

Effectiveness of Agricultural Extension of Making Liquid Organic Fertilizer (POC) from Coconut Husk at KWT Pamelum, Hayaping Village, Awang District, East Barito Regency

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ABSTRACT

The farmer women's group has a strategic role in improving the farming skills of its members. This study aims to analyze the effectiveness of the implementation of the agriculture extension program carried out at KWT Pamelum, Hayaping Village, Awang District, East Barito Regency with material for making liquid organic fertilizer made from coconut husk. Counseling was conducted on 30 female farmers. Measurements are carried out before and after the activity. Using Wilcoxon analysis, a significant increase in results ($p = 0.00$) was obtained in the value before and after the extension program. With N gain score analysis, there is an effective improvement in both knowledge, attitudes, and skills. These results are then implemented in shared gardens at KWT. It is expected that extension workers will assist farmers to continue to apply the use of liquid organic fertilizer in their farming because the results are proven to be better and safer.

Keywords: waste, liquid organic fertilizer, coconut husk, agricultural extension

INTRODUCTION

Liquid organic fertilizers have a very good influence on plant growth as researched [1][2], [3], especially liquid organic fertilizers made from coconut husk[4], but farmers have not been able to utilize this potential well. The Hayaping Village Farmer Women's Group (KWT) is a village whose residents' livelihood is farming. Coconut husk waste in Hayaping Village has not been used properly by farmers. Even though coconut waste in the form of coconut husk can be processed into various products that have benefits and high selling

value if properly processed into processed products such as liquid organic fertilizer.

Coconut coir is coconut fruit waste that is often just thrown away but can be processed into liquid organic fertilizer which is a very beneficial product for plants. Liquid organic fertilizer made from coconut husk can be used as fertilizer because it contains the main nutritional elements needed by plants, namely Nitrogen (N), Phosphorus (P), and Potassium (K).

Agricultural extension is a systematic effort

made to self-suffice farmers [5]. The agricultural extension uses various approaches according to the conditions of empowered farmers. Out-of-school learning for farmers is usually carried out by extension workers so that farmers can further improve the quality of their farming [6], [7].

The practice of making liquid organic fertilizer was chosen to improve the ability of farmers to make and apply liquid organic fertilizer made from coconut husk. The method carried out is a demonstration method, which is a method by providing examples and direct practice of making liquid organic fertilizer by all members of KWT. It is hoped that the farmers present will be able and apply the manufacture of coconut husk waste into liquid organic fertilizer, to increase the income of KWT members.

Coconut coir is a material for making Liquid Organic Fertilizer (POC) which is environmentally friendly and in its use is better when compared to using chemical fertilizers. Organic fertilizers are materials that do not contain chemicals that can cause environmental damage. Organic fertilizer from coconut husk can be made at a low cost because it can be made by yourself by utilizing unused coconut waste. Liquid organic fertilizer is a liquid-phase fertilizer made from organic materials

through a composting process. The use of organic fertilizer in liquid form has several advantages, among others, it can be directly absorbed by leaves to photosynthesize, help revitalize tillage and help condense soil media optimally. In coconut husk, there is an element of potassium (K) needed by plants. In addition, coconut coir also contains other nutrients and is also useful for plant needs. These nutrients are Phosphorus (P), Calcium (Ca), Magnesium (Mg), Sodium, and several other microelements. The potassium (K) content is more dominant, therefore coconut husk POC is a natural source of potassium fertilizer [8]

Liquid Organic Fertilizer (POC) serves to improve the physical, chemical, and biological properties of the soil, can also help increase crop production, can improve the quality of crop yields, can reduce the use of organic fertilizer. The benefits of coconut husk Liquid Organic Fertilizer (POC) are numerous, including to strengthen plant roots and stems, increase the weight of fruit and plant seeds, brighten the color of plant fruits, Add a nice aroma to the fruit and the fruit will taste sweeter[9].

The purpose of the activity is to change the habits and dependence of farmers on the use of chemical fertilizers, production cost efficiency

MATERIALS AND METHODS

Time and Place

Counseling and training activities for making liquid organic fertilizer made from coconut husk waste were carried out on Friday, January 13, 2023, at Hayaping Village. This activity was attended by 30 participants. This research is experimental. Experimental research is research used to look for the effect of certain treatments on others under controlled conditions, controlled conditions mean the results of the research are converted into numbers, and analysis used is to use statistical analysis [10]. The Wilcoxon analysis is used to measure differences before and after.

treat, while the level of effectiveness uses N Gain Score with categories:

- Low category (less effective) = < 33.33 %
- Medium category (effective) = 33.33 – 66.66 %
- High category (very effective) = more than 66.66 %

By way of calculation can use the formula:

To measure the Effectiveness of Extension

$$EP = \frac{\text{Kejadian Perilaku}}{\text{Target Perubahan Perilaku}} \times 100 \%$$

$$EP = \frac{X_2 - X_1}{SM} \times 100 \%$$

Level of Knowledge

$$EP = 34.1 \text{ (Effective)} \frac{261-169}{270} \times 100 \%$$

Attitude Level

$$EP = \frac{X_2 - X_1}{SM} \times 100 \%$$

$$EP = \text{(Effective)} \frac{258-164}{270} \times 100 \% = 34,8$$

Action Level

$$EP = \frac{X_2 - X_1}{SM} \times 100 \%$$

$$EP = \text{Effective} \frac{266-171}{270} \times 100 \% = 35,2 \%$$

With caption:

$X_1 = \sum \text{score pre-test}$

$X_2 = \sum \text{score post-test}$

SM = Maximum Score

To measure the effectiveness of behavior change (EPP)

$$EPP = \frac{\text{Target of behavior increase}}{\text{Target of behavior increase}} \times 100 \%$$

$$EPP = \frac{X_2 - X_1}{D} \times 100 \%$$

$$EPP = \text{(highly Efev)} \times 100 \% = 91,8$$

Tools and Materials

Equipment needed in the practice of making POC includes buckets, knives, barrels, packaging bottles, and packaging stickers. The necessary ingredients are coconut husk, water, brown sugar, and EM4. This research begins with the delivery of theoretical material related to the practice of making liquid organic fertilizer made from coconut husk waste to increase the understanding and awareness of farmers, then continued with the direct practice to make liquid organic fertilizer made from coconut husk waste. The manufacture of liquid organic fertilizer involves all members of KWT Tetei Pamelum Hayaping Village

Tools and Materials

- 1) Container (bucket/used keg/barrel)
- 2) Machete/cleaver
- 3) Coir 1 kg (dried)
- 4) Brown sugar 100 grams
- 1) EM4 100 ml

Information:

$X_1 = \sum \text{score pre-test}$

$X_2 = \sum \text{score post-test}$

D = Diskrepansi = SM – X1

SM = Score Maximal

Tools and Materials

Equipment needed in the practice of making POC includes buckets, knives, barrels, packaging bottles, and packaging stickers. The necessary ingredients are coconut husk, water, brown sugar, and EM4.

Implementation

This research begins with the delivery of theoretical material related to the practice of making liquid organic fertilizer made from coconut husk waste to increase understanding and awareness of farmers, then continued with the direct practice to make liquid organic fertilizer made from coconut husk waste. The manufacture of liquid organic fertilizer involves all members of KWT Tetei Pamelum Hayaping Village

- 2) Water 10 liters

How to Manufacture

- 1) Chop/cut the coconut husk into small pieces. Then put it in a container.
- 2) Dissolve water, brown sugar, and EM4. Mix thoroughly. Put it in a barrel containing pieces of coir.
- 3) The barrel was tightly closed. Open the lid of the barrel every morning for a few seconds to remove the gas that arises.
- 4) Store in a shaded place. Leave all the ingredients for 2 weeks
- 5) After 2 weeks or approximately the finished POC, strain the solution with a filter
- 6) The POC solution is ready for use or packaged.



Figure 1. Coconut husk



Figure 2. Tools and materials



Figure 3. The practice of making liquid organic fertilizer made from coconut husk



Figure 4. Production result of liquid organic fertilizer



Figure 5. Comparison of plants using POC coconut fiber (right side) and not using POC coconut fiber (left)

Use of Organic Liquid Fertilizer

Fertilizer application is carried out in a ratio of 20 ml of liquid organic fertilizer mixed with 5 liters of water. Or 1 liter of liquid organic fertilizer with 100 liters of water. Or it can be adapted to the needs of plants, some plants may require larger doses. So you can experiment with your dosage for various types of plants as well as altitude, temperature, and other factors. Avoid excessive use of plants because it can cause plants to die. But the use of liquid organic fertilizer (POC) is relatively safe. Liquid organic fertilizer (POC) is applied to leaves, stems, or flowers. Liquid organic fertilizer also serves as a growth stimulant, especially at the time when plants begin to sprout or at the time of change from the vegetative phase to the generative phase, serving to stimulate the growth of fruits and seeds. Leaves and stems can absorb directly. POC application is usually at intervals of one week once, or every three days during the rainy season, this spraying dose must be adjusted to the type of plant to be sprayed.

In the manufacture of this liquid organic fertilizer, the addition of brown sugar solution is carried out. The addition of brown sugar solution aims to make microorganisms as decomposers of organic matter work optimally [11]. The results of the practice of making coconut husk liquid organic fertilizer have been carried out before this extension practice. Researchers have conducted trials on the use of coconut husk liquid organic fertilizer so that researchers have confidence that the liquid organic fertilizer produced is very useful

in accelerating the growth and development of vegetable crops.

Based on trials and observations that have been carried out on the growth of vegetables, researchers found that vegetable plants given liquid organic fertilizer have faster growth compared to vegetable plants that are not given fertilizer, such as the growth of larger and green leaves and stronger vegetable plant stems. Monitoring and evaluation activities are carried out to know the achievement of the objectives of the activities that have been carried out as evidenced by seeing changes in the knowledge and skills already

possessed by farmers and to what extent the coconut husk liquid organic fertilizer products produced are used by farmers

Pre and Post-Test Results and The Effectiveness of Extension Implementation for Making Liquid Organic Fertilizer from Coconut Coir

The implementation of counseling is carried out so that farmers have knowledge, attitudes, and skills in making and applying liquid organic fertilizer made from coconut husk. The following are the results of the tests that have been done:

Table 1. Pre dan Post Test Result

Knowledge aspect	Pre-test	Post-test
Know the meaning of liquid organic fertilizer	61	88
Know the benefits of liquid organic fertilizer	48	87
Knowing liquid organic fertilizer from coconut coir	60	86
Attitude Aspect		
Making liquid organic fertilizer is easy to do through the fermentation process	57	88
The application of liquid organic fertilizer makes the crops healthier	56	84
Liquid organic fertilizer from coconut fiber is easy to make and apply to plants	51	86
Skill Aspect		
Skilled in preparing containers that will be used to make POC	59	86
Skilled in preparing POC raw materials from coconut coir	52	90
Skilled in applying POC in the field with the right dosage	60	90

Based on the results of the comparison of pre and post in Table 1, the results of Wilcoxon's analysis in Table 2 and Table 3 obtained results are the positive rank of 15 and a negative rank of 0 with a significance level (0.00). Furthermore, the measurement of the gain score is carried out to ensure the

effectiveness of the increase that occurs before and after counseling. The increase in each aspect, knowledge 34.1%, attitude 34.8%, and action 35.2%, were rated effective, and the effectiveness of behavior change 91.8% was very effective.

Table 2. Wilcoxon Analysis Results

		Ranks		
		N	Mean Rank	Sum of Ranks
post - pre	Negative Ranks	0 ^a	0.00	0.00
	Positive Ranks	29 ^b	15.00	435.00
	Ties	1 ^c		
	Total	30		
a. post < pre				
b. post > pre				
c. post = pre				
Test Statistics				

Table 3. Pre and Post-Test Significance Results

	post - pre
Z	-4.708 ^b
Asymp. Sig. (2-tailed)	0.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

CONCLUSION

The counseling carried out effectively changed the knowledge, attitudes, and skills of KWT member farmers in making and applying

liquid organic fertilizer from coconut husk. Follow-up was carried out by applying it to the group's P2L garden.

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