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Reasons and constraints in adoption of soil Health card among the farmers and suggestions to overcome

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Abstract

The present study was conducted with an objective to study the reasons and constraints in adoption of Soil Health Card (SHC) among the farmers in erstwhile Guntur district. A total of 120 respondents including 90 farmers and 30 extension workers were selected for the study. With respect to the reasons perceived by extension workers for the non-adoption of SHC results by farmers, the majority reported that farmers were unwilling to accept the recommended fertilizer doses, as they believed that the quantities suggested in the SHC were insufficient followed by getting lower yields if applied the fertilizer as per SHC (83.33%) and high dependency of Input dealers (76.67%). Whereas the majority (92.22%) of farmers expressed that they faced difficulty in following the fertilizer doses recommended as per SHC, as the exact quantities prescribed are not readily available as major constraint followed by over dependency on others to get understand about the SHC results (81.11%) and non-availability of micronutrients in nearby shops like zypsum and other micro nutrients to apply (76.67%). With respect to suggestions to overcome the constraints, majority (93.33%) of the extension personnel suggested that it is highly necessary to conduct results demonstrations on Soil Test Based Nutrient Management (STBNM) in the farmers' fields under the supervision of scientists in order to create awareness about the results of SHC, whereas, majority (86.70%) of the farmers suggested it is also necessary to arrange interactions with successful farmers who were benefited by using SHCs wherever possible.

Keywords: Adoption, constraint, nutrient, soil health, and perception

Introduction

Govt of India initiated Soil Health Card (SHC) scheme in the year 2015 in order to empower the farmers for sustainable growth for stable yields with optimum cost of cultivation by minimizing the excessive use of fertilizers. Over and over use of fertilizers not only increase the costs but also make the soil unfertile and become barren. The purpose of scheme was mainly to issue soil health cards every 3 years so as to provide a basis to address nutrient deficiencies; to strengthen functioning of Soil Testing Laboratories (STLs) through capacity building; to diagnose soil fertility related constraints; to develop and promote soil test based nutrient management and finally to build capacities of staff as well as progressive farmers for promotion of nutrient management practices (soilhealth.dac.gov.in, 2017). The overall objective is to achieve the Integrated Nutrient Management by judicious use of chemical fertilizers in combination with organic manures and biofertilizers for improving soil health and its productivity. But the deficiency of primary nutrients & secondary nutrients and micronutrients occurs in most parts of country due to imbalanced application of fertilizers

(Singh *et al*, 2020) ^[6]. As the year after year passes, farmers continually increase the use of fertilizers. In view of the above, the present study has been taken to identify the reasons as well as constraints in adoption of soil health card results by involving both the farmers and gross root level extension workers.

Materials and Methods

A Structured Interview schedule was developed for collection of data from the farmers as well as extension workers of Erstwhile Guntur district during the year 2019-20. Ex-post facto research design was employed. Out of 57 Mandals in the districts, 3 mandals and from each mandal 2 villages were selected. A total of 90 farmers at the rate 15 farmers from each village were selected randomly to study the constraints perceived in adoption of SHC results. Beside the farmers, 10 gross root level extension workers from each mandal were selected to study the reasons perceived by the extension workers for non-adoption of SHC results by farmers. Thus, a total sample was 120. Descriptive statics viz., frequency and percentage were used to anylise and interpret the data

Results and Discussion

Table 1: Reasons perceived by the extension workers for non-adoption of SHC results by farmers n= 30

Sl. No.	Statements	Frequency	Percentage	Rank
1	Lack of awareness about the advantages of soil sampling.	18	60.00	5
2	Farmers believe that applying fertilizers as per the soil test report results in lower yields	25	83.33	2
3	Farmers feel that the fertilizer doses recommended in the soil test report were insufficient	28	93.33	1
4	High dependency of Input dealers	23	76.67	3
6	Influencing of neighboring farmers	19	63.33	4

With respect to constraints perceived by extension workers in adoption of SHC results by the farmers that majority (93.33%) reported in Table 1. that farmers were unwilling to accept the recommended fertilizer doses, as they believed that the quantities suggested in the SHC were insufficient which was ranked first followed by getting lower yields if applied the fertilizer as per SHC (83.33%), High dependency of Input dealers (76.67%), Influencing of

neighboring farmers (63.33%) and Lack of awareness about the advantages of soil sampling (60.00%). Farmers applying higher fertilizers with expectation of higher yields since most of them are tenant farmers as well as a high difference in recommended dose as per the SHC and farmers practice against fertilizer application led the farmers not to follow the recommended dose.

Table 2: Constraint perceived by the farmers in adoption of SHC results n =90

Sl. No.	Statements	Frequency	Percentage	Rank
1	Lack of skilled technicians to collect the sample	61	67.78	5
2	Delay in issuing the soil test report	64	71.11	4
3	lack of availability of mobile soil testing laboratories	57	63.33	6
4	over dependency on others to get understand about the SHC results	73	81.11	2
5	Difficulty in following the doses recommended as per the soil test report.	83	92.22	1
6	Non-availability of micronutrients in nearby shops like zypsum to apply as per the SHC results	69	76.67	3

As per the Table 2. It is evident that majority (92.22%) of farmers expressed that they faced difficulty in following the fertilizer doses recommended as per SHC, as the exact quantities prescribed are not readily available as major constraint ranks 1st. For instance, if nitrogen is recommended at the rate of 55 kg per hectare as per the SHC, farmers can buy neither 100 kg urea as it contains only 46 kg N₂ it is lesser than the recommended nor 150 kg of urea as it contains 62 kg N₂ which higher than the recommended. 81.11 percent of them expressed that over dependency on others to get understand about the SHC results is another important constraint as many of the farmers were not literate or having primary school education. Moreover, non-availability of micronutrients in nearby shops like zypsum & other prescribed micronutrients to apply as per the SHC results (76.67%), Delay in issuing the soil test report (71.11%), Lack of skilled technicians to collect the sample (67.78%) and lack of availability of mobile soil testing laboratories (63.33%) other constraints expressed by the farmers in adoption of SHC results. Few studies were in line with the findings of the study.

Manisha Das *et al.*, observed that the major constraints expressed by the farmers were ‘unawareness of soil sample collection for different crops followed by time gap between the soil sample taken and issue of SHC is high, the SHC recommendations are far from the actual field condition, the follow up activities by extension agency is inadequate and ‘illiteracy of farmers to read the content in SHC. Chundru *et al* 2024, indicated in their study that received soil health cards after crop harvest and difficulty in calculating fertilizer dose on the basis of the nutrient status of soil; Rajib Das *et al* reported in their studies that the unavailability or inadequate supply of essential inputs at the required time emerged as a major concern, reported by a substantial proportion of respondents (61.90%) followed by difficulties in comprehending and the perceived complexity of the recommendations provided on the Soil Health Card (21.90%). Whereas, Ashish *et al*, 2024 reported that 85.83 per cent citing the high cost of fertilizers as a major concern followed by 80.83 per cent of respondents indicating inadequate knowledge regarding the importance of micronutrients.

Table 3: Suggestions given by the extension workers to overcome the constraints in adoption of SHC results by farmers n=30

Sl. No.	Statements	Frequency	Percentage	Rank
1	Conduct demonstrations on Soil Test Based Nutrient Management (STBNM) in the villages in order to create awareness about the results of SHC	28	93.33	1
2	Establish soil testing laboratory along with sufficient staff at every panchayat	24	80.00	2
3	Create awareness about benefits and usage of soil health cards among farmers at larger scale before commencement of the kharif season	22	73.33	4
4	Making follow-up visits after issuing SHC to the farmers in order to record their adoption levels	20	66.67	5
5	Establish fertilizer shops run by Govt institutions in addition to private dealers	23	76.67	3

The present investigation revealed several notable suggestions given by the extension personnel, as elucidated in Table 3. Majority (93.33%) that it is needed to conduct

demonstrations on Soil Test Based Nutrient Management (STBNM) in farmers’ fields under the supervision of scientists in order to create awareness about the results of

SHC ranks 1st followed by establish soil testing laboratory along with sufficient staff at every panchayat (80.00%), create awareness about benefits and usage of soil health cards among farmers at larger scale before commencement

of the kharif season (73.33%), Establish fertilizer shops run by Govt institutions in addition to private dealers (76.67%) and making follow-up visits after issuing SHC to the farmers in order to record their adoption levels (66.67%).

Table 4: Suggestions given by the farmers to overcome the constraints in adoption of SHC results n=90

Sl. No.	Statements	Frequency	Percentage	Rank
1	Provide soil health cards in right time	69	76.67	3
2	Soil health card should be as simple as possible to understand by the farmers	73	81.11	2
3	Necessary to arrange interactions with farmers who were benefited by using SHCs	78	86.67	1
4	Farmers need to be involved while collection of the soil sample in their field	58	64.44	5
5	Take soil samples in proper time and in proper way by the skilled team	62	68.89	4

To overcome the constraints, majority (86.70%) of the farmers suggested in Table 4 that it is necessary to arrange interactions with farmers who were benefited by using SHCs wherever possible which was ranked 1st among the suggestions followed by SHC should be as simple as possible to understand by the farmers (83.30%), provide soil health cards in right time (73.30%), take soil samples in proper time and in proper way by the skilled team (65.00%) and farmers need to be involved while collection of the soil sample in their field (64.44%). Similarly, Manisha Das *et al.*, in their study elicited that mobile soil testing laboratory for on-spot delivery of soil health cards, timely agriculture extension services and making availability of recommended inputs in the market were the suggestions given by the farmers to overcome the constraints in adoption of SHC results. Further, Raini *et al* also reported that government could organize awareness training programs to farmers on soil health card (89.16%) followed by making availability of recommended inputs in the market (75.83%), the soil sampling should be done in presence of farmers to increase the credibility of soil health card (83.33%), interpretation of results of Soil Health Card should make simpler with visual charts (77.50%) and mobile soil testing laboratory for on spot delivery of soil health cards (72.50) were the suggestions expressed by the farmers to overcome the constraints in adoption of SHC results.

Conclusion

It was elicited from the study that, though the SHC augments the Integrated Nutrient Management by judicious use of chemical fertilizers, majority of the farmers were not able use the SHC results due to various notable constraints such as farmers were unwilling to accept the recommended fertilizer doses, as they believed that the quantities suggested in the SHC were insufficient, low fertilizers results lower the yields as well as facing difficulty in following the fertilizer doses recommended as per SHC, as the exact quantities prescribed are not readily available and over dependency on others to get understand about the SHC results is another important constraint as many of the farmers were not literate or having primary school education. In light of the constraints, as suggested by the farmers, it is highly required to popularize the benefits of SHC by organizing result demonstration in the farmers fields at larger scale as well as it's necessary to arrange interactions with successful farmers who have followed SHC results. Farmers expect the SHC report before the commencement of season, hence, mobile soil testing laboratories are the alternative where the establishment of

soil testing labs are not possible. Beside private dealers, all the essential fertilizers should be made available for sale at government institutions at village level like Rythu Seva Kendras with sufficient technical staff to ensure transparency and to reap sustainable yields for the benefit of the farming community.

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