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Mahesh Kumar
M.Sc. Scholar, Department of
Agricultural Extension, COA,
IGKV, Raipur, Chhattisgarh,
India

Subhash Rawat
Subject Matter Specialist, Krishi
Vigyan Kendra, Khandawa,
Madhya Pradesh, India

PK Sangode
Associate Professor, Department
of Agricultural Extension, COA,
IGKV, Raipur, Chhattisgarh,
India

Vinay Bachkaiya
Scientist, Department of Soil
science, COA, IGKV, Raipur,
Chhattisgarh, India

Influence of soil health card (SHC) on nutrients management practices by farmers in major Rabi crops of Chhattisgarh

Mahesh Kumar, Subhash Rawat, PK Sangode and Vinay Bachkaiya

Abstract

The purpose of this study was to assess Influence of soil health card (SHC) on nutrients management practices by farmers in major rabi crops of Chhattisgarh state. To serve this purpose, a sample size of 120 respondents were selected from 3 blocks of Mungeli district during the year 2020-21. The findings reveal that 75.00 percent of the majority of the respondent had applied micro nutrients Zinc in wheat crops and 25.00% respondents not applied for Zinc in own field. In case of Chickpea 91.67% percent respondents had use Zinc nutrient in Chickpea crop and 8.33% respondent not applied for Zinc in field. The findings regarding cropping intensity are compiled and observed that 76.67% of the respondents had more than 200 percent cropping intensity. Overall, the average dose of fertilizers application on the basis of SHC were 62.44% and 43.42% for wheat and chickpea crops respectively.

Keywords: Soil health card (SHC), nutrients management practices, rabi crops

Introduction

The soil health card (SHC) is a comprehensive evaluation of soil quality, including functional characteristics, water and nutrient content, and other biological characteristics. It outlines the steps a farmer should take to increase yield. The SHC helps farmers receive crop-specific recommendations for nutrients and fertilizers needed in each soil type. They are commanded by The Government of India launched the Soil Health Card Scheme on February 19, 2015, with the goal of issuing soil health cards to farmer It makes crop-specific recommendations on the nutrients and fertilizers required by individual farms in order to assist farmers in increasing crop productivity. The judicious application of inputs. To obtain this information, all soil samples must be tested in various soil testing laboratories across the country. The experts will then evaluate the soil's strengths and weaknesses (micronutrient deficiency) and make recommendations. The outcome and suggestion will be displayed in the cards. The government intends to distribute cards to 14 crore farmers. Soil Health Card includes soil status for 12 parameters, including N, P, K (Macronutrients), S (Secondary-nutrients), Zn, Fe, Cu, Mn, B (Macronutrients), pH, electronic conductivity, and organic carbon (Physical Parameters). The Soil Health Card assists farmers in increasing productivity. The soil health card (SHC) is an analysis of the quality of the soil right from its functional characteristics to water and nutrient content and other biological properties. It contains corrective measure that a farmer should adopt to obtain a better yield. The SHC helps the farmers to get a well monitored report about the soil and they are guided by the expert to improve soil health.

Material and Methods

The study was conducted during the year 2020-2021 in the Mungeli district of Chhattisgarh state covering three blocks i.e., Mungeli Lormi and Patharia. Four villages were selected randomly from each of the block, making 12 Villages and 120 SHC respondent. The data was collected by personal interview with the help of well prepared, structured and pretested interview schedule. The data collected were tabulated and analysed using appropriate statistical tools and methods.

Corresponding Author:
Mahesh Kumar
M.Sc. Scholar, Department of
Agricultural Extension, COA,
IGKV, Raipur, Chhattisgarh,
India

Results and Discussion

The findings of the Table 1. reveal that 75.00 percent of the majority of the respondent had use applied micro nutrients in Zinc in wheat crops and 25.00% respondents not applied for Zinc in own field similarly in case of Chickpea 91.67% percent respondents had use applied Zinc nutrients in Chickpea crop and 8.33% respondent not applied for Zinc nutrients in own field The findings regarding cropping intensity are compiled and presented in It was observed that 76.67% of the respondents had more than 200 percent cropping intensity. In the study area all the respondents had cultivated wheat and Chickpea. The data revealed that total average area under wheat was 9.456 ha and in case of Chickpea, total average area was only 14.05 ha. The total average productivity of wheat crops and Chickpea was 12.07 q/ha and 19.04 q/ha respectively. Pertaining to use of different sources of nutrients in wheat crops reveals that 87.50% respondents' farmers use's DAP as per recommendation whereas 12.50% applied it all below recommendation level. Organic sources i.e., FYM/GM (farm yard manure/ green manure) were also used by responded and it was found that 85.83% respondents applied FYM/GM at recommended level.

Shows use of fertilizers organic manure and biofertilizer in chick crop as nutrients sources. It was recorded in chickpea crop application in recommended dose of various fertilizers were highest for biofertilizer i.e., *Rhizobium* are 91.67% respondents uses it at recommended level whereas only 8.33% respondents applied *Rhizobium* at below recommended level. organic sources i.e., FYM/GM (farm yard manure/ green manure) were also used by responded our it was found that 70.83% respondents applied FYM/GM at recommended level whereas 29.17% applied FYM /GM at below recommended level. Present the data on gap between application of different fertilizers and their respective recommended dose. It was found that there is a gap of 81.37% for application of Urea in wheat where actual application was 188.44 kg/ha. Whereas. In case of chickpea crop the data on gap between application of different fertilizers and their respective recommended dose reveals a gap of 87.17% for application of Urea in chickpea where actual application 58.67kg/ha whereas recommended dose is 67.58 kg/ha indicating lesser application of 8.91kg /ha Urea recommended dose is 232.44kg/ha., i.e., respondent farmers were applying 44 kg /ha less amount of Urea.

Table 1: Distribution of the respondents according to their Influence of soil health card (SHC) on nutrients management practices by farmers in major Rabi

S. No.	Particular	SHC Respondents (N=120)	
		F	%
1.	Use of micro nutrients Zinc		
I	Wheat		
	Applied	90	75
	Not applied	30	25
ii	Chickpea		
I	Applied	110	91.67
	Not applied	10	8.33
2.	Cropping intensity		
I	Up to 100%	00	00.00
Ii	101 to 200%	28	23.33
Iii	More than 200%	92	76.67
3.	Productivity of major Rabi crop	Total average area (ha)	Average productivity (q/ha)
I	Wheat	9.456	12.07
Ii	Chickpea	14.05	19.04

1.2 Impact of soil health card scheme on adoption of nutrients management practices

The adoption process is the mental process through which an individual pass from first hearing of an innovation to its final adoption. Adoption is a decision to continue full use of an innovation. With a view to find out the level of adoption of SHC based nutrients managements practices in major Rabi crops the soil health card respondents were asked to indicate at what application of plant nutrients they adopted recommended practices of SHC based nutrients managements practices the data in this regard are presented in Table 2 Data presented in table show that 6 selected practices of recommended SHC based nutrients managements practices and among all the respondents the number of respondents and the different level of adoption categories such as in application of nutrients

The data presented in Table 1 Pertaining to use of different sources of nutrients in wheat crops reveals that 87.50% respondents' farmers use's DAP as per recommendation whereas 12.50% applied it all below recommendation level. Similarly for Urea and MOP the application at recommendation dose by respondents were 66.67% and 80.83% respectively whereas application below the recommended dose for Urea and MOP by farmers were

33.33% and 19.17% respectively. Among micro nutrients only zinc was applied by farmers and 77.50% respondent's uses it at recommended amount while 22.50% applied below recommended dose. Organic sources i.e., FYM/GM (farm yard manure/ green manure) were also used by responded and it was found that 85.83% respondents applied FYM/GM at recommended level whereas 14.17% applied FYM /GM at below recommended level.

Table 2 shows use of fertilizers organic manure and biofertilizer in chick crop as nutrients sources. It was recorded in chickpea crop application in recommended dose of various fertilizers were highest for biofertilizer i.e., *Rhizobium* are 91.67% respondents uses it at recommended level whereas only 8.33% respondents applied *Rhizobium* at below recommended level. However, among fertilizers viz Urea. DAP. MOP it was found that MOP were applied by majority of respondent at recommended level (87.50%) followed by recommended application of Urea (81.67%) and DAP (69.17%) whereas 12.50% respondents were applying MOP below recommendation level and for Urea and DAP application below recommended dose by respondents were 18.33% and 30.83% respectively in chickpea crops. organic sources i.e., FYM/GM (farm yard manure/ green manure) were also used by responded our it was found that 70.83%

respondents applied FYM/GM at recommended level whereas 29.17% applied FYM /GM at below recommended level Table 4 Present the data on gap between application of different fertilizers and their respective recommended dose. It was found that there is a gap of 81.37% for application of Urea in wheat where actual application was 188.44 kg/ha. Whereas recommended dose is 232.44kg/ha., i.e., respondent farmers were applying 44 kg /ha less amount of Urea. Similarly, a gap of 95.12% was found for application of DAP in wheat where actual application 119.38 kg/ha. Whereas recommended dose is 125.63 kg/ha. i.e., respondent farmers were applying 6.25kg /ha less amount of DAP. It was found that there is a gap of 96.23% for application of MOP in wheat where actual application 41.65 kg/ha whereas dose is 43.37 kg/ha. i.e., respondent farmers were applying 1.72 kg /ha less amount of MOP. It was found that there is a gap of 59.49% for application of Zinc in wheat where actual application 12.61 kg/ha. Whereas recommended dose is 21.66 kg/ha. i.e., respondent farmers were applying 9.05 kg /ha less amount of Zinc. It was found that there is a gap of 38.33% for application of FYM/GM in wheat where actual application

4.43 ton/ha whereas it recommended dose is 11.60 ton/ha. i.e., respondent farmers were applying 7.17ton/ha less amount of FYM/GM.

In case of chickpea crop the data on gap between application of different fertilizers and their respective recommended dose reveals a gap of 87.17% for application of Urea in chickpea where actual application 58.67kg/ha whereas recommended dose is 67.58 kg/ha. Indicating lesser application of 8.91kg /ha Urea. It was found that there is a gap of 87.68% for application of DAP in chickpea where actual application 123.11 kg/ha. Whereas recommended dose is 140.71 kg/ha. i.e., farmers were applying 17.6 kg /ha less amount of DAP. It was found that there is a gap of 75.51% and 65.79% for application of MOP and zinc, respectively in chickpea with 7.81 kg /ha less amount of and 6.25kg /ha less amount of MOP and Zinc. It was found that there is a gap of 36.25% for application of Rhizobium in chickpea where actual application 0.72 kg/ha whereas recommended dose is 2 kg/ha. i.e., farmers were applying 1.28kg /ha less amount of rhizobium. A gap of 65.02% for application of FYM/GM in chickpea were also recorded.

Table 2: Distribution of the respondent according to the application of plant nutrients in wheat crops, (N-120)

S. No.	Application of nutrients in wheat crops	Recommended dose		Below Recommended	
		Nutrients	Frequency	Percent	Frequency
1.	Urea	80	66.67	40	33.33
2.	DAP	105	87.50	15	12.50
3.	MOP	97	80.83	23	19.17
4.	Zinc	93	77.50	27	22.50
5.	FYM/Green manures	103	85.83	17	14.17

Table 3: Distribution of the respondent according to the application of plant nutrients in Chickpea crops, (N-120)

S. No.	Application of nutrients in Chickpea crops	Recommended dose		Below recommended dose	
		Nutrients	Frequency	Percent	Frequency
1.	Urea	98	81.67	22	18.33
2.	DAP	83	69.17	37	30.83
3.	MOP	105	87.50	15	12.50
4.	Zinc	67	55.83	53	44.17
5.	FYM/Green manures	85	70.83	35	29.17
6.	Rhizobium	110	91.67	10	8.33

Table 4: Actual Application of plant nutrients in major Rabi crops, (N-120)

S. No.	Application of nutrients in average use	Wheat		Chickpea	
		Nutrients	Application (kg/ha.)	SD	Application (kg/ha.)
1.	Urea	186.59	20.64	58.21	8.94
2.	DAP	116.42	15.78	127.13	10.14
3.	MOP	37.96	4.86	29.86	4.64
4.	Zinc	17.54	4.89	11.57	2.29
5.	Rhizobium	00	00	1.18	0.39
	Nutrients	Application (ton/ha.)	SD	Application (ton/ha.)	SD
6.	FYM /green manures	12.23	1.41	4.64	1.50

Table 5: Application of recommended and applied dose (%) of plant nutrients in major Rabi crops, (N-120)

S. No.	Application of nutrients in average use	Re	Wheat		Re	Chickpea	
			Application (kg/ha.)	DP%		Application (kg/ha.)	DP%
1.	Urea	232.44	188.44	81.37	67.58	58.67	87.17
2.	DAP	125.63	119.38	95.12	140.71	123.11	87.68
3.	MOP	43.37	41.65	96.23	30.89	23.08	75.51
4.	Zinc	21.66	12.61	59.49	17.81	11.56	65.79
5.	Rhizobium	00	00	00	2	0.72	36.25
	Overall average Application (kg/ha.)			62.44			43.42
	Nutrients		Application (ton/ha.)	DP		Application (ton/ha.)	DP
6.	FYM /green manures	11.60	4.43	38.33	10	6.81	65.02

From the Table 4, it was observed that there was significant influence of dose of percent among different plant nutrients. In wheat crop, the difference dose of percent in different nutrients viz. Urea, DAP, MOP, Rhizobium and farm yard manure were 81, 95.12, 96.23, 59.49 and 38, 33%, respectively. Similarly, in chickpea crop, the dose of percent varied from 87.17, 87.68, 75.51, 65.79, 36.25 and 65.02%, respectively. Overall, the average dose of percent for wheat was 62.44% whereas in chickpea it was 43.42% on the basis of recommended soil health card nutrient management practices in major Rabi crops.

The analysis carried (Spearman's rank correlation) out to test the correlation between independent variables with average application of plant nutrients of recommendation of soil health card by the respondent was given in tables 5 out of all two-annual income, productivity, variables was significance at 0.01 probability level whereas only two variables use of nutrients, soil type was significant at 0.05 probability level and one variable cropping intensity, was not significant

Table 6: Correlation average application of nutrients adoption of Soil Health Card based nutrient management practices by chickpea crops respondents' with independent variables, (N=120)

S. No.	Variables	Correlation coefficient
7.	Annual income	0.353**
8.	Soil type	0.168*
13.	Use of nutrients	-0.126*
14	Cropping intensity	0.017 ^{NS}
15	Productivity of major Rabi wheat	0.253**

*Significant at the 0.05 level of probability

**Significant at the 0.01 level of probability

**NS = non-significant

Conclusion

The finding shows that most of the SHC respondent applied micro nutrients Zinc in major Rabi crops. Majority of the SHC respondent were cropping intensity is more than 200% The data revealed that total average area under wheat was 9.456 ha and in case of Chickpea, total average area was only 14.05 ha. The total average productivity of wheat crops and Chickpea was 12.07 q/ha and 19.04 q/ha respectively. Overall, the average dose of fertilizers application on the basis of SHC were 62.44% and 43.42% for wheat and chickpea crops respectively.

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