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Adoption level and constraints in vegetable production technology

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ABSTRACT

The yield level of vegetable which is comparatively low at present need to be increased substantianly. Higher vegetable production can be achieved by adoption of all the recommended technologies by large number of farmers. Adoption of vegetable production technology was studied during 2004-09 at Kullu district of Himachal Pradesh. Majority of the farmers showed low level of overall adoption of recommended technology. Weedicide application in nursery, weedicide application in main field, plant population, seed treatment with fungicides, organic manure application and nursery area were not adopted by the majority of the farmers. Non ovailability of high-yielding varieties, High cost of labour, Lack of awareness of new technology and weak extension activities at the village level were the major constraints faced by the farmers. Therefore, it was necessary to intensify the extension efforts to increase their knowledge level and adoption of recommended vegetable technologies, which would help in increasing the yield, of vegetable at farm level.

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Key words : Adoption, Constraints, Vegetable production technology

INTRODUCTION

Vegetable is most important to the human diet for better health, because vegetable possess high nutritive value and is a source of carbohydrates, proteins, vitamins and minerals etc. The selection of research area in Kullu Valley of Himachal Pradesh was due to the chilling required after vegetative phase to transform in to reproductive phase. Hence, the area was suitable for both vegetable production and their breeding for most of the temperate types of vegetables. The yield of vegetable is low at present, need to be increased sustainably. Higher vegetable production can be achieved by adoption of all the recommended technologies by large number of farmers. In general, recommended vegetable technologies are not accepted by all the farmers at a time and also to full extent. In this context the study was conducted with the objective to ascertain adoption level of recommended Vegetable technologies by the farmers to find out the relationship between socio-personal and psychological traits and adoption of vegetable production technologies and to delineate the constraints experienced by the farmers.

MATERIALS AND METHODS

The study was conducted during 2004-09 in the Kullu district for the research and number of villages in each Block were collected from the Block headquarters and as well district headquarters. After the collection of the information as above, 3 blocks, 20 villages and the 300 farmers (Large, Medium and Small) were selected on the basis of purposive and stratified random sampling. Based on the judges opinion, thirteen recommended vegetable technologies were selected for studying level of adoption by the farmers. Personal interviews were conducted using a pre tested structured interview schedule. The data collected, compiled, tabulated, analysed and interpreted (statistical methods mean and S.D. were applied).

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been presented under following heads :

Adoption of recommended vegetable technologies:

Majority of the respondents (48.40 per cent) were found to be low adopters, followed by medium (42.00 per cent) and high (9.60 per cent) adopters (Table 1).

It is revealed from the Table 2 that farmers with

Table 1 : Distribution of respondents according to the overall adoption of recommended vegetable production technologies (N=300)

Sr. No.	Adoption level	N	Percentage
1.	Low	137	48.40
2.	Medium	140	42.00
3.	High	23	9.60

Table 2 : Adoption of recommended vegetable production technologies (N=300)

Sr. No.	Recommended technologies	N	Percentage
1.	Varieties	210	70.00
2.	Seed rate	190	63.33
3.	Nursery area	45	15.00
4.	Seed treatment with fungicides	35	11.67
5.	Weedicide application in nursery	0	0.00
6.	Manure application in nursery	60	20.00
7.	Pest and disease management in nursery	65	21.67
8.	Age of seedling at the time of plantation	145	48.33
9.	Plant population	24	8.00
10.	Weedicide application in main field	0	0.00
11.	Organic manure application	40	13.33
12.	Recommended dose of fertilizer application	70	23.33
13.	Plant protection measures	164	54.67

more economic resources alone could adopt more production technologies. It may be due to the different constraints faced by the small size holding respondents. A majority of the respondents (65.00 %) adopted the recommended varieties in their cultivation. In case of 54.17 per cent of the respondents, seed rate was adopted as per the recommendation. Some of the respondents were not willing to take risk while raising their own nursery and the possibility of loss of seedlings during germination due to heavy rain, pest and disease attack. Only 40.83 per cent of respondents had adopted the recommended nursery practice in their cultivation. Most of the respondents expressed that they could not afford to take risk due to poor germination of own seeds, pest and disease and root snapping problem during pulling of seedling.

Seed treatment with fungicides was adopted by 11.67 per cent of the respondents as per the recommendations. The non-adopters were either not convinced of the practice or due to non-availability of fungicides and high cost of labour at the village level had not adopted this practice. All the respondents (100.00 per cent) were non-adopters of the recommendations on weedicide application in nursery. They believed that the application of weedicide might result in scorching of young seedlings. Recommended manures in nursery were adopted by 20 percent of the respondents. Most of the respondents believed that the application of manures in nursery leads to non-availability of required quantity in time. Higher cost of labour was also cited as a reason for non-adoption of this practice. Few respondents (21.67010) did use the recommended chemicals for pest and disease control in vegetable nursery due to lack of skill in identifying pest and diseases, high cost of labour, high cost of inputs and non availability of trained labour. Half (48.33%) of the respondents adopted the recommended age of seedlings for transplanting. In case of recommended plant population, only 8.00 per cent of respondents adopted the recommended numbers of seedlings per square meter. The reason was that most of the farmers were not prepared to take risk and also were of the view that excess number of seedling get higher yield. No respondents applied weedicide in the main field. Lack of conviction of the practice, non-availability of trained labour and high cost of inputs contributed to moderate adoption of this practice. Manure and fertilizer application was adopted as per the recommendation by 13.33 per cent of the respondents. It included right dosage of organic manure like farm yard manure or green leaf with regard to recommended dosage of fertilizer application, 23.33 per cent of the respondents adopted the recommended dosage. Plant protection measures in main field were adopted by little more than half of the respondents (54.67%).

Personal characteristics and level of adoption:

Results revealed from Table 3 that 13 independent variables taken together explained the variation to the extent of 75.03 per cent. The remaining 24.97 per cent of the variation may be due to other variables which were not included in the study. The t-test of the significance

Table 3 : Multiple regression coefficients of socio-personal and psychological traits

Sr. No.	Socio-personal and psychological traits	Regression coefficient	t-value
1.	Age	-0.048	-0.96
2.	Education	0.987**	7.22
3.	Social participation	-0.021	-0.28
4.	Land holding	0.603**	2.93
5.	Family size	-0.119	-0.32
6.	Farm power	0.065	0.86
7.	Material possession	0.024	0.27
8.	Social-economic status	0.053	0.48
9.	Mass media exposure	0.043	0.65
10.	Extension contact	0.108	1.58
11.	Economic motivation	0.146	2.11
12.	Scientific orientation	-0.088	-0.88
13.	Risk preference	-0.083	-0.99

* and ** indicate significance of values at P=0.05 and 0.01, respectively $R^2 = 0.684$

indicated that coefficient of regression were highly significantly for education (0.987) and land holding (0.603) and significant for economic motivation (0.146). So it can be predicted that one unit change in the independent variable of education, land holding and economic motivation leads to corresponding change of 0.987, 0.603 and 0.146 in adoption level of vegetable production technology. Other variable like farm power, material possession, extension contact, socio-economic status and mass-media exposure were non significant and exerted positive influence on the adoption level of vegetable production technology. Variables like age, social participation, family size, scientific orientation and risk preference were negatively contributing to the adoption of vegetable production technology. .

The first two variables related to the education and land holding of the farmers while the third economic motivation was completely psychological. Hence, it was very important for extension workers to manipulate these variables in a manner so that farmers could be able to increase their adoption level of improved vegetable production technology. Similar findings were reported by Sheriff (2006) who found that 12 independent variable contributing 57 per cent to the adoption of vegetable production technology.

Constraints in adoption:

Non-availability of suitable high yielding varieties was the most important constraint reported by 72.33 per cent of the respondents. The cost was very high due to high production cost and non-availability of subsidy. Occurrence of heavy weed growth ranked as the second important constraint by 69.00 per cent of the respondents. Weed growth was considered as one of the main factors responsible for declining vegetable yield in these areas. In addition, lack of knowledge, non-availability of weed control chemicals and equipment, high cost of inputs, lack of trained labour were the main reason for non-adoption of recommended weed management technologies. High cost of seeds was expressed as a constraint by 61.67 per cent of the respondents. Heavy pest and disease incidence was an important constraint mentioned by 56.00 per cent of the respondents. It was also found that seeds produced and marketed by the State Government and other agencies were priced higher due to high production cost. Complexity of view practices was ranked as the fourth important constraint by 41.67 per cent of the respondents. Most of the respondents thought that the

Table 4 : Constraints faced by the farmers in adoption of vegetable production technologies (N=300)

Sr. No.	Constraints	N	Percentage	Rank
Bio-physical constraints				
1.	Non-availability of suitable high yielding varieties	217	72.33	I
2.	High cost of seeds	205	61.67	III
3.	Complexity of new practices	157	41.67	V
4.	Heavy weed growth	207	69.00	II
5.	Pest and disease incidence	168	56.00	IV
Socio-economic constraints				
1.	High cost of inputs	172	57.33	II
2.	High cost of labour	187	62.33	I
3.	Non-availability of trained labour	165	55.00	III
4.	Non-availability of credit facilities	121	40.33	V
5.	Lack of subsidy for inputs	156	52.00	IV
6.	Lack of support price	161	53.67	III
Technological constraints				
1.	Lack of awareness of technologies	226	75.33	I
2.	Lack of conviction	186	62.00	II
3.	Non-availability of desired technology	137	45.67	III
Institution constraint				
1.	Weak extension services at village level	241	80.33	I
2.	Unawareness of supplies and services offered by the Government	142	47.33	V
3.	Insufficient training programmes	201	67.00	II
4.	Lack of proper communication	135	45.00	VI
5.	Lack of regulated market	168	56.00	IV
6.	Lack of transport facilities	195	65.00	III

adoption of new practices required specialized skills and knowledge, new implements and more labour.

High cost of labour was expressed as a constraint by 62.33 per cent of the respondents as the agricultural laboures were demanding higher wages irrespective of nature of work. High cost of inputs as a constraint was expressed by 57.33 per cent of the respondents. In addition sometimes due to shortage of input, the traders were selling their inputs at high cost. Veeraswamy et al. (2003) reported similar constraints perceived by the vegetable farmers of Cuttack and Puri districts of Orissa. Non-availability of trained labour in time was also considered as a constraint by 55.00 per cent of the respondents. Most of the respondents reported that the available farm labourers were not properly trained since most of the cultivation practices in vegetable farming right from sowing to post harvest requires special skills. Lack of reasonable support price was reported by 53.67 per cent of the respondents. Lack of subsidy for inputs was seen as a problem by 52.00 per cent of the respondents. Inputs were distributed at subsidised rates mostly to small and marginal farmers. Some of the respondents expressed that the subsidy amount given by the State and Central Governments was very low compared to the actual sale price of various inputs recommended.

Lack of awareness and knowledge about certain technologies was the response given by 75.33 per cent of the respondents with regards to adoption of recommended vegetable technologies in their farm. Lack of conviction in new technology was expressed by 62.00 per cent of the respondents. Most of the respondents were not convinced about the merits of some of the costly vegetable technologies and did not adopt them as they were unsure of proportionate increase in production. Non-availability of desired technology was seen as a constraint by 45.67 per cent of the respondents in vegetable cultivation. The recommended vegetable technologies may not be suitable to all the regions. The recommendations of State Department of Agriculture for obtaining higher yields may not be relevant to the village level conditions. As a result, there is a possibility for reduction of yield at farm level due to various climatic and soil factors.

Weak extension activities at village level were reported by 80.33 per cent of the respondents and insufficient training programmes reported by 67.00 per cent of the respondents caused misunderstanding on actual potential and utility of the recommended practices. Lack of transport facilities was reported by 65.00 per cent of the respondents. Lack of regulated market as a constraint was expressed by 56.00 per cent of the respondents. The entire farming community in the study area depended on private traders for the purchase of the agricultural inputs and for selling their produce. Due to the absence of regulated market at village level, farmers sell their produce to middle men and get lower price for their produce. Lack of information supply and services offered by the State and Central Governments was the institutional constraint expressed by 47.33 per cent of the respondents. The respondents reported that the personnel of the State Department of Agriculture were not taking adequate efforts to crate awareness among various sections of the respondents regarding benefits given by the government to boost agricultural production at farm level. Lack of proper communication system was reported as a constraint by 45.00 per cent of the respondents. Due to the inadequacy of agricultural programmes on radio and television, print publications, farm and home visit etc., the respondents were not aware of yield gap and how to eliminate it. A large number of farmers who live in interior places spend more money on transport to reach depots for the purchase of inputs and sale of harvested produce.

Conclusion:

Majority of the farmers showed low level of overall adoption of recommended technology. Weedicide application in nursery, weedicide application in main field, plant population, seed treatment with fungicides, organic manure application and nursery area were not adopted by the majority of the farmers. Non availability of high yielding varieties, High cost of labour, Lack of awareness of new technology and Weak extension activities at the village level were the major constraints faced by the farmers. Therefore, it was necessary to intensify the extension efforts to increase their knowledge level and adoption of recommended vegetable technologies, which would help in increasing the yield of vegetable at farm level.

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