

Community Service of Farmers in Training on Making Liquid Organic Fertilizer in Wonosari Village, Gondangrejo District, Karanganyar Regency

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ABSTRACT

Wonosari Village has quite a lot of rain-fed rice fields. The use of inorganic fertilizers in rice fields can also cause damage to soil structure, decreased fertility of soil microbes, environmental contamination, crop dependency, decline in biodiversity. Liquid organic fertilizer is a nutrient-rich solution produced through the breakdown of organic matter derived from plant residues, agricultural and industrial waste, animal manure, and human waste. This service is intended to train farmers in the production of liquid organic fertilizer, which can be used in place of inorganic fertilizers on their rice farms. The training program was held on February 25 2024 at Embung Munggur located in Wonosari Village, Gondangrejo District, Karanganyar Regency. The method of implementing this activity is carried out in several stages including introduction, implementation and evaluation. The results of the training showed that 80% of farmers who took part in the training understood how to make POC, and 60% wanted to make POC in the future. The post test results also show that community knowledge about LOF is 20% and skills are 60%. And It is hoped that it can continue to be developed so that farmers no longer depend on inorganic fertilizers.

Keywords: farmer, fertilizer, plant residues, rain-fed rice fields

INTRODUCTION

Wonosari Village is located in Gondangrejo District, Karanganyar Regency. The condition of Wonosari Village environment is in a hilly area and has quite a lot of cistern rice fields. Rain-fed rice fields are a type of agricultural land in the form of rice fields that are used for growing rice by relying on rain as the main source of water without requiring artificial irrigation. There are advantages and challenges of having rain-fed rice fields. The main advantage of rain-fed rice fields is lower cost because they do not require

infrastructure irrigation, as well as a smaller environmental impact ([Agapitus et al., 2024](#)). The challenges of rain-fed rice fields are also greater vulnerable to climate fluctuations, water shortages, and the risk of crop failure caused by unpredictable weather ([Wihardjaka & Harsanti, 2023](#)). Apart from that, the use of inorganic fertilizers can also cause damage to soil structure, decreased fertility of soil microbes, environmental contamination, crop dependency, and a decline in biodiversity. This can cause the

water holding capacity required in rainfed land is reduced.

Many people really need fertilizer to add nutrients for plant growth. The application of organic fertilizers and additional organic substances is recommended as a solution to address current problems caused by chemical inputs, which have been shown to harm soil health and the environment ([Maryani et al., 2025](#)). Based on its form, organic fertilizers available today are generally classified into solid and liquid types. Liquid organic fertilizer is a nutrient-dense liquid derived from the breakdown of organic matter, including plant residues, agro-industrial waste, animal manure, and human excreta, and contains various essential nutrients. The use of liquid organic fertilizer can increase soil fertility damaged by the use of inorganic fertilizer. Organic materials are able to improve soil aeration and penetration of roots, water absorption, and reduce soil surface movement. Addition of organic ingredients in the soil can improve nutrient and water retention ([Listyarini et al., 2023](#)). The objective of this service is to teach farmers how to create liquid organic fertilizer, enabling them to substitute inorganic fertilizers in their rice cultivation.

Organic materials can be added by applying Liquid Organic Fertilizer (LOF), which is a solution derived from the decomposition of organic matter such as plant residues, animal waste, and human waste, and contains essential nutrients ([Tanti et al., 2019](#)). LOF has advantages, namely that it can improve soil structure. Besides that, it can also fertilize plants and can be used as an alternative to inorganic fertilizer. Basically, liquid organic fertilizer is better compared to solid organic fertilizer. This is due to the use of liquid organic fertilizer has several advantages, namely easier application, the nutrients contained in liquid fertilizer is easily absorbed by plants, contains many microorganisms, overcomes nutrient deficiencies, no problems in leaching nutrients, able to provide nutrients quickly, the manufacturing process takes less time, and it is easy to implement on farms that is, just spray it on the plants ([Fitria, 2013](#)).

The physical characteristics of good liquid fertilizer are: brownish yellow in color, neutral pH, odorless, and high nutrient content. Kirinyuh plants have more potential for use as organic fertilizer ([Duaja, 2012](#)). The use of Kirinyu organic fertilizer has a good influence on growth

and plant development ([Bete, 2018](#); [Murdaningsih & Mbu'u, 2014](#); [Wahyudi et al., 2017](#)). Liquid organic fertilizer is mostly applied through the leaves or is referred to as liquid fertilizer leaves, which contain essential macro and micro nutrients ([Wenda et al., 2017](#)). Liquid organic fertilizer offers several advantages, such as enhancing chlorophyll formation in leaves and promoting root nodule development in leguminous plants. This leads to improved photosynthetic efficiency and increased nitrogen absorption from the atmosphere. It also boosts plant vigor, making plants sturdier and more resilient. Additionally, it enhances resistance to drought, environmental stress, and disease-causing pathogens, stimulates the growth of productive branches, promotes flower and fruit ovary formation, and reduces the shedding of leaves, flowers, and developing fruits ([Marpaung et al., 2019](#); [Mappanganro et al., 2018](#)).

METHODS

The training program was held on 25 February 2024 at Embung Munggur, located in Wonosari Village, Gondangrejo District, Karanganyar Regency. The target of this program is a member of Makmur Satu Farmers Group. Method of implementing this activity carried out in several stages, including introduction, implementation, and evaluation. Following this, more details are explained about the implementation that will be carried out by the UNS 15 community service team. The preliminary stages in implementing this program are carried out by conducting observations or initial surveys regarding identification of related circumstances, problems, and applicable potential materials that can be used.

After completing the observation, the next stage is to convey ideas and thoughts regarding the work program we are planning. After the ideas submitted have been accepted, we started preparing tools and materials to carry out our activities. The materials needed to make LOF are kirinyuh leaves, kale leaves, johar leaves, banana stems, leri water, EM4, and molasses. Then, to know the level of success of the activities carried out, a program evaluation is carried out. The evaluation carried out is through pre-test and post-test. The pre-test and post-test results were analyzed simply through questions and answers. Then the pre-test and post-test results are presented in graphic form to see the changes that occur after the activity program takes place.

RESULT AND DISCUSSION

Identification Result

The results of survey activities obtained information about farmer groups and their problems experienced. The Makmur Satu Farmers Group has 48 members, whose members consist of residents Village Munggur and Gemblung Wetan. The ownership of the garden varies, with the condition that diverse. A common problem is lack of soil fertility. Excessive application of inorganic fertilizer without balance with organic fertilizer can be detrimental soil quality ([Padmanabha et al., 2014](#); [Purba et al., 2019](#)). So that needs to be balanced with use organic fertilizer that can be made yourself from surrounding materials so that you can minimize additional expenses.

Implementation

Training activities are carried out using outpouring and worthless materials in village ([Figure 1](#)). This makes farmers very interested in this activity. Farmers participated in training activities enthusiastically.



Figure 1. Creating LOF



Figure 2. Discussion process during training

It can be seen in [Figure 2](#) that farmers record training activities to document the steps enthusiastically asked about the manufacturing steps. During the training there were several farmers who ask for alternative materials, this proves farmers' enthusiasm for manufacture and use of LOF from surrounding natural materials. Apart from training in making LOF, too explained the benefits and role of each ingredient used. Farmers also get it knowledge of why organic fertilizer is important to apply as a companion as well as a substitute for inorganic fertilizer. The results of this activity are increasing knowledge and farmers' skills in utilizing surrounding materials into products such as organic fertilizer liquid.

Evaluation

The results of the implementation of all activities were evaluated using a questionnaire via post test. The results of the post test analysis show an increase in farmers' knowledge and skills. This result can be seen in [Figure 3](#).

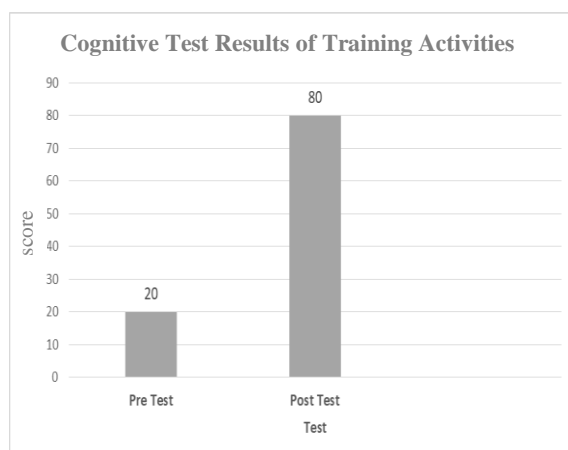


Figure 3. Pre and post cognitive test results of training activities

The post test results showed that 80% of farmers who took part in the training understood it regarding how to make a LOF, and 60% want to make a LOF in the future. Based on the pretest results show that many farmers do not know the benefits of existing materials around. The results in [Figure 3](#) and [4](#) show that there has been an increase knowledge and skills of farmers in Wonosari Village regarding the material provided through training activities.

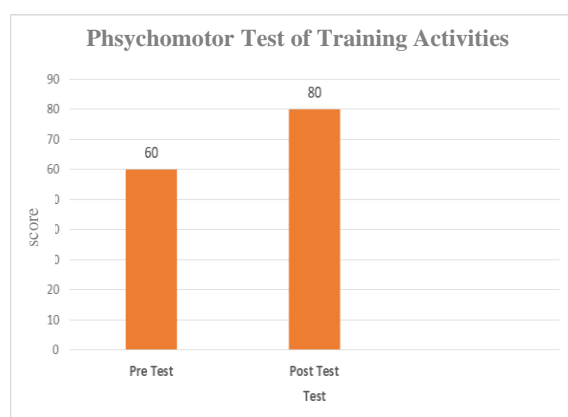


Figure 4. Results of pre and post psychomotor test of training activities

[Figure 3](#) shows that this training activity is able to improve farmers' skills in making LOF, namely from 20% to 80% (by 60%). The training activities in [Figure 4](#) also showS that public knowledge has increased from 60% to 80% (by 20%). Based on the activities has been carried out, it is known that, with training, residents are interested in making LOF by themselves.

CONCLUSION

The conclusion that can be drawn is that farmers understand how to make LOF and interested in creating your own LOF. This is reflected in the increase community knowledge about LOF is 20% and skills are 60%. And it is hoped that it can continue to be developed so that farmers no longer depend on inorganic fertilizers.

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