



Utilization Of Household Waste Into Liquid Organic Fertilizer: Empowering Community Collaborated With The Muhammadiyah Branch Office Of Colomadu Karanganyar Indonesia

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Abstract

Waste is stuff that is useless, underused, or abandoned as a byproduct of a process. The amount of organic household waste produces new environmental concerns, thus there must be a method to reduce it, one of which is converting it into liquid organic fertilizer. Organic waste can be utilized as a raw material to make organic fertilizers (liquid fertilizer and compost), which farmers can use. A moist organic matter or organic material with high water content, such as fruit or vegetable residue, is an excellent source material for liquid fertilizer made from organic waste. The goal of this community service is to teach people how to make liquid organic fertilizer out of household garbage, to conduct NPK tests for liquid organic fertilizer (POC), and to offer training and packaging support for POC products women's farming group (KWT) Berkah Tani 2. As a result of this community service project, the KWT Berkah Tani 2 has gained experience in the production of liquid organic fertilizer, which will aid in the reduction of organic waste in the Colomadu region. attempting to sell POC items derived from organic garbage.

1. Introduction

The term "garbage" refers to any item or substance that is no longer useful to people and is therefore discarded. The general consensus among members of the community regarding waste is that it is repugnant, unclean, and the like and that it should either be burned or disposed of in an appropriate manner (Mulasari, 2012). Waste is inevitably produced by any and all communal activities. The processing of garbage in such a way that it does not have a detrimental effect on the natural environment is not only the responsibility of the local government but also of the entire community (Hardiatmi, 2011). The majority of the time, garbage is composed of solids or semi-solids that are classified as either wet waste or dry

waste. Organic waste is one category of trash that can be generated. Waste that is primarily made up of organic substances is referred to as organic waste (plant, animal, or excrement residues).

Organic fertilizers are fertilizers made from natural elements such as animal excrement, animal body parts, and plants. This sort of fertilizer is mineral-rich and can effectively fertilize the soil (Roidah, 2013). Organic fertilizer is classified into two types based on its shape: solid fertilizer and liquid fertilizer. Organic fertilizer/compost made from liquid organic waste is known as liquid organic fertilizer (POC). Liquid organic fertilizers, which contain necessary macro and micronutrients, are typically applied through the leaves (N, P, K, S, Ca, Mg, B, Mo, Cu, Fe, Mn, and organic matter). Liquid organic fertilizer provides various advantages, including the ability to induce and boost chlorophyll development. It is well known that increasing the amount of chlorophyll increases plant photosynthetic ability and nitrogen absorption from the air. Furthermore, organic fertilizers can strengthen and strengthen plants, boost plant resilience to drought, promote the growth of production branches, increase the formation of flowers and ovaries, and prevent falls and, flowers and ovaries (Huda, 2013).

The amount of organic waste in the Colomadu Karanganyar area is quite a lot. This waste comes from household organic waste and agricultural waste left over from rice fields in Colomadu and its surroundings. This waste has not been utilized as organic fertilizer. On the other hand, the Colomadu people's need for plant fertilizers is relatively high. Fertilizer is needed to fertilize plants in paddy fields and to fertilize vegetable crops that are planted by Colomadu housewives in their yards. Most farmers and housewives who grow vegetables in their yards still use chemical fertilizers that contain chemicals that are not beneficial to the soil. Continuous use of chemical fertilizers can contaminate the soil and can be toxic to good organisms in the soil that function to maintain soil fertility naturally. In addition, chemical fertilizers used can also be absorbed by plants and become residues that are harmful to the body if consumed continuously. In addition, the price of this form of fertilizer tends to increase, resulting in higher production expenses for farmers.

Due to a lack of information about organic fertilizers and how to convert waste into organic fertilizer, there are still many Colomadu who utilize chemical fertilizers. To address this issue, the authors. PCM Colomadu, and the Women Farmers Group (KWT) Berkah Tani 2 collaborated to transform organic waste into a liquid fertilizer that can be used as an alternative to chemical fertilizers. In addition to minimizing organic waste, this initiative aims to familiarize the community with producing its own natural fertilizer. The second effect of producing liquid fertilizer is to encourage entrepreneurship in agriculture.

2. Methods of Implementation

The implementation of community service takes the form of:

- a) Socialization and Preparation for Making Liquid Organic Fertilizer (POC)
- b) Training on making liquid fertilizer and how to use the fertilizer.
- c) POC content test (NPK test) and POC plant experiment.
- d) Label creation, point of purchase packaging, and product marketing training.
- e) Monitoring and evaluating community service activities.

Tools and Materials

Tools and materials used in this activity include a household organic waste (can be in the form of vegetable waste, coconut pulp, fish waste, fruit waste, etc.), clean water, molasses/sugar, em4 liquid, plastic barrels, bottles for storing POC.

3. Results and Discussion

The stages of implementing the program for making POC from organic waste in the Berkah Tani 2 Women Farmers Group (KWT) under PCM Colomadu are presented as follows

Phase I: Socialization and Activity Planning

Socialization and activity preparation took place twice. On January 8, the Community Service team met with PCM Colomadu to present an outline of the activities to be carried out. Based on the socialization, it was agreed that PCM Colomadu would propose and suggest 10 Women Farmer Groups (KWT) to engage in the program under the auspices of PCM. KWT Berkah Tani 2 Ngasem, Colomadu, led by Mrs. Puji Lestari, was one of the ten groups that were later chosen as the location for community service activities.

The second socialization and preparation activity was held on January 15 2022. This activity was carried out online through a zoom meeting and was attended by all KWTs in Colomadu, totaling 10 groups. In this activity, the materials and tools used for POC manufacturing activities were discussed so that when the field activities were carried out, group members were ready to make POC. Because there has been communication between the parties and good cooperation, activities can run smoothly. The Implementation of Phase I is shown in Figure 1.

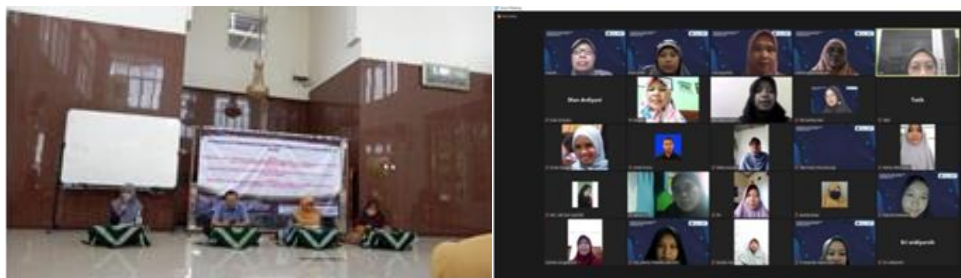


Figure 1 The Implementation of Phase 1

Phase II. Training and Making Organic Fertilizers Liquid (POC)

POC Training and Production Activities were conducted on January 22, 2022. KWT prepares materials originating from household organic waste such as fruit peels, vegetable scraps and others. Other materials are prepared by the Community Service team. In this activity, KWT members worked in groups to create the POC using simple tools and materials. KWT members had no difficulty in making POC. POC Training and Manufacturing Activities can be seen in Fig 2.

The steps for creating a POC include the following:

- Finely chop organic trash.
- Bring coconut water to a boil
- Combine the minced garbage with the boiling ingredients.
- Add groundwater and mix thoroughly

- Stir in the molasses and EM4 until thoroughly combined.
- Perform preliminary pH, texture, and color analysis, then leave the combination for 15 days. Throughout the procedure, the pH is measured.
- After the pH is stabilized, the liquid is removed from the solid and packed.

After participating in training and practice, KWT members have gained the knowledge and abilities necessary to convert organic waste into POC on their own.



Figure 2 Training and Manufacturing Activities

Phase III: pH testing and harvesting

After the POC production process is finished, the pH should be checked; a suitable pH for excellent quality POC readings is 6-6.5. This exercise is repeated 5 times every 3 days to assess the pH. After the pH stabilizes at 6, the POC fermentation process can be terminated and the POC product harvested or separated from the solids. POC products that are ready for harvest have a constant pH of approximately 6, no unpleasant odor, and are separated from the solids. POC is packaged in jerry cans and 1 L bottles, and the solids are combined with rice husk charcoal and regular soil to create a ready-to-use planting media. pH testing and harvesting activities can be seen in Fig 3.



Figure 3 pH testing and harvesting activities

This activity has shown two outcomes from the exploitation of organic waste: liquid organic fertilizer and ready-to-use planting material. This activity drew a lot of energy from the participants.

Phase IV. POC experiments on conventional plants

To find out the effectiveness of POC on plants POC was tested on vegetable plants that had been prepared at KWT Berkah Tani 2. The plants used were kale and onions. The test was carried out by giving 3 different dilutions. This is intended to find out the best treatment. The best dilution treatment will be used as rules or usage instructions written on the label on the POC packaging. POC experiments on conventional plant activities can be seen in Fig 4.

This activity is useful for convincing KWT members that the POC that is made can be used as fertilizer for agriculture or vegetable gardens owned by KWT, even in the future they can make POC products that are ready for sale.



Figure 4 pH . POC experiments on conventional plant activities

Phase V: POC Content Testing and Labeling

The POC content test activity was carried out on February 16, yielding values of N (0.25%), P (0.014%), and K (1.46%). After the results of the POC composition test were known, the activity continued with labeling. POC content laboratory test results are written on the label. On the label are the laboratory test results for POC content. On the container label, in addition to the results of the content test, the dose and application technique for POC in vegetable and fruit plants are also listed. After labeling, the POC is available for personal consumption as KWT Berkah Tani 2 or sale through farm shops. POC Content Testing and Labeling. Fig 5 shows the POC resulted in community service activities.



Figure 5 POC resulted in Community Service Activities

4. Conclusion

The Community Service activities carried out at PCM Colomadu (KWT Berkah Tani 2) have gone well. KWT members can make POC from organic waste produced every day, and

it is hoped that KWT members can make POC independently and make POC products for marketing.

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