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ANALYSIS OF TRAINING NEEDS OF VEGETABLE GROWERS TOWARDS IMPROVED PRODUCTION TECHNOLOGY IN HARDOI DISTRICT OF UTTAR PRADESH, INDIA

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ABSTRACT

The study was conducted to assess the training needs of vegetable growers in Mallawan Block of Hardoi district of Uttar Pradesh. A pre-tested structured interview schedule was used to collect the data from 120 randomly selected farmers. The results revealed that the top three training needs, “Selection of improved and hybrid seeds” emerges as the most critical, with 70.83% of respondents considering it most essential. This is closely followed by “Recommended chemicals for weed control” identified by 69.17% of farmers as crucial. Additionally, “Knowledge on farmyard manure and compost” is highlighted, with 60.83% of participants prioritizing this training need. Conversely, the study identifies three least prioritized training needs. “Summer ploughing” ranks lowest, with only 6.67% of respondents deeming it most essential. Similarly, “Proper time for use of weedicides” and “Recommended quantity for weed control” are perceived as less critical, with 50.83% and 44.17% of farmers considering them most essential, respectively.

Key words : Market, Productivity, Training, Sustainability, Vegetable farming.

Introduction

Vegetables play a crucial role in maintaining human health and providing essential nutrients for a balanced diet. It is recommended that a daily intake of about 300 grams of vegetables, including green leafy vegetables and root crops, is necessary for a balanced diet, yet the available supply is only around 130 grams per capita per day according to the Indian Council of Medical Research (ICMR). Consumption of an adequate amount of vegetables on a daily basis has been linked to the prevention of major diseases such as cardiovascular diseases and certain cancers, as highlighted by the World Health Organization (WHO) in 2003. Vegetables are also rich in micronutrients such as calcium, iron, phosphorus, copper, folate, zinc, as well as vitamins A, C and B-complex.

India ranks second globally in vegetable production, with Uttar Pradesh being the leading vegetable-growing state. Despite the vast variety of vegetables grown by Indian farmers, including staples like potatoes, tomatoes, onions, cabbage and cauliflower, there remains a significant gap between the yield levels achieved by scientists and those attained by vegetable growers. This underscores the importance of providing farmers with the necessary knowledge and skills through continuous training programs to maximize the use of available agricultural technology. Training plays a critical role in enhancing farmer efficiency in agricultural practices, with the goal of inducing behavioural changes rather than simply increasing knowledge. Effective training programs should be need-based, as stated by Lynton and Pareek (1990), offering participants organized opportunities to acquire essential understanding and skills. Assessing the specific training needs of vegetable growers in terms of content, timing, duration, location, and methodology is essential for improving production-oriented utilization of

farm technology. Therefore, efforts have been made to evaluate the training requirements of vegetable growers, aiming to tailor programs that address their specific needs and promote efficient and productive farming practices.

Materials and Methods

The present study was conducted in the Mallawan block of Hardoi district (U.P.). There are nineteen blocks in the district Hardoi, out of which, one block Malllawan, was purposively chosen for the study. There were 77 villages in the Mallawan, and 10 of them were chosen because they had a significant amount of land planted in vegetable crops. Using a random sampling technique, an equal number of vegetable growers from each village were chosen. For the purposes of the study, a total of 120 respondents made up the sample size. The data were collected with help of pretested interview schedule. The investigator used rank order, percentage and frequency to analyse them.

Results and Discussion

The results revealed (Table 1) that training on "Knowledge of farmyard manure and compost" was the most perceived training need by farmers. Majority (60.83%) considered it most essential, 36.67% found it essential and only 2.50% deemed it not essential. This training need ranked first among field management training needs and fifth overall. The second most perceived need in field management was "Selection of field." Sixteen percent (16.67%) of farmers considered it most essential, 59.17% found it essential and 24.17% deemed it not essential. This need ranked twenty-seventh overall. The need for "Knowledge on seed selection" ranked third in field management and thirty-first overall. Six percent (6.67%) of farmers considered it most essential, 70.00% found it essential and 23.33% deemed it not essential. The findings of the study are in conformity with the study of Sonkar *et al.* (2015).

The findings (Table 2) on most perceived training need by farmers was training on "Selection of improved and hybrid seeds." A vast majority of farmers, (70.83%), considered this training most essential, with the remaining 29.17% finding it essential. This need ranked first overall. The second most perceived need was "Method of seed treatment," with 57.50% of farmers considering it most essential and 42.50% finding it essential. This need ranked second overall. "Recommended fungicides and its quantity for seed treatment" ranked third in this category, with 56.67% of farmers considering it most essential and

Table 1 : Preference of training of the vegetable growers on Field Management practices (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Selection of field	20(16.67)	71(59.17)	29(24.17)	120(100)	II	XXVII
2.	Summer ploughing	08(06.67)	84(70)	28(23.33)	120(100)	III	XXXI
3	Knowledge on farm yard manure and compost	73(60.83)	44(36.67)	03(02.50)	120(100)	**I**	V

Table 2 : Preference of training needs of the vegetable growers on selection of seeds (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Selection of improved and hybrid seeds	85(70.83)	35(29.17)	00(00)	120(100)	**I**	**I**
2.	Method of seed treatment	69(57.50)	51(42.50)	00(00)	120(100)	II	VII
3	Recommended fungicides and its quantity for seed treatment	68(56.67)	52(43.33)	00(00)	120(100)	III	VIII
4	Suitable time for seed treatment	53(44.17)	62(51.67)	05(4.17)	120(100)	IV	XIV
5.	Row to row and plant to plant distance	40(33.33)	73(60.83)	7(5.83)	120(100)	V	XXII

Table 3 : Preference of training needs of the vegetable growers on Fertilizer management (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Recommended fertilizer and its quantity	46(38.33)	63(52.50)	11(9.17)	120(100)	**I**	XIX
2.	Method of application	45(37.50)	33(27.50)	42(35.00)	120(100)	II	XX
3.	Precautions in fertilizers application	34(28.33)	44(36.67)	42(35.00)	120(100)	III	XXIII

Table 4 : Preference of training needs of the vegetable growers on Irrigation management (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Number of irrigations according to vegetables	18(15)	43(35.83)	59(49.17)	120(100)	II	XXVIII
2.	Proper time and method of irrigation	25(20.83)	63(52.50)	32(26.67)	120(100)	**I**	XXV

43.33% finding it essential, ranking it third overall. "Suitable time for seed treatment" and "Row to row and plant to plant distance" ranked fourth and fifth, respectively, in seed selection training needs. Forty-four percent (44.17%) of farmers considered suitable time for seed treatment most essential, while 51.67% found it essential, and 4.17% deemed it not essential. For row to row and plant to plant distance, 33.33% of farmers considered it most essential, 60.83% found it essential, and 5.83% deemed it not essential. These needs ranked fourteenth and twenty-second overall, respectively. The findings of the study are in conformity with the study of Raina *et al.* (2014) and Sonkar *et al.* (2015).

The results (Table 3) revealed that the most perceived training need among farmers was "Recommended fertilizer and its quantity." 38.33% considered it most essential, 52.50% found it essential, and only 9.17% deemed it not essential. This training need ranked first among fertilizer management needs and nineteenth overall. The second most perceived need in fertilizer management was "Method of application." 37.50% of farmers considered it most essential, 27.50% found it essential, and 35.00% deemed it not essential. This need ranked twentieth overall. The need for "Precautions in fertilizer application" ranked third in fertilizer management and twenty-third overall. 28.33% of farmers considered it most essential, 36.67% found it essential, and 35.00% deemed it not essential. The findings of the study are in conformity with the study of Raina *et al.* (2014) and Sonkar *et al.* (2015).

The findings (Table 4) revealed that among irrigation management training needs, "Proper time and method of irrigation" was identified as the most critical requirement by farmers. Twenty percent (20.83%) considered it most essential, 52.50% found it essential, and 26.67% deemed it not essential. This training need ranked first among irrigation management needs and twenty-fifth overall. The second most perceived need in irrigation management was "Number of irrigations according to vegetables." Fifteen percent (15%) of farmers considered it most essential, 35.83% found it essential, and 49.17% deemed it not essential. This need ranked twenty-eighth overall. The findings of the study are in conformity with the study of Raina *et al.* (2014) and Sonkar *et al.* (2015).

The results (Table 5) revealed that the training need most perceived by farmers in weed management was "Recommended chemicals for weed control." A significant majority, 69.17%, considered it most essential, with only 28.33% finding it essential and a mere 2.50% deeming it not essential. This training need ranked first in the weed management category and second overall. The second most perceived need in weed management was "Proper time for use of weedicides." Fifty percent (50.83%) of farmers considered it most essential, 49.17% found it essential, and none deemed it not essential. This need ranked second in weed management and twelfth overall. The need for "Recommended quantity for weed control" ranked third in weed management and fifteenth overall. Forty-four percent (44.17%) of farmers considered it most essential, 55.83% found it essential, and none deemed it not essential. The least perceived need in weed management was "Knowledge on methods of weed control," ranking fourth in weed management and twenty-ninth overall. Twelve percent (12.50%) of farmers considered it most essential, 28.33% found it

Table 5 : Preference of training needs of the vegetable growers on Weed Management (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Knowledge on methods of weed control	15(12.50)	34(28.33)	71(59.17)	120(100)	IV	XXIX
2.	Recommended chemicals for weed control	83(69.17)	34(28.33)	03(02.50)	120(100)	**I**	**II**
3.	Recommended quantity for weed control	53(44.17)	67(55.83)	00(00)	120(100)	III	XV
4.	Proper time for use of weedicides	61(50.83)	59(49.17)	00(00)	120(100)	II	XII

Table 6 : Preference of training needs of the vegetable growers on Plant protection measure (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Identification of insects and insecticides	80(66.67)	33(27.50)	07(05.83)	120(100)	**I**	**III**
2.	Recommended doses of insecticides	76(63.33)	41(34.17)	03(02.50)	120(100)	II	IV
3.	Proper time for insecticide uses	57(47.50)	46(38.33)	17(14.17)	120(100)	VII	XIII
4.	Identification of major diseases	67(55.83)	49(40.83)	04(03.33)	120(100)	IV	IX
5.	Knowledge on major fungicides	64(53.33)	56(46.67)	00(00)	120(100)	V	X
6.	Recommended doses of fungicides	71(59.17)	45(37.50)	04(03.33)	120(100)	III	VI
7.	Proper time for use of fungicides	63(52.50)	56(46.67)	01(0.83)	120(100)	VI	XI
8	Precautions in fungicides application	43(35.83)	60(50)	17(14.17)	120(100)	VIII	XXI

essential, and 59.17% deemed it not essential. The findings of the study are in conformity with the study of Sonkar Raina *et al.* (2014) and *et al.* (2015).

The results presented in Table 6 revealed that among the plant protection measures, "Identification of insects and insecticides" emerged as the most significant training need, with 66.67% of respondents considering it most essential, 27.50% finding it essential and only 5.83% deeming it not essential. This need ranked first within plant protection measures and third overall. The second most crucial need in plant protection measures was "Recommended doses of insecticides." 63.33% of respondents considered it most essential, 34.17% found it essential, and only 2.50% considered it not essential. This need ranked second within plant protection measures and fourth overall. The need for "Proper time for insecticide uses" ranked third within plant protection measures and seventh overall. 47.50% of respondents considered it most essential, 38.33% found it essential, and 14.17% deemed it not essential. "Recommended doses of fungicides" ranked third in plant protection measures and sixth overall. 59.17% of farmers considered it most essential, 37.50% found it essential and only 3.33% deemed it not essential. "Identification of major diseases" was the fourth perceived need in plant protection measures and ninth overall. 55.83% of farmers considered it most essential, 40.83% found it essential, and only 3.33% deemed it not essential. "Knowledge on major fungicides" ranked fifth in plant protection measures and tenth overall. 53.33% of farmers considered it most essential, 46.67% found it essential, and none deemed it

Table 7 : Preference of training needs of the vegetable growers on Picking (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Suitable time and method of vegetable picking	52(43.33)	46(38.33)	22(18.33)	120(100)	II	XVII
2.	Moisture level at the time of picking	46(38.33)	49(40.83)	25(20.83)	120(100)	III	XVIII
3.	Improved implements of vegetable picking	53(44.17)	60(50)	07(05.83)	120(100)	**I**	XVI

Table 8 : Preference of training needs of the vegetable growers on Storage Management (n=120).

S. no.	Area of training needs	Level of training needs				Ranked	
		Most essential	Essential	Not essential	Total	Group Rank	Overall Rank
1.	Methods of storage	21(17.50)	54(45)	45(37.53)	120(100)	II	XXVI
2.	Moisture, temperature, humidity for storage vegetables	33(27.50)	53(44.17)	34(20.83)	120(100)	**I**	XXIV
3.	Ideal storage house	11(09.17)	64(53.33)	45(37.53)	120(100)	III	XXX

not essential. "Proper time for use of fungicides" ranked sixth among plant protection measures and eleventh overall. 52.50% of farmers considered it most essential, 46.67% found it essential, and only 0.83% deemed it not essential. The need for "Proper time for insecticide use" ranked seventh among plant protection measures and thirteenth overall. 47.50% of farmers considered it most essential, 38.33% found it essential, and 14.17% deemed it not essential. Finally, "Precautions in fungicide application" ranked eighth in plant protection measures and twenty-first overall. 35.83% of farmers considered it most essential, 50% found it essential and 14.17% deemed it not essential. The findings of the study are in conformity with the study of Verma *et al.* (2019) and same findings of the study are in conformity with the study of Sonkar *et al.* (2015).

In Table 7, concerning training needs in the area of picking, the data reveals that the most perceived need by farmers is "Improved implements of vegetable picking." Forty-four percent (44.17%) of respondents considered it most essential, 50% found it essential, and only 5.83% deemed it not essential. This training need ranked first in picking and sixteenth overall. The second most perceived need in picking was "Suitable time and method of vegetable picking." Forty-three percent (43.33%) of farmers considered it most essential, 38.33% found it essential and 18.33% deemed it not essential. This need ranked seventeenth overall. The need for "Moisture level at the time of picking" ranked third in picking and eighteenth overall. Thirty-eight percent (38.33%) of respondents considered it most essential, 40.83% found it essential, and 20.83% deemed it not essential. The findings of the study are in conformity with the study of Raina *et al.* (2014) and Sonkar *et al.* (2015).

The results presented in Table 8 highlights the training needs in storage management. "Moisture, temperature, humidity for storage vegetables" emerged as the most perceived need among farmers, with 27.50% considering it most essential, 44.17% finding it essential, and 20.83% deeming it not essential. This training need ranked first among storage management needs and twenty-fourth overall. The second most perceived need in storage management was "Methods of storage," with 17.50% of farmers considering it most essential, 45% finding it essential, and 37.53% deeming it not essential. This need ranked twenty-sixth overall. The need for an "Ideal storage house" ranked third in storage management and thirtieth overall. Nine percent (9.17%) of farmers considered it most essential, 53.33% found it essential, and 37.53% deemed it not essential. The findings of the study are in conformity with the study of Raina *et al.* (2014) and Sonkar *et al.* (2015).

The results presented in Table 9 highlights the areas where vegetable growers most essentially require training, along with their corresponding rank order. The important first ten areas on which they required training most essentially were as: selection of seeds (70.83%), recommended chemicals for weed control (69.17%), Identification of insects and insecticides (66.67%),

Table 9 : Training needs of vegetable growers towards improved production technology (n=120).

S. no.	Area of training needs	Level of training needs				Rank order of most essential needs
		Most essential	Essential	Not essential	Total	
I	**Field Management**					
1.	Selection of field	20(16.67)	71(59.17)	29(24.17)	120(100)	**XXVII**
2.	Summer ploughing	08(06.67)	84(70)	28(23.33)	120(100)	**XXXI**
3	Knowledge on farm yard manure and compost	73(60.83)	44(36.67)	03(02.50)	120(100)	**V**
Il	**Selection of seeds**					
1.	Selection of improved and hybrid seeds	85(70.83)	35(29.17)	00(00)	120(100)	**I**
2.	Method of seed treatment	69(57.50)	51(42.50)	00(00)	120(100)	**VII**
3	Recommended fungicides and its quantity for seed treatment	68(56.67)	52(43.33)	00(00)	120(100)	**VIII**
4.	Suitable time for seed treatment	53(44.17)	62(51.67)	05(4.17)	120(100)	**XIV**
5.	Row to row and plant to plant distance	40(33.33)	73(60.83)	7(5.83)	120(100)	**XXII**
Ill	**Fertilizer management**					
1.	Recommended fertilizer and its quantity	46(38.33)	63(52.50)	11(9.17)	120(100)	**XIX**
2.	Method of application	45(37.50)	33(27.50)	42(35.00)	120(100)	**XX**
3.	Precautions in fertilizers application	34(28.33)	44(36.67)	42(35.00)	120(100)	**XXIII**
IV	**Irrigation management**					
1.	Number of irrigations according to vegetables	18(15)	43(35.83)	59(49.17)	120(100)	**XXVIII**
2.	Proper time and method of irrigation	25(20.83)	63(52.50)	32(26.67)	120(100)	**XXV**
V	**Weed Management**					
1.	Knowledge on methods of weed control	15(12.50)	34(28.33)	71(59.17)	120(100)	**XXIX**
2.	Recommended chemicals for weed control	83(69.17)	34(28.33)	03(02.50)	120(100)	**Il**
3.	Recommended quantity for weed control	53(44.17)	67(55.83)	00(00)	120(100)	**XV**
4.	Proper time for use of weedicides	61(50.83)	59(49.17)	00(00)	120(100)	**XII**
VI	**Plant protection measure**					
1.	Identification of insects and insecticides	80(66.67)	33(27.50)	07(05.83)	120(100)	**III**
2.	Recommended doses of insecticides	76(63.33)	41(34.17)	03(02.50)	120(100)	**IV**
3.	Proper time for insecticide uses	57(47.50)	46(38.33)	17(14.17)	120(100)	**XIII**
4.	Identification of major diseases	67(55.83)	49(40.83)	04(03.33)	120(100)	**IX**

Table 9 continued...

Table 9 continued...

5.	Knowledge on major fungicides	64(53.33)	56(46.67)	00(00)	120(100)	**X**
6.	Recommended doses of fungicides	71(59.17)	45(37.50)	04(03.33)	120(100)	**VI**
7.	Proper time for use of fungicides	63(52.50)	56(46.67)	01(0.83)	120(100)	**XI**
8.	Precautions in fungicides application	43(35.83)	60(50)	17(14.17)	120(100)	**XXI**
VII	**Picking**					
1.	Suitable time and method of vegetable picking	52(43.33)	46(38.33)	22(18.33)	120(100)	**XVII**
2	Moisture level at the time of picking	46(38.33)	49(40.83)	25(20.83)	120(100)	**XVIII**
3	Improved implements of vegetable picking	53(44.17)	60(50)	07(05.83)	120(100)	**XVI**
VIII	**Storage Management**					
1.	Methods of storage	21(17.50)	54(45)	45(37.53)	120(100)	**XXVI**
2.	Moisture, temperature, humidity for storage vegetables	33(27.50)	53(44.17)	34(20.83)	120(100)	**XXIV**
3.	Ideal storage house	11(09.17)	64(53.33)	45(37.53)	120(100)	**XXX**

recommended doses of insecticides (63.33), knowledge on FYM and compost (60.83%), proper time for use of fungicides (58.33%), Recommended doses of fungicides (59.17%), Method of seed treatment (57.50%). Recommended fungicides and its quantity for seed treatment (56.67%) and Identification of major diseases (55.83%). However, the least important areas were Selection of field (16.67%), Number of irrigations according to vegetables (15%), and Knowledge on methods of weed control (12.50%), ideal storage house (09.17%) and summer ploughing (6.67%). The findings of the study are in conformity with the study of Sonkar *et al.* (2015) and Verma *et al.* (2019)

Conclusion

Through comprehensive analysis, it is evident that there are significant gaps in knowledge and skills among farmers, particularly in areas such as seed selection, fertilizer management, irrigation practices, weed and pest management, picking techniques and storage management. The findings underscore the importance of targeted training programs tailored to address the specific needs of vegetable growers in the region. By prioritizing training on critical areas such as seed selection, weed and pest management and irrigation practices, stakeholders can empower farmers with the necessary knowledge and skills to enhance productivity, optimize resource utilization, and improve crop quality. Furthermore, the study highlights the need for collaborative efforts involving government agencies, agricultural extension services, research institutions and non-governmental organizations to design and implement effective training initiatives. These initiatives should incorporate innovative teaching methods, practical demonstrations, and farmer-to-farmer knowledge sharing to ensure maximum impact and sustainability.

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