Friendly Organic Fertilizer for Green Environment: Exploring Farmers Knowledge and Skills

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Abstract: Environmental friendly organic fertilizer is needed a lot of farmer’s knowledge and skill. This survey research focused on two specific matters namely farmers’ skill and knowledge. The method will be designed to take the sample using purposive sampling to ensure sufficient data. Bukit Agung Village in Kerinci District, Kabupaten Siak was chosen as a research place as it well-known place for their farming activities. Questionnaires and interviews were used to collect the data. The produced result was most of the farmers already using organic fertilizer as a substitute for artificial fertilizers. Also, most of the farmers already have high knowledge of using organic fertilizer and how to use organic fertilizer.

Keywords: knowledge, skill, organic fertilizer, environmentally friendly

1. Introduction

Farmers need knowledge and skills in conducting organic farming to make a better result. Knowledge is important for someone actions because behavior based on knowledge will be more lasting than behaviors that are not based on knowledge. Knowledge is the result of one's own experience or experience of others that are very important for one's actions. Skills are one's ability to change things become more valuable and meaningful.

Organic fertilizer is a fertilizer derived from cow slurry which can be used as solid and liquid fertilizer. At the current situation, the price of fertilizer is always increasing and difficult to find in the field, farmers need it for growth and crop production especially palm oil that requires large amounts of fertilizer. Other than that, chemical fertilizers damage the soil and the environment. To increasing public awareness of developing an environmentally friendly agricultural system, making organic fertilizer is one of the options [10].
Farmers begin to realize the need for organic agriculture. Starting from the use of chemical fertilizers that have more negative impacts rather positive impact on the environment. The increase in agriculture towards organic direction is determined by the government through the Minister of Agriculture Regulation No. 28 / Permentan / SR.130 / 5/2009 concerning Organic Fertilizers, Biofertilizers and Soil Improvement (Minister of Agriculture Regulation, 2009).

The village of Bukit Agung is a village where all residents have an oil palm plantation with an area of 800 ha, so it requires a lot of fertilizer. The fertilizer also varies according to the needs and age of the plant. In 2016 a team from Lancang Kuning University provided training in making organic fertilizer from cow dung in the form of solid fertilizer and liquid fertilizer from cow urine, this is an alternative to meet the fertilizer needs for palm oil. It is available to do it around the farmer's house because farmers in this village also have 3-8 cows and can be used as ingredients to make solid and liquid organic fertilizers to reduce or even to decrease the use of chemical fertilizers. With organic fertilizer, farmers do not need to queue to buy fertilizer anymore, when they need fertilizer, they just need to change it in from the cow dung and is environmentally friendly.

From the description above, the problem is how the knowledge and skills of farmers in utilizing solid and liquid organic fertilizers for environmentally friendly. Therefore, this study intended to find out the farmers’ knowledge and skills towards organic fertilizers for environmentally friendly.

2. Method

This survey research was conducted in Bukit Agung Village, Kerinci Kanan District, Siak Regency in February to July 2018. The data collection took by purposive sampling where the respondents were farmers who had cattle and oil palm plantations and had participated in training for making organic fertilizer from cow dung and liquid fertilizer from cow urine. The research involving 30 people as its sample. We took the primary data through questionnaires with direct interviews with farmers and secondary data from the Siak District livestock and plantation agriculture and service offices.

3. Results and discussion

3.1 Characteristics of Respondents

Respondents in this study were farmers who used organic fertilizer from raising cattle. Characteristics of respondents showed that 43.33% farmers are 41-45 year; this is showing that most of them in productive age so they can easily apply biogas technology. According to (Ananta, 1994) human age between 30 to 60 years has a better thinking ability so that it is expected to manage its business well. The majority of farmers, 50% of them, were only until Junior High School. It shows the level of education still low. Education help in changing attitudes and ways of thinking to a better direction, also a high level of awareness that will make it easier to develop their farm.

People that mostly does cattle breeding business is male, which is 86.67% because usually, cattle breeding business requires a lot of energy to process cow dung into fertilizer and collect urine to make fertilizer liquid. 40% of them own 4 – 8 breeding cattle. With this number of cattle, it is enough to make compost and liquid fertilizer which can be used to fertilize the oil palm plants themselves. There also no need to spend money buying chemical fertilizers. 33.33% percent of them was saying they're already do breeding for 9-12 years. This will affect the breeding knowledge according to Purwanto (2005). The experience can also shape attitudes as a process of increasing knowledge of farmers, including the experience of using new technologies. Knowledge is the initial stage of perception which then gives birth to an attitude and it gives birth to actions. Experience shows that interactions that occur tend to lead to reciprocal self-adjustment and skills adjustments to the situation of farmers’ knowledge.
3.2 Farmers’ Knowledge and Skill

Table 1. Farmer Knowledge

| No | Indicator                          | Average score | Criteria |
|----|-----------------------------------|---------------|----------|
| 1  | Knowing the source of organic fertilizer | 3.56          | High     |
| 2  | Benefits of organic fertilizer     | 3.53          | High     |
| 3  | Type of organic fertilizer         | 3.69          | High     |
| 4  | How to fertilization               | 2.98          | Average  |
| 5  | Dose of fertilizer                 | 2.96          | Medium   |
| 6  | Fertilizing time                   | 3.56          | High     |
|    | Knowledge                          | 3.38          | High     |

Source: Processed Data 2018

Knowledge of fertilizer achieved by farmers is 3.69. In general, farmers already know the type of fertilizer so they can carry out fertilization by the type of fertilizer used. The dosage and method of fertilizing are in the medium category. Farmers did not know the dose in the medium category is 2.98 and 2.96 farmers already knew the dosage and method of fertilization but had not done it according to the recommendations. Overall knowledge of organic fertilizer farmers is already high with 3.38 points.

Table 2. Farmer skills

| No | Indicator                      | Average score | Criteria |
|----|--------------------------------|---------------|----------|
| 1  | Make solid organic fertilizer  | 3.53          | High     |
| 2  | Make liquid organic fertilizer | 3.53          | High     |
| 3  | Types of organic fertilizer    | 3.68          | High     |
| 4  | How to fertilize               | 2.98          | Medium   |
| 5  | Fertilizer dose                 | 2.98          | Medium   |
| 6  | Time of fertilization          | 3.56          | High     |
|    | Total                           | 3.38          | High     |

Source: Processed Data 2018

Farmers are skilled at making solid and liquid organic fertilizers with a 3.53 category and skilled in determining the maturity of organic fertilizers. Farmers who are already skilled use the type of organic fertilizer as much as 3.68. While the method and dosage of fertilization are in the medium category. Farmers are skilled in fertilizing with solid and liquid organic fertilizers. So farmers will give a high response in the use of organic fertilizers for plants. The total skills of farmers in using organic fertilizers are in the high category of 3.38, Artawan et al. (2017) state that the level of knowledge of farmers in using organic fertilizers can be said to be a high category if it passes 3.41. Using skills can be with mind, reason, and creativity, if the skill is honed, it can produce something that is beneficial for the farmer himself.
According to Iverson (2001) "skills do not only require training but the basic abilities possessed by everyone can help to produce something more quickly." Whereas according to Robbins (2000) "skills are divided into four categories: 1. Basic literacy skills, basic skills that everyone has, such as reading, writing, counting and listening. 2. Technical skill; technical expertise gained through learning in technical fields such as operating computers and other digital devices. 3. Interpersonal skill, the knowledge of each person in communicating with each other such as someone, giving opinions and working in teams. 4. Problem-solving; someone's expertise in solving problems using logic.

From the results of this training, farmers are expected to be aware of the use of organic fertilizers that are easily available and environmentally friendly. The application of organic fertilizer by farmers has changed the attitude of using chemical fertilizers, so the need for organic fertilizer increases according to the demand of farmers. Mardikanto (2010) said that "Adoption of technology in agricultural counseling can be interpreted as a process of changing behavior both in the form of knowledge, attitudes, and skills in a person after accepting innovations delivered by instructors to the target. Acceptance here means not just knowing but actually being implemented or applied correctly. Recognition of these technologies can usually be observed directly or indirectly by others as a reflection of changes in attitudes, knowledge, and skills.

The knowledge and skills of farmers making their fertilizer from cow dung and urine have reduced the time to look for artificial fertilizers. By using solid and liquid organic fertilizers for tall plants, they reduce the cost of purchasing fertilizers and become more environmentally friendly. Puspadi (2002) stated "Changes in farmer attitudes lead to changes in farmers' needs. Current farmers' needs are a reasonable level of income and availability of fresh money as an instrument to actualize them, develop them and defend them". Farmers no longer need to queue to buy fertilizer when it is needed. After this training, we hope they can process organic fertilizer and can immediately use for plants. It also helps them to reduce or decrease the money to buy fertilizer for their crops. This integrated farming utilizes waste to be environmentally beneficial; by Siswati L. (2012), integrated farming of livestock and horticultural crops has used livestock manure as fertilizer for plants and plant waste for animal feed.

4. Conclusions and suggestions

The study concludes that most of the farmers agreed to have used organic fertilizer as a substitute for chemical fertilizer. It showed most of the farmers have high knowledge of organic fertilizer and fertilization time. Moreover, they still need improvement for fertilizer method and fertilizer dose. For the skill that they obtained through trainee, most of them acquire good ability in using organic fertilizer and fertilization time. While for the fertilization method and dose skill, still need more improvement.

Therefore, this study would like to suggest to the Farmers to increase the use of solid and liquid organic fertilizers to be environmentally friendly and less cost money.

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