



UTILIZATION OF NATURAL RESOURCES OF RUMAH GALUH IN THE PRODUCTION OF LIQUID ORGANIC FERTILIZER (POC) FROM BAMBOO SHOOTS

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Abstract

This community service activity was carried out in Rumah Galuh Village, Sei Bingai sub-district, Langkat Regency. The Liquid Organic Fertilizer (POC) demonstration was carried out for 1 day and was attended by local residents with the aim of making people aware that liquid organic fertilizer is an alternative to chemical fertilizer. Apart from being environmentally friendly, POC can also be made by yourself by utilizing the natural wealth in their village. The problem with the Galuh house community is chemical fertilizers whose prices are unaffordable because chemical fertilizers, which can be categorized as expensive to buy, make people lazy to fertilize their plants. Bamboo shoots are one of the natural resources that can be used as POC. Bamboo shoots are a material that can be used as organic fertilizer because they contain organic materials and other ingredients that can increase plant growth. Bamboo shoots contain the hormone gibberalin, phosphorus 59mg, calcium 13mg, iron 0.5mg, potassium 20.12mg. The content of the gibberalin hormone and these nutrients will be useful in stimulating the growth of oil palm seedlings and possibly reducing the dose of NPK fertilizer used when fertilizing oil palm seedlings. PKM ITS MEDAN students conducted socialization to the Rumah Galuh community about procedures for making POC. The benefits of POC itself can support the development of environmentally friendly agriculture, and can produce materials that are free from chemical content and become an environmentally friendly alternative to chemical fertilizers.

Keywords : *Liquid Organic Fertilizer, Bamboo Shoots, Environmentally Friendly, Empowerment Community*

INTRODUCTION

Palm oil is a crop that plays an important role in national development. Palm oil plantations are capable of creating many job opportunities and becoming a source of foreign exchange for the country. (Fauzi, 2009). Oil palm plants that have entered the productive phase are those that can be harvested regularly, usually aged between 3 to 25 years or until they need to be rejuvenated. To ensure optimal growth and production results, regular plant maintenance is essential. The main objective of this care is to encourage a balance between leaf and fruit growth, maintain optimal fruit ripeness, and ensure the health of the oil palm plants. One important aspect of oil palm care is fertilization, which aims to meet the nutrient needs of the plants. Fertilization is carried out using chemical and organic fertilizers. Although chemical fertilizers provide significant effects in the short term, their use is often accompanied by organic fertilizers. Organic fertilizers are very beneficial, especially during the productive phase of the plant, as they support the generative and vegetative growth of the plant. Fertilization is essential to meet the nutrient requirements of the plants. Fertilizers function as one of the sources of nutrients needed to address macro and micronutrient deficiencies. The application of fertilizer needs to consider the needs of the plants. (Susetya, 2014).



Liquid organic fertilizer is a solution formed from the decomposition of organic materials such as plant residues, animal manure, and human waste, which contain more than one nutrient. The advantage of this liquid organic fertilizer is its ability to quickly address nutrient deficiencies, not cause problems with nutrient leaching, and provide nutrients rapidly. In addition, this fertilizer contains binding agents, so the solution applied to the soil or water surface can be directly absorbed by the plants. Because it is made from natural materials, liquid organic fertilizer does not have adverse effects on plant health and is easily fully absorbed by the plants. (Kasi & Palopo, 2019). To address the issue of land degradation, organic fertilizers derived from animal or plant materials are used. One of the plants that can be used as fertilizer is bamboo shoots. Bamboo shoots are buds that emerge from the rhizome or nodes of the stem that grow from underground. For some people, bamboo shoots are often used as a vegetable ingredient. Bamboo shoots contain potassium, phosphorus, calcium, and the phytohormone gibberellin. (Andriani, 2020).

Liquid fertilizer or liquid organic fertilizer contains a solution resulting from the decomposition of organic materials from plant residues, animal manure, and human waste, which contain more than one nutrient (Hadisuwito, 2012). The use of organic fertilizer in farming can be the right choice for farmers to increase crop yields, as plants treated with organic fertilizer tend to be more resistant to pests and diseases. Economically, the use of organic fertilizer can also reduce production costs, allowing farmers to achieve greater profits (Erwin, 2017).

One of the materials used to make liquid organic fertilizer is bamboo shoots. Bamboo is a plant with the appearance of both a tree and grass. Bamboo is a natural composite because it can survive in many habitats. (Anane-Fenin & Akwada, 2012). Bamboo is a group of angiosperms in the monocot order. (Biango-Daniels, Wang, & Hodge, 2018). There are around 1200 – 1500 species of bamboo in the world that grow in hilly areas but do not grow in alkaline soil, deserts, and swamps. (R, YKT, C, PG, & GK, 2015). Bamboo can grow in various locations, both in lowland and highland areas, in very dry, humid, or even waterlogged regions for 2-3 months. In addition, bamboo can grow in various types of soil, including barren land. However, to achieve optimal bamboo growth and produce high-quality bamboo shoots, manipulation of growth conditions in marginal or barren soils is necessary. (Widjaja, 2001).

Bamboo shoots are materials that can be used as organic fertilizer because they contain organic matter and other substances that can enhance plant growth. Bamboo shoots contain gibberellin hormones, phosphorus 59mg, calcium 13mg, iron 0.5mg, and potassium 20.12mg. The content of gibberellin hormones and these nutrients will be beneficial in accelerating the growth of oil palm seedlings and may reduce the dosage of NPK fertilizer used during the fertilization of oil palm seedlings. (Harahap, 2021). Desa Rumah Galuh is one of the villages that has a lot of bamboo shoots potential, so the purpose of this Community Service is to create an alternative liquid organic fertilizer that is more economical compared to chemical fertilizers. The problem in Desa Rumah Galuh is that the Fresh Fruit Bunches (TBS) produced per hectare is not in accordance with expectations, leading to a mismatch between the income and expenses of the farmers. By using liquid organic fertilizer, it is hoped that there will be an improvement in the TBS produced.

METHOD

This community service activity is a collaboration between students and ITSI lecturers to enhance the capacity of natural resources (local wisdom) in Rumah Galuh Village through a village community empowerment program. The stages prepared by the team are:

1. Field Survey
Directly observing the condition of the palm oil plantations of the Rumah Galuh village community and the availability of bamboo/shoots.
2. Interview
To add information obtained from the field survey, so that the problems of the palm oil plantation in Rumah Galuh Village are identified.

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3. Preparation Tools

Carried out by collecting bamboo shoots as an alternative liquid organic fertilizer to address the community garden issues in Rumah Galuh Village.

4. Cooperation/Team Work

Team work between the Community Service Team and the village head, village officials, and local farmer group leaders to ensure that the implementation of the program receives approval from all parties involved. In addition, it is hoped that this collaboration can help the smooth running of activities so that they can be beneficial to the community.

5. Making liquid organic fertilizer (trial)

Making liquid organic fertilizer carried out by all members of Community Service by preparing tools and materials

6. Implementation

The implementation of the activity was carried out together with all members of the Community Service, village officials, the lecturer team, and local residents in Rumah Galuh Village, making Liquid Organic Fertilizer (POC) from bamboo shoots.

In the production of liquid fertilizer, students educate the community of Rumah Galuh Village about the materials and methods of production, is :

Tools and Ingredients:

1. Clean water 250 ml
2. Brown sugar 250 grams
3. Shrimp paste 1 packet
4. Bamboo shoots 1 kg
5. Rice wash water 3 liters
6. EM4 1 liter
7. Blender
8. Pot
9. Jerrycan
10. Stirring tool
11. Stove

Procedure for making

- a) The bamboo shoots to be used, amounting to 1 kg, are cleaned and cut into small pieces.
- b) Then, the bamboo shoots are boiled for 7 minutes until the boiling water turns slightly brown.
- c) The boiled bamboo shoots are blended until smooth and placed in a bucket.
- d) Add 3 liters of rice wash water to the blended bamboo shoots and stir until evenly mixed.
- e) Add 1 bottle of EM 4, 200 grams of brown sugar, and 1 packet of shrimp paste, and stir again using a stirring tool.
- f) Transfer the liquid organic fertilizer into a 10-liter jerrycan.
- g) Then, let it sit for 2 weeks as the fermentation process of POC.
- h) The fertilizer is ready to be applied.

RESULTS AND DISCUSSION

Socialization of the production, utilization, and application of Liquid Organic Fertilizer with Bamboo Shoots.

The socialization was carried out on August 19, 2024, in Rumah Galuh Village, Sei Bingai District, Langkat Regency. This activity involved students from the Community Service program of the Indonesian Palm Oil Institute of Technology, village officials, ITSI faculty team, and local residents. This activity went well, starting at 11 AM and ending at 12:30 PM. The meeting began with an opening by the head of Rumah Galuh Village, followed by welcoming remarks from the

team of lecturers. Followed by an explanation from ITSI Medan students regarding the production, utilization, and application of liquid organic fertilizer. This activity provides a lot of knowledge and benefits regarding solutions to the problems occurring in Rumah Galuh Village, namely how to address expensive fertilizers and TBS that do not meet the Ton/ha standard by applying fertilization to seedlings with the correct dosage. community empowerment activities of Desa Rumah Galuh in collaboration with ITSI lecturers and students.



Figure 1. Community Empowerment Activities Of Desa Rumah Galuh

From the socialization regarding the liquid organic fertilizer provided, many questions arose from all participants regarding the dosage given and the advantages of using this liquid organic fertilizer. The dosage given for 1 oil palm seedling is by adding 900 ml of liquid organic fertilizer with 1 liter of water. The advantage of using liquid organic fertilizer is that it is cheaper compared to using NPK Mutiara fertilizer.

This empowerment activity is also a program from ITSI through lecturers and students to transfer technology by utilizing the abundant natural resources in Rumah Galuh Village as a form of utilizing the village's local wisdom, namely to achieve the following goals: a) Developing and enhancing the community's capacity; b) Increasing the community's knowledge about the utilization of organic waste so that it has environmental value, increases income, and reduces fertilizer purchase expenses for agricultural/plantation needs; c) Developing an attitude that leads to cooperation with others to improve the living conditions of the Rumah Galuh Village community.

This community service activity is very well received and is perceived as beneficial by the people of Desa Rumah Galuh. This activity has the ability to change people or communities both in the short term and the long term. Finally, the community can directly transform bamboo shoot waste, which has become the village's main commodity, into plant fertilizer to add value and utility to the waste, and it can be reused by the community as organic fertilizer for their agriculture/plantation, which is a unique attraction. The community promises to continue using the

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science and technology they obtained from this service. The science and technology belong to the Rumah Galuh Village community and are supported by the always-available raw materials that can be processed into POC, opening up development opportunities in the future.

CONCLUSION

The community service activities aimed at the transfer of science and technology (IPTEKS) are deemed successful because they have increased knowledge and skills and have changed the behavior of the community to utilize bamboo shoot waste from the Rebung Bambu village's natural product potential into useful products with potential market value to increase the income of the Rumah Galuh village community. After the implementation of the community service program in Rumah Galuh village, it can be concluded that the dissemination of the production and benefits of liquid organic fertilizer has become a more economical solution compared to NPK Mutiara fertilizer. Using bamboo shoots as fertilizer material also helps in organic waste management, reduces the environmental impact of agricultural waste, and bamboo shoots contain nutrients that can help improve soil structure and increase nutrient absorption by plants.

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