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Impact of training programmes on maize production technology with drip irrigation among the farmers of West Nimar region Barwani, Madhya Pradesh

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Abstract

Maize is the third most important food crops after rice and wheat in India. Maize is a source of nutrition as well as phytochemical compounds. The technology transfer through training, demonstration and extension activities has been viewed as most important critical factors for increasing agriculture production. The study was conducted in Barwani district of West Nimar region Madhya Pradesh due to its having maximum number of trained farmers of KVK on drip irrigation in Maize production technology. In this study 60 trained and 60 untrained farmers were selected randomly, thus the total sample was consisted of 120 respondents for the study. Majority 60.00 per cent respondents (trained farmers) had medium category of knowledge about Maize production through drip irrigation technology. Out of the total 60 untrained farmers, majority 58.33 per cent respondents had medium knowledge about drip irrigation technology in Maize production category. Majority 58.33 per cent respondents (trained farmers) had medium adoption of drip irrigation technology in maize production category and high cost of inputs was the major constraints.

Keywords: training programme, maize production, drip irrigation and Krishi Vigyan Kendra

Introduction

Water is the driving force of all nature. Conserving water means using our water supply wisely and be responsible. As every individual depends on water for livelihood, we must learn how to keep our limited supply of water pure and away from pollution. Drip irrigation's popularity may continue to grow as its benefits become more evident. Increased education and awareness, the availability of more technologically-advanced products and word of mouth exposure are all keys to heightening landscape drip irrigation's role as a significant water-conserving irrigation method. Drip Irrigation is the most efficient water and nutrient delivery system for growing crops. It delivers water and nutrients directly to the plant's root zone, in the right amounts, at the right time, so each plant gets exactly what it needs, when it needs it, to grow optimally. It enables farmers to produce higher yields while saving on water as well as fertilizers, energy and even crop protection products. Drip irrigation is known to be the most efficient irrigation methods with 95-100% water use efficiency. This is compared to sprinkler systems that have 80-85% water use efficiency or flood and furrow that are 60-70% efficient. Efficiency is related to the effectiveness of the system on crop performance and eventually on yield and profitability of the farmer.

Maize (*Zea mays* L) is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. Globally, maize is known as queen of cereals because it has the highest genetic yield potential among the cereals. Due to increasing population there is more food demand, therefore maize can satisfy the food requirements as well as provide human nutrition along with number of health benefits. Maize is widely processed into various types of products such as cornmeal, grits, starch, flour, tortillas, snacks, and breakfast cereals. Maize flour is used to make chapatis or flat breads which are eaten. Among the maize growing countries, India Rank 4th in area and 7th in production.

Training and education are lifelong requirement to improve the living standard of large number of people in the villages. The significance of training for development and mobilization of human resources energies has been recognized long back, but finding out ways for improving effectiveness of training received attention only recently. Keeping this views, Krishi Vigyan Kendra's are the grass-root level training institutions, designed for bridging the gap between the available technologies at the one end and their application for increased production at the other.

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In recent years, cultivation of Maize is very popular. The various extension agencies are continuously making efforts to create awareness among the farmers about scientific cultivation of Maize. Krishi Vigyan Kendras and other Govt. Institutes are playing major role for promoting the cultivation of Maize and conducting Training programme, Exhibition, Kisan Mela, Sangosthi and other programme for dissemination of information about cultivation of Maize with low cost and environmentally safe condition. The success of any training programme depends greatly on the perception of the trainees towards it. Hence it is worthwhile to assess the impact of training on cultivation of maize with drip irrigation in term of trainees' perception so that the farmers may adopt these technologies and enhance their production with low cost and environmentally safe condition. The training brings out the required change in the individuals behavior for improving his performance therefore, to determine the impact of training on Maize production technology. The present study was under taken with the following objectives:

- To study the personal characteristics of trained and untrained maize growers.
- To determine the level of knowledge and adoption of maize production with drip irrigation among the trained and untrained farmers.
- To explore the relationship between personal characteristics of trained and untrained farmers with their knowledge and adoption of drip irrigation in Maize production.
- To find out the constraints experienced by the maize growers.

Materials and Methods
In order to fulfill these objectives, the study was conducted during 2020 in purposively selected Barwani and Sendhwa blocks of Barwani district of West Nimar region M.P, due to its having maximum number of trained farmers in Maize production technology. A list of villages where training programmes on drip irrigation in Maize production technology were conducted by KVK was prepared and out of which 4 villages (2 from each block) were selected randomly. A village wise list of trained farmers, who are trained about drip irrigation in Maize production technology by Krishi Vigyan Kendra was prepared and from each village fifteen trained and fifteen untrained farmers was selected by using simple random sampling method. Thus, the total sample was consisted of 120 respondents for the study. The data were collected with the help of pre-tested interview schedule. The data thus collected was tabulated and presented in the form of tables and graphs as per necessity. Keeping in view the objectives of the study and to draw logical results mean, percentage, standard deviation and correlation tests was applied where they were required.

Results and Discussion
A. Distribution of trained and untrained farmers according to their personal characteristics
The data in Table-1 shows that that the majority of the trained farmers were of middle and young age group, educated up to middle and primary school level, had medium social participation, having small and medium size of land holding, medium range of annual income (53.33%), low and high irrigation potential, medium source of information (75.00%), medium innovativeness (58.33%) and medium cosmopoliteness (46.67%).

The data presented in Table-1 reveals that the majority of untrained farmers were in middle aged group (41.67.00%), educated up to middle and primary school level, had medium social participation (48.33%), having small size of land holding (41.67%), medium range of annual income (55.00%), low to medium irrigation potential, medium source of information (75.00%), medium innovativeness (56.67%) and medium cosmopoliteness (45.00%).

B. Knowledge and adoption of Maize production with drip irrigation among the trained farmers and untrained farmers
I. Overall knowledge of Maize production with drip irrigation among the trained and untrained farmers
The data in Table-2 shows that out of the total 60 trained farmers, majority 60.00 per cent respondents had medium knowledge about drip irrigation in Maize production category, while 25.00 per cent respondents had high level of knowledge about Maize production through drip irrigation technology and only 15.00 percent of the respondents had low level of knowledge about drip irrigation technology in Maize production. The overall mean and SD score of this category was found to be 12.66 and 3.94 respectively.

It can be also concluded that out of the total 60 untrained farmers, majority 58.33 per cent respondents had medium knowledge about Maize production with drip irrigation technology category, while 28.33 per cent respondents had low level of knowledge about drip irrigation technology in Maize production and only 13.34 percent of the respondents had high level of knowledge about drip irrigation in Maize production technology. The overall mean and SD score of this category was found to be 10.71 and 3.64 respectively.

The t-test indicated that the mean score of trained farmers Vs untrained farmers varied significantly, from each other.

Thus, it can be concluded that majority of the trained as well as untrained farmers were in medium category regarding knowledge about drip irrigation in Maize production technology. Wadge *et al.* (2018) [5] and Ranawat *et al.* (2012) [6] also reported majority of the respondents had medium level of knowledge.

II. Overall adoption of maize production with drip irrigation among the trained and untrained farmers
The data compiled in Table-3 revealed that out of the total 60 trained farmers, majority 58.33 per cent respondents had medium adoption of maize production with drip irrigation technology category, while 21.67 per cent respondents had high adoption of maize production with drip irrigation and only 20.00 percent of the respondents had low adoption of drip irrigation in Maize production technology. The overall mean and SD score of this category was found to be 8.77 and 3.53 respectively.

It can be also concluded that out of the total 60 untrained farmers, majority 55.00 per cent respondents had medium adoption of Maize production with drip irrigation technology category, while 33.33 per cent respondents had low adoption of maize production with drip irrigation and only 11.67 percent of the respondents had high adoption of drip irrigation in Maize production technology. The overall mean & SD score of this category was found to be 7.54 and 3.47 respectively. The t-test indicated that the mean score of trained farmers Vs untrained farmers varied significantly, from each other.

Thus, it can be concluded that majority of the trained as well as untrained farmers were in medium category regarding

adoption of maize production with drip irrigation. Wadge *et al.* (2018) [5], Ranawat *et al.* (2012) [6] and Chouhan *et al.* (2013) also revealed that majority of the respondents found in medium category of adoption.

Impact: After Intervention of KVK, more than 30 percent of the area of Maize crop covered under drip irrigation and overall area of maize crop is also increased. (More than 70,000 ha. area is covered under maize crop in Barwani district. Source- Deptt. of Agriculture
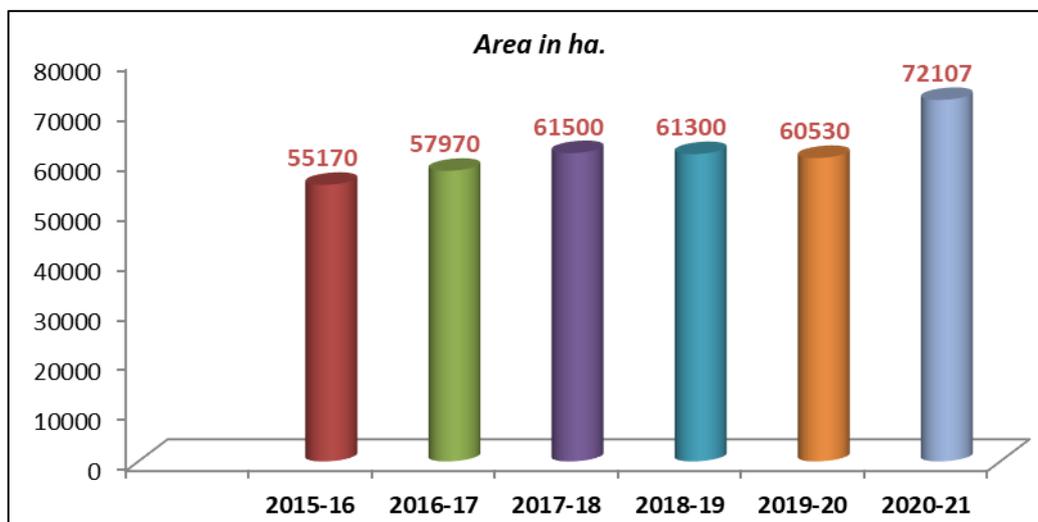
Overall area of Maize crop is increased in the District

C. Relationship between personal characteristics of trained and untrained farmers with their knowledge and adoption of Maize production with drip irrigation-
It is evident from the Table-4 that out of nine independent attributes of trained farmers i.e. education, social participation and innovativeness were found significant with knowledge about maize production with drip irrigation at 1% level of significance while size of land holding, irrigation facility, source of information and cosmopoliteness were found significant with knowledge about maize production technology at 5% level of significance and only one attributes found non significant i.e. age.
It is revealed that in case of untrained farmers, out of nine independent attributes, only education, social participation, size of land holding, annual income and irrigation potential and source of information were significant with knowledge about maize production with drip irrigation while age, innovativeness and cosmopoliteness were no significant relationship with knowledge about Maize production technology.
In case of trained farmers, Table-5 shows that out of nine independent attributes, education, social participation, land holding, source of information, innovativeness and cosmopoliteness were found significant with adoption of

maize production with drip irrigation at 1% level of significance and rest of the attributes found significant with adoption of Maize production technology at 5% level of significance except age.
It is revealed that in case of untrained farmers, out of nine independent attributes, only age and cosmopoliteness were found no significant relationship with adoption of maize production with drip irrigation and rest of the attributes were found in significant relationship with adoption of Maize production technology.

D. Constraints experienced by maize growers both trained and untrained farmers
Multiple responses were taken to ascertain the constraints faced by the maize growers both trained and untrained farmers in production and marketing of maize. Various constraints are presented in Table-6 Maximum number of respondents were reported that high cost of inputs, 78.33 per cent. In the next order, non availability of labor was accounted by 73.33 per cent maize growers. High wages of labor was also serious constraint which was faced by 71.67 per cent maize growers. In the next order, abnormal weather condition was one of the major problems which were articulated by 50.00 per cent maize growers.

Table 6: Constraints faced by maize growers both trained and untrained farmers

SN	Particulars	Frequency	Percentage	Rank
1	Timely unavailability of inputs	37	30.83	VI
2	High cost of inputs	94	78.33	I
3	non availability of labor	88	73.33	II
4	high wages of labor	86	71.67	III
5	Abnormal weather conditions	60	50.00	IV
6	High weed infestation	35	29.16	VII
7	Low price for maize	52	43.33	V

Another constraint was low price for grain was expressed by 43.33 per cent maize growers they need minimum support price for output. Another constraint was high weed infestation which was expressed by 29.16 per cent of maize and 30.83

per cent maize growers were facing constraint of timely unavailability of inputs. The findings of Chahal and Katariya (2010) [1] and Krishana *et al.* (2018) [3] were in the same line of the present finding.

Table 1: Distribution of trained and untrained farmers according to their personal and socio-economic characteristics

S.N.	Categories	Trained farmers	Mean	SD	Untrained farmers	Mean	SD
1	Age						
	Young	21 (35.00)			25(41.67)		
	Middle	22 (36.67)	1.93	0.79	17(28.33)	1.88	0.84
	Old	17 (28.33)			18(30.00)		
2	Education						
	Illiterate	6 (10.00)			9(15.00)		
	Primary school	16 (26.67)			17(28.33)		
	Middle school	20 (33.33)	1.91	1.10	18(30.00)	1.73	1.18
	High school	13 (21.67)			13(21.67)		
	Higher second. & above	5 (8.33)			3(5.00)		
3	Social participation						
	Low	23 (38.33)			24(40.00)		
	Medium	29 (48.33)	1.75	0.67	29(48.33)	1.71	0.66
	High	8 (13.34)			7(11.67)		
4	Size of land holding						
	Marginal	13 (21.66)			13(21.66)		
	Small	24 (40.00)	2.28	0.94	25(41.67)	2.30	0.97
	Medium	16 26.67)			13(21.67)		
	Large	7 (11.67)			9(15.00)		
5	Annual income						
	Low	17 (28.33)			23(38.33)		
	Medium	32 (53.33)	1.90	0.68	33(55.00)	1.68	0.59
	High	11 (18.33)			4(06.67)		
6	Irrigation potential						
	Low	23 (38.33)			23(38.33)		
	Medium	15 (25.00)	1.98	0.87	20(33.33)	1.90	0.81
	High	22 (36.67)			17(28.34)		
7	Source of information						
	Low	8 (13.33)			9(15.00)		
	Medium	45 (75.00)	4.76	1.43	45(75.00)	4.71	1.49
	High	7 (11.67)			6(10.00)		
8	Innovativeness						
	Low	11 (18.33)			11(18.33)		
	Medium	35 (58.33)	6.05	1.70	34(56.67)	6.16	1.67
	High	14 (23.34)			15(25.00)		
9	Cosmopoliteness						
	Low	11 (18.33)			23(38.33)		
	Medium	28 (46.67)	2.16	0.71	27(45.00)	1.78	0.71
	High	21 (35.00)			10(16.67)		

Table 2: Distribution of the trained and untrained farmers according to their knowledge about drip irrigation technology in maize production

S.N.	Categories	Trained farmers	Percentage	Untrained farmers	Percentage
1	Low	09	15.00	17	28.33
2	Medium	36	60.00	35	58.33
3	High	15	25.00	8	13.34
	Total	60	100.00	60	100.00
	Mean	12.66		10.71	
	SD	03.94		03.64	
	t	02.021*			

*significant at 0.05 level of probability

Table 3: Distribution of the trained and untrained farmers according to their adoption of drip irrigation technology in maize production

S.N.	Categories	Trained farmers	Percentage	Untrained farmers	Percentage
1	Low	12	20.00	20	33.33
2	Medium	35	58.33	33	55.00
3	High	13	21.67	07	11.67
	Total	60	100.00	60	100.00
	Mean	08.77		07.54	
	SD	03.53		03.47	
	t	02.002*			

*significant at 0.05 level of probability

Table 4: Relationships between attributes of trained and untrained farmers with their level of knowledge about drip irrigation in maize production technology

S. N.	Attributes	Trained farmers		Untrained farmers	
		Correlation coefficient 'r'	t-value	Correlation coefficient 'r'	t-value
1	Age	0.031[NS]	0.311	0.112[NS]	1.012
2	Education	0.728**	8.328	0.562**	5.311
3	Social participation	0.339**	2.651	0.377**	2.913
4	Size of land holding	0.214*	1.831	0.261*	2.142
5	Annual income	0.254*	2.082	0.259*	2.125
6	Irrigation potential	0.283*	2.332	0.313*	2.426
7	Source of information	0.279*	2.295	0.332*	2.772
8	Innovativeness	0.316*	2.446	0.118[NS]	1.455
9	Cosmopoliteness	0.248*	1.874	0.128[NS]	1.060

** Significant at 1% level of probability * Significant at 5 % level

Table 5: Relationships between attributes of trained and untrained farmers with their level of adoption of drip irrigation in maize production technology

S. N.	Attributes	Trained farmers		Untrained farmers	
		Correlation coefficient 'r'	t-value	Correlation coefficient 'r'	t-value
1	Age	0.040[NS]	0.320	0.176[NS]	1.285
2	Education	0.621**	5.893	0.546**	5.092
3	Social participation	0.362**	2.910	0.315*	2.473
4	Size of land holding	0.399**	3.274	0.318*	2.464
5	Annual income	0.239*	1.791	0.315*	2.508
6	Irrigation potential	0.264*	2.342	0.264*	2.078
7	Source of information	0.294*	2.084	0.388**	3.137
8	Innovativeness	0.347**	3.004	0.107[NS]	2.045
9	Cosmopoliteness	0.388**	2.698	0.056[NS]	0.414

** Significant at 1% level of probability * Significant at 5 % level

Conclusion
KVK is playing most important role in dissemination of technology. Majority 60.00 per cent respondents (trained farmers) had medium knowledge about maize production with drip irrigation category. Out of the total 60 untrained farmers, majority 58.33 per cent respondents had medium knowledge about maize production with drip irrigation category. Majority 58.33 per cent respondents (trained farmers) had medium adoption of drip irrigation technology in Maize production category. Out of the total 60 untrained farmers, majority 55.00 per cent respondents had medium adoption of with drip irrigation Maize production category. Education was found very important factor and it had highly significant with knowledge and adoption of trained farmers. High cost of inputs was the major constraints reported by 78.33 per cent maize growers. As evinced in this study, drip irrigation is an important viable technology for water conservation, labor saving and to overcome water stress during drought situations.

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