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Knowledge and Adoption of Integrated Nutrient Management Practices of Sugarcane Crop by the Farmers from Kolhapur District of Western Maharashtra

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Abstract – **All farmers had complete knowledge about all practices except quantity required for biological seed treatment, time of fertilizer application. Most of the farmers (93.33 per cent) prefers the ratoon season planting after 15 th February. Soil testing were not adopted by 80.00 per cent of farmers for integrated nutrient management. Regarding chemical fertilizer treatment, 60.00 per cent of farmers were not adopted the proper time and quantity of fertilizer for Adsali and Suru planting season of sugarcane. All the farmers faced the constraints like lack of technical knowledge regarding fertilizer dose conversion on the basis of Soil testing results, unavailability of soil testing labs in nearby area and high prices & timely unavailability of straight fertilizers. All the farmers suggested needs of technical knowledge regarding fertilizer dose conversion on the basis of soil testing results, timely availability of straight fertilizers at reasonable prices and availability of soil testing labs in nearby area.**

Keywords – **Integrated Nutrient Management, Sugarcane, Knowledge and Adoption.**

I. INTRODUCTION

Sugarcane occupies a pivotal position in the agricultural economy of India. In India, it is cultivated on an area of 4.94 million hectares in 2011 with a production of 339.17 million tones with an average productivity of 68.6 ton /ha. (Anonymous, 2011). The Kolhapur is well known for the major sugarcane growing district of Western Maharashtra. Plants needs a given quantity and mix of nutrients to flourish. The higher the yield, the greater the nutrient requirement. A shortage of one or more nutrients can inhibit or stunt plant growth but excess nutrients, especially those provided by the correct quantity and proportion, in a usable form and at the right time For the farmer, an economic optimum may differ from physical optimum, depending on the added costs of inputs and the value of benefits derived from increased output. With this view the present study was conducted with the following objectives.

1. To study the knowledge and adoption of Integrated Nutrient Management Practices of Sugarcane followed by the farmers.
2. To study the constraints faced and suggestions made by the farmers.

II. METHODOLOGY

The study was conducted in College Development Block of Agriculture, Kolhapur consisting Hatkanangle, Bhudharghar and Radhanagari tahsils of Kolhapur district. In all 5 villages from these tahsils were selected randomly. From these selected villages, 6 farmers from each village were selected randomly. Thus the 30 farmers were interviewed with the help of structured interview schedule personally. The data was tabulated and processed through the primary and secondary tables. The statistical tools like frequency, percentages, and means of the averages was used for interpreting the data and inferences are drawn.

III. RESULTS AND DISCUSSIONS

Knowledge and adoption

The data regarding the knowledge and adoption of integrated nutrient management practices for sugarcane crop by the farmers is presented in Table.1 and the results obtained are as follows.

Knowledge:

The data from the Table 1 revealed that all farmers had complete knowledge about all practices mentioned in table except quantity required for biological seed treatment and time of fertilizer application.

Adoption: fertilizer application

The data further revealed that all the farmers completely adopted the ridges and furrow method of planting and irrigation. Most of the farmers (93.33 per cent) preferred the ratoon season planting after 15 th February. Manganese sulphate and Borax as a micronutrient was completely adopted by 60.00 per cent of farmers. Considering the importance in integrated nutrient management, soil testing was not adopted by 80.00 per cent of farmers. Regarding use of chemical fertilizers, 60.00 per cent of farmers had not adopted the proper time and quantity of fertilizer in Adsali and Suru planting of sugarcane. It might be due to flood situation and fertigation is not possible.

Table 1: Distributions of farmers according to the knowledge and adoption.

S. No.	Technologies	Knowledge (n=30)		Adoption (n=30)		
		Complete	No	Complete	Partial	No
1.	**Planting Season:**					
	• Adsali (15 July- 15 Aug)	30 (100.00)	-	08 (26.67)	04 (13.33)	18 (60.00)
	• Preseasonal-(15 Oct- 15 Nov)	30 (100.00)	-	14 (46.67)	03 (10.00)	13 (43.33)
	• Suru (15- Dec- 15 Feb)	30 (100.00)	-	12 (40.00)	-	18 (60.00)
	• Ratoon – Before 15 th Feb	30 (100.00)		08 (26.67)	-	22 (73.33)
	• After 15th Feb	30 (100.00)		28 (93.33)	02 (6.67)	-
2.	**System of planting**					
	• Ridged & furrows	30 (100.00)	-	20 (66.67)	-	10 (33.33)
	• Paired row	30 (100.00)	-	14 (4.676)	-	16 (53.33)
3.	**Seed treatment**					
a)	**Chemical:** Bavistin+Malathion	30 (100.00)	-	19 (63.33)	-	11 (36.67)
b)	**Biological-**					
	• Acetobacter	30 (100.00)	-	14 (46.67)	03 (10.00)	13 (43.33)
	Qty.- 10 Kg/100 lit. water	26 (86.67)	-	15 (50.00)	03 (10.00)	02 (06.67)
	• PSB	30 (100.00)	-	12 (40.00)	02 (06.67)	16 (53.33)
	Qty.- 2.5 Kg/100 lit. water	24 (80.00)	-	13 (43.34)	01 (03.33)	16 (53.33)
4.	**Soil Testing**	30 (100.00)	-	02 (06.67)	-	28 (80.00)
5.	**Fertilizer management**					
a)	**Organic fertilizer** (FYM):					
	Suru : Quantity 20 ton/ha.	30 (100.00)	-	08 (26.67)	04 (13.33)	18 (60.00)
	Preseasonal : 25 ton /ha	30 (100.00)	-	12 (40.00)	05 (06.67)	13 (43.33)
	Adsali : 30 ton/ha	30 (100.00)	-	06 (20.00)	06 (20.00)	18 (60.00)
b)	**Time of application**					
	Half dose of FYM at ploughing	28 (93.33)	02 (06.67)	12 (40.00)	05 (16.67)	13 (43.33)
	½ dose of FYM at ridges opening	30 (100.00)	-	17 (56.67)	04 (13.33)	09 (30.00)
c)	**Green Manuring**					
	• Jute	30 (100.00)	-	06 (20.00)	06 (20.00)	18 (60.00)
	• Dhaincha	30 (100.00)	-	01 (03.33)	-	29 (96.67)
	• Time : 45 days after germination	29 (96.67)	01 (03.33)	05 (16.67)	03 (10.00)	22 (73.33)
d)	**Chemical Fertilizer**					
I)	**Adsali (N:P:K Kg/ha)**					
	• Total :400:170:170	29 (96.67)	01 (03.33)	07 (23.33)	05 (16.67)	18 (60.00)
	• At planting : 40:85:85	29 (96.67)	01 (03.33)	07 (23.33)	05 (16.67)	18 (60.00)
	• 6-8 weeks after planting:160:0:0	30 (100.00)	-	07 (23.33)	05 (16.67)	18 (60.00)
	• 12-16 weeks after planting: 40:0:0	30 (100.00)	-	07 (23.33)	05 (16.67)	18 (60.00)
	• Earthing up :160:85:85	30 (100.00)	-	07 (23.33)	05 (16.67)	18 (60.00)
II)	**Preseasonal (N:P:K Kg/ha)**					
	• Total :340:170:170	30 (100.00)	-	13 (43.33)	04 (13.33)	13(43.33)
	• At planting : 34:85:85	24 (80.00)	-	11 (36.67)	06 (20.00)	13 (43.33)
	• 6-8 weeks after planting :136:0:0	22 (73.33)	-	11 (36.67)	06 (20.00)	13 (43.33)
	• 12-16 weeks after planting:34: 0:0	24 (80.00)	-	11 (36.67)	06 (20.00)	13 (43.33)
	• Earthing up :136:85:85	25 (83.33)	-	11 (36.67)	06 (20.00)	13 (43.33)
III)	**Suru & Ratoon(N:P:K Kg/ha)**					
	• Total :250:115:115	30 (100.00)	-	09 (30.00)	03 (10.00)	18(60.00)
	• At planting : 25:60:60	30 (100.00)	-	05 (16.67)	07 (23.33)	18 (60.00)
	• 6-8 weeks after planting:100:0:0	30 (100.00)	-	11 (36.67)	01 (03.33)	18 (60.00)
	• 12-16 weeks after planting :25:0:0	30 (100.00)	-	11 (36.67)	01 (03.33)	18 (60.00)
	• Earthing up :100:55:55	30 (100.00)	-	11 (36.67)	01 (03.33)	18 (60.00)

6.	**Use of micronutrients (10kg/ha)**					
	• Ferrous sulphate	30 (100.00)	-	16 (53.33)	12 (40.00)	02 (06.67)
	• Zinc sulphate	30 (100.00)	-	16 (53.33)	12 (40.00)	02 (06.67)
	• Mangense sulphate	30 (100.00)	-	18 (60.00)	05 (16.67)	07 (23.33)
	• Borax	30 (100.00)	-	18 (60.00)	05 (16.67)	07 (23.33)
	• Method: Mix with FYM	30 (100.00)	-	18 (60.00)	06 (20.00)	06 (20.00)
7.	**Production (t/ha)**					
	• Adsali :a. Less than 155	30 (100.00)	-	11 (36.67)	-	19 (63.33)
	b. 156-200	30 (100.00)	-	01 (03.33)	-	29 (96.67)
	c. More than 201	30 (100.00)	-	-	-	30 (100.00)
	• Preseasonal : a. less than121	30 (100.00)	-	04 (13.33)	-	26 (86.67)
	b. 122-139	30 (100.00)	-	10 (33.33)	-	20 (66.67)
	c. More than 140	30 (100.00)	-	03 (10.00)	-	27 (90.00)
	• Suru : a. Less than 98	30 (100.00)	-	05 (16.67)	-	25 (83.33)

* Figures in parenthesis indicate percentages.

Constraints Faced by the farmers in adoption of INM practices in Sugarcane

The data regarding constraints faced by the farmers in adoption of integrated nutrient management practices in respect to the Sugarcane is depicted in Table No. 2

Table 2: Distribution of farmers according to their constraints faced

S. No.	Particulars	Frequency (n= 30)	Percentage
1.	Lack of Technical knowledge regarding fertilizer dose conversion on the basis of Soil testing results.	30	100.00
2.	High prices & timely unavailability of straight fertilizers	30	100.00
3.	Unavailability of Soil testing labs in nearby area	30	100.00
4.	Lack of Technical Knowledge regarding use of Drip Irrigation method	26	86.67
5.	High Prices & Unavailability of FYM	20	66.67

It is revealed from data that all the farmers faced the constraints like Lack of technical knowledge regarding fertilizer dose conversion on the basis of Soil testing results, high prices & timely unavailability of straight fertilizers and unavailability of soil testing labs in nearby area in adoption of integrated nutrient management practices of sugarcane.

Suggestions made by the farmers in adoption of INM practices in Sugarcane

The data regarding suggestions made by the farmers to overcome the constraints faced by them in adoption of integrated nutrient management practices in respect to the Sugarcane is depicted in Table No.3.

It is revealed from data that all the farmers suggested for the need of technical knowledge regarding fertilizer dose conversion on the basis of Soil testing results, timely supply of straight fertilizers at reasonable prices and need for soil testing labs in nearby area for adoption of integrated nutrient management practices of sugarcane.

Table 3: Distribution of farmers according to suggestions made by them

S. No.	Particulars	Frequency (n= 30)	Percentage
1.	Needs Technical knowledge regarding fertilizer dose conversion on the basis of Soil testing results.	30	100.00
2.	Timely availability of straight fertilizers at reasonable prices	30	100.00
3.	Availability of Soil testing labs in nearby area.	30	100.00

IV. CONCLUSIONS

1. All farmers had complete knowledge about all practices mentioned in table except quantity required for biological seed treatment, time of fertilizer application. Most of the farmers (93.33 per cent) prefers the ratoon season planting after 15 th February.
2. Regarding chemical fertilizer treatment, 60.00 per cent of farmers were not adopted the proper time and quantity of fertilizer for Adsali and Suru planting season of sugarcane.

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