Constraints opined by paddy and cotton cultivation farmers in the application of recommended doses of chemical fertilizers in Karnataka (India)

Abstract

Chemical fertilizers have played a vital role in the success of India's Green Revolution and consequent self-reliance in foodgrain production. The increase in fertilizer consumption has contributed significantly to the sustainable production of foodgrains in the country. In the Indian context, the land is becoming a shrinking resource for agriculture owing to competing for demand for its use. Hence, in order to realize the constraints opined by paddy and cotton cultivation farmers in application of recommended doses of fertilizers (RDF) needs to sustain the agricultural production, the result pertaining to this aspect was based on the primary data collected through survey method from paddy and cotton cultivation farmers 120 farmers in Raichur and Yadgiri district during 2015-16. Farmers faced many problems in applying recommended doses of fertilizers in paddy. In the case of small farmers, not available in adequate quantity was a major constraint with a mean score of 73.10. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 65.80 While in case of large farmers, adequate quantity as per RDF not available was a major constraint with a mean score of 76.20. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 69.80. Similarly, in cotton cultivation by small and large farmers also faced many problems in applying recommended doses of fertilizers, among different constraint, adequate quantity as per RDF not available was a major constraint major constraint.

Keywords: Availability, Constraint, Cultivation, Quantity and Recommended doses of fertilizers.

INTRODUCTION

Application of chemical fertilizers was popularised in our country during the Green Revolution of the 1960s and the 1970s. Incremental use of fertilizers in synergy with high yield seeds proved to be a tremendous contribution to the success of the green revolution.

Chemical fertilizer was identified as one of the three most important factors, along with seed and irrigation, for raising agricultural production and sustaining food self-sufficiency in India [1] (Chand and Pandey 2009).

Chemical fertilizers are composed mainly of nitrogen, phosphorous and potassium. The use of chemical fertilizers has significantly improved the quality and quantity of the food available. Increasing agriculture production in Indian by area increasing process is no longer possible as cultivable and leftover land is only marginal. Further, a considerable cultivable land is being diverted year after year for housing, industrial and other purposes. Hence self-sufficiency in food lies in increasing the yield per unit area per unit time through the adoption of modern agricultural technology. There is a need for efficient use of fertilizers as major plant nutrient resource in enhancing the farm productivity.

The use of chemical fertilizers to increase agricultural production particularly in a developing country like India is a well-known fact. Some argue that fertilizer was as important as seed in the Green Revolution (Tomich *et al.,* 1995) that contributed as much as 50 % to the yield growth in Asia (Hopper, 1993 and FAO, 1998). Chemical fertilizers have been considered as an essential input to enhance yield in Indian agriculture for meeting the foodgrain requirements of the growing population of the country. In the last few decades, the use of technology combined with high-yielding variety (HYV) seeds, fertilizer, and irrigation took the centre stage for raising agricultural productivity.

The application of essential plant nutrients particularly chemical fertilizer in optimum quantity and right proportion through correct methods is the key factor to increase crop production on a sustained basis. The success of modern agriculture depends largely on the use of off farm produced inputs of which chemical fertilizers happen to be quite important ones. The chemical fertilizer technology became popular among the Indian farmers only after independence. A proper understanding of the observed pattern of fertilizer consumption at the district level and fertilizer use pattern at farmers' level can be emerged only after studying the behaviour of the individual farmer. It is important to undertake such a study because it gives feedback to researchers and policymakers.

Though there are very few recent studies focused on constraints opined in the usage of chemical fertilizers for the crops under cultivation, it is found that farmers are not using Recommended Dosage of Fertilizers (RDF) of fertilizers for the crops under cultivation, which result into a gap in fertilizer use. The usage of chemical fertilizers may differ widely in

respect of soil, climatic conditions, irrigation, and adoption of HYVs, the average size of the farm. Therefore, to overcome the constraints opined by paddy and cotton farmers in the application of chemical fertilizers as per the recommended dosage of fertilizers (RDF). Thus, it is clear that the studies on chemical fertilizer consumption will be of paramount importance to the planners as well policymakers in preparing realistic future plans to create a condition for a rapid increase in chemical fertilizer consumption to attain long term goals of agricultural productivity. Hence, the present study has examined the constraints opined by paddy and cotton cultivation farmers in the application of recommended doses of fertilizers.

METHODOLOGY

Primary data were obtained from the farmers who are growing paddy and cotton crops through personal interviews with the help of pre-tested and structured schedule. Multistage random sampling techniques were employed. In the first stage for Raichur and Yadgiri district was selected in the North Eastern Karnataka region based on highest chemical fertilizer consumption. In the second stage from Raichur districts, two taluks were selected by considering above-mentioned criteria, Shindhanur and manvi taluks were selected, from Yadgiri districts, two taluks was selected by considering above-mentioned criteria, yadgiri and shapur taluks were selected. In the third stage, three villages from each taluks were selected randomly, from the selected villages ten farmers were chosen in random way. Thus the data was collected from 120 (30 from each taluk) sample farmers.

In order to assess the constraints faced by farmers for the application of chemical fertiliser according to RDA. Based on these ranks, using the formula was given below, ranks were converted into percentage. The order of the merit given in ascending order was converted into ranks by using the formula. Accordingly, these ranks were converted into scores by referring to Garrets table. Garrett's formula for converting ranks into per cent was given by

$$\text{Per cent position} = \frac{100*(R_{ij}-0.50)}{N_j}$$

Where

R_{ij} = Rank given for i^{th} item in j^{th} constraint faced by small and large farmers

N_j = Number of items ranked in j^{th} constraint faced by small and large farmers

The per cent position of each rank was converted to scores by referring to tables given by Garret and Woodworth (1969). Then for each factor, the scores of individual respondents were summed up and divided by the total number of respondents for whom scores were gathered. The mean scores for all the factors were ranked, following the decision criterion that higher the value the more is the constraint faced by small and large farmers.

Results and discussions

The details of ranks for various constraints faced by the paddy farmers in applying recommended doses of fertilizers and their mean (Garrett) scores are given in Table 1. Farmers faced many problems in applying recommended doses of fertilizers. In the case of small farmers, not available in adequate quantity was a major constraint with a mean score of 73.10. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 65.80 followed by fertilizers prices as per RDF are high, non availability of information regarding RDF by fertilizer shop, Lack of money to purchase fertilizers and not interested in application of fertilizer according to RDF. While in case of large farmers, adequate quantity as per RDF not available was a major constraint with a mean score of 76.20. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 69.80 followed by non availability of information regarding RDF by fertilizer shop, fertilizers prices as per RDF are high, not interested in application of fertilizer according to RDF and Lack of money to purchase fertilizers.

Table 1 Constraints opined in applying recommended doses of fertilizers by paddy farmers

Sl. No.	Particulars	Small farmers		Large farmers	
		Garret score	Rank	Garret score	Rank
1	Not available in adequate quantity	73.10	I	76.20	I
2	Fertilizers prices as per RDF are high	53.73	III	46.80	IV
3	Lack of money availability to purchase fertilizers	38.27	V	31.30	VI
4	Non availability of information regarding RDF by fertilizer shop	43.60	IV	48.63	III
5	Difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market	65.80	II	69.80	II
6	Not interested in application of fertilizer according to RDF	24.40	VI	33.27	V

The details of ranks for various constraints faced by the cotton farmers in applying recommended doses of fertilizers and their mean (Garrett) scores are given in Table 2. Farmers faced many problems in applying recommended doses of fertilizers. In the case of small farmers, not available in adequate quantity was a major constraint with a mean score of 67.30. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 64.57 followed by fertilizers prices as per RDF are high, non availability of information regarding RDF by fertilizer shop, Lack of money to purchase fertilizers and not interested in application of fertilizer according to RDF. While in case of large farmers, adequate quantity as per RDF not available was a major constraint with a mean score of 58.74. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market with a mean score of 51.62 followed by non availability of information regarding RDF by fertilizer shop, fertilizers prices as per RDF are high, not interested in application of fertilizer according to RDF and Lack of money availability to purchase fertilizers.

Table 2 Constraints opined in applying recommended doses of fertilizers by cotton farmers

Sl.	Particulars	Small farmers	Large farmers

No.		Garret score	Rank	Garret score	Rank
1	Not available in adequate quantity	67.40	I	58.74	I
2	Fertilizers prices as per RDF are high	51.90	III	38.50	IV
3	Lack of money availability to purchase fertilizers	42.97	V	28.83	VI
4	Non availability of information regarding RDF by fertilizer shop	47.13	IV	44.10	III
5	Difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market	64.57	II	51.62	II
6	Not interested in application of RDF	31.73	VI	35.29	V

Conclusion

Farmers faced many problems in applying recommended doses of fertilizers in paddy. Among both the small and large farmers, adequate quantity as per RDF not available was a major constraint. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market. Similarly, in cotton cultivation by small and large farmers also faced many problems in applying recommended doses of fertilizers, among different constraint, adequate quantity as per RDF not available was a major constraint. The second major constraint was difficulty in calculating NPK ratio as per RDF from the availability of fertilizers bags in the market faced by small and large farmers in cultivation of cotton in the study area.

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