

Blocking Stones Perceived by Farmers in Utilizing the Soil Health Management Practices—A Case Study of West Bengal

Anwasha Mandal¹ and Neelam Bhardwaj²

¹G. B. Pant University of Agriculture and Technology, Pantnagar.

²G. B. Pant University of Agriculture and Technology, Pantnagar
E-mail: ¹manwasha.2515@gmail.com, ²n_11bhard@yahoo.co.in

Abstract—Upkeeping soil health is one of the priorities in agriculture in India. The present study was, therefore, undertaken to find out the major constraints faced by the farmers in adopting good soil health management practices. The study was conducted in Hooghly, one of the most intensively cultivated districts of West Bengal. Four villages viz. Damra and Bagdi from Chinsurah-Mogra block and Pratappur and Bahira from Balagarh block were selected by random sampling method for the purpose. The samples constituted of 120 respondents, selected through Probability Proportionate to Size (PPS) method. In spite of having many alternative practices for upkeeping soil health, their satisfactory adoption have still not been achieved. Practices related to soil test based recommendation, integrated nutrient management, soil reclamation and agronomical practices were taken into consideration for this purpose. Major constraints expressed by the respondents in adoption of soil health management practices were: difficulty in understanding the soil test report, lack of knowledge on soil test, untimely availability of test reports, lack of knowledge on biofertilizers, monetary constraints in using vermicompost and biofertilizers, lack of understanding of the benefits of secondary and micro nutrients, unawareness on acid soil problems, poor production of pulses and non-availability of Dhaincha seeds.

1. INTRODUCTION

As a consequence of the green revolution of 1960s, Indian agriculture is facing a lot of challenges. One of the alarming issues of present day agriculture is deteriorating soil health. Soil, the soul of agriculture, needs the utmost care in order to meet the hunger of the increasing population of the country, which will otherwise put the foodgrain production at stake. The ill effects of continuous use of high dosages of pesticides, insecticides and other chemicals is serious degradation of productive lands resulting in lower production as well as productivity. In the recent years, the central government has planned another green revolution in the eastern part of the country and launched the programme, “Bringing Green Revolution to Eastern India (BGREI)” in the year 2010-11. West Bengal, an important state out of the seven states included under this programme, is all set to explore its potentialities in agricultural sector. In order to curb the

consequences of the BGREI like the earlier green revolution, it is necessary to adopt some soil health management practices for safeguarding the state’s soil. Although several practices of soil health management are existing, there lies a huge gap between their existence and field level adoption. Researchers have found out a number of reasons or factors that hinder such adoption of the soil health management practices at field level. Chaudhury and Chauhan (2016) ^[2] in a study conducted on constraints faced by bio-fertilizer users found that inability to understand the details of bio-fertilizers and lack of knowledge on it are the major reasons for the farmers not using them. Researchers like Bodake *et al.* (2009) ^[1], and Jangid *et al.* (2012) ^[4] have also indicated that non-availability of proper agricultural literature, lack of awareness among the farmers, less knowledge about the scientific techniques of the practices are the reasons of their non-adoption. Friedrich and Kassam (2010) ^[3] while studying the adoption of conservation agriculture technologies found that the limiting factors for adoption of the technologies are intellectual and knowledge, social, financial, technical, infrastructural and last but not least policy.

2. MATERIALS AND METHOD

Hooghly district of West Bengal was selected purposively for the present study as it is one of the most intensively cultivated districts of the state. Out of the 18 blocks, two blocks - Balagarh and Chinsurah-Mogra were selected through chit method following simple random sampling without replacement method. Four villages, taking two from each block, were selected through chit method following simple random sampling without replacement method. Bahira and Pratappur villages were selected from Balagarh block and Damra and Bagdi villages were selected from Chinsurah-Mogra block. A total sample of 120 respondents was selected through probability proportionate to size (PPS) method. The head of the households who were actively engaged in

agriculture was chosen as respondents from the selected households from each village.

3. RESULTS AND DISCUSSION

A study pertaining to the constraints faced by the farmers in adopting soil health management practices was conducted among 120 respondents of Hooghly district of West Bengal. The results obtained are presented below.

The constraints mentioned by the respondents were grouped under four heads, i.e. constraints related to soil testing technology, constraints related to integrated nutrient management, constraints related to soil reclamation and constraints related to agronomical practices.

Table 1 describes the constraints perceived by the farmers in adopting the soil testing technology. The major constraints included difficulty in understanding the soil test based recommendation (40.0%). This indicates that soil testing technology is a complex one and difficult to understand which leads to its low adoption. The other constraints include lack of knowledge on soil test (23.3%) and non-availability of test report on time (12.5%). It was also inferred through discussion that since advantage of soil test cannot be observed directly, farmers generally do not show keen interest in performing the test. Patel, *et al.* (2017) ^[5] also reported similar findings.

Table 1: Constraints in adoption of soil testing technology (n=120) (multiple responses)

Sl. No.	Constraints	Frequency
1.	Difficulty in understanding the soil test based recommendations	48 (40.0)
2.	Lack of knowledge in soil testing	28 (23.3)
3.	Non-availability of report on time	15 (12.5)

**figures in the brackets indicates percentage*

Table 2 enumerates the factors that hinder the adoption of integrated nutrient management practices. As mentioned by the respondents, the major constraints include lack of knowledge on bio-fertilizers (69.2%), followed by monetary constraints for using bio-fertilizers and vermicomposting (60.0%) and lack of understanding of the benefits of using secondary- and micro-nutrients (25.8%). Low income and uncertain returns also discourage most of the respondents to invest in untried practices. When probed further, the respondents revealed that as the effects of secondary- and micro- nutrient are not much prominent, they tend to avoid application of such fertilizer/s. These findings were found to be similar with that of Rajula Shanthi and Subramaniam (2015) ^[7] who conducted study on integrated nutrient management in sugarcane.

Table 2: Constraints in adoption of integrated nutrient management practices (n=120) (multiple responses)

Sl. No.	Constraints	Frequency
1.	Lack of knowledge in usage of bio-fertilizers	83 (69.2)
2.	Monetary constraints in using vermicompost and bio-fertilizers	72 (60.0)
3.	Lack of understanding in the benefits of secondary and micro-nutrients	31 (25.8)

**figures in the brackets indicates percentage*

When enquired about the problems faced in using soil reclamation practices, the respondents only mentioned their inability to understand the problems of acid soils (12.5%) as the blocking stone in proper adoption of the recommended measures. Another problem which was observed but never mentioned by the respondents was absence of higher educational qualification disabled them to generate a proper knowledge on the concept of pH, which is essential to distinguish between acidic, normal and alkaline soils.

There are many recommended agronomical practices to upkeep the soil health. Mulching, crop rotation with pulses and cereals as well as deep rooted followed by shallow rooted crops, growing green manuring crops, incorporation of crop residues, minimum tillage are few of them. Since the Hooghly region is mainly predominated by rice-potato-rice cropping pattern, the farmers do not get any fallow period to grow green manuring crops like *Dhaincha*. Also the unsatisfactory production of pulses in the recent past has restricted their cultivation for home consumption only or in worst cases no production at all. Fear of being deviant is also a psychological issue in hindering the pulse production in the area. Another problem as mentioned by the respondents was unavailability of *Dhaincha* seeds which also discouraged them to try the practice. The results were found similar with the work of Patel (2013) ^[6] who indicated similar problems faced by the farmers in accepting green manuring practices. Table 3 shows both the constraints faced by the respondents in adopting the soil reclamation measures as well as agronomical practices.

Table 3: Constraints in adoption of soil reclamation measures and agronomical practices (n=120) (multiple responses)

Sl. No.	Constraints	Frequency
1.	Unaware of the problems associated with acid soil	15 (12.5)
2.	Unsatisfactory production of pulses	55 (45.8)
3.	Non-availability of <i>Dhaincha</i> seeds	43 (35.8)

**figures in the brackets indicates percentage*

4. CONCLUSION

The present study indicated several problems encountered by farmers in adopting different soil health management practices. The major constraints were difficulty in understanding the soil test based recommendation, lack of

knowledge on soil test, unavailability of report on time, lack of knowledge on usage of bio-fertilizers, monetary constraints in using vermicompost and bio-fertilizers, lack of understanding the benefits of secondary- and micro-nutrients, unaware of acid soil problems, unsatisfactory production of pulses and non-availability of *Dhaincha* seeds.

5. ACKNOWLEDGEMENTS

This study was carried out as a part of the Masters' thesis work. All the helping hands and advice received during the course of work are duly acknowledged.

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