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Adoption of Nutrient Management Practices in Rice Crop – A Study of Jammu and Kashmir, India

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A B S T R A C T

The study on level of adoption regarding nutrient management practices in rice crop conducted during the year 2016 on a sample of 160 farmers drawn from eight randomly selected villages of four randomly selected blocks of Baramulla district of Jammu and Kashmir revealed that none of the respondents had applied the recommended dose/s of SKUAST-Kashmir. A substantial percentage of the respondents had applied 75-100 per cent of recommended dose/s of Urea (58.13 %,) DAP (42.40%) and MOP (52.50%) respectively at last puddling. It was also found that 51.25 percent and 40.62 percent of them had applied 75-100 per cent of 1st and 2nd top dressing of urea in the rice crop respectively. It was further noticed that only 36.88 per cent respondents had applied 50-75 percent of the recommended dose $ZnSo_4$ in rice crop. The data further revealed that a majority of the respondents applied Urea, DAP and MOP at the recommended time. So far as 1st and 2nd top dressing of Urea is concerned, almost half of the respondents applied it at the right time in the rice crop.

Introduction

Rice is not only a staple food but also a source of livelihood for the people. In India, the crop is cultivated over an area of 42.65 million hectares with a production of 104.32 million tones and productivity of 2228 kg/ha (Economic Survey 2013-14). Rice accounts for about 43 percent of total food grains production and 55 percent of cereals production of the country (FAOSTAT, 2013). Although area under rice in Kashmir accounts for about 0.27 m ha only, yet it plays a significant role in the state economy. The productivity (3.2MT/ha) in the valley is higher as compared to the National average productivity of about 1.9 MT/ha (Sharma *et al.*, 2011). In Baramulla District of J& K, the area under rice during the years 2011-12 to 2014-15 has increased from 8094 to 8514 hectares but the production during the said period has decreased from 194.39 to 144.39 thousand metric tonnes (Directorate of Economics & Statistics, J&K 2015-16). The imbalance use of nutrients has adversely affected soil health, nutrient reserve and ultimately the yield. The soil-test based fertilizer application along with judicious

combination of chemical and organics for achieving enhanced and sustainable production is the need of the hour. Integrated use of organic manures and inorganic fertilizers is desirable for stability in production through maintaining the soil productivity and soil health. Keeping this in view the present study was undertaken with specific objective of determining the level of adoption of recommended nutrient management practices in rice crop.

Materials and Methods

The present study was conducted in Baramulla District of Jammu and Kashmir. Out of 26 development blocks in District Baramulla, four Development Blocks were selected randomly for the present study. Two villages were randomly selected from each of the four Development Blocks. List of rice growers in all the eight selected villages was prepared in consultation with the concerned Agriculture Extension Officers (AEOs), Junior Agriculture Assistants (JAAs), Village Agriculture Extension Assistants (VAEAs) and other extension functionaries.

Out of the list, 160 farmers were selected through Stratified Random Sampling technique. The size of the sample from each stratum was proportional to the number of farmers in it.

The data were collected through personal interview technique with the help of pre tested interview schedule. The data were digitized, processed and analyzed with frequencies and percentages.

Results and Discussion

The main findings of the study have been discussed as under:

Adoption of FYM

Majority of the respondents (40.62%) had applied 75-100 per cent of the recommended dose of FYM, followed by 31.88 per cent who had applied 50-75 per cent of the recommended doses of FYM. The respondents who had applied below 50 per cent of recommended dose of FYM were 27.50 per cent (Table 1).

Adoption of urea

A perusal of the data in Table 2 reveals that majority of the respondents (58.13%) had applied 75-100 per cent of the recommended basal dose of Urea at last puddling.

The data also revealed that 30.62 per cent of them applied 50-75 per cent of the basal dose of urea at last puddling and the remaining (11.25%) applied below 50 percent of the recommended dose.

Adoption of Diammonium Phosphate (DAP)

A perusal of the data in Table 3 indicates that 42.50 percent of the respondents had applied 75 -100 per cent of recommended dose of DAP at last puddling followed by 33.12 per cent respondents who had applied 50-75 percent of the recommended dose of DAP at last puddling. However, those who were found to apply below 50 percent of recommended dose of DAP were 24.37 Percent only.

Adoption of Muriate of Potash (MOP)

It was noticed from Table 4 that a majority of the respondents (52.50%) had applied 75-100 per cent of the recommended dose of MOP at last puddling, followed by 36.88 per cent who had applied 50-75 per cent of the recommended dose of MOP.

Only 10.62 per cent of the respondents were found to apply below 50 of the recommended dose of MOP at last puddling.

Adoption of first top dressing of urea

The data presented in Table 5 reveals that majority of the respondents (51.25%) had applied 75-100 per cent of the recommended dose of 1st top dressing of Urea in the rice crop followed by 35.62 per cent respondents who had applied 50-75 per cent of the recommended dose of 1st top dressing of urea. The data further revealed that only 13.13 per cent respondents had applied below 50 per cent dose of 1st top dressing of urea in the rice crop.

Adoption of 2nd top dressing of urea

The data in Table 6 depicted that a substantial percentage of respondents (40.62%) applied 75-100 per cent of the recommended 2nd top dressing of Urea, followed by respondents (31.88%) who had applied 50-75 per cent of the recommended 2nd top dressing of urea. It was further revealed that only 27.50 percent respondents had applied below 50 percent of 2nd top dressing of Urea in the rice.

Adoption of zinc sulphate ($ZnSO_4$)

The data in Table 7 depicted that only 36.88 per cent respondents had applied $ZnSO_4$ in rice crop. Out of which majority of the respondents (45.77%) had applied 50-75 per cent of the recommended dose of $ZnSO_4$ in rice crop, followed by 32.20 per cent respondents who had applied below 50 per cent of the recommended dose of $ZnSO_4$. The data further reveals that only 22.03 per cent respondents had applied 75-100 per cent of the recommended dose of $ZnSO_4$ in the rice crop.

Adoption of time of application of fertilizers

The data presented in Table 8 revealed that majority of the respondents applied Urea (54.38%), DAP (70.00%) and MOP (58.75%) at the recommended time in the rice crop. Almost 50 per cent respondents applied 1st and 2nd top dressing of Urea at the recommended time in the rice crop.

Table.1 Distribution of respondents according to deviations from the recommended dose of FYM applied in rice (n=160)

Dose of FYM applied		Number of respondents	Percentage
i)	75-100% of recommended *	65	40.62
ii)	50-75% of recommended	51	31.88
iii)	Below 50% of recommended	44	27.50
* Recommended Dose of FYM = 10 t /ha			

Table.2 Distribution of respondents according to deviations from the recommended dose of Urea applied in rice (n=160)

Dose of urea applied		Number of respondents	Percentage
i)	75-100% of recommended *	93	58.13
ii)	50-75% of recommended	49	30.62
iii)	Below 50% of recommended	18	11.25
* Recommended Dose Urea (Basal) = 4 kg/kanal as basal dose before transplanting			

Table.3 Distribution of respondents according to deviations from the recommended dose of DAP applied in rice (n=160)

Dose of DAP applied	Number of respondents	Percentage
i) 75-100% of recommended *	68	42.50
ii) 50-75% of recommended	53	33.13
iii) Below 50% of recommended	39	24.37
*Recommended Dose of DAP = 6.5 kg/kanal at last puddling		

Table.4 Distribution of respondents according to deviations from the recommended dose of MOP applied in rice (n=160

Dose of Urea	Number of respondents	Percentage
i) 75-100% of recommended *	84	52.50
ii) 50-75% of recommended	59	36.88
iii) Below 50% of recommended	17	10.62
*Recommended Dose of MOP = 2.5 kg/kanal at last puddling		

Table.5 Distribution of respondents according to deviations from the recommended 1st top dressing of urea applied in rice (n=160)

Dose of urea 1st top dressing	Number of respondents	Percentage
i) 75-100% of recommended *	82	51.25
ii) 50-75% of recommended	57	35.62
iii) Below 50%of recommended	21	13.13
*Recommended 1st top dressing of urea = 3.25 kg/kanal		

Table.6 Distribution of respondents according to deviations from the recommended 2nd top dressing of Urea applied in rice (n=160)

Dose of fertilizer, urea 2nd top dressing	Number of respondents	Percentage
i) 75-100% of recommended *	65	40.62
ii) 50-75% of recommended	51	31.88
iii) Below 50% of recommended	44	27.50
*Recommended 2nd top dressing of Urea =3.25 kg/kanal		

Table.7 Distribution of respondents according to deviations from the recommended dose of $ZnSO_4$ applied in rice (n=59)

Dose of $ZnSO_4$ applied	Number of respondents	Percentage
i) 75-100% of recommended *	13	22.03
ii) 50-75% of recommended	27	45.77
iii) Below 50% of recommended	19	32.20
*Recommended Dose of $ZnSO_4$ =0.50-0.75kg/kanal		

Table.8 Distribution of respondents according to deviations from the recommended time of application of fertilizers applied in rice (n = 160)

Time of Application	Distribution of respondents according to time of application of fertilizers									
	Urea		DAP		MOP		Urea 1st top dressing		Urea 2nd top dressing	
	No. of farmers	% Age	No. of farmers	% age	No. of farmers	% Age	No. of farmers	% age	No. of farmers	% Age
Recommend* time	87	54.38	112	70.00	94	58.75	76	47.50	82	51.25
3-5 days after recommend time	73	45.62	48	30.00	66	41.25	84	52.50	78	48.75

*Recommended time of application of chemical fertilizers Urea @4kgs/kanal; DAP @ 6.5 kgs/kanal; MOP @ 2.5 kgs/kanal to be applied at last puddling. I[st] top dressing of Urea (Tillering stage) =18-22 days after transplanting (DAT) and 2 [nd] top dressing of Urea (Panicle Initiation stage) =35-40 DAT

The data further revealed that 45.62, 30.00 and 41.25 per cent respondents applied Urea, DAP and MOP 3-5 days after the recommended time in the rice crop respectively.

It is concluded while going through the data it has been observed that none of the respondents had applied the recommended doses of Urea, DAP, MOP, $ZnS0_4$ and FYM in the rice crop. There is a dire need of educating farmers that the recommended doses of fertilizers and manures should be applied in the rice crop for obtaining the potential yields through awareness camps, training programmes and Kisan Goshtis which should be conducted prior to the sowing of rice. The farmers should be provided technical backstopping by conducting method demonstrations on seed treatment, planting of 2-3 seedlings/hill, line sowing and soil testing. The extension personnel should facilitate the organization of Farmers Field Schools (FFSs) in the villages and educate the fellow farmers regarding the application of fertilizers and manures at the critical stages of growth of rice crop. Besides, farmers need to be educated on the application of nutrients on soil test basis for getting the potential yields and saving of money in some cases. The farmers should be educated to apply chemical fertilizers and manures at the right time recommended by SKUAST-Kashmir for increasing the productivity.

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