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## Usage of soil health card in crop management practices for doubling the farmers' income of Sirsa District (Haryana), India

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### Abstract

The data was collected from 15 selected villages from Sirsa district (Haryana), India during Rural Agricultural Work Experience program of B.Sc. (Hons.) Ag.(Final Year students) in 2017. Ninety farmers were selected, randomly. The study revealed that the 61.33 % of farmers were found aware about the SHC and farmers are found aware that 'SHC studies soil health' (56.34%), 'it is a Govt. of India's scheme' (57.34%), 'helped to reduce the input cost' (53.67%), 'give soil nutrient status' (57.34%) and 'it contain the soil type information' (56.34%), 'SHC contain the cropping pattern information', 'crop sequence information' and 'fertilizers dosages' with 47.00 %, 47.34 % and 56.67 %, respectively. 53.66 % of farmers were aware 'SHC helps to maintain the soil fertility', 'increases productivity of crops' 'judicious application of fertilizers' and 'soil-related constraints' with 53.00 %, 53.67% and 53.34 %, respectively. While, 47.00 % respondents were aware about the soil fertility map and SHC issued for three years with only 40.67 % of farmers. 56.67% of farmers had opinion that 'SHC provides the dose of organic manure' and 'an idea of fertilizer's usage pattern' followed by 'information about crop grown suited to soil type' (54.44%). 53.33% farmers had opinion that 'it helps to increase the organic matter in soil', 'timely management of fertilizers' and 'improve the quality of produce'. Further, 50.00% farmers had opinion that 'provide the dose of farmyard manure (FYM)/ compost' and 'provides the dose of lime and gypsum'. These findings are of noval nature based on primary data collected directly from farmers. The study soil health is of very much importance for motivating farmers to use balanced fertilizers application for all field crops.

**Keywords:** Awareness, Crop yield, Management practices, Soil fertility, Soil health card

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### INTRODUCTION

The injudicious and haphazard use of chemical in agriculture is a matter of concern in recent times (Patel and Chauhan, 2012). Soil is one of the elements required for farming as it provides nutrients to the plant and healthy soil containing all the elements for growth and development of crop. On the other hand, soil deprived of one or more elements either reduces production or degrades quality of crops. To avoid deterioration of soil in long run and visualizing the importance of balance nutrient in crop production, the Government of India launched Soil Health Cards (SHC) Scheme in February 2015. It is a simple document, which contains useful data on soil based on chemical analysis of the soil to describe soil health in terms

of its nutrient availability and its physical and chemical properties (Nalin, 2013). The soil health card is made available online also for the farmers and provides soil health data to get appropriate guidance to the farmers for the efficient use of fertilizer to cultivate crops based on soil health analysis (Patel and Chauhan, 2012). The scheme is considered as a holistic measure for soil health and farm economy and carries crop wise recommendation of nutrients and fertilizer required for the individual farms to help farmers to improve productivity through judicious use of inputs (Jotinand Das, 2017). It is one of the important approaches in agriculture for the sustainable production, which serves as a natural nutrient source for growth of plants (Charelet *et al.*, 2018). The present study was made to know farmers' awareness

about soil health card and farmers' opinion on usage pattern of soil health card in selection and management practices of different crops.

## MATERIALS AND METHODS

The data was collected from the 15 selected villages viz. Ramgaria, Kharian, Shahidanwali, Panihari, FarwaiKalan, Sultanpuria, Khairekan, FarwaiKhurd, Mallewala, DhaniBharokhan, Kotli, Moriwala, Bansudhar, Bajekan, NejadelaKalan from Sirsa district (Haryana), India during Rural Agricultural Work Experience program organised of B.Sc. (Hons.) Agriculture (Final Year) out going students during the month of February and March 2017. Survey was completed and 90 farmers were selected, randomly and data was collected with the help of prepared interview schedule. The collected data was analysed, tabulated, interpreted and conclusion were drawn.

## RESULTS AND DISCUSSION

**Profile of farmers:** Table 1 indicates that majority of the respondents (41.11%) belonged to the middle age group (36-50 years), (24.44%) had acquired matriculation qualification, and about 80.00 % had land holdings more than 6 acres. It was surprising that neither of farmers had visited the soil-testing laboratory and nor had soil health cards. Majority of respondents belonged to middle age group. Dwivedi (2007) collected data from Saikheda block of Narsinghpur district. He reported that majority of soyabean growers belonged to middle age group. Comparing with Dwivedi (2007)

findings, in present study, majority of farmers also belonged to middle age group.

Dudi and Meena (2016) reported in western Rajasthan that majority of the farmers have education upto metric level. On the same lines, in our study, majority of the farmers have education upto metric level.

**Farm machinery:** More than half (53.30)% farmers had tractor, 38.80 % of farmers had Harrow/Thresher/ Combine harvester, 58.80 % of farmers had seed drill, 28.80 % of farmers had zero tillage seed drill and 81.10 % of farmers had to pump set on their fields. Also 92.20 per cent of farmers had tube well/ submersible pump, laser leveler (03.30 %), and spray pump (84.40%), respectively.

**Farmers' mass media exposure:** It was found that TV was ranked first for getting the information followed by newspaper ranking second, radio ranking third, Kisan Seva Kendra ranking fourth, magazine ranking fifth and internet was list ranked (Table 2).

**Farmers' extension contact:** It was observed that among the extension contact of farmers, the most popular were the progressive farmers with total score 341. On the other hand, ADO and Scientists were ranked second and third with a total score of 336 and 208 followed by SDAO/SMS and NGO ranked fourth and fifth with their total score of 197 and 31, respectively (Table 3).

**Farmers' awareness towards soil health card (SHC):** It is revealed from the Table 4 that 61.33 % of farmers were found aware about the SHC and more than half of the farmers were found

**Table 1.** Profile of the respondents of farmers in Sirsa, Haryana (n=90).

Sr.No.	Variable(s)	Category	Frequency	%age(s)
1	Age (years)	Young (20-35)	23	25.55
		Middle (36-50)	37	41.11
		Old (50 and above)	30	33.34
2	Education	Illiterate	05	05.55
		Primary	07	07.80
		Middle	08	08.90
		Metric	22	24.44
		Higher secondary	18	20.00
		Graduate	21	23.30
		Post-graduate	09	10.00
3	Visited for soil testing		00	00.00
4	Having SHC		00	00.00
5	Land holding	Landless	02	02.20
		Less than 1 acre	04	04.40
		Up to 5 acres	13	14.40
		6-10 acres	23	25.50
		Acres	26	28.90
		16 and above	22	24.40
6	Farm machinery	Tractor	48	53.30
		Harrow/Thresher/Combine	35	38.80
		Seed Drill	53	58.80
		Zero Tillage Seed Drill	26	28.80
		Pumping Set	73	81.10
		Tube well/ Submersible pump	83	92.20
		Laser leveler	03	03.30
Spray pump	76	84.40		

**Table 2.** Mass Media Exposure used by farmers of Sirsa, Haryana(n=90).

Sr. No.	Mass media	Used	Extent of utilization			Total score	Rank Order
			Daily(3)	Often(2)	Sometimes(1)		
1	TV	87(96.66)	77(231)	08(16)	02(2)	249	I
2	Newspaper	85(94.40)	49(147)	17(34)	19(19)	200	II
3	Radio	43(47.80)	28(84)	09(18)	06(6)	108	III
4	KisanSeva Kendra	37(83.33)	25(75)	10(20)	02(2)	99	IV
5	Magazine	46(51.10)	16(48)	18(36)	12(12)	96	V
6	Internet	25(27.80)	8(16)	13(26)	04(4)	46	VI

**Table 3.** Extension Contact made by farmers of Sirsa, Haryana (n=90).

Sr. No.	Extension Official	Frequency of contact					Total score	Rank Order
		Weekly (4)	Fortnightly (3)	Monthly (2)	Whenever Needed (1)	None (0)		
1	Progressive farmer	80(320)	5(15)	02(4)	2(2)	01(0)	341	I
2	ADO	75(300)	9(27)	04(8)	01(1)	01(0)	336	II
3	Scientists	34(136)	13(39)	08(16)	17(17)	18(0)	208	III
4	SDAO/SMS	31(124)	9(27)	08(16)	30(30)	12(0)	197	IV
5	NGO	05(20)	01(3)	03(6)	02(2)	81(0)	031	V

**Table 4.** Farmers' awareness level of soil health card (SHC) in Sirsa, Haryana (n = 90)

S. N.	Statements	Awareness Level			TWS	WMS	%age
		Fully Aware(3) N %	Aware (2) N %	Not aware(1) N %			
1.	Do you know about soil health card (SHC)?	15(16.67)	46(51.11)	29(32.22)	166	1.84	61.33
2.	SHC studies the health of soil	08(8.89)	46(51.11)	36(40.00)	152	1.69	56.34
3.	SHC is a Govt. of India's scheme	13(14.44)	39(43.33)	38(42.22)	155	1.72	57.34
4.	SHC helps to reduce the input cost	10(11.11)	35(38.89)	45(50.00)	145	1.61	53.67
5.	Soil Health Card gives soil nutrient status	15(16.67)	35(38.89)	40(44.44)	155	1.72	57.34
6.	SHC contains the soil type information	12(13.33)	38(42.22)	40(44.44)	152	1.69	56.34
7.	SHC contains the cropping pattern information	05(5.56)	27(30.00)	58(64.44)	127	1.41	47.00
8.	SHC contains the crop sequence information	05(5.56)	28(31.11)	57(63.33)	128	1.42	47.34
9.	SHC tells the information on fertilizer usage	10(11.11)	37(41.11)	43(47.78)	147	1.63	54.34
10.	SHC advice on fertilizers dosage	11(12.22)	41(45.56)	38(42.22)	153	1.70	56.67
11.	SHC helps the farmers to use chemical fertilizers	09(10.00)	43(47.78)	38(42.22)	151	1.68	56.00
12.	SHC helps to maintaining soil fertility	07(07.78)	41(45.56)	42(46.67)	145	1.61	53.66
13.	SHC increases productivity of crops	08(08.89)	37(41.11)	45(50.00)	143	1.59	53.00
14.	SHC encourage judicious application of fertilizers	12(13.33)	31(34.44)	47(52.22)	145	1.61	53.67
15.	SHC helps to diagnose soil-related constraints	8(08.89)	38(42.22)	44(48.89)	144	1.60	53.34
16.	SHC identifies the requirements of different nutrients	14(15.56)	29(32.22)	47(52.22)	147	1.63	54.34
17.	Do you know about the soil fertility map?	08(08.89)	21(23.33)	61(67.78)	127	1.41	47.00
18.	Do you know that SHC issued for 3 years?	01(1.11)	18(20.00)	71(78.89)	110	1.22	40.67
19.	Do you know the plans to distributing the SHC until 2017?	00(0.00)	10(11.11)	80 (88.89)	100	1.11	37.00
20.	SHC tells about plantation of hort. Crops	05(05.56)	17(18.89)	68(75.56)	117	1.30	43.34

(Figures in parentheses indicate %ages); TWS-Total weighted score, WMS-Weighted mean score

aware that 'SHC studies soil health' (56.34%), 'it is a Govt. of India's scheme' (57.34%), 'helped to reduce the input cost' (53.67), 'give soil nutrient status' (57.34%) and 'it contain the soil type information' (56.34%).

Farmers were also found aware that 'SHC contain the cropping pattern information' and 'it contains crop sequence information' with 47.00 % and 47.34 %, respectively.

The results vividly explains that, 56.67 % of farmers were aware that 'SHC tells about fertilizers dosages', 'it helps the farmers to use the chemical fertilizers' (56.00 %) and the farmers had awareness that 'SHC helps to maintain the soil fertility'

with 53.66 % and 'increases productivity of crops' with 53.00 %.

More than fifty % (53.67%) of famers expressed their awareness that 'SHC encourage judicious application of fertilizers' and equal numbers of farmers (54.34%) were found that 'it helps to diagnose soil-related constraints' and 'identifies the requirement of different nutrients'. Dwivedi and Meena (2015) submitted their report in Indian Institute of Soil Science in 2015 that the soil testing under soil health card suggests farmers about judicious application of fertilizers. As compared to Dwivedi and Meena (2015), most of the farmers were aware about soil health card in our study

**Table 5.** Farmers' opinion on usage pattern of SHC in selection and management practices of different crops in Sirsa, Haryana. (n = 90)

Sr. No.	Aspects	Response Level	
		Yes (%)	No (%)
1.	SHC helps in selection of crop (Kharif& Rabi)	47(52.22)	43(47.78)
2.	SHC helps in adoption of crop rotation	38(42.22)	52(57.78)
3.	It helps in future cropping pattern	39(43.33)	51(56.67)
4.	SHC effects the irrigation schedule	32(35.56)	58(64.44)
5.	SHC helps to improve the quality of produce	48(53.33)	42(46.67)
6.	SHC effects the water logging condition	38(42.22)	52(57.78)
7.	SHC helps to reduce the soil degradation	39(43.33)	51(56.67)
8.	SHC helps to maintain soil structure & texture	45(50.00)	45(50.00)
9.	SHC helps to increase the organic matter in soil	48 (53.33)	42 (46.67)
10.	SHC gives an idea of fertilizers usage pattern	51(56.67)	39(43.33)
11.	SHC provide the dose of farmyard manure (FYM)/ compost	45(50.00)	45(50.00)
12.	SHC helps in timely management of fertilizers	48(53.33)	42(46.67)
13.	SHC helps to increase farm income by applying recommended fertilizers dosage at appropriate time	41(45.56)	49(54.44)
14.	SHC provides the dose of lime and gypsum	45(50.00)	45(50.00)
15.	SHC provides the dose of organic manure	51(56.67)	39(43.33)
16.	SHC provides information about crop grown suited to soil type	49(54.44)	41(45.56)

(Figures in parentheses indicate percentages)

also. Oladele (2001) conducted study in Oyo state, Nigeria. He reported that most of the farmers were aware of the use of technologies of the soil health card. In our study, it was also reported that most of the farmers are aware of soil health card.

**Farmers' opinion on usage pattern of SHC in selection and management practices of different crops:** For this purpose, a schedule was developed consisting 18 statements explaining. The usage pattern of SHC in selection and management practices of different crops this usage pattern were rated on two point continuum rating scale ranging from 'yes and 'no' and a weighted of 2 and 1 were assigned, respectively. Based on the responses obtained from the farmers, a total score for each loss was worked out and this total score was converted into weighted mean value. A perusal of the Table 5 indicated that an equal number of farmers (56.67%) had opinion that 'SHC provides the dose of organic manure' and 'an idea of fertilizer's usage pattern' followed by 'information about crop grown suited to soil type' (54.44%). More than half of farmers (53.33%) had opinion that 'it helps to increase the organic matter in soil', 'timely management of fertilizers' and 'improve the quality of produce', and it helps in selection of crop (Kharif& Rabi) with 52.22 % of farmers. Further, it was found that half of farmers (50.00%) had opinion that 'it helps to maintain soil structure & texture', 'provide the dose of farmyard manure (FYM)/ compost' and 'provides the dose of lime and gypsum'.

### Conclusion

It was concluded that neither of farmers had visited soil testing lab and nor had soil health card. Further, it was found that majority of farmers

(61.33 %) were aware about the soil health card and had opinion that soil health card helped them in knowing the soil nutrient status, doses of different fertilizer(45.56%) and finally in selection of crops in both Rabi and Kharif season (52.22%).

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