



Constraints Faced by Farmers in Adoption of Soil Testing Based Fertilizer Application

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ABSTRACT

To improve soil testing advisory service, KVK- Valsad (Gujarat) conducted a study during 2020-21. Randomly two villages selected from each block of Valsad district of Gujarat. Thus, ten respondents from each village comprising of total number of respondents to be 120 were selected at random sample for the study. Valsad district is tribal dominated area so about 93.33 per cent respondents were belonged to scheduled tribe. Average data of study revealed that maximum 49.7% respondents having partial knowledge, 42.7% respondents had complete knowledge and only 9% respondents had no knowledge about soil testing however, average 57.80% respondents had adopted the soil testing based recommendations. Further, data also showed that 75.83% respondents explained the problem of unavailability of sufficient quantity of organic manures whereas 60.0 per cent respondents faced the problem of unavailability of soil testing facility in nearby village due to interior hilly tribal areas as major constraints in adoption of soil test based fertilizer recommendation.

Key Words: Soil health, Adoption, Constraints, Fertilizer

INTRODUCTION

Soil testing is a chemical process by virtue of which requirement of nutrients for plant can be analyzed so as to sustain the soil fertility. Soil testing is essential and is the first step in obtaining high yields and maximum returns from the money invested in fertilizers. Naruka *et al* (2018) found the soil testing satisfactory and important with respect to lower the input cost in farming operation. KVK-Valsad established soil testing laboratory in year 2007, with an objective to provide a service to the farmers regarding the nutrient problems of soils and crops and suggest appropriate remedial measures for efficient correction to better and more economic use of fertilizers and better soil management practices for increasing agricultural production in their farm. Therefore, a study to evaluate knowledge level of farmers, level of adoption and constraints faced by farmers during adoption of soil testing based fertilizer application in their farm.

MATERIALS AND METHODS

KVK- Valsad conducted a study during 2020-

21 in its jurisdiction area, consists of 6 blocks *viz.*, Dharampur, Kaprada, Pardi, Valsad, Umargam and Vapi. Randomly two villages selected from each block, having more number of respondents who got soil samples tested at KVK-Valsad. A comprehensive list of all the respondents having soil testing report was obtained from the respective villages. Thus, ten respondents from each village comprising of total number of respondents to be 120 were selected at random sample for the study. An interview schedule was prepared consisting of tools to measure the variables. The reliability and validity of the schedule were ensured in order to record the authentic information from the respondents. Responses of the respondents were recorded by personal interview method. The responses were then converted in to scores and transferred in master table to analyze applying appropriate statistical test.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

The data (Table 1) represent the socio-economic characteristics of respondents selected

Table 1. Socio-economic characteristics of respondents**N=120**

Sr. No.	Particular	Frequency	Percentage
1	Gender		
	Male	82	68.33
	Female	38	31.67
2	Age(Year)		
	Below 25	24	20.00
	26-45	59	49.17
	Above 45	37	30.83
3	Education		
	Illiterate	12	10.00
	Primary education	41	34.17
	Secondary education	32	26.67
	Graduation	26	21.67
	Post graduate	9	7.50
4	Land holding		
	<1 ha	58	48.33
	(1-2 ha)	34	28.33
	> 2 ha	28	23.33
5	Annual income		
	< Rs. 35,000	54	45.00
	Rs. 35,000- Rs. 65,000	46	38.33
	> Rs. 65,000	20	16.67
6	Caste		
	SC	5	4.17
	ST	112	93.33
	OBC	0	0.00
	General	3	2.50

for study. It can be seen from the table that out of 120 respondents, majority of respondents was male (68.33%), belonged to age group of 26 to 45 years (49.17%) having a primary level education (34.17%) and owns below 1 ha. land (48.33%) with the annual income below Rs. 35,000/-. Valsad district is tribal dominated area so about 93.33 per cent respondents were belonged to scheduled tribe.

Sources of information about soil testing

The details on different sources of information on soil test available to farmers are presented in the Table 2. According to the respondents,

KVK (25.85%) remained the major source and ATMA(16.67%) were secondary source of information about soil testing in Valsad district. About 12 per cent respondents were got soil test information during agricultural mega events and from agriculture department. Data also reveals that neighbours, private companies, SAU, other extension agencies and social media became the source of information (Ramappa *et al*, 2015). Due to scattered population and interior hilly area only 1.67% respondents were got information from the news paper

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Table 2. Sources of Information about Soil Testing. N=120

Sr. No	Source	Frequency	Percentage
1	News paper	2	1.67
2	Agricultural mega events	12	10.00
3	Neighbours	11	9.17
4	Social media	9	7.50
5	State Agricultural University	4	3.33
6	Krishi Vigyan Kendra	31	25.83
7	ATMA	20	16.67
8	Agriculture Department	12	10.00
9	Private companies	10	8.33
10	Other extension agencies	9	7.50

Extent of knowledge regarding soil testing report

Data (Table 3) show that maximum 85.83% respondents had a complete knowledge about ideal time for collection of sample and 78.33% about procedure of soil sample collection for analysis. Whereas, 73.33% respondents had partial knowledge about types of fertilizers available in market and 71.67per cent respondents about calculation of fertilizer according to soil test report. Average data of study also reveals that maximum 49.7per cent respondents having partial knowledge, 42.7per cent respondents had complete knowledge and only 9per cent respondents had no knowledge about soil testing. The findings are supported by Ghaswa *et al* (2019) and Jadav *et al*(2018) stated that farmers' knowledge of technology made contribution to its adoption.

Adoption level of soil testing based fertiliser recommendation

It can be observed (Table 4) that maximum number of respondents (92.50%) had applied phosphatic and potash fertilizers as basal application and 78.33per cent respondents had applied nitrogenous fertilizer in split as recommended in soil testing report. However, 25.83per cent respondents had applied gypsum/lime for reclamation of soil. They use their lands for crop production which are located with minimal soil salinity. Further study also

reveals that average 57.80per cent respondents had adopted the recommendations of soil testing report due to low literacy level and soil test laboratories located far away from villages, which desists them from soil testing. Similar trend have been reported by Ramappa *et al* (2015).

Constraints faced by the respondents in adoption of soil test based fertilizer recommendation

It can be seen that 75.83per cent respondents explained the problem of 'unavailability of sufficient quantity of organic manures ' as most important constraint and ranked first due to low cattle population and improper management of cow dung, cow urine and biomass, whereas 60.00per cent respondents faced the problem of unavailability of soil testing facility in nearby village ranked second due to interior hilly tribal areas. Third major constraints in adoption of soil test based fertilizer recommendation faced by the 53.33per cent respondents are lack of technical guidance by the extension agencies. It was also illustrated that 44.17per cent respondents had a problem of low literacy level, so 34.17per cent respondents express their difficulty in calculation of fertilizers as per soil test report and 33.33 per cent respondents found that the soil test report is more complicated. Similar trend have been reported by Jadav *et al* (2018) and Veeraiah *et al* (2019).

Table 3. Distribution of respondents according to their knowledge regarding soil testing. N=120

Sr. No.	Particular	Complete knowledge		Partial knowledge		No knowledge	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	Procedure of soil sample collection for analysis	94	78.33	16	13.33	10	8.33
2	Ideal time for collection of sample	103	85.83	15	12.50	2	1.67
3	Role of nutrients for plant growth	29	24.17	67	55.83	24	20.00
4	Type of fertilizers available in market	27	22.50	88	73.33	5	4.17
5	About printed content of nutrients on fertilizer bag	48	40.00	60	50.00	12	10.00
6	Calculation of fertilizer according to soil test report	27	22.50	86	71.67	7	5.83
7	Method of application of fertilizers	34	28.33	78	65.00	8	6.67
8	Application of soil amendments as per soil test report	48	40.00	67	55.83	5	4.17
Average Knowledge level		51	42.7	60	49.7	9	7.6

Table 4. Distribution of respondents according to adoption of soil testing based fertilizer recommendation N=120

S r . No	Soil test based recommendation	Adoption	
		Frequency	Percentage
1	Application of gypsum/lime for reclamation of soil	31	25.83
2	Application of organic manures	52	43.33
3	Application of biofertilisers	46	38.33
4	Split application of nitrogenous fertilisers	94	78.33
5	Basal application of phosphatic and potash fertilizers	111	92.50
6	Application of fertilizer quantity as per the nutrient content printed on fertiser bag	68	56.67
7	Application of micronutrients	87	72.50
8	Sending soil samples on regular interval for soil testing	66	55.00
Average adoption		69	57.80

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Table 5. Constraints faced by the farmers in adoption of soil test based fertilizer recommendation.

N=120

Sr. No	Constraint	Frequency	Percentage	Rank
1	Low literacy level	53	44.17	IV
2	Untimely availability of soil testing report	12	10.00	XI
3	Poor economic condition	37	30.83	VII
4	Soil test report is more complicated	40	33.33	VI
5	Lack of soil testing facility in nearby areas	72	60.00	II
6	Lack of technical guidance by the extension agencies	64	53.33	III
7	No knowledge about soil sampling	27	22.50	IX
8	Difficulty in calculation of fertilizers as per soil test report	41	34.17	V
9	Soil testing is costly	19	15.83	X
10	Unavailability of sufficient quantity of organic manures	91	75.83	I
11	Unavailability of fertilisers, recommended in soil test report	35	29.17	VIII

CONCLUSION

The study revealed that the major constraints faced by the farmers of valsad district in adoption of soil test based fertilizer recommendation are non-availability of organic manure, lack of soil testing facility in nearby areas and lack of technical guidance. Extension agencies of district should be organized method demonstrations to educate the farmers for producing organic manure from farm wastes. There is a need for conducting regular training programmes for building capacity of farmers on collection of soil samples and reading of soil test results, understanding of which is utmost important for adoption of soil test based fertilizer recommendation.

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