A Study on Knowledge and Attitudes of Farmers at Hong Saeng Municipality towards the Use of Organic Fertilizers

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ABSTRACT

The aims of this study were 1) to study farmers' knowledge and attitude levels about the use of organic fertilizer. 2) To compare farmers' knowledge and attitude levels between two groups, one that has used the organic fertilizer and the other that has never used it. 3) To study problems in and suggestions of using organic fertilizer. The population in this study were 2,871 household heads in Tambon Hong Saeng. The sample for this quantitative research consisted of 351 farmers, which the number was determined using Taro Yamane formula (Yamane, 1973). The data were collected through a set of questionnaire. Percentage, mean, and standard deviation were used to analyzed data, while an independent sample t-test was used to test the research hypotheses.

Keywords : knowledge , attitude , organic fertilizer

The results showed that

1. The level of knowledge of farmers about the use of organic fertilizers was approximately at 11.41 points ($\bar{x}$ =11.41 ; SD=1.74) out of a total of 15 points or 76.07 percent , meaning that the farmers had a high level of knowledge about the use of organic fertilizer. The attitude level of organic fertilizer users was at a high level ($\bar{x}$ =4.08; SD=.035) while the attitude level of the non-users of organic fertilizer was at an average level ($\bar{x}$ =3.32; SD=0.37).

2. Farmers who were users and non-users of organic fertilizer possessed knowledge of using the fertilizer at .05 level of significance. The fertilizer users had more knowledge than did the non-users. The two groups had a statistically significant difference in the attitude towards the use of at .05 level. The fertilizer-users group had more positive attitude than did the non-users group.

3. The problems found in using the organic fertilizer were difficulties in using the fertilizer, slower-growing rice, extravagant use of the organic fertilizer for a farm, and its opacity.

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Recommendations concerning the use of organic fertilizers are that the organic fertilizer should be molded before sowing, the municipalities should establish organic fertilizer factories and sell it at manufactured cost, and the organic fertilizer should reach the global standard and receive the government accreditation.

Keywords : Knowledge, attitude, organic fertilizer

Introduction

In the present, consumers worldwide have increasingly been aware of food consumption, with the emphasis on the quality of life and quality of the food more than in the past. Food is currently contaminated with chemicals from chemical-dependent agriculture, causing health and environmental problems. This leads to a drastic change from the chemical-dependent agriculture to organic agriculture in which the International Federation of Organic Agriculture Movements or IFOAM provides an alternative definition as "organic farming". In other words, "it is an agricultural system that produces food and fibers with environmental sustainability, society, and economy. The main emphases are soil nourishment, respect for the natural potential of crops, animals, and agro-ecosystems. Organic farming reduces the use of external inputs and avoids the use of synthetic chemicals such as fertilizer, pesticides, and animal supplies; at the same time, they try to apply its nature to increase productivity and develop resistance to diseases of plants and pets. This organic farming principle is a universal principle that complies with economic conditions, societies, climates, and cultures" (Sriphonthong, 2017, p.266-268).

Following the Twelfth Plan of National Economic and Social Development (2017-2021), the Thai government has determined 20%, or approximately 40,000 square kilometers, of land nationwide to be used for sustainable agriculture. To make agriculture sustainable, it means that the success of agricultural resource management to produce sufficient agricultural products has to meet the increasing human needs while it is possible to preserve the quality of the environment and the resources must remain intact. The essence of agriculture is soil resources, while the main indicator of the success is soil fertility. If agriculture is to become sustainable in productivity, pros of the soil properties in food and other factors will have to be examined (National Economic and Social Development, 2016, p.73).

The National Council for Peace and Order (NCPO) has introduced farmers the policy to produce more agricultural products by reducing expenses in fertilizers, from chemical to organic. This has become a national agenda to which the government has placed its emphasis on organic fertilizer, especially giving knowledge to farmers on how

to produce and use it. Olan Pitak, Director General of Department of Agricultural Extension, mentioned the NCPO policy to support the organic fertilizer manufacture as shown below:

"The Department of Agricultural Extension has conducted the campaign and cooperate with the public sector, local administrations and Thai military to encourage farmers and communities to produce organic fertilizer and to learn about organic fertilizer production. We also promote production cost reduction by two parts as follows: 1) Effective use of chemical fertilizers. We encourage farmers to use fertilizers based on soil testing or 'tailor-made' fertilizer, which aims to reduce the chemical fertilizer cost at least 20 percent. We also set up the soil and fertilizer management center to every district in 77 provinces nationwide, which totals 882 in all, managed by farmers. It is found that this can reduce the cost of using chemical fertilizers up to 49 percent; and 2) Supporting the organic fertilizer use. We have a minimum target of 250,000 tons, operated by the Provincial Agriculture office, integration with other entities inside and outside the Ministry of Farmers and Cooperatives to promote organic fertilizer production in the 882 districts throughout the country. We require one agricultural extension officer to produce at least 50 tons of organic fertilizer in one Tambon (Sub-district). To promote the use of organic fertilizer, the provincial agriculture offices in every district have prepared a compost in front of every provincial agriculture office to promote the use of organic fertilizer in 77 provinces nationwide, from August 2557. It appears that the amount of organic fertilizer produced until March 2015 was up to 474,703.34 tons, which is 189.88 percent of the minimum goal that the Department of Agricultural Extension has anticipated at 250,000 tons" (Sustainable Agriculture Foundation, 2015)

The government has announced the support of organic agriculture and the plan to start organic-related projects, as well as to promote organic agriculture in the countryside and among schoolers in many areas. However, most projects still have a limited understanding of organic agriculture, thinking that organic agriculture is merely a modification to organic fertilizer in production processes. Instead of promoting organic agricultural principles as conservation agriculture and environment rehabilitation, today's organic agricultural project is only a specific project for bio-fertilizer and microbial use for various compost production. Most activities are the production of organic fertilizer pellets or plant-based biological extraction, which is a project that misuses the organic agriculture and also does not emphasize the principles of conservation and rehabilitation of agricultural ecosystems, especially soil fertility improvement, which is a key factor of the organic agriculture system (Panyakul&Sukrattikarn, 2003, p.58)

Therefore, Hong Saeng sub-district Municipality, Leong NokTha district, Yasothon-Province, is one of the first municipalities that announces the strategy of sustainable agriculture or organic agriculture. For example,

it has launched "No Paddy Stubble-burning" after the harvest season and "Toxic-free Rice Area for Consumption and Export" Campaigns to raise farmers' awareness of environmental concerns. Changing the behaviors of farmers who have relied on the chemical agriculture into the organic agriculture has impacted the farmers in which they are those who have always been committed to the chemical use for continually increasing their productivity. It is the belief and values that are treated as tradition. Creating new dilemmas to farmers requires that farmers have seen clarity in that chemical fertilizer costs higher. However, from the on-site research and an interview with Mr. KamonsakWannapan, agricultural research officer and acting director of Hong Saeng Sub-district municipality mentioned that the policy has not yet been accepted. This could be due to the attitude of farmers in the municipality in that people do not realize the importance and difference between the use of chemical fertilizer and organic fertilizer use. The researcher is also a farmer in the area of Hong Saeng sub-district, utilizing organic fertilizers, namely bio-fertilizer produced from Lam Pao dam fishes, cow dung, and straw, and fertilizers made from plants such as durian, mangosteen, banana, mango, coconut, and rubber. It is found that the plants grow exponentially. Interestingly, the fruits from plants grown with bio-fertilizer are found to have better taste than those grown with chemical fertilizers. It is, thus, necessary to promote this concept of organic agriculture to people who are local farmers in the adjacent area. Additionally, the researcher is interested to apply for a local administration unit in the area and this is to bring organic agricultural knowledge to both developing communities and reducing the cost of chemical fertilizer. Therefore, it is essential to study the knowledge and attitude of farmers in the municipality according to the social demands and policies of the Hong Saeng sub-district municipality, which requires the researcher to adopt the use of local wisdom and the technology to conserve biodiversity and environment for sustainability. The authorities can apply research findings to relevant government sectors as it might be useful for planning, designing guidelines, or promoting the use of organic fertilizer to farmers in the area, which will deliver a positive impact on developing the nation.

Objectives

The objectives of this study were threefold as follows:

To study the knowledge and attitude levels of farmers at Hong Saeng Sub-district municipality towards the use of organic fertilizer;

To compare the knowledge and attitude levels of farmers at Hong Saeng Sub-district municipality about the use of organic fertilizer, classified by group used and never used organic fertilizer; and

To study the problems and recommendations that occurred to farmers at Hong Saeng Sub-district municipality about the use of organic fertilizer.

Research Hypotheses

Farmers have knowledge and attitude towards the use of organic fertilizer at a moderate level.

Farmers who are organic fertilizer users have a higher level of knowledge and more positive attitudes towards the utilization of organic fertilizer than those who are non-users of organic fertilizer.

Research Scopes

Area scope

This study was conducted in the area of nine villages at Hong Saeng Sub-district municipality, consisting of farmers with cultivating profession. It is divided into 2 groups that used organic fertilizer and groups that never used organic fertilizer.

Population and Sample Scope

The population consisted of 2,871 householders from nine villages in the administrative area of Hong Saeng Sub-district municipality.

The samples consisted of 351 householders in the area of nine villages at Hong Saeng Sub-district municipality. The selected samples were chosen from nine villages by using Taro Yamane method.

Variable Scope

Independent variables were farmers in the Hong Saeng Sub-district municipality, categorized into 2 groups as follows:

Users of organic fertilizer (UOF).

Non-users of organic fertilizer (NUOF).

Dependent variables are level of knowledge and attitude.

Research Instruments

The instruments used in this research was a questionnaire comprising 4 main parts:

Part 1: Background information of the respondents consisting of 12 questions about gender, marital status, education level, and revenue level.

Part 2: Knowledge of farmers at Hong Saeng Sub-district municipality about the use of organic fertilizer. The researcher employed 15 dichotomous questions (Yes-No questions).

Part 3: Attitudes about the use of organic fertilizer. This part contained ten 5-point Likert scale questions.

Part 4: open-ended questions

Data Analysis

Descriptive statistics were employed to illustrate basic information of selected samples. The statistical methods used in the analysis were frequency, average, mean, and standard deviation.

Means and standard deviation (SD) were used to answer Research Objective 1: education and attitude levels of the participants.

An Independent samples t-test was used to compare knowledge and attitude between farmers who used and never used organic fertilizer. This was to answer Research

Objective 2.

Content analysis and table in findings were used to answer Research Objective 3.

Research Findings

The knowledge level of farmers at Hong Saeng Sub-district municipality about the use of organic fertilizer was 11.41 points ($\bar{x}$ = 11.41 ; SD=1.74) out of a total of 15 points, or 76.07%, meaning that the knowledge farmers was at a good level about the use of organic fertilizer.

The attitude level of UOF towards the use of organic fertilizer was at a high level, having 4.08 points ($\bar{x}$ =4.08 ; SD=0.035), while the score of NUOF was at a moderate level, having 3.32 points ($\bar{x}$ =3.32 ; SD=0.37).

Farmers who UOF and NUOF showed a statistical difference at .05 in level which the UOF group possessed more knowledge of organic fertilizer than did the NUOF Group. Moreover, with regard to knowledge about the use of organic fertilizer, the UOF group had an average score of 12.86 points ($\bar{x}$ =12.86 ; SD=1.52) and the NUOF group had an average score of 9.96 points ($\bar{x}$ =9.96 ; SD=1.84).

The UOF and the NUOF groups showed a statistical difference in an attitude towards using organic fertilizer at .05 level. The UOF group had a higher attitude score than the NUOF group ($\bar{x}$= 4.08 and $\bar{x}$ = 3.32, respectively).

Problems in using organic fertilizers were usage complicated, slower-growing rice, the extravagant use of the organic fertilizer for a farm, and its opacity.

Recommendations concerning the use of organic fertilizer are that the organic fertilizer should be molded before sowing, the municipalities should establish organic fertilizer factories and sell it at manufactured cost, and the organic fertilizer should reach the global standard and receive the government accreditation.

Discussion

According to the research hypotheses proposed above, the findings will be used to discuss the hypotheses as explain below:

Research hypothesis 1: Farmers have knowledge and attitude about the use of organic fertilizer at a moderate level.

Result: The knowledge of farmers at Hong Saeng Sub-district municipality about the use of organic fertilizer is overall rated 11.41, or 76.07 percent, ($\bar{x}$ =11.41 ; SD=1.74) from a total of 15 points. This can be considered to be the most knowledgeable. The attitude towards the use of organic fertilizers of farmers who used organic fertilizer has a high level of attitude. There is an average attitude of 4.08 ($\bar{x}$ =4.08 ; SD=0.035) and a group that never uses organic fertilizer, there is moderate attitude, an average attitude equal to 3.32 ($\bar{x}$ =3.32 ; SD=0.37), which does not correspond to the hypothesis that the researcher has proposed. However, the result in this study is in the same direction as reported

in the study by Thannasit et al. (2006), who studied the level of knowledge in using chemicals among farmers on the banks of the Chi River, KosumPhisai District, MahaSarakham Province. The study revealed that farmers have a high level of knowledge in using chemicals in spite of their low level of educational attainment, a primary degree. This may be due to the farmers receiving information from the media, radio, television publication, as well as trainings arranged by provincial agricultural extension officers, district agricultural extension officers, the public and private sectors, manufacturers, and the general fertilizer distributors. Most farmers know the benefits of organic fertilizers ,for example, improving soil fertility, reducing production costs, restoring the natural environment, and enhancing the produce of high-quality products without harm to users and consumers. The organic fertilizer is cheap, and it meets with customer needs as well.

Research hypothesis 2:Farmers who are organic fertilizer users have a higher level of knowledge and more positive attitudes towards the utilization of organic fertilizer than those who are non-users of organic fertilizer.

Result: Farmers who were users of organic fertilizer at Hong Saeng Sub-district municipality had higher level of knowledge and higher level of attitudes towards organic fertilizer than did non-users of organic fertilizer. This result is in line with the proposed hypothesis. This may be because the users of organic fertilizer might experience positive results and gain experience in organic fertilizer than the non-users of organic fertilizer.

Besides, it is possible that after farmers who used the organic fertilizer at Hong Saeng Sub-district municipality tend to become more self-reliant as they explicitly can reduce the cost of buying chemical fertilizers. All the vegetables, fruits, corn, or rice planted by using organic fertilizer taste better than those planted by using chemical fertilizer. The organic-fertilizer-used plants can be sold at an increasingly higher price, thereby causing satisfaction. The farmers' attitude on organic fertilizer is further improved byNattaphon (2016, p.145) who devised the management process according to the self-sufficient economy to sustainably develop self-reliance on Ban Phue Community, Udon Thani province. The study found that the devised strategy could deliver success and pride to Ban Phue community. The emphasis on self-reliance helped to balance family life, making the community strong, and remaining peaceful to the society. The results of this study and Nattaphon correspond with the previous study conducted by Thongklongsai (2003, p.66), who designed and developed vocational education according to the self-sufficient economy for community enterprises at the Thai-Myanmar border.

Suggestions

The researcher has suggestions for applying research results as follows: Most organic fertilizers are made of fine powder that can cause problems in using, generating some farmers with a lack of motivation to use this

kind of fertilizer. Farmers who have long used the chemical fertilizer usually make a comparison of the effects of the organic fertilizer in various aspects, such as the characteristics. Farmers will compare the features of chemical fertilizer and organic fertilizer. The organic fertilizer is likely to decay slowly, unlike the chemical fertilizer that decays faster, causing farmers to be concerned about the plant growth results.

Most farmers will compare the effects of using both fertilizers during the initial period. They will observe the color of the plant to indicate growth. The chemical fertilizer, when put on the plant, will give darker green to the leaves while the organic fertilizer will give the light green color. This, thus, give farmers an understanding of leaf colors as the indicator of plant fertility. That is to say, the government officers in areas related to agricultural fields should educate farmers to fully understand the organic fertilizer benefits as it can help the nation in the long run. Government officers should provide knowledge about the organic fertilizer concerning key features of fertilizers and the biodegradation process to which it can be used to produce the organic fertilizer.Shaping the farmer's attitude about the of organic fertilizer is required. The government should give the very knowledge by setting the experimental areas in various villages as this can provide farmers knowledge from experiencing actual situations.

Recommendation for further studies

Further studies should study about the effects of using organic fertilizers with various kinds of plants, such as comparing the production cost of organic fertilizers with chemical fertilizers. Making a comparison of the product taste between products from using organic fertilizer and from the chemical fertilizer. Comparing the environment before and after organic fertilizer applications.

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