Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 24, Issue 3, 2024
PRINT ISSN 2284-7995, E-ISSN 2285-3952

FACTORS AFFECTING THE DECISION TO PURCHASE BIO-ORGANIC FERTILIZER FOR RICE PRODUCTION IN THE MEKONG DELTA, VIETNAM

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Abstract

Using industrial bionitrogen fertilizer for crops is a new trend to improve the quality and value of agricultural products while helping to improve the soil environment and can completely replace traditional chemical nitrogen. Industrial bionitrogen fertilizer is gradually being produced and consumed in Vietnam and the Mekong Delta. However, the level of industrial bionitrogen fertilizer consumption is still limited for many reasons. This study interviewed 250 rice farmers in the Mekong Delta provinces who consumed industrial bionitrogen fertilizers, then used exploratory factor analysis to evaluate the influence of factors on their decisions of purchasing industrial bionitrogen fertilizer. The results show that there are at least 5 factors that have a positive impact on purchasing decisions, arranged according to their importance: consumer awareness, subjective standards, product quality, distribution system and sales promotion. On this basis, some policy implications and solutions have been proposed.

Key words**:** *awareness, bionitrogen fertilizer, consumer, decision, exploratory factor analysis*

INTRODUCTION

The Mekong Delta (MD) is a key agricultural production region of Vietnam, mainly producing rice and fruit trees. The abuse of inorganic fertilizers and chemical pesticides, increasing production costs, affecting the health of users, polluting the environment, and leaving residue on agricultural products is ongoing [15]. At the conference "Current situation and solutions for managing the use of fertilizers and pesticides and growing areas and packaging facilities for agricultural products in the MD provinces" in 2021, the agricultural authority revealed a lot of related information and problem of using fertilizers on crops. The average amount of fertilizer used in the MD is over one ton of fertilizer per cultivated hectare, of which inorganic fertilizer is 754 kg/ha and followed by 392 kg/ha of organic fertilizer, accounting for about 36.6% of the total amount of fertilizer used [12].

The Ministry of Agriculture and Rural Development (MARD) has had a strategy to develop organic fertilizers to increase the value of agricultural products and protect the environment. The program to develop the production and use of organic fertilizer has been implemented by the sub-ministry unit of Plant Protection Department since 2017. By 2020, the country had 4,798 organic fertilizer products recognized for circulation, and there were 265 fertilizer production manufacturers with a capacity of 4.04 million tons/year. The MARD has also organized cooperation with businesses and trained farmers on how to use fertilizer effectively, aiming to use more organic fertilizer. Data up to 2020 show that there are 124 models and 6,683 hectares of models trained to use organic fertilizer. In the Mekong Delta, there are 909 classes and 30,273 farmers trained to use organic fertilizers.

On the market there are two types of traditional organic fertilizer and industrial organic fertilizer. Traditional organic fertilizers are often limited in popularity on a large scale due to problems in collecting raw materials, transporting and distributing them. Meanwhile, industrial organic fertilizers overcome these

limitations and can be promoted in the future. However, the level of use of organic fertilizers, especially industrial organic fertilizers, in the MD is still limited. There are currently pilot models and trained farmers who are acting as really adopters to spread the organic fertilizer use strategy. Practically, many problems are arising in encouraging producers to use organic fertilizers to meet the goals of the agricultural sector towards sustainable development in the future.

N. Humate + TE is a product of PetroVietnam Ca Mau Fertilizer Joint Stock Company (PVCFC) and is a form of bio-industrial organic fertilizer. This product is a complex of Urea and organic Humic Acid creating Humate in associated with micro-mineral elements of Zinc and Boron... Commonly it can be called a new generation organic fertilizer since it can provide nutritional solutions for plants, combining sufficient chemical nitrogen fertilizer and biological ingredients to stimulate the growth of beneficial microorganisms and supplement nutrients. Organic matter in the fertilizer increases soil fertility, and helps completely replace chemical nitrogen fertilizers in farming [9]. With its ingredients and uses, the product N. Humate + TE 28-5 can be abbreviated as Ca Mau Fertilizer brand and is a microbial organic (MBO) fertilizer.

Although MBOF fertilizer has been traded on the market in recent years, its widespread use in agriculture to replace the long-standing practice of completely using chemical fertilizers is a task that requires time and a lot of effort from all related parties. The amount of MBOF consumed on the market in the period 2018 - 2022 is still quite low. Data from Ca Mau Fertilizer Company shows that the average amount of this fertilizer consumed is 3,449 tons/year and is much lower than chemical nitrogen fertilizer (urea) sold by the same company with 348,366 tons/year [13].

In the context of the MD regarding the limited use of organic fertilizers on crops, as well as the specific case of PVCFC's MBO fertilizer consumption, research to find solutions to increase the use of organic fertilizers is necessary. This study therefore has the purpose of analyzing the factors that affect consumers' decisions to purchase and use so that it can supplement useful solutions for the process of spreading MBO fertilizer use in the domestic market in the following years. The study applied theories of consumer behavior in the context of agricultural production, specifically purchasing MBO fertilizer for rice production in some provinces in the MD.

MATERIALS AND METHODS

Theoretical model of factors influencing consumer decisions

Consumers choose and decide to buy a product on the market are influenced by many factors that represent characteristics of product quality, brand, price, marketing, and customer perception etc., …. In this study, consumers are rice farmers and the product they decide to buy is the MBO fertilizer. Many studies have proposed theoretically hypotheses about factors that influence consumer decisions that can be inherited in this study.

(a) Product quality

Previous studies have concluded that product quality has an important influence on the choice to buy bio-organic fertilizer products such as Sumbayak [15], Kusumah [7] or deciding to buy food in Vietnam like Hung [4]. This study inherits the above studies and hypothesizes as follows:

Hypothesis 1: Product quality has a positive (+) correlation with the decision to buy biofertilizer products.

(b) Price

The selling price of a product represents the value of the product and also shows the competitiveness of the product when compared to similar products from the consumer's perspective. Studies on consumer product purchase decisions as above cited also hypothesize the influence of price and can be inherited for this study.

Hypothesis 2: Price has a negative (-) correlation with the decision to buy biofertilizer products.

(c) Supply system

The product distribution or supply system in general and biofertilizer in particular is a bridge between manufacturers and consumers. In this study, there is a system of biofertilizer

dealers or stores in the research provinces. A rich and convenient product distribution system will help consumers easily choose and positively influence their decision to buy fertilizer [3]. Authors such as Sumbayak et al. [15] argued that the distribution system has an influence on product purchase decisions. This study also hypothesizes inheritance.

Hypothesis 3: The distribution system has a positive (+) correlation with the decision to buy biofertilizer products.

(d) Sale promotion

Sales promotion is convincing customers to buy products, can be considered an art of sales and can make customers increase their level of satisfaction when buying products [2], [4]. Some studies show that this factor affects the decision to buy products and services such as Sumbayak et al. [15] for biofertilizers. This study also has a similar hypothesis.

Hypothesis H4: Sales promotion has a positive (+) correlation with the decision to buy biofertilizer products

(e) Personal characteristics

Consumers' personal factors represent internal characteristics of consumers due to cultural factors, social relationships or even human characteristics. Personal characteristics can also be influenced by the surrounding community where consumers live and interact on a daily basis such as family, friends, neighbours, and colleagues [6]. Some authors have shown that social influence has an impact on the decision to apply technical advances in rice production [14], or accept organic agricultural production [8]. This study inherits the following hypothesis.

Hypothesis H5: The personal factor has a positive (+) correlation with the decision to buy biofertilizer products.

(f) Trademark

A trademark or brand is a relatively abstract concept as it has commercial value. Customers' brand knowledge includes brand awareness and brand impressions [5], [19]. The hypothesis is set out as follows.

Hypothesis H6: Trademark has a positive correlation (+) with the decision to buy biofertilizer products.

(g) Consumer perception

Perceived usefulness of a product is the degree to which customers believe it will improve work performance when they consume that product. Venkatesh and Davis [20] suggested that perceived usefulness and perceived ease of use have an impact on behaviour intention to use. The higher the perceived usefulness of a product, the easier it will be for consumers to make purchasing decisions. The hypothesis of this study is inherited as follows.

Hypothesis H7: Consumer perception on the usefulness of fertilizer has a positive (+) correlation with the decision to purchase biofertilizer products.

Thus, the theoretical model of this study is a collection of all seven hypotheses mentioned above, all of which influence the decision to buy biofertilizer products in different directions and levels. These hypotheses will be evaluated through factor analysis and regression methods in the following section.

Observation sample

This study employs the method of exploratory factor analysis (EFA) to reduce a large number observed variables into smaller representative variables, thereby determining the factors influencing the decision to buy biofertilizers. Subsequently, the study uses multivariate regression to determine the magnitude and direction of influenced factors on the decision to buy biofertilizers.

The observed sample size is determined based on the number of observed variables, with a minimum of 5 observations for each observed variable to ensure reliability [3]. With 34 observed variables, the minimum size required of the observation sample is $n \geq 5*34$ equivalent to ≥ 170. In fact, we randomly selected 3 farmers on each of the 93 agents of the fertilizer distribution system scattered in different rice-produced provinces in the MD namely Can Tho, Hau Giang, Soc Trang, Bac Lieu and Ca Mau. A total of 279 farmers were interviewed, however, after eliminating those with incomplete information, 250 observations remained and were used for the analysis.

Data interviewed

Primary data was collected through questionnaires and direct interviews with farmers who purchased fertilizer. The questionnaire consists of information showing

basic characteristics of buyers such as name, age, gender, rice land area and factors affecting the decision to buy fertilizer. For asking about factors influencing the decision to buy fertilizer, the questionnaire was designed with a 5-level Likert scale from 1 to 5, whereby level 1 corresponds to "strongly disagree", level 2 is "disagree". ", level 3 is "neutral", level 4 is "agree" and level 5 is "strongly agree" to evaluate the level of influence on the decision to buy fertilizer. The factor analysis model includes 7 scale groups including 34 observed independent variables (Table 1) and a scale on purchasing decisions including 3 observed dependent variables (Table 2).

Table 1. Scales and observed independent variables affecting the decision to buy fertilizer

Scale	Coding	Description
Product quality (PQ)	PQ1	Biofertilizer is of good quality
	PQ2	Fertilizer content is clearly shown on the packaging
	PQ3	The packaging quality is good and waterproof
	PQ4	The fertilizer grain are black and uniform, with good solubility
	PQ5	Instructions for use are clear, easy to read and understand
Product price (PP)	PP1	Selling price is reasonable
	PP2	Competitive selling price compared to other products
	PP3	The selling price is corresponding to the quality of the fertilizer
	PP4	Selling price is stable
Distribution system (DS)	DS1	The product is easy to buy at the dealer
	DS2	Product is delivered quickly
	DS3	There is a large network of distributors
	DS4	Products can be ordered easily over the phone
	DS5	Products can be purchased online
Sale promotion (SP)	SP1	There are gifts included when buying fertilizer
	SP2	There are gifts when participating in fertilizer consulting sessions
	SP3	Participate in sales seminars at dealerships with promotions
	SP4	Regular promotions and discounts when the season comes
	SP5	Receive technical support after purchasing fertilizer
Trademark (TM)	TM1	The Ca Mau Fertilizer brand is of good quality
	TM2	The Ca Mau Fertilizer logo has a familiar impression
	TM3	The Ca Mau Fertilizer brand creates trust in customers
	TM4	Ca Mau Fertilizer products are as good as the nitrogen fertilizers used before
	TM5	Ca Mau Fertilizer products stand firmly in the market
Personal characteristics (PC)	PC1	Know the product through acquaintances and neighbors
	PC2	Get to know the product through referral distributors
	PC3	Know the product through advertisements on TV and YouTube
	PC4	Know the product through sales seminar
	PC5	Know products from local agricultural authorities
Perception (PE)	PE1	Using this fertilizer is less costly than conventional use
	PE2	This fertilizer has organic content that is good for the soil
	PE3	Hard and round fertilizer granules are easy to use and mix
	PE4	The product has beneficial properties for plant growth
	PE5	The product has multi-nutrients that are good for agricultural products

Source: Author's research design.

Table 2. Scales showing the decision to buy fertilizer

Decision	DE1	I am completely satisfied when choosing to buy and use biological nitrogen fertilizer
	DE2	I faithfully use biological nitrogen fertilizer
	DE3	I advise my friends and neighbours to use biological nitrogen fertilizer

Source: Author's research design,

Analytical method

This study firstly employs the EFA method and then runs multivariate regression to evaluate the influence of factors on the decision to buy biofertilizers. The analysis steps are performed on SPSS statistical software version 26, in the following:

Step 1: Evaluate the quality of the scale through Cronbach's Alpha coefficient

Evaluate the quality of the scale are based on the total variable correlation coefficient and Cronbach's Alpha [1], according to which variables with a total variable correlation coefficient less than 0.3 will be eliminated [16], and at the same time, the selected variables must have a Cronbach's Alpha coefficient greater than 0.6 [10], [11], [18]. After eliminating variables that do not meet the requirements, if any, the evaluation of the scale will be continued for the remaining variables to determine the total variable correlation coefficient and Cronbach's Alpha coefficient until all variables remained meet the requirements.

Step 2: EFA exploratory factor analysis for the independent variable

EFA analysis is performed to reduce a set of many interdependent observed variables into a smaller group of variables called meaningful factors and still contain most of the information of the original set of variables. head. The KMO (Kaiser-Meyer-Olkin) and Bartlett's test methods were used to measure the compatibility of the surveyed sample. The factor analysis is meaningful whenever the KMO value > 0.5 and the sig value < 0.05; The factor loading factors must be > 0.5. In case an observed variable loads on both factors, the factor loadings must be greater 0.3 different and this observed variable is included in the factor that it has the highest loading with the condition that it must satisfy loading factor > 0.5.

Eigen value is the criterion used to determine the number of factors in EFA analysis, according to which only factors with Eigen value ≥ 1 are retained in the analytical model [3]. At the same time, the total explained variance of the factors must be greater than 50% or better than 60% [3], this value explains the percentage of variation of observed variables in the model.

Step 3: EFA exploratory factor analysis for the dependent variable

Similar to the EFA analysis procedures for the independent variable above, this study also performed EFA analysis for the dependent variable. Use the KMO value > 0.5 and the statistical significance level of the Barlett test to confirm the appropriateness of EFA for the dependent variable.

Step 4: Multivariate regression analysis and hypothesis testing

The least squares (OLS) multivariate regression model was used to analyze the influence of the independent variables determined through the EFA analysis above on the dependent variable (decision intend to buy biological fertilizer). The regression model has the form:

$$DE = \beta_0 + \beta_1 F_1 + \beta_2 F_2 + \beta_3 F_3 + \beta_4 F_4 + \beta_5 F_5 + \beta_6 F_6 + \beta_7 F_7 + \varepsilon \quad \text{..... (1)}$$

where:

DE: dependent variable

F_1, F_2, F_3, F_4, F_5, F_6, F_7: independent variables

β_0, ….,β_7: coefficient

ε: residual

The variables in the regression model are created according to the factor score method based on the loading factor in the factor analysis above. The appropriateness of the regression model is determined through the F test with the hypothesis H_0 that the determining coefficient $R^2 = 0$. At the same time, the "t" (student) test is also used to determine the significance level of the regression coefficients with H_0that the $\beta n = 0$. At the same time, to avoid multicollinearity, the variance inflation factor (VIF) values of the variables are considered, so that the VIF must be less than 2 [16]. At the same time, in order to avoid correlation in the residuals of the model, the value of the Durbin-Watson coefficient (DW) is determined so that this value must range from 1.50 to 2.50 ($1.50 \leq DW \leq 2.50$) according to Yahua [21].

RESULTS AND DISCUSSIONS

Consumer's characteristics

The basic characteristics of farmers who decided to buy biofertilizers are shown in the survey sample of 250 farmers as shown in Table 3. Farmers are mainly male, their average age is 52.3 years old, of which the majority are over 40 years old (88.4%), which also means they have a lot of experience in agricultural production. Up to 40% of farmers have primary school education, nearly 50% have lower secondary education and just over 10% have high school education. The average agricultural land area is 1.8 hectares/household, of which 54.4% have an area of 1 to 3 hectares and 38% have an area of less than 1 hectare/household. In general, farmers who buy MBO fertilizers are people who have a lot of production experience and are mature enough in their production decisions as well as buying and using fertilizers on their farms. Survey data show that, on average, each farmer household used general fertilizers at 1,611 kg/ha (ranging from 200 to 8,000 kg/ha), of which MBO fertilizer was 349 kg/ha (ranging from 100 kg/ha to 2,000 kg/ha).

Table 3. Main characteristics of consumers

Characteristics		Frequency	Rate (%)
Gender	Male	231	92.40
	Female	19	7.60
Age (year)	< 40	29	11.60
	40 – 50	63	25.20
	>50	158	63.20
	Mean	52.3	
Land area (ha/household)	< 1	95	38.00
	1 – 3,0	136	54.40
	> 3 – 5	15	6.00
	> 5	4	1.60
	Mean	1.8	
Education (level)	Primary school	100	40.00
	Secondary school	123	49.20
	High school	27	10.80
	University	0	0

Source: Data surveyed in 2023.

Evaluation of quality of the scale using Cronbach's Alpha coefficient

The results of evaluating the scale quality of the independent and dependent variables are shown in Table 4.

Based on the total variable correlation coefficient must be greater than 0.3 and Cronbach's Alpha value greater than 0.6, the scales of the independent variable group are all appropriate.

However, through screening, the scales of Product Quality (PQ) and Distribution System (DS) have eliminated two variables PQ4 and DS5 respectively because they did not meet the requirements.

After eliminating the above two variables, the evaluation of the scales was performed again and showed that the scales had Cronbach's Alpha coefficients greater than 0.6 and at this time the total number of observed variables of the remaining scale of independent variables was 32 instead of 34 as initially.

Similarly, evaluating the dependent variable scale shows that the total correlation coefficient and Cronbach's Alpha both meet the requirements.

Table 4. Results of evaluating the quality of the scale using the Cronbach Alpha coefficient

No.	Scale	Observed variable	Number of appropriated variables after evaluation	Cronbach's Alpha
Independent variable				
1	Product quality (PQ)	PQ1, PQ2, PQ3, **PQ4**, PQ5	4	0.832
2	Product price (PP)	PP1, PP2, PP3, PP4	4	0.885
3	Distribution system (DS)	DS1, DS2, DS3, DS4, **DS5**	4	0.901
4	Sale promotion (SP)	SP1, SP2, SP3, SP4, SP5	5	0.830
5	Trademark (TM)	TM1, TM2, TM3, TM4, TM5	5	0.899
6	Personal characteristics (PC)	PC1, PC2, PC3, PC4, PC5	5	0.914
7	Perception (PE)	PE1, PE2, PE3, PE4, PE5	5	0.906
Dependent variable				
1	Decision (DE)	DE1, DE2, DE3	3	0.970

Note: the observed variables with bold highlight (PQ4, DS5) are eliminated variables due to Corrected Item-Total correlation value <0.3.
Source: Author's analysis.

EFA analysis results

Exploratory factor analysis is considered satisfactory with the data when the analysis results satisfy the following conditions: (i) KMO value ranges from greater than 0.5 to less than 1 (0.5). < KMO < 1), (ii) Bartlett test is statistically significant (Sig. < 0.05) and (iii) the cumulative of variance > 50%.

Table 5. Rotated loading factor matrix

Observed variables	**Factors**						
	1	2	3	4	5	6	7
PC1	0.823						
PC2	0.820						
PC3	0.787						
PC4	0.741						
PC5	0.596						
DS1		0.850					
DS2		0.813					
DS3		0.793					
DS4		0.781					
TM1			0.845				
TM2			0.829				
TM3			0.674				
TM4			0.591				
TM5			0.569				
PE1				0.908			
PE2				0.850			
PE3				0.686			
PE4				0.680			
PE5				0.612			
PQ3					0.827		
PQ5					0.768		
PQ2					0.737		
PQ1					0.710		
PP3						0.882	
PP2						0.856	
PP1						0.842	
PP4						0.828	
SP5							0.856
SP3							0.589
SP2							0.566
SP4							0.536
SP1							0.530
Eigenvalues	1.102						
Total cumulative variance	76.827						
KMO value	0.872						
Sig. value	0.000						

Source: Author's analysis.

The results of the above tests are shown in Table 5, whereby we see that the KMO value is 0.872, the Eigen value is 1.102, leading to the total cumulative variance being 76.827 (%), this represents 76 82% of the variation in factor results is explained by observed variables in the model. The Bartlett test is statistically significant (Sig. = 0.000), so the calculation results show that the observed variables are linearly correlated with the representative factor with 99% confidence.

Through the rotated factor matrix in Table 5, the original factor groups were rearranged into 7 factor groups (Table 6), including:

Group 1 includes 4 variables PQ1, PQ2, PQ3, PQ5, this group is named Product Quality, with the representative variable symbol F_PQ.

Group 2 includes 4 variables PP1, PP2, PP3, PP4. This group is named Product Price, with the representative variable symbol F_PP.

Group 3 includes 4 variables DS1, DS2, DS3, DS4, this group is named Distribution System, with the representative variable symbol F_DS.

Group 4 includes 5 variables SP1, SP2, SP3, SP4, SP5, this group is named Sale Promotion, with the representative variable symbol F_SP.

Group 5 includes 5 variables TM1, TM2, TM3, TM4, TM5, this group is named Trademark, with the representative variable symbol F_TM.

Group 6 includes 5 variables PC1, PC2, PC3, PC4, PC5, this group is named consumer Personal Characteristics, with the representative variable symbol F_PC.

Group 7 includes 5 variables PE1, PE2, PE3, PE4, PE5, this group is named Personal Perception, with the representative variable symbol F_PE.

On the basis of grouping the variables into 7 representative variables as above, the next step is multivariate regression analysis to see the level of impact of the variables on the decision to buy MBO fertilizer.

Table 6. Factors and representative variables used in multivariate regression

Factors	Observed variable	Factor name	Representative variables
1	PQ1, PQ2, PQ3, PQ5	Product Quality	F_PQ
2	PP1, PP2, PP3, PP4	Product Price	F_PP
3	DS1, DS2, DS3, DS4	Distribution System	F_DS
4	SP1, SP2, SP3, SP4, SP5	Sale Promotion	F_SP
5	TM1, TM2, TM3, TM4, TM5	Trademark of Product	F_TM
6	PC1, PC2, PC3, PC4, PC5	Personal Characteristics	F_PC
7	PE1, PE2, PE3, PE4, PE5	Perception of consumer	F_PE

Source: Author's analysis.

Determination of factor influence

In order to quantify the level and direction of impact of the factors identified above, a multivariate regression model was set up as in formula [1] above and performed. The regression results were performed twice, the first time was performed with 7 independent variables as above. However, this first result occurred multicollinearity in the variable F_TM with VIF value = 2,458 (>2), so this variable was eliminated to perform the second time with the remaining 6 variables. The later regression results are shown in Table 7. We see that the regression equation is statistically significant (Sig. value = 0.000), the value of the adjusted determined coefficient R^2 is 0.716, which means there are up to 71.6% of the variation in the dependent variable is explained by the variation in the independent variables. Besides, the Durbin-Watson value = 1.637 is within the limit, showing that the residual correlation phenomenon of the model does not occur, and the VIF values of the independent variables are all less than 2, proving that this multicollinearity phenomenon does not occur between independent variables. The above parameters show that the regression model is statistically significant and completely appropriate.

The regression results also show the impact of independent variables on the decision to buy fertilizer. Accordingly, up to 5 out of 6 independent variables had a statistically significant impact including F-PQ, F_DS, F_SP, F_PC, F_PE and 1 variable was not statistically significant, F_PP. The impact

coefficients after standardization show that the variable F_PE (buyer's perception) has the highest contribution to the decision to buy fertilizer with 31.27%, followed by the variable F_PC (personal characteristics) with 21.79%, variable F_PQ (product quality) with 20.88%, variable F_DS (distribution system) with 13.76% and variable F_SP (sale promotion) with 12.31%.This result also proves that all the hypotheses set out above are correct, except for the hypothesis that product price does not have a meaningful impact on the decision to buy fertilizer.

Table 7. Regression results of factors influencing the decision to buy MBO fertilizer

Factors/ variables	**Unstandardized β**	**t**	**Sig.**	**VIF**	**Standardized β**	**Absolute value of standardized β**	**Level of distribution (%)**
Constant	-2.427	-8.431	0.000				
F_PQ	0.384	5.717	0.000	1.404	0.229	0.229	20.88
F_PP	**0.013**	**0.736**	**0.463**	**1.109**	**0.026**	-	-
F_DS	0.180	3.425	0.001	1.714	0.151	0.151	13.76
F_SP	0.132	3.213	0.001	1.548	0.135	0.135	12.31
F_PC	0.399	5.100	0.000	1.935	0.239	0.239	21.79
F_PE	0.470	7.364	0.000	1.906	0.343	0.343	31.27
						1.097	100.00
Dependent variable: Decision to buy MBO fertilizer (DE) Observation: 250 F = 105.884 Sig. value = 0,000 R^2 = 0.723; R^2 adjusted = 0.716 Durbin-Watson = 1,637							

Source: Author's analysis.

Policy implication

Policy implications are drawn from the results of factor analysis as well as multivariate regression above. There are 5 factors that positively influence the decision to buy and use MBO fertilizer and the price of fertilizer does not affect the purchase of fertilizer, in other words, the decision to buy fertilizer is not influenced by the price of fertilizer. The upcoming policy implication is to deploy solutions related to the above five factors to attract buyers and promote the decision-making process of producers to buy MBO fertilizer. The proposed policy solutions are as follows:

(i) Raise awareness for producers

Changing the perception of producers about the usefulness of MBO fertilizer in production is the most important factor, accounting for nearly 1/3 of the decision to buy MBO fertilizer. Local agricultural extension agencies, governments as well as multimedia systems need to do a better job of propagandizing about the usefulness of MBO fertilizer such as improving the ecological environment, increasing the quality of agricultural products while meeting the tastes of domestic and export markets.

(ii) Enhance community relations and access to information for consumers

MBO fertilizer factories and distribution networks, supplier facilities and input supply companies need to create better opportunities for farmers to access information and MBO product designs through many different means, thereby helping to change consumer thinking.

(iii) Maintain product quality

The quality of MBO products as announced on the market recently needs to be guaranteed honestly and strictly, creating solid trust for consumers. Related measures such as protein content and micronutrients need to be guaranteed and clearly stated on the packaging. At the same time, printing techniques to prevent counterfeit and counterfeit goods can reduce the reputation of genuine fertilizers.

(iv) Upgrade distribution system

The MBO fertilizer distribution system through agents as well as agricultural input material stores needs to be maintained and

expanded to make it easier for farmers in communities to access. In addition, online ordering and delivery of fertilizers to consumers is also a measure that needs to be considered to improve the level of convenience and competitiveness to attract a greater number of consumers to buy MBO fertilizers.

(v) Maintain and upgrade sales promotions

Sales skills as well as promotions in recent times have had an effect and influenced the decision to buy MBO fertilizer. Therefore, these measures and skills need to be maintained and promoted to an optimal level to attract more customers and consumers' intended purchase.

CONCLUSIONS

Using organic fertilizers as well as MBO fertilizers is a progressive trend in the process towards sustainable development of the agricultural industry as well as the rice industry in the Mekong Delta. The amount of MBO fertilizer being used for rice production in this area is quite limited.

There are 5 factors that affect consumers' decisions to buy MBO fertilizers in order of importance including awareness, personal characteristics, product quality, distribution system and sales promotion.

In order to increase the number of consumers buying MBO fertilizer products, the above proposed solutions need to be taken into consideration and have better measures by managers, manufacturing plants as well as MBO fertilizer distribution systems in the coming years.

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