

Perception of farmers about soil health

V. T. PATEL^{1*}, ASHOK PATEL², M. R. PRAJAPATI³ AND R. R. PRAJAPATI⁴

C. P. College of Agriculture, S. D. Agricultural University,
Sardarkrushinagar- 385 506

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ABSTRACT

This study was conducted in Mahesana District of Gujarat State. Out of nine talukas of the district, three talukas viz., Unjha, Kadi and Bhecharaji were selected purposively on the basis of soil fertility indices (pH and EC) for the study. Five villages were randomly selected from each selected taluka. The purpose of the study was to know the perception of farmers about soil health. The study revealed that maximum number of farmers were middle to old aged, literate, had medium farming experience, small to medium land holding, small herd size, annual income up to 2 lakh, tube well as their major source of irrigation, ground water level between 400-600 feet and had cropping intensity ranging between 101-200 per cent. The indicators for good soil health perceived by a great majority of the farmers were: good and fast crop growth, more crop yield, dark brown soil colour and good soil tilth. While, water is not absorbed in the soil, salt come up to soil surface and frequent irrigation is needed were bad soil health indicators perceived by a great majority of the farmers. The purposes perceived important by the farmers for maintaining good soil health were; sustaining crop productivity, increasing soil water holding capacity, reducing irrigation cost and sustaining crop against water shortage. Among nine characteristics under study, farming experience, land holding and annual income had positive and significant correlation while, cropping intensity had negative and significant correlation with the perception of farmers about soil health.

Key words: Perception, Indicators, Soil Health

Perception is the thorough understanding of the concept through all the senses that makes the final impression of the concept in the mind of individual. Imbalanced use of fertilizers, low addition of organic matter and non-replenishment of depleted micro and secondary nutrients over the years, resulted in nutrient deficiencies and decrease in soil fertility. Soil health needs to be assessed at regular intervals to ensure that farmers apply the required nutrients while taking advantage of the nutrients already present in the soil (Kinyangi 2007). A fully functioning soil produces the maximum amount

of agriculture produces at the least cost. Improving soil health is essential to maximize profitability. Managing for soil health (improved soil function) is mostly a matter of maintaining suitable habitat for the myriad of creatures that comprise the soil food web. Soil works for you if you work for the soil by using management practices that improve soil health and increase productivity and profitability immediately and into the future. Hence, it was thought to study the perception of the farmers about soil health in light of the following objectives.

- i. To study the characteristics of the farmers
- ii. To know the perception of farmers about soil health
- iii. To ascertain relationship between selected characteristics of the farmers and their perception about soil health

¹Professor and Head, ⁴Associate Professor, Department of Extension Education, ³Dean (Agriculture), C. P. College of Agriculture, ²Hon'ble Vice Chancellor, S. D. Agricultural University, Sardarkrushinagar

*Email: eedcpcasda@gmail.com

PERCEPTION OF FARMERS ABOUT SOIL HEALTH

MATERIALS AND METHODS

The study was carried out in Mahesana District where, tube well is the main source of irrigation. Out of nine talukas of the district, three talukas viz., Unjha, Kadi and Bhecharaji were selected purposively on the basis of soil fertility indices (pH and EC) for the study. Five villages from each selected taluka and ten farmers from each selected village were randomly selected, making a sample of 150 farmers. The perception of indicators was measured with two point continuum *i.e.* agree and disagree with 2 and 1 score respectively. Mean score was calculated

for assigning ranks. Structured interview schedule was used for collection of data. The farmers were interviewed personally and their responses were recorded. The data were tabulated and interpreted on the basis of frequency, mean, standard deviation and correlation coefficient.

RESULTS AND DISCUSSION

Characteristics of the farmers

The data regarding selected characteristics of farmers are presented in Table 1.

Table 1: Distribution of the respondents according to their characteristics (n= 150)

Sr. No.	Characteristics	Frequency	Percentage
01	Age		
	Young (Up to 35 years)	36	24.00
	Middle (36 to 50 years)	49	32.67
	Old (Above 50 years)	65	43.33
02	Level of education		
	Illiterate	03	02.00
	Primary (up to VII)	37	24.67
	Secondary (VIII to X)	72	48.00
	Higher Secondary (XI to XII)	24	16.00
	College	14	09.33
03	Farming experience (Years)		
	Low (up to 13)	24	16.00
	Medium (14 to 33)	104	69.33
	High (above 33)	22	14.67
	Mean: 23.47	SD: 10.02	
04	Land holding		
	Marginal (Below 1.00 ha)	23	15.33
	Small (1.01 to 2.00 ha)	48	32.00
	Medium 2.01 to 4.00 ha)	55	36.67
	Big (Above 4.00 ha)	24	16.00
05	Herd size		
	Small (up to 3 animals)	122	81.33
	Medium (4 to 6 animals)	21	14.00
	Large (above 6 animals)	07	04.67
06	Annual income (Rs.)		
	Up to 1,00,000/-	28	18.67
	1,00,001 to 2,00,000/-	62	41.33
	2,00,001 to 3,00,000/-	36	24.00
	3,00,001 to 4,00,000/-	13	08.67
	Above 4,00,001/-	11	07.33

07	Irrigation source		
	Tube well	115	76.67
	Open well	26	17.33
	Canal	08	05.33
	Tank	01	00.67
08	Water level (ft)		
	Up to 400	17	11.33
	400 to 600	96	64.00
	Above 600	37	24.67
09	Cropping intensity (%)		
	Up to 100	06	04.00
	101 to 200	119	79.33
	201 to 300	25	16.67

The data presented in Table 1 indicates that majority of the farmers were middle to old aged (76.00 per cent) and had medium experience of farming (69.33 percent). Almost all (98.00 per cent) were literate *i.e.* educated from primary to college level.

Further, majority of them had small to medium size of land holding (68.67 per cent), possessed small size of herd (81.33 per cent), had annual income up to Rs. 2 lakh (60.00 percent), tube well as their major source of irrigation (78.67 per cent), tube well water table from 400 to 600 feet

(64.00 per cent) and had 101 to 200 per cent cropping intensity (79.33 per cent).

Perception of farmers about soil health

The responses of farmers regarding their perception about soil health were obtained against two aspects i) indicators of good soil health and ii) indicators of bad soil health.

Indicators of good soil health

The information regarding good soil health indicators as perceived by the farmers is presented in Table 2.

Table 2 Perception of farmers about good soil health indicators (n=150)

Sr. No.	Indicators	Farmers (%)		Mean Score	Rank
		Agree	Disagree		
1	Good and fast crop growth	93.33	6.67	1.93	I
2	More crop yield	89.33	10.67	1.89	II
3	Dark brown soil colour	85.33	14.67	1.85	III
4	Good soil tilth	81.33	18.67	1.81	IV
5	Good growth of root system	74.67	25.33	1.75	V
6	More earthworms	66.67	33.33	1.66	VI
7	Higher organic matter	63.33	36.67	1.63	VII

Table 2 reveals that 93.33 per cent of the respondents perceived that if the crop growth is good and fast it indicates good soil health. Whereas, 89.33 per cent of the farmers agreed to if soil gives more crop yield then the health of the soil is good. Further, 85.33 per cent of the farmers felt that if the soil colour is dark brown then the health of the soil is good. The 81.33 per

cent farmers perceived that if soil has good soil tilth means it has good health. Majority of the respondents perceived that more earthworms (66.67 per cent) and higher organic matter (63.33 per cent) present in the soil, indicates good soil health.

From the foregoing discussion, it can be concluded that "good and fast crop growth",

"more crop yield", "dark brown color of soil" and "good soil tilth" were the indicators considered more important by the farmers for perceiving the good soil health, and were ranked first, second, third and fourth, respectively.

Indicators of bad soil health

The information regarding indicators of bad soil health as perceived by the farmers was also collected and presented in Table 3.

Table 3 Perception of farmers about indicators of bad soil health (n=150)

Sr. No	Indicators	Farmers (%)		Mean Score	Rank
		Agree	Disagree		
1	Water is not absorbed in soil	90.67	09.33	1.90	I
2	Salt comes up to soil surface	82.67	17.33	1.82	II
3	Frequent irrigation needed	80.00	20.00	1.80	III
4	Soil gets cracked	74.67	25.33	1.74	IV
5	Soil gets hard when dry	73.33	26.67	1.73	V
6	Plant growth remain slow	66.67	33.33	1.66	VI
7	<i>Vapsa</i> gets delay	63.33	36.67	1.63	VII
8	Poor seed germination	60.00	40.00	1.60	VIII
9	Crop show water shortage even after irrigation	56.00	44.00	1.56	IX

The data presented in Table 3 reveals that 90.67 per cent of the respondents felt that if the water is not absorbed in the soil shows that the soil health is bad. The 82.67 per cent and 80.00 per cent of the respondents perceived that if the salt comes up to soil surface and the soil needs frequent irrigation then the health of the soil is bad. Almost three-fourths (74.67 per cent) of the respondents perceived the bad soil health on the basis of cracking of soil. Moreover, 73.33 per cent of the respondents perceived the hardness of the soil as an indicator of bad soil health. The respondents also perceived that when the "plant growth remains slow" (66.67 per cent), "*vapsa* gets delayed" (63.33 per cent), "seed

germination is poor" (60.00 per cent) and "crop shows water shortage even after irrigation" (56.00 per cent) then the health of the soil is not good.

It can be concluded that the most important indicators perceived by the farmers for bad health of soil were; "water is not absorbed in soil", "salt comes up to soil surface", "frequent irrigation needed", "soil gets cracked" and soil gets hard when dry" and were ranked first, second, third, fourth and fifth, respectively.

Purpose of maintaining soil health

The responses of the farmers regarding purpose of maintaining soil health were obtained and depicted in Table 4

Table 4 Perception of farmers regarding purpose of maintaining soil health (n=150)

Sr. No	Purposes	Farmers (%)		Mean Score	Rank
		Agree	Disagree		
1	Sustaining crop productivity	90.67	09.33	1.90	I
2	Increasing soil water holding capacity	84.00	16.00	1.84	II
3	Reducing irrigation cost and sustaining crop against water shortage	73.33	26.67	1.73	III
4	Increasing microbial activities	46.67	53.33	1.46	IV
5	Controlling soil erosion by conserving soil	33.33	66.67	1.33	V
6	Sustaining nutrients level in soil	30.00	70.00	1.30	VI

Data presented in Table 4 indicates that the perceived purposes of maintaining soil health by vast majority of the respondents were; to sustain crop productivity (90.67 per cent), increasing soil water holding capacity (84.00 per cent) and reducing irrigation cost and sustaining crop against water shortage (73.33 per cent) and ranked first, second and third, respectively.

Less than half of the respondents perceived that the soil health should be maintained to increase microbial activities in the soil (46.67 per cent), controlling soil erosion by conserving the soil (33.33 per cent) and to sustain the nutrients level in the soil (30.00 per cent) and were ranked fourth, fifth and sixth, respectively. This implies

the poor perception of the farmers about these purposes of maintaining soil health.

Thus, from the discussion, it can be concluded that the purposes to maintain the good soil health perceived by the majority of the farmers were: "sustaining crop productivity", "increasing soil water holding capacity", "reducing irrigation cost and sustaining crop against water shortage" and "maintaining nutrients level in the soil".

Correlates of perception of the farmers regarding soil health

The correlation coefficient was worked out to find out the association between the characteristics of the farmers and their perception about soil health. The data in this regards are presented in Table 5.

Table 5 Correlation between selected characteristics of farmers and perception about soil health

Sr. No.	Variables	Correlation Coefficient (r value)
1	Age	0.1464 ^{NS}
2	Education	0.1270 ^{NS}
3	Farming experience	0.1646*
4	Land holding	0.3660**
5	Herd size	0.0010 ^{NS}
6	Annual income	0.1646*
7	Irrigation source	0.0568 ^{NS}
8	Water level	0.0386 ^{NS}
9	Cropping intensity	-0.2334**

* = Significant at 0.05 level ** = Significant at 0.01 level NS = Not significant

A perusal of the data in Table 5 shows that farming experience had positive and significant association with perception of the farmers about soil health it indicates that farmers having more experience had positive perception. Land holding had positive and highly significant association with perception of soil health. It signifies that medium and large farmers had positive perception regarding soil health. Annual income had positive and significant association with farmers' perception. Cropping intensity had negative and significant association with perception of farmers about soil health. Rest of the characteristics of farmers *viz.*, age, education, herd size, irrigation source and water

level had no association with perception of farmers about soil health.

CONCLUSION

Maximum number of farmers were middle to old aged, literate, had medium farming experience, small to medium land holding, small herd size, annual income up to 2 lakh, tube well as major source of irrigation, ground water level between 400-600 feet and had cropping intensity ranging from 101 to 200 per cent.

The indicators for good soil health perceived by a great majority of the farmers were: good and fast crop growth, more crop yield, dark brown soil

colour and good soil tilth while, water is not absorbed in the soil, salt come up to soil surface, frequent irrigation is needed, soil gets cracked and soil gets hard when dry were the indicators of bad soil health perceived by a great majority of the farmers.

The purposes perceived important by the majority farmers for maintaining good soil health were; sustaining crop productivity, increasing soil water holding capacity and reducing irrigation cost and sustaining crop against water shortage. Among nine characteristics under study, farming experience, land holding and annual income had positive and significant correlation while, cropping intensity had negative and significant correlation with perception of farmers about soil health.

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