul *et al.* (2001). The nearby public units preparing spawn compost could not meet the demand of growers. As much as, 14.50 per cent of the growers found that the quality of the spawn for mushroom production provided by public units was not good. Nearly, 38 per cent each of growers reported the incidence of insect pests and disease. Similarly, 27.50 per cent of the growers reported that they lacked perfectness in knowledge about mushroom cultivation technology.

CONCLUSION AND RECOMMENDATIONS

In this study, the economic profitability of mushroom production, resource-use

TABLE 9: MAIN PROBLEMS ENCOUNTERED IN MUSHROOM PRODUCTION

(Multiple response)

Particulars	Small	Medium	Large	All units
Lack of awareness	29	17	9	55
	(42.65)	(28.33)	(12.50)	(27.50)
Non availability of compost bags at appropriate time	35	36	17	88
	(51.47)	(60.00)	(23.61)	(44.00)
Non availability of quality spawned compost material	-	-	29	29
			(40.28)	(14.50)
Higher incidence of insect pest	20	25	30	75
	(29.41)	(41.67)	(41.67)	(37.50)
Higher incidence of disease	36	09	30	75
	(52.24)	(15.00)	(41.67)	(37.50)

Note: Figures in parentheses are percentages of total.

efficiency and problems associated were determined. The results of study indicate that farmers were faced with constraints but in spite these they were able to make net profit of ₹45 to ₹75 per kg over variable cost. The sum of the elasticities indicated an increasing return to scale (1.43). The study identified major constraints in mushroom production to include non availability of compost bags when needed, non availability of quality raw material and incidence of insect pests and diseases. The suggestions emerged from the study are that the farmers should form cooperative unit for the purpose of self-help in terms of input acquisition and output marketing. Similarly, the farmers deserve adequate extension services like timely distribution of the spawned compost at the doorsteps of growers at affordable prices and ensuring sufficient visits of subject matter specialists to put a check on the prevalence of disease and attack of insect pests.

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Received: July 23, 2015
Accepted: August 3, 2015