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FARMERS' CHALLENGES IN ADOPTING SOIL HEALTH CARD RECOMMENDATIONS IN MUZAFFARPUR DISTRICT OF BIHAR

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Abstract

In Muzaffarpur district of Bihar, the adoption of Soil Health Card (SHC) recommendations by farmers faces multiple challenges. Despite the potential benefits of improved soil management practices, farmers encounter several impediments that hinder effective implementation. Firstly, the lack of awareness and understanding of the SHC guidelines among farmers is a significant barrier. Many farmers are not adequately informed about the purpose of the SHC and how to interpret the recommendations. Secondly, financial constraints play a critical role; the cost of acquiring necessary inputs like fertilizers and organic matter as per SHC advice is often prohibitive for small and marginal farmers. Furthermore, logistical issues such as the unavailability of recommended inputs in local markets exacerbate the situation. The accessibility of extension services is another challenge. Limited interaction with agricultural extension officers results in insufficient technical support and follow-up, leaving farmers uncertain about the practical application of SHC recommendations. Additionally, traditional farming practices and resistance to change contribute to low adoption rates. Farmers often rely on inherited knowledge and are skeptical about altering established practices, even when faced with evidence of potential benefits. Climatic factors also influence adoption. Generic recommendations provided by SHCs may not always suit the diverse soil and crop conditions across different farms in Muzaffarpur.

Keywords: Awareness, Constraints, Suggestion, Soil health card, Recommendation

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Introduction

A Healthy soil provides a sufficient amount of macronutrients and micronutrients to the crop and determines its yield. A healthy should contien adequate and proportional macronutrients and micronutrients (Patel, 2013). The health of the soil is important for producing healthy crops, which nourish people and animals (FAO, 2015). As part of soil health, four key functions should be maintained: carbon transformation, nutrient cycles, and control of pests and diseases (Kibblewhite et al., 2008). A quality and healthy soil does play a significant role production of food, the resilience of the environment, and the sustainability of ecosystems (Stevens, 2018). The majority of farmers chemical fertilizers in their fields in

order to increase their crops yields without understanding the soil composition and fertility status in their fields (Chowdary et al., 2017) In order to achieve sustainable agriculture, it is imperative to adopt sustainable soil fertility management (SFM) practices (Chowdary et al., 2018), According to the survey conducted by Kumar et al., (2021), it was revealed that the knowledge level and adoption of SFM are relatively much lower among farmers, ie, the adoption rate is eight percent. of farmers are aware of it. To resolve all these problems, it is necessary to adopt sustainable soil fertility management practices, based on soil tests (Saha et al. 4, 2016). There are always reported constraints in adoption of technologies and several researchers tried to study constraints in different settings (kumar et al., 2010, Kumar & Nain, 2012; Gupta et al., 2013; Das et al., 2014; Slathia et al., 2015; Gireesh et al., 2019, Kobba et al., 2020). Taking all these factors into account, the government of India has launched. a national flagship program namely the soil health card scheme (SHC). The aims of the SHC scheme do soil tests on each and every farm, and to formulate micro-level maps of soil fertility at the farm level (Singh et al., 2020). Most of the nutrients are reflected in the soil health card (SHC), which represents the state of soil health. As a key objective of the System, one of its objective is to assess the current status of soil health to determine changes in soil health that are affected by land management to unprove its efficiency, a website has been developed called Soil Health Card, which allows you to register soil samples, record soil test results, and generate a Soil Health Card along with fertilizer recommendations after registering soil samples on this site (MoA & FW, Govt. of India, 2018). The attitude of farmers towards this scheme was positive for some variables, Farmers faced numbers of constraints while adopting the scheme (Ghate et al., 2020). Extension personnel's should plan urganising capacity building along with demonstrations on soil sampling to stilization of soil health cand recommendations by the farmers (Rani et al., 2022). Several researches has empirically proved that balanced use of organic and inorganic nutrients resulted in improved soil physio chemical and biological status of the which in turn makes the soil healthier and productive on sustainable basis (Singh et al.,2023).

Sample Collection and Handling

Proper soil sample collection relies on three principles:

1. **Organization**: having an orderly system for soil sample collection and handling simplifies sample collection and minimizes the chance of human errors such as mislabeling or misplacing soil samples.
2. **Consistency**: collecting each sample in a uniform manner between years and within the course of a sampling event will greatly improve the quality and reliability of your results. This means taking samples in the same manner for each sample.
3. **Simplicity**: following simple procedures will help ensure sample collection is consistent and easily organized.

Samples and Subsamples

Soils can be highly variable, even over short distances. Because of this variability, it is often insufficient to collect soil at just one location. Instead, it is preferable to collect so-called composite samples. Composite samples are a mixture of individual samples, or subsamples, generally collected from multiple locations and mixed together to form a single composite sample. By combining multiple subsamples into a single composite sample, we

can minimize the effects of soil variability by averaging the soil properties over larger areas. Composite samples are less sensitive to unusually high or low soil test values that might occur due to concentrated fertilizer applications (e.g. banded applications) or natural soil variation.

Sample Collection

Before collecting soil samples, you will need to gather certain materials and tools:

- A soil probe
- A clean plastic bucket
- A trowel
- Permanent markers**.**
- Sample bags. Many soil testing laboratories will provide wax-lined sample bags. In lieu of laboratory- provided bags, consider using paper bags or zip-top bags.
- Clipboard and paper or field notebook
- GPS-enabled smart phone or handheld gps unit (optional)

To Collect a Composite Sample by Use the Following Procedure

1. Before arriving to the field, determine the number and approximate location of soil samples. (See the Sampling locations and strategies section for details.)

2. Once the appropriate materials have been collected, travel to the first sampling location. If you'd like, you may record the location with a GPS or GPS application on your smart phone. This information can be useful later for tracking where samples have been collected. You may find it helpful to return to the same sampling locations in subsequent sampling events.

3. At the sample location, remove any crop residue from the soil surface.

4. Insert the soil probe to the desired depth. (S1 for details on sample depths) Take care to the probe is inserted vertically into the soila tilted to the side. Remove the probe and tra soil core from the probe into a bucket.

Table1. Sample Depth Guidelines

Tillage System	Sample depth
Conservation tillage (Less than 50% of crop residue incorporation)	Take separate samples: • 0-4 inches for pH/liming recommendations • 0-8 inches for fertility analysis
Conventional tillage (Greater than 50% of crop residue incorporation)	0-8 inches for pH/liming recommendations and fertility analysis

5. Move to a new location and repeat Steps. The distance between locations where subsamples will vary depending on the sam strategies you are employing. (See the Samp locations and strategies section for more in a general guideline, the larger the area of la are sampling, the more distance you need sampling locations. As a rough guideline, sa locations should be separated by a minimum 20-30 feet. If employing a zone-based or gri soil sampling program, it is often worthwhile select the location of soil samples prior to al the field for sampling. These preidentified be loaded onto a GPS-enabled device and can be used to direct you to the sampling lo 6. Continue this process of sample collection a locations until you have collected a sufficier number of samples. Typically, a composite should be comprised of

between 10 and 2 subsamples. The more subsamples you add composite, the more reliable a sample.

Soil Testing Laboratories

Soil testing is available for a nominal fee through several specialized laboratories. Each laboratory will have specific instructions for how to ship and label samples. To ensure the laboratory provides accurate and timely results, be careful to follow any laboratory-specific instructions. For details on laboratory-specific instructions, contact your chosen soil testing service. While most commercial laboratories provide quality, reliable testing services, there can be differences in methodology and results between laboratories. For this reason, it is often desirable to use the same soil- testing laboratory every year. This will ensure that any observed change in soil-test results from year to year are attributable to true changes in soil fertility status and not due to deviations in testing practices between different laboratories.

Sampling Locations and Strategies

Determining where to take soil samples der largely on the management strategy you on your farm. These management strategi be broken down into two types: whole-field and spatially explicit. In a whole-field management the field is managed as one unit. When fertilizer is applied in a whole-field approach, one fertilizer rate is applied uniformly across the entire field. Whole-field management is simple to implement and does not require any special equipment or data handling. In spatially explicit management, the field is broken into smaller sections, and each section is managed individually. Spatially explicit management can identify areas of the field with specific fertilizer of liming needs and provides a map of a field's nutrient and liming requirements. Spatially explicit management is an essential part of precision agriculture.

Methodology

This study was conducted at Tirhut Agriculture College (2019-2023) Muzaffarpur Bihar On the basis of data of maximum soil health card issued by Muzaffarpur a block named Bandra was selected for the study. Further, on the basis of masinsam density of card holders, two villages named Balgaon and Bakhri kaila we selected from Bandra Block to identify respondents as per the comprehensive list of soil health card holders in Tirhut Agriculture College, Muzaffarpur Hundred respondents frons each village were selected randomly making a sum total of 200 Soil Health Card Holders. The data were collected through pre-tested interview schedule (questionnaire), tabulated and analyzed in the light of the objectives to draw the result and conclusion in terms of percentage and frequency. The constraints faced by the farmers. for soil health card recommendation with more focus on cereals cultivation were identified, documented and ranked.

Results and Discussion

There are many significant constraints perceived by the farmers in the study area and they can be viewed in table 1 as a representation of the concerns raised by the respondents were inadequate follow-up of extension agency (71.0%), soil sample not taken from each farmer's field (59%) followed by not getting SHC reports in time (57.0%), not using of recommended dose of fertilizers as per SHC recommendation (49%), no productivity of results (46%), No awareness of SHC Scheme (37%) among farmers, complexity of recommendations on the SHC (31.0%), lack of knowledge about soil health card (23.0%), non-scientific method of collecting soil samples (17%), less benefit (13.0%), receiving of soil health card after crop showing/planting (11.0%), Inability to report any problem (9.0%), and non-availability of final recommendation of fertilizers in kattha (4.0%). We analyzed the

views of the respondents and drew up a list of suggestions based on their responses. In order to rank the suggestions of farmers according to their importance, the percentages were expressed in the Table 2. suggested that Snil Health Card should he issued prior to crop season (70%), there is a need for farmers be trained to take soil samples from their soil (63%) It is recommended that a soil testing laboratory to be established at at the the block level with highly qualified staff to support it (61%), hands on sampling techniques should be promoted (59%), Internet facility should be provided at village level (57%), reports should be distributed in time (56%), The soil sample should be collected regularly and from every farmer's land so that the sod can be tested (51%), farmers should use recommended dose of fertilizer for betterment (47%), there needs to be increased awareness about the Soil Health Card Scheme, as well as providing proper information regarding the importance/reading and usage of the Soil Health Card (43%). However, no suggestion came out from 14% Farmer.

Conclusion

There were many challenges faced by farmers in Muzaffarpur district, Bihar, when implementing the recommendations on the soil health cards. Although the government and stakeholders have made significant efforts to improve soil health management, there are still significant barriers. Farmers in Muzaffarpur faced many challenges due to their lack of knowledge and awareness about soil health management. These recommendations are discouraged by farmers because they are not aware of their long-term benefits. Many farmers do not fully understand the information contained in the soil health cards due to a lack of awareness. Extension workers should promote soil health knowledge as way to strengthen agricultural education and attitudes. Agricultural Extension Officers and KVK specialists should visit villages to encourage farmers to adopt cultivation-friendly practices**.**

References

Chowdary, R. K., Theodore, R. K., Anandarja, N., & Santhi, R. (2017). Factors determining the use of soil health card (SHC) recommen- dations in Kurnool District of Andhra Pradesh. International Journal of Pure & Applied Bioscience, 5(6), 1689-1694.

Chowdary, R., Babu, G P., & Theodore, R. K (2018). Soil health card adoption behaviour of farmers in Andhra Pradesh State of India. and Applied International Journal of Current Microbiology Science, 7(Special Issue), 4028-4035.

.Kumar, A., Singh, S., Singh, D. K., Yadav, R. N., Singh, L.. B., Malik, S., & Shahi, U. P. (2021). To study the socio-economic profile of soil health card scheme beneficiaries. Progressive Agriculture, 21(2), 211-215.

Kobba, F., Nain, M. S., Singh, R., Mishra J. R., & Shitu, G. A. (2020). Entrepreneurial profile and constraint analysis of farm and non- farm sectors entrepreneurial training programmes in krishi vigyan kendra and rural development & self-employment training institute. Indian Journal of Extension Education, 56(3), 17-26.

Kumar, P., & Nain, M. S. (2012). Technology use pattern and constraint analysis of farmers in Jammu district of Jammu and Kashmir state of India. Journal of Community Mobilization and Sustainable Development, 7(2), 165-170.

Patel, N. G. (2013). Attitude of the farmers towards soil health card programme, M.Sc. Thesis, Anand: Anand Agricultural University, India

Kumar, P., Peshin, R., Nain, M. S., & Manhas, J. S. (2010). Constraints in pulses cultivation as perceived by the farmers. Rajasthan Journal of Extension Education, 17&18, 33-36.