Original Research Article

Knowledge and Adoption of *Kharif* Maize Production Technology among the Farmers

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A B S T R A C T

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The present study was conducted in Aurangabad district of Marathwada region in Maharashtra state with an objective to analyse knowledge and adoption of *kharif* maize production technology among the farmers. The data were collected by personally interviewing the selected 120 respondents with the help of structured interview schedule. Results of the study revealed that 91.66 per cent of respondents had knowledge about suitable soil for cultivation of *kharif* maize crop, 97.50 per cent of them had knowledge of recommended ploughing and harrowing and 87.50 per cent of them had knowledge about application of compost / FYM for *kharif* maize crop. Majority of the respondents (93.33 %) had knowledge about seed rate while 95.83 per cent of them had knowledge about recommended spacing. Whereas 65.00 per cent respondents had knowledge about proper sowing time and 70.83 per cent respondents had knowledge about recommended dose of NPK fertilizer. It was noted that 83.33 per cent of them had knowledge about recommended herbicide and 70.83 per cent of them had knowledge about proper stage of weeding. It was clearly observed that 95.83 per cent of them had knowledge about major disease and 92.50 per cent of them had knowledge about Integrated Pest Management practices to avoid losses from insect. It was observed that majority (48.33 %) of the respondents had possessed medium level of knowledge, followed by 36.67 per cent and 15.00 per cent of them had high and low level of knowledge about *kharif* maize production technology, respectively. The data regarding adoption revealed that, 75.00 per cent of respondents had full adoption of recommended soil type, whereas cent per cent respondents followed practices of proper sowing time. Only 10.00 per cent respondents fully adopted thinning as per recommendation. The data also shows that cent per cent of the respondents hand weeding their crop at proper stage. As regards to pest management, 70.83 per cent of them had fully adopted the control measures of pest. Whereas 45.00 per cent of them had fully adopted the control measures practices of diseases as per recommendation. As regards harvesting of crop, it was clear that 98.33 per cent of respondents had harvested their crops at proper maturity stage. Results revealed that majority (68.33 %) of farmers had medium level of adoption, followed by 16.67 per cent and 15.00 per cent of respondents had low and high level of adoption of recommended practices of *kharif* maize production technology.

Introduction

Maize is one of the most important cereal crops in India. It has very high yield potential, there is no cereal on the earth which has so immense potentially and that is why it is called as "Queen of the cereals". Maize is versatile crop grown over a range

of agro–climatic zones. Maize is principally a rainy season crop but grown in all three season *Kharif*, *Rabi* and Summer. The major producers of Maize in the world are China, European community, Brazil, Mexico, Argentina and South Africa. USA stands first in production, followed by China and Brazil, Mexico, France, Argentina, Romania and India stands on 8th position of production. In a country like India, where majority of the population depends vegetarian diet, maize offers a good source of energy. Maize has a great importance as a food and fodder crop for human as well as animal. It is also useful for industrial purposes.

Maize crop furnishes huge quantities of green fodder, grown throughout the year and can be fed to cattle at any stage of growth. Sweet corn as fodder for milch animal increase fat percentage in the milk. In industrial production or manufacture of starch, syrup, alcohol, acetic acid, glucose, sugar, milk, paper, rayon, plastic, textile, adhesive, dyes, synthetic rubber, raisins, artificial leather and shoe polish, maize is used on large scale. *Kharif* Maize is short duration crop, hence it becomes possible for farmers to take next crop and utilize available soil moisture under rainfed conditions. Due to which maize cultivation has popularity among farmers and it is replacing jowar crop very rapidly. It has over taken sorghum and pearl millet in India. *Kharif* maize cultivation has becomes prominent in Aurangabad and Jalna districts of Marathwada region of Maharashtra from last 8 to 10 years. The acreage under maize crop increased, but as compared to acreage, the yield has not been increased. The average yield after following all the recommended practices is expected to be 45 to 50 q/ha, but average productivity of maize crop in India in general and Maharashtra in particular, is low mainly because of non-

adoption or low adoption and low knowledge about improved cultivation practices of maize by the farmers. There is a need to increase maize yield, it is therefore, necessary to create awareness among farmers about improved cultivation practices and motivate them for adoption of recommended improved cultivation practices. The present research, therefore, aims to know the extent of knowledge and adoption of *kharif* maize production technology among the growers with following specific objectives;

To study the knowledge of the respondents about *kharif* maize production technology.

To study the adoption of recommended *kharif* maize production technology by the respondents.

Materials and Methods

The present study was conducted in Aurangabad district of Marathwada region in Maharashtra state which was purposively selected for the study taking into account the maximum area under *kharif* maize crop in the Marathwada region. Out of nine talukas of Aurangabad district Kannad and Sillod tahsils have been purposively selected because these tehsils constituted maximum area under *kharif* maize cultivation. Eight villages from two talukas were selected purposively for the study. Fifteen *kharif* maize growers were selected randomly by lottery sample method from each village, who was having cultivated area under *kharif* maize crop. Thus a total of 120 respondents were selected as sample respondents for the study. The data were collected by personally interviewing the selected respondents with the help of structured interview schedule. The statistical methods such as percentage, frequency, standard deviation and mean were used for analysing the data.

Results and Discussion

Knowledge of respondents about *kharif* maize production technology

The data pertaining to knowledge of respondents about *kharif* maize production technology have been given in Table 1. It was revealed from Table 1 that 91.66 per cent of respondents had knowledge about suitable soil for cultivation of *kharif* maize crop, 97.50 per cent of respondents had knowledge of recommended ploughing and harrowing and 87.50 per cent of them had knowledge about application of compost / FYM /ha for *kharif* maize crop. It was further observed Table 1 that 80.83 per cent and 87.50 per cent of the respondents had knowledge about recommended early and late varieties / hybrids of *kharif* maize crop, respectively. Majority of the respondents (93.33 per cent) had knowledge about seed rate of *kharif* maize crop, whereas recommended seed treatment was known to 58.33 per cent respondents. It was also noticed that 95.83 per cent respondents had knowledge about spacing. Whereas 65.00 per cent respondents had knowledge about proper sowing time for *kharif* maize.

In case of application of chemical fertilizers, it was observed that 70.83 per cent respondents had knowledge about recommended dose of NPK fertilizer for *kharif* maize. Whereas 81.66 per cent of respondents had knowledge about basal dose of NPK fertilizer and 76.66 per cent of respondents had knowledge about application of top dressing. It was also revealed that 50.00 per cent respondents had knowledge about intercultural operations thinning at 8-10 day after sowing.

Regarding intercultural operations, it was noted that 83.33 per cent of respondents had knowledge about recommended herbicide and 70.83 per cent of them had knowledge about proper stage of weeding of *kharif* maize. It was noticed that 90.00 per cent respondents had knowledge about proper stage of irrigation whereas 41.66 per cent of respondents had knowledge about inter cropping system.

It was clearly revealed Table 1 that 98.33 per cent of respondents had knowledge about major pest observed on *kharif* maize crop, whereas 62.50 per cent of respondents had knowledge about sucking pest, 71.66 per cent of respondents had knowledge about stem borer. It was clearly observed that 95.83 per cent of respondents had knowledge about major disease on *kharif* maize, whereas 33.33 per cent of respondents had knowledge about seed treatment and 92.50 per cent of them had knowledge about Integrated Pest Management practices to avoid losses from insect of *kharif* maize.

Further, it was noticed that 83.33 per cent of the respondents had knowledge about harvesting of early varieties of *kharif* maize, 90.00 per cent of them had knowledge about harvesting of late and medium varieties. Whereas cent per cent of the respondents had knowledge about maturity signs of *kharif* maize for harvesting.

Overall knowledge level

From Table 2, it was observed that majority (48.33 per cent) of the respondents had possessed medium level of knowledge, followed by 36.67 per cent and 15.00 per cent of them had high and low level of knowledge about *kharif* maize production technology, respectively.

Similar findings were noted by Mane (2012), Deshmukh (2014) Singh *et al.,* (2014) and Shinde (2014).

Table.1 Distribution of respondents according to their knowledge about
Kharif maize production technology

(N=120)

Recommended *Kharif* Maize Production Technology	Frequency	Percent
Preparatory tillage		
Proper soil for cultivation	110	91.66
One deep ploughing and 2-3 harrowings	117	97.50
Application of FYM / compost (25 carts / ha)	105	87.50
Seed and sowing		
Recommended early varieties / hybrids	97	80.83
Recommended late varieties / hybrids	105	87.50
Seed rate (15-20 kg/ha.)	112	93.33
Seed treatment with azatobacter / thiram	70	58.33
Spacing (60 X 30 cm)	115	95.83
Proper sowing time	78	65.00
Application of chemical fertilizer		
Recommended dose of fertilizer (NPK 150:75:75 kg /ha)	85	70.83
Application of basal dose of fertilizer	98	81.66
Application of half dose nitrogen one month after sowing	92	76.66
Intercultural operations		
Thinning (8-10 days after sowing)	60	50.00
Proper stage of weed management	85	70.83
Recommended herbicide	100	83.33
Irrigation management		
Proper stage of irrigation	108	90.00
Intercropping / Mixed cropping		
Kharif maize + black gram intercropping system	50	41.66
Plant protection		
Major pest of *kharif* maize	118	98.33
Insecticide to control sucking pest	75	62.50
Insecticide to control stem borer	86	71.66
Major diseases of *kharif* maize	115	95.83
Seed treatment to control diseases	40	33.33
IPM to control insect	111	92.50
Harvesting		
Proper stage of harvesting of early varieties	100	83.33
Proper stage of harvesting of late and medium varieties	108	90.00
Maturity sign of the *kharif* maize	120	100.00

Table.2 Distribution of respondents according to their level of overall knowledge about *kharif*
maize production technology

(N=120)

Category	Frequency	Percentage
Low (up to22)	18	15.00
Medium (23 to 30)	58	48.33
High (above 31)	44	36.67

Table.3 Practice wise adoption of k*harif* maize production technology by the respondents

(N=120)

Recommended practices	Full adoption		Partial adoption		Non adoption	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Preparatory tillage						
Selection of proper soil	90	75.00	30	25.00	00	00
One deep ploughing and 2-3 harrowing	115	95.83	05	4.16	00	00
Application compost/ FYM (25carts/ha)	45	37.50	60	50.00	15	12.50
Seed and sowing						
Recommended seed rate (15-20 kg/ha)	110	91.66	10	8.33	00	00
Use of improved and hybrid varieties	15	12.50	75	62.50	30	25.00
Recommended sowing time (Jun to July)	120	100.00	00	00	00	00
Recommended spacing (60 X 30 cm)	56	46.66	49	40.83	15	12.50
Seed treatment with Azatobactor	19	15.83	30	25.00	71	59.16
Seed treatment with Thiram	25	20.83	45	37.50	52	43.33
Fertilizer management						
Recommended dose of fertilizer	50	41.66	70	58.33	00	00
Application of basal dose of fertilizer	60	50.00	60	50.00	00	00
Application of half nitrogen dose	50	41.66	55	45.83	15	12.50
Intercultural operations						
Thinning	12	10.00	25	20.83	83	69.16
Hand weeding at proper stage	120	100.00	00	00	00	00
Use of herbicide	20	16.66	30	25.00	70	58.33
Irrigation management	45	37.50	28	23.33	47	39.16
Plant protection measures						
Control measure of insects	85	70.83	25	20.83	10	8.33
Control measure of disease	54	45.00	22	18.33	14	11.60
Harvesting						
Harvesting at proper maturity stage	118	98.33	2	1.66	9	7.50
Harvesting by threshing machine	52	43.33	56	46.66	22	18.33

Table.4 Distribution of respondents according to their level of overall adoption of *kharif* maize production technology

(N=120)

Category	Frequency	Percentage
Low (up to 20)	18	15.00
Medium (21 to 28)	82	68.33
High (above 29)	20	16.67
Total	120	100.00

Adoption of respondents about *Kharif* maize production technology

The data revealed in Table 3 that, 75.00 per cent of respondents had full adoption of recommended soil type for *kharif* maize cultivation, whereas 25.00 per cent of farmers selected the soil type partially. While, 95.83 per cent of them were full adopted practice of one ploughing and two-tee harrowing operations as a preparatory tillage practices. As regards to the application of FYM / compost, data revealed that fully adoption was done by only 37.50 per cent of respondents, 50.00 per cent of respondents applied FYM / compost partially to their crop and 12.50 per cents respondents had no adoption of FYM /compost to their crop. As far as use of improved and hybrid seeds is concerned, it was observed that there was full adoption of seeds of improved and hybrid varieties by 12.50 per cent respondents, 62.50 per cent of respondents adopted partially and 25.00 per cent of respondents non- adopted. Similarly, 91.66 per cent respondents used recommended seed rate (i.e. 15-20 kg/ha) fully, and 8.33 per cent respondents used recommended seed rate partially.

As about to sowing time, cent per cent respondents followed practices of proper sowing time. Whereas, 46.66 per cent respondents had adopted spacing (60X30 cm) fully while, 40.83 per cent of respondents adopted spacing partially and 12.50 per cent of respondents had not adopted recommended spacing of sowing.

It was noticed that only 15.83 per cent of respondents treated the seed with azatobacter fully, 25.00 per cent respondents treated seed partially and 59.16 per cent of them had not treated the seed. Only 20.83 per cent respondents treated with thiram (2-2.5 gm/kg.) fully, 37.50 per cent respondents treated seed partially and against 43.33 per cent respondents who had not adopted seed treatment. As per recommended fertilizer doses, 41.66 per cent respondents applied dose fully, whereas, 58.33 per cent of them adopted partially. Whereas 50.00 per cent of respondents had applied first split dose fully and 50.00 per cent of respondents had applied partially. While 41.66 per cent of respondents had applied half nitrogen dose of fertilizer fully and 45.83 per cent of respondents had applied half nitrogen dose partially. In case of intercultural operations, 10.00 per cent respondents fully adopted thinning as per recommendation, whereas 20.83 per cent of them adopted it partially and 69.16 per cent of them had not adopted it as intercultural operations. The data also shows that cent per cent of the respondents hand weeding their crop at proper stage as per the recommendation. Whereas only 16.66 per cent of respondents fully adopted the practice of herbicide use as per recommendation, 25.00% respondents adopted it partially and 58.33 per cent of respondents had not adopted it. As regards to the application of irrigations, it revealed that full adoption was done by only 37.50 per cent respondents, while, 23.33 per cent respondents had applied partially and 39.16 per cent of respondents not adopted irrigations to their crop.

As regards to pest management, 70.83 per cent of respondents had used fully the control measures, 20. 83 per cent of them had use partially it and 8.33 per cent of respondents not adopted it as per recommendation. Regarding to diseases management, 45.00 per cent of the respondents had fully adopted the control measures practices of diseases as per recommendation, whereas 18.33 per cent of respondents had partially adopted it and 11.60 per cent of them had not adopted the recommended disease management

practices. As regards harvesting of crop, it was clear that 98.33 per cent of respondents had harvested their crops at proper maturity stage while, 1.66 per cent of respondents had partially followed it. As regards harvested by threshing, 43.33 per cent respondents harvested as per the recommended practices fully while, 46.66 per cent harvested their crop partially.

Overall adoption level

Table 4 revealed that majority (68.33 %) of farmers had medium level of adoption, followed by 16.67 per cent and 15.00 per cent of respondents had low and high level of adoption of recommended practices of *kharif* maize production technology.

Similar findings were noted by Mane (2012), Deshmukh (2014) Singh *et al.,* (2014) and Shinde (2014).

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