



Purchasing Behaviour of Farmers for Bio-fungicide in Meerut District of Uttar Pradesh

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ABSTRACT

In this study, an attempt was made to examine the variables affecting farmers' satisfaction with bio fungicide use, the variables affecting their buying behaviour for the product and constraints faced by the farmers in usage of bio-fungicides. A total of 100 farmers were selected on the basis of snowball sampling. RBQ mean was calculated to find out the most influencing factors for purchasing of bio fungicide by the farmers. Garrett's standard procedure was adopted to determine the significance of a number of different factors as expressed by respondents in the use of bio-fungicides. It was found that the retailers influence, quality, price of positives and the opinion leaders with implant agency were the important factors that affect the purchasing decision of farmers. Further, a substantial percentage of farmers in the research area were quite satisfied with the bio-fungicide's efficacy, followed by its relative quality and history of widespread usage.

INTRODUCTION

The bio-fungicide is created of useful fungi and microorganism that colonize and attack plant germs, therefore meddlesome with the diseases they cause. Bio-pesticide was discovered in Japan in the early 20th century and first became a commercial product in France in 1938 (Mullaney, 2011). Microorganisms (microbial pesticides) and naturally occurring substances with the capacity to manage plant diseases are collectively referred to as "bio fungicides" (Abbey et al., 2019). The term "bio-fungicides" refers to substances used to treat plant diseases that are made through microorganisms and their by-products (Francis & Keinath, 2010). The majority of the formulations in this category are thought to be ecologically pure because of their biological origins and extremely low active ingredient concentrations. Additionally to being barely harmful, these products have a variety of impacts on different diseases, boost plants' resilience to harmful elements, and seem to be less expensive (Khakimov et al., 2020).

As of 2018, the North Yankee Bio-fungicide market had USD 496.9 million and is anticipated to succeed in USD 1046.2 million

by 2024, with a CAGR of 13.2 per term (Research and Markets Report, 2019). The market for bio-fungicides in Asia Pacific is expected to grow rapidly during the monsoon season. Due to the growing demand for food crops, especially cereals and grains and increased awareness of the benefits of agrochemicals derived from farmers also increases the demand for bio-fungicides in Asia Pacific. Government support for funding and awareness programs to educate farmers about the harmful effects of chemical-based fungicides is estimated to further the popularity of bio-fungicides in Asia Pacific.

Fan et al., (2015) studied that understanding of farmers' behaviour in pesticide use is essential for promoting sustainable pest control and protecting the health of farmers and the environment. Vegetable and fruit growers had higher levels of education and knowledge than grain growers, but the first ones were less willing to reduce pesticide use for fear of lower profits and a lack of reliance on government and pesticide dealers. Liu et al., (2016) found that vegetable growers used lower levels of bio pesticide and 68.63 per cent of them would prefer to use bio pesticide if they differed slightly from pesticides in the production

process. Naginbhai (2017) found that farmers these days rely heavily on chemical inputs to increase agricultural production and have little interest in the use of organic inputs due to lack of awareness and unavailability of natural products in the local market. It is therefore necessary for an hour to inform the farming community about inputs. Ravi Kumar et al., (2015) pointed out that education, land grabbing size and the linking of the marketing agency were the most important factors influencing the acceptance of the use of bio pesticides. Partial budget estimates suggest the use of bio-pesticides, rice fungicides, growing turmeric and sugarcane is economically viable. High prices are a major barrier to the adoption of bio products quoted by farmers.

METHODOLOGY

For the purpose of this study, descriptive research design was considered. It comprises of survey and fact finding enquiries of different kinds. Farmers’ primary data was gathered using pre-planned schedules. The study area was Meerut, district of Uttar Pradesh state as it has leading research and production centre for bio-agents located in Uttar Pradesh. A multistage sampling was adopted for the study. Uttar Pradesh state was selected on the basis of judgmental sampling (highest production area of the Sugarcane). Meerut district was selected on the basis of judgmental sampling (Potential consumption area of the bio-fungicide). Sardhana tehsil of Meerut district was selected on the basis of judgmental sampling (highest production of bio-fungicide area with usage of product). A total of 10 potential villages suggested by directorate of biocontrol S.V.P. Agriculture University. Ten farmers were selected from each villages based on snowball sampling method and hence, a total of 100 farmers were covered.

Various aspects affecting the performance of the bio-fungicide related were questioned to the farmers and the most effective feature was determined using the Rank Based Quotient mean method (Nisha & Vimalraj Kumar, 2019).

$$RBQ = \frac{\sum_{i=1}^n fi(n+1-i)*100}{Nn}$$

Where, fi= Number of respondents who recorded a certain element under its rank

N = Number of respondents,

n = Number of factors identified

A five point Likert Scaling method was used to study the level of satisfaction of farmers using bio-fungicides. In this way, sample respondents were asked to indicate by five points (Rensis Likert, 1932) whether they were very satisfied, satisfied, neutral, dissatisfied and very dissatisfied (Joshi et al., 2015). Rank Based Quotient (RBQ) was used by Gupta et al., (2013); Das et al., (2014); Yadav et al., (2018); Gireesh et al., (2019) & Gireesh et al., (2023) in their study to analyse the adoption and discontinuation of agricultural ponds.

Garrett’s standard procedure was adopted to determine the significance of a number of different factors as expressed by respondents in the use of bio-fungicides. According to this method, respondents were asked to rank each element, and the results of these rankings were then transformed into score values using the subsequent method (Dhanavandan, 2016):

$$\text{Percent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where, R_{ij} = Rank given for the i^{th} variable by j^{th} respondents
 N_j = Number of variables ranked by j^{th} respondents

RESULTS AND DISCUSSION

This study was designed to analyse the factors influencing purchasing behaviour for bio-fungicide in the study area, to assess factors influencing satisfaction level of farmers for bio-fungicide and constraints faced by the farmers in usage of bio-fungicides. The findings of the study are presented in Tables and relevant interpretations were drawn using the primary data collected from farmers and analysed using measurement models.

Factors influencing purchasing behaviour for bio fungicide usage

Table 1 depicts the factors influencing the modification of the reception of bio-fungicides depends on a variety of economic conditions. Equal significance of these items was categorized using RBQ Meaning as the discovery of bio-fungicide. The study revealed that the factors such as retailers influence, quality and price had positive influences on purchasing of bio-fungicides with mean value of 93.67, 92 and 89, respectively. The opinion leaders with the implant agency was an important factor with a positive impact and increased the chances of acquisition by 81. The factors such as brand image and packaging had positive effects on purchase of bio-fungicides, while media has least effect on adoption.

The results were supported by study of Sharma et al., (2020), in their study the buying behaviour of farmers concerning about agrochemicals use on rice crop in Punjab was analysed. The result of their study shows that half of the farmers favoured their peer farmers experience as their information source for agrochemicals, while less than half farmers preferred dealers recommendations. Whereas 16 per cent obtained information via demonstrations, out of which four per cent of the respondents referred that extension specialists forget the details of agrochemicals.

Factors influencing satisfaction level of farmers for bio-fungicide

Likert Scaling approach was used to study the satisfaction level of farmers using bio-fungicides. In this approach, the sample

Table 1. Analysis of factors determinant in purchasing of bio-fungicides

S.No.	Factors	Mean	Rank
1	Retailers influence	93.67	I
2	Quality	92.00	II
3	Price	89.00	III
4	Opinion Leaders	81.00	IV
5	Ready availability	77.00	V
6	Brand image	50.67	VI
7	Packaging	48.67	VII
8	Effective & ease of use	48.33	VIII
9	Advertisements	43.67	IX
10	Media	43.33	X

Source: Researcher’s compilation from primary data

respondents were asked to indicate on a five point scale (Rensis Likert, 1932) whether they were highly satisfied, satisfied, neutral, dissatisfied and highly dissatisfied with the various attributes of bio-pesticides and fungicides. The responses were recorded and the scores were added to obtain the mean score towards the satisfaction level of the sample respondents. The score for each factor responses is given in the Table 2. Table 2 shows that the majority of farmers in the research area were quite pleased with the bio-fungicide's efficiency, followed by the product's general quality and continuous usage history. Conversely, equal percentages of the farmers were not satisfied with the price of the products. The result infers that the availability of product is not in line with its performance.

Table 2. Degree of satisfaction of farmers indicated by a score

S.No.	Factors	Score
1	Effectiveness	72.50
2	Overall quality	68.75
3	Regular usage experience	65.00
4	First use experience	63.75
5	Price of product	60.00
6	Availability of product	42.50

The results are supported by the research of Sahar et al., (2020), where it was found that the respondents were generally pleased with the response in terms of the play's technical information, the play's message's applicability, and the play's linguistic style. They liked how the street play was presented, how it addressed agricultural issues, and how it came at the right time.

Constraints faced by the farmers in usage of bio-fungicides

To study the constraints faced by the farmers in usage of bio-fungicide, six major factors were identified and farmers were asked to rank the factors according to their severity. The Garrett score of each factor was calculated and ranks were given (Table 3).

It was noticed from the Table 3, the lack of technical support was the major constraints faced by the farmers was ranked first. Storage and slow results were the other constraints and they were ranked second and third, respectively. Naik et al., (2022) in their study analysed the constraints faced by the farmers in adopting CRA technologies through Garrett's Ranking Method. The results shows that in socio-personal category of constraints, the major problem was inability of farmers to take risk which was given as rank I. In financial constraints the major constraints was inadequate institutional financial support which was given as rank I.

Table 3. Constraints faced by farmers in usage of bio-fungicides

S.No.	Factors	Garrett Score	Ranks
1	Lack of technical support	66.60	I
2	Storage	64.00	II
3	Slow results	62.53	III
4	Adequate unavailability	55.93	IV
5	Products are very expensive	39.37	V
6	Bad smell	33.47	VI

Source: Researcher's compilation from primary data

CONCLUSION

The study concluded that majority of the farmers (33%) who had >4 hectares of land uses bio-fungicide in the study area. Educational status and land holding size of farmers had positive influences on adoption of bio-fungicide by 86.47 per cent and 39.76 per cent, respectively. The contact of farmers with extension agency were the important factor positively influences and increases the probability of adoption by 57.66 per cent, whereas the land quality index has the least effect on adoption. A substantial percentage of farmers in the research area were quite satisfied with the bio-fungicide's efficacy, followed by its relative quality and history of widespread usage. Conversely, equal percentages of the farmers were not satisfied with the price of the products. The result infers that the availability of product is not in line with its performance. The major constraints faced by the farmers using bio-fungicide were reported to be adequate unavailability followed by lack of technical support.

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