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FERTILIZER USE BEHAVIOUR OF COTTON GROWERS

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ABSTRACT

The present study was conducted in Rajsamand district of Rajasthan. Two tehsil namely Railmagra and Rajsamand were selected for the study. Total 120 cotton growers (40 marginal, 40 small and 40 large farmers were randomly selected from the identified tehsils. Data were collected by personal interview technique from selected respondents. The study revealed that 45.83 per cent cotton growers possessed medium level of fertilizer use behaviour whereas, 34.17 and 20.00 per centrespondents have high and low level of fertilizer use behaviour. The study further indicates that Urea (56.04%), Di-ammonium phosphate (35.83), Murate of potash (19.38%), Zinc sulphate (24.17%) and Azotobactor (17.71%) are commonly used by the cotton growers in cotton cultivation. It was also observed that there was a significant difference in extent of fertilizer use behaviour between marginal and large farmers in the study area.

INTRODUCTION

The major cotton growing countries are USSR, USA, China, India, Brazil, Pakistan, Turkey, Mexico and Sudan, which account for nearly 85.00 per cent of the total world's production. India ranks first in the area under cotton cultivation in the world and stands fourth in terms of production. In India, the total area under cotton crop is 12.18 million hectares with 34.09 million bales production with 476 kg/ha average yield (Anonymous, 2011). Rajasthan covers about 5.30 lakh hectares with 17.10 lakh bales production with 548 kg/ha average yield

(Anonymous, 2011). In Rajasthan cotton is mainly cultivated in Sriganganagar, Hanumangarh,

Bikaner, Jodhpur, Bhilwara, Nagaur, Sirohi, Pali, Chittorgarh, Rajsamand and Ajmer.

Keeping in view the vital role played by fertilizers in the increase of food grain and fibre production, the government of India has been consistently pursuing policies conducive to increased availability and consumption of fertilizers in the country. As a result, the annual consumption of fertilizers in nutrients terms (N, P&K), has increased from 0.7 lakh MT in 1951-

52 to 264.86 lakh MT 2010-11, while per hectare consumption of fertilizers, which was less than 1 kg in 1951-52 has risen to the level of 141.27 kg in 2010-11.

It has been observed that the use behaviour of fertilizers among farmers is uneven and sometimes there is great gulf between convictions of farmers about the fertilizer use in fields. It is a fact that constraints in the purchase and use of fertilizers play an important role because utilization behaviour of farmers may also vary from individual to individual depending on their choice for particular fertilizers brand and their socio-economical, psychological and technical factors. With this background in view, the present study was undertaken with the following specific objectives:

1. To find out the extent of fertilizer use behaviour of cotton growers.
2. To compare the extent of fertilizer use behaviour among marginal, small and large farmers.

RESEARCH METHODOLOGY

The present study was conducted in the purposely selected Rajsamand district of Rajasthan State. There are total 7 tehsils in Rajsamand district of Rajasthan, out of which Rajsamand and Railmagra tehsils were selected on the basis of maximum area under cultivation of cotton. For village selection, a comprehensive list of all the major cotton growing

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villages was prepared in consultation with the personnel of Revenue and Agriculture Department from the identified tehsils. On the basis of maximum area under cotton cultivation eight villages from identified Tehsils were selected for the present investigation. For selection of respondents, a comprehensive list of cotton growers was prepared with the help of village Patwari and agricultural supervisor of respective villages. The list so prepared 5 marginal, 5 small and 5 large farmers were selected randomly from each identified village. Thus, in all 120 farmers (40 marginal, 40 small and large farmers) were included in the sample of the study. Data were collected from selected respondents by personal interview technique with the interview schedule prepared by the investigator. Thereafter, data were analysed, tabulated and results were interpreted

RESULTS AND DISCUSSION

To get an overview of fertilizer use behaviour level, the respondents were categorized into there categories i.e.,t (i) low level (upto 6 score), (ii) Medium level (6 to 13 score) and (iii) high (above 13 score) level on the basis of calculated mean and standard deviation of the obtained scores by the respondents. The distribution of respondents in each category is presented in Table 1.

Table 1 shows that majority (45.83%) of the cotton growers had used the fertilizers at medium level. Whereas, 34.17 per cent cotton growers were categorized in high level of fertilizer use behaviour group and 20.00 per cent respondents were fell in the low level of fertilizer use behaviour group in the study area.

Table 1: Distribution of respondents on the basis of their fertilizer use behaviour in cotton crop n=120

S. No.	Fertilizer use behaviour level	Marginal farmers		Small farmers		Large farmers		Total	
		f	%	f	%	f	%	f	%
1.	Low (<6)	13	32.50	8	20.00	3	7.50	24	20.00
2.	Medium (6 -13)	16	40.00	19	47.50	20	50.00	55	45.83
3.	High (>13)	11	27.50	13	32.50	17	42.50	41	34.17
	Total	**40**	**100.00**	**40**	**100.00**	**40**	**100.00**	**120**	**100.00**

f = Frequency % = Per cent

An analysis of table further shows that 17 (42.50%) large farmers were in high fertilizer use behaviour group and only 3 (7.50%) were in low fertilizer use behaviour group, while 20 (50.00%) large farmers were found in the medium group of fertilizer use behaviour towards cotton cultivation. Likewise 20.00, 47.50 and 32.50 per cent small farmers possessed low, medium and high level of fertilizer use behaviour in cotton crop. In case of marginal farmers' category, it was observed that 32.50, 40.00 and 27.50 per cent were in low, medium and high fertilizer use behaviour group respectively. From the above rejects, it can be concluded that majority of the large farmers were reported in medium to high level of fertilizer use behaviour of cotton crop. This may be due to the fact that majority of the large farmers are educated, higher economic motivation, more cosmopoliteness and better extension contacts with extension functionaries for getting agricultural technology.

Table 2 indicates that the extent of use of Urea was highest in nitrogenous fertilizers for cotton cultivation among the marginal, small and large farmers with MPS 41.88, 61.88 and 64.38 respectively and ranked first by all the categories of respondents. The extent of use of Ammonium sulphate, it was found that marginal, small and large farmers had 6.88, 11.25 and 10.00 per cent respectively and it was ranked second by the respondents. The data presented in the table further reveals that Calcium ammonium nitrate fertilizer was applied by marginal, small and large farmers with the extent of only 2.50, 1.25 and 6.25 per cent respectively. The extent of use of Ammonium sulphate nitrate was negligible among the marginal, small and large farmers for cultivation of cotton in the study area. Further analysis of table 2 shows

that the extent of application of Single super phosphate fertilizer among marginal, small and large farmers was 28.13, 20.63 and 20.63 MPS respectively and it was ranked second by all the categories of farmers under category of phosphatic fertilizers. The extent of use of Di-ammonium phosphate it was found that 21.88, 41.88 and 43.75 per cent in marginal, small and large farmers respectively. Regarding use of Triple super phosphate the extent of application was found only 0.63, 3.13 and 1.25 per cent among marginal, small and large farmers respectively.

Regarding the use of Murate of potash for cotton cultivation, it was found that 15.00, 16.88 and 26.25 per cent among marginal, small and large farmers respectively. Whereas, use of potassium sulphate was found in very poor level by all the three categories of respondents for cotton cultivation in the study area.

The extent of use of Zinc sulphate among marginal, small and large farmers was 21.88, 18.75 and 31.88 per cent respectively and ranked first by the respondents under the group of micro-fertilizers. Regarding the use of Manganese sulphate, the extent of application was noted only 4.38, 4.38 and 6.88 per

Table 2: Extent of use of fertilizers by the farmers in cotton crop **n=120**

Use of fertilizers	Marginal farmers		Small farmers		Large farmers		Total	
	MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.Nitrogenous fertilizers								
(i) Urea	41.88	1	61.88	1	64.38	1	56.04	1
(ii)Ammonium sulphate	6.88	2	11.25	2	10.00	2	9.38	2
(iii) Calcium ammonium nitrate	2.50	3	1.25	3	6.25	3	3.33	3
(iv) Ammonium sulphate nitrate	0.63	4	0.00	4	1.88	4	0.83	4
2. Phosphate fertilizers								
(i) Single super phosphate	28.13	2	20.63	2	20.63	2	23.13	2
(ii) Di- ammonium phosphate	21.88	1	41.88	1	43.75	1	35.83	1
(iii) Triple super phosphate	0.63	3	3.13	3	1.25	3	1.67	3
3. Potassic fertilizers								
(i) Murate of potash	15.00	1	16.88	1	26.25	1	19.38	1
(ii) Sulphate of potash	0.63	2	0.00	2	0.63	2	0.42	2
4. Micro fertilizers								
(i) Zinc sulphate	21.88	1	18.75	1	31.88	1	24.17	1
(ii) Mangnese sulphate	4.38	5	4.38	5	6.88	5	5.21	5
(iii) Calcium sulphate	12.50	2	15.00	2	12.50	2	13.13	2
(iv) Iron sulphate	8.13	3	8.13	3	11.25	4	9.17	3
(v) Magnesium sulphate	5.63	4	6.88	4	9.38	3	7.29	4
5. Bio-fertilizers								
(i) Azotobactor	15.63	1	18.75	1	18.75	1	17.71	1
(ii) PSB Culture	9.38	2	8.75	2	5.00	2	7.71	2

MPS= Mean per cent score

cent among marginal, small and large farmers respectively. Further analysis of table shows that the extent of application of Calcium sulphate in marginal, small and large farmers was 12.50, 15.00 and 12.50 per cent respectively. The extent of adoption of Iron sulphate was observed that 8.13, 8.13 and 11.25 per cent among marginal, small and large farmers respectively. In other hand the extent of Magnesium sulphate was adopted 5.63, 6.88 and 9.38 per cent by the marginal, small and large farmers respectively for cultivation of cotton Regarding the extent of application of Azotobactor among the marginal, small and large farmers was recorded 15.63, 18.75 and 18.75 per cent respectively. Likewise, the extent of use of P.S.B. culture was 9.38, 8.75 and 5.00 per cent among marginal, small and large farmers respectively. It means that majority of cotton growers were not using bio-fertilizers for treatment of cotton seed.

Thus, it could be concluded that fertilizers namely Urea, Di-ammonium phosphate and Single super phosphate were commonly used by majority of the respondents for cultivation of cotton crop. Further, it was noted that the use of micro-nutrients and bio-fertilizers in cotton cultivation was very poor due to poor economic condition, high market rate of micro-fertilizers and less awareness among farmers towards micro and bio-fertilizers. The similar findings have been reported by the Manhas *et al*. (2003) who reported that the extent of adoption of manure and fertilizer application was 46.47, 57.20 and 66.47 per cent among small, medium and large farmers in cultivation of cotton crop. Singh *et al*. (2006) who observed that majority of farmers were using less or higher doses of fertilizers for different crops without consulting agricultural specialists/experts. Joshi *et al.* (2007-08) also reported that 68.18 per cent farmers were not applied the chemical fertilizers as a basal dose in cultivation of cotton crop.

Comparison of extent of fertilizer use behaviour among marginal, small and large farmers:

Analysis of variance (F test) was applied to find out the significant variation among marginal, small and large farmers about extent of fertilizer use behaviour. The results of ANOVA computed for this purpose are presented in Table 3.

Table 3: Comparison of extent of fertilizer use behaviour among different categories of farmers (n= 120)

Source of variation	d. f.	S.S.	M.S.S.	F value
Between the categories of farmers	2	180.817	90.408	25.0836**
Error	117	421.700	3.6043	
Total	**119**	**602.517**		

** Significant at 1per cent level.

Mean value table

S.N	Categories of farmers	Mean value	CD	CV
1.	Marginal farmers	7.03		
2.	Small farmers	9.50	3.078	21.26
3.	Large farmers	10.83		

Table 16 shows that calculated F value 25.0836 is higher than tabulated value at 1 per cent level of significance. Thus, there was a significant difference among marginal, small and large farmers with respect to fertilizer use behaviour in cotton cultivation. Table further shows that by comparing the mean value with critical difference (C.D.) value, it was found that there was a significant difference between large and marginal farmers about extent of fertilizer use behaviour of cotton growers. The mean value further indicates that large farmers had more mean value than small and marginal farmers. This reveals that large farmers used more quantity of fertilizers than small and marginal farmers for cotton cultivation. This may be due to the fact that large farmer had high economic status, big of land holding and more extension contact

as compared to small and marginal farmers. The present findings are conformity with the findings of Chaturvedi (2000) who found that there had been a significant variation among the IGNP and non-IGNP cotton growers with respect to adoption of improved cotton cultivation practices.

CONCLUSION

From the above study it can be concluded that nearly fifty per cent of the total respondents possessed medium level of fertilizer use behaviour whereas high and low level of fertilizer use behaviour was possessed by 34-20 per cent cotten growerss. It was further observed that fertilizers namely Urea, Diammonium phosphate and Zinc sulphate were commonly used by the farmers with extent of 56.04, 35.83 and 24.17 per cent respectively. There was a significant difference in extent of fertilizer use behaviour between the marginal and large farmers.

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