Research Article

Adoption of improved cultivation practices of *Kharif* rice crop and constraint faced by the farmers of Kheda district of middle Gujarat

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SUMMARY : Rice is the most important and extensively grown food crop in India. It is the staple food crop for more than half of the world. Rice is grown on about 44 per cent of the total area under cereals crop and it contributed about 45 per cent of the total cereal production in India. In Gujarat state, district Kheda is ranked first in production and area with the area 0.095 million ha and 0.23 million tonne production. The present study was undertaken in Matar taluka of Kheda district with the specific objectives to study the adoption of improved cultivation practices of *Kharif* rice crop and constraints faced by the farmers of Kheda District in Gujarat. Majority of the respondents had medium level to high level of adoption about improved cultivation practices of rice. About 74 per cent of the respondents had medium level of adoption where as 16 per cent respondents had high level of adoption about improved cultivation practices of rice. Majority of the respondents had adopted hand weeding practices and no. of hand weeding required, land preparation, application of FYM, used improved varieties, suitable soil type, selection of land for nursery preparation practices etc. While least adopted practices were TP system (Line sowing), seed treatment, disease control method, seed treatment by bio- fertilizers, marketing of harvested produce and chemical weed control etc., respectively.

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BACKGROUND AND OBJECTIVES

Rice is the most important and extensively grown food crop in India and is the staple food for more than half of the world. It is not only a cereal crop, but also a way of life in Asian countries. Rice is grown on about 44 per cent of the total area under cereals and it contributes about 45 per cent of the total cereal production in India. It also contributes about 40 to 70 per cent of the population's total calorie intake. Hence, sustained production and increased productivity of rice crop is critical for food and nutritional security in Asia. Rice (*Oryza sativa* L.) has recognition as a supreme commodity to mankind, because rice in truly life, culture, a tradition and means of livelihood to millions of people all over the world.

India has the largest area(43.3m.ha in 1996-97) under the rice in the world, yet the average productivity of rice in India is only 2.9 t. ha which is less than half of that USA(6.75t ha.) China (6.3 t ha.) and Japan (6.4 t.ha.) (Prasad, 1999).

Rice production in India in the year 2005-06 was 91.79 million tonne with the area of 43.66 million ha. Average rice production in the Gujarat state is 7.28 per cent (19.49 q/ha.) less than national average production. The present level of rice production in India needs to be increased in order to meet the ever increasing demand. It is estimated that India will require 100 million tonnes in 2010 and 140 million tonnes of rice in 2025 against the present 91.79 million tonnes. The required level of production can be achieved through the increased production which requires high management practices; efficient input supply system, quality genetic material and above all the understanding and knowledge of the practicing

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farmers need to be strengthened to respond to the challenge.

In case of production of state rice, in the year 2007-08 it is approximately 1.03 million tonnes in 0.45 million hectares with the productivity of 22.73 quintal per hectare. In case of Kheda district, irrigated rice is being cultivated in the area of 0.095 million ha with production of 0.23 million tonnes and productivity was 24.55 quintal per ha. District is first in the area and production in Gujarat state.

Efforts are being made for transfer of scientific information to the farmers at a good pace. But there are still gap exist between scientific information as recommended practices and practices followed by farmers. This may be one of the reasons for adoption gap. The extent of yield gap is very high under Indian condition as compared to global productivity. Even in India, Punjab, Tamil Nadu, Hariyana, Andhra Pradesh West Bengal and Kerala states possess more yield of rice as compared to Gujarat state.Therefore, it becomes necessary to study the adoption level of rice grower about improved cultivation practices of rice crop and what are the constraints rice grower facing in adoption of improved cultivation practices of *Kharif* rice crop.

The present research study was undertaken to find out the extent of adoption by the rice growing respondents about improved cultivation practices of rice crop and to find out the constraints faced by the rice growers in adoption of improved cultivation practices of rice crop.

RESOURCES AND METHODS

The present study was carried out in the Kheda district of Gujarat state. A multistage sampling design was adopted to select sample for data collection for the present study. For this purpose, the study was conducted by interviewing 100 *Kharif* rice growers from four villages of the Matar Taluka of Kheda district. So as to collect the information in line with the objective of the study, a well structured interview schedule was prepared,. Personal interview technique was used for data collection. All the practices for *Kharif* rice cultivation recommended by Anand Agricultural University, Anand were considered. Score '1' and '0' was given for correct and incorrect responses, respectively. Based on the cumulative adoption score obtained, the respondents were categorized into three categories *viz.,* low, medium and high. Percentile was used to find out the adoption level of the farmers and frequency and rank method was used to identify the constraints as perceived by *Kharif* rice growers.

OBSERVATIONS AND ANALYSIS

The data depicted in Table 1 show that majority of the respondents (74%) were having medium level of adoption about improved cultivation practices of rice. 16 per cent were in high adoption category and only 10 per cent of them had a low level of adoption about improved cultivation practices of rice. It could be concluded from findings depicted in Table 1 that majority of the respondents had medium level of adoption of improved cultivation practices of rice.

Table 1: Distribution of the respondents according to their overall adoption about improved cultivation practices of rice

(n=100)

Sr. No.	Adoption level	Respondents (n = 100)	
		Number	Percentage
1.	Low (upto 9.48)	10	10
2.	Medium (9.48 to 17.88)	74	74
3.	High (17.88 and above)	16	16
	Total	100	100

(Average adoption = 13.68)

Adoption about improved cultivation practices of rice:

In case of adoption of improved cultivation practices of rice, Table 2 depicts that most of the respondents (94 %) had adopted hand weeding and number of hand weeding required followed by the application of FYM and land preparation (each 86 %). Majority of the rice growing farmers (75%) tried to control harmful insect and accordingly adopted the use of insecticides for control of insects. A handful of the rice growing farmers (73%) adopted improved varieties of *Kharif* rice crop. 72 per cent of the respondents were adopted suitable soil type and almost similar no. of the rice growers (71%) adopted the methods of selection of land for nursery preparation practices. While among least adopted practice, only 2 per cent of the rice growers' farmers had adopted the line sowing method of rice transplanting followed by seed treatment (12%) and disease control methods (14%). Other least adopted practices were seed treatment by bio-fertilizers (20%), marketing of harvested produce (20%), type of pesticides used for control of disease (24%) and chemical weed control (26%) etc. These findings are similar with those reported by Tambat and Shindesai (2009).

Constraint faced by respondents in adoption of improved cultivation practices of rice:

In case of constraints faced by the rice growers, the Table 3 reveals that most important constraint faced by rice growing farmers of the Kheda district was lack of timely and adequate availability of irrigation water. 78 per cent rice growers opined that they are not getting irrigation water on time as well as it is inadequate for crop hence this constraint was ranked 1st by rice growing farmers. Lack of adoption about appropriate chemical pesticides and its concentration used for controlling pest and diseases and lack of facility for farm produce storage were observed as constraints by 62 per cent and 54 per cent rice growing farmers, respectively and perceived 2nd and 3rd ranks.

Other constraints faced by the rice growing farmers

Table 2 : Adoption about improved cultivation practices of rice   (n = 100)

Sr. No.	Particular	Adoption	Percentage
1.	Suitable soil type	72	72
2.	Land preparation	86	86
3.	Improved varieties used	73	73
4.	How much area of nursery needed for one ha.	58	58
5.	Selection of land for nursery preparation	71	71
6.	Chemical fertilizer (N P K) applied	43	43
7.	How many day old nursery plant used for TP ?	42	42
8.	In which month TP was carried out ?	40	40
9.	TP system (Line sowing Method)	2	2
10.	Type of insect infestation founded in nursery	58	58
12.	Type of disease infestation found in nursery	20	20
13.	Type of pesticides used for control of diseases	24	24
14.	Seed rate (For nursery)	48	48
15.	Seed treatment	12	12
16.	Seed treatment by bio-fertilizer	20	20
17.	Spacing between row and plant	53	53
18.	Application of FYM (Quantity)	86	86
19.	Application of Chemical Fertilizer (N P K)		
	Nitrogen	33	33
	Phosphorus	44	44
20.	Water management	35	35
21.	Hand weeding in practice or not and no. of hand weeding	94	94
22.	Chemical weed control	26	26
23.	Harmful insect infestation	75	75
24.	Insecticide used for control of insect	66	66
25.	Disease infestation in rice crop	41	41
26.	Disease control method	14	14
27.	Crop yield / ha.	70	70
28.	Marketing of harvested produce	20	20

Table 3 : Constraint faced by respondents in adoption of improved cultivation practices of rice

Sr. No.	Constraints	Frequency	Percentage	Rank
1.	Lack of timely availability of certified seed locally	10	10	XV
2.	Shortage of chemical fertilizers during the season	28	28	X
3.	Timely unavailability of bio-fertilizers	6	6	XVI
4.	Lack of adoption about appropriate chemical pesticides, its concentration use	62	62	II
5.	Higher cost of agricultural inputs	33	33	VIII
6.	Soil affected by salinity	30	30	IX
7.	Small size land holding	13	13	XIV
8.	Timely unavailability of farm implements	2	2	XVII
9.	Lack of availability of timely information	26	26	XI
10.	Lack of timely and adequate availability of electricity	41	41	VI
11.	Lack of timely and adequate availability of irrigation water	78	78	I
12.	Lack of timely availability of agricultural labour	52	52	IV
13.	Lack of market facility	14	14	XIII
14.	Lower market price of agricultural produce	40	40	VII
15.	Higher transportation cost	18	18	XII
16.	Lack of facility for farm produce storage	54	54	III
17.	Other	52	52	IV

were lack of timely availability of agricultural labour (52%), lack of timely and adequate availability of electricity (41%), lower market price of agricultural produce (40%), higher cost of agricultural inputs (33%), Soil affected by salinity (30%), Shortage of chemical fertilizers during the season (28%), lack of availability of timely information (26%), higher transportation cost(18%) lack of market facility (14%) and small size of land holdings(13%) etc. While in case of least faced constraints, timely unavailability of farm implements was the constraints faced least by the rice growing farmers (2%) and ranked last (17th) followed by constraints related to timely availability of bio fertilizers (6(%) and Lack of timely availability of certified seed locally (10%) perceived 2nd and 3rd least important constraints for them.

Conclusion :

In case of adoption of improved cultivation practices of rice, majority of the respondents had medium level of adoption (74%) followed by high (16%) and low level (10%) adoption. Most of the rice growing farmers had adopted hand weeding practices and no. of hand weeding required, land preparation, application of FYM, used improved varieties, suitable soil type, selection of land for nursery preparation practices etc. While TP system (Line sowing), seed treatment, disease control method, seed treatment by bio- fertilizers, marketing of harvested produce and chemical weed control etc were among least adopted practices.

In case of constraints faced by the rice growers, most important constraints as perceived was lack of timely and adequate availability of irrigation water. Among other constraints, lack of knowledge about appropriate chemical pesticides and its concentration to be used lack of facility for farm produce storage, lack of timely availability of agricultural labour, and lack of timely and adequate availability of electricity and lower price of agricultural produce, higher cost of agricultural inputs, soil affected by salinity, shortage of chemical fertilizers during the season, lack of availability of timely information etc. The least important constraints were timely availability of agricultural implements, timely unavailability of bio fertilizers and lack of timely availability of certifies seed locally.

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