

## Application Of Liquid Organic Fertilizer From Moringa Leaves (*Moringa Oleifera*) On Sweet Plants (*Brassica Juncea L*)

Ade Praditya<sup>1\*</sup>, Novilda Elizabeth Mustamu<sup>2</sup>, Badrul Ainy Dalimunthe<sup>3</sup>, Widya Lestari<sup>4</sup>

<sup>1,2,3,4</sup> Agrotechnology Study Program, Faculty of Science and Technology, Labuhanbatu University, Indonesia

\*Corresponding Author:

Email: [adepraditya91@gmail.com](mailto:adepraditya91@gmail.com)

---

### Abstract.

*Liquid Organic Fertilizers Are Fertilizers Made From Plants That Have Been Heated, And The Product Is Liquid. The Purpose Of This Community Service Activity Is To Increase Public Knowledge About Liquid Organic Fertilizers And Skills In Making Poc. This Service Method Consists Of Preparation, Implementation, Monitoring, And Evaluation. Communities Can Make Their Own Poc And Apply It To Plants. And The Processing Results Can Be Used By The Community. The Research Method Used Was 3 Treatments And 4 Replications With A Completely Randomized Design (Crd). This Study Aims To Determine The Effectiveness Of The Combination Of Liquid Organic Fertilizer Of Moringa Leaves On The Growth Of Mustard Greens (Brassica Juncea L).*

**Keywords :** *Mustard Greens (Brassica Juncea L), Liquid Organic Fertilizer And Moringa Leaves.*

---

### I. INTRODUCTION

Sweet mustard greens (*Brassica juncea L.*) is one of the horticultural leaf vegetable commodities that is popular with the public because it tastes good, is easy to obtain, and is not too difficult to cultivate. The contents of mustard greens are protein, fat, carbohydrates, Ca, P, Fe, vitamin B, and vitamin C. Mustard greens can live in various places, both in the high and lowlands. However, green mustard greens are mostly cultivated in the lowlands with an altitude of between 5-1200 meters above sea level, both in paddy fields, fields and home gardens. Mustard greens are weather-resistant plants, in the rainy season they are resistant to exposure to rainwater, while in the dry season they are also resistant to hot weather as long as they are accompanied by regular watering (Fuad, 2010). The sweet mustard plant is a type of vegetable that has good economic value and prospects. Generally, cultivating sweet mustard greens is done using soil as a planting medium, but recently due to limited land for cultivating plants, especially in urban areas, many people have been cultivating plants hydroponically. Hydroponics is a farming method or cultivation system without using soil. To support growth with a hydroponic system, good planting media is needed. Plant media commonly used include Rockwool, rice husk Biochar, and Coopeat. Rockwool is a non-organic material made from a mixture of basalt rock and sand in the form of fibers. Rockwool as a planting medium has advantages, namely that it is clean and looks neat, has high water absorption capacity so that water use is more efficient, does not contain bacteria that are harmful to plants, water levels can be controlled easily (Arnett, 1989).

Currently, the vegetable products that consumers want are vegetables that are good quality, healthy and safe for consumption. To achieve this, mustard cultivation needs to be carried out in a sustainable manner, namely increasing the application of organic fertilizer and reducing the application of inorganic fertilizer. Using organic fertilizer in farming can be the right choice for farmers to get better harvest results, because plants given organic fertilizer are resistant to pest or disease attacks. Meanwhile, from an economic perspective, the use of organic fertilizer can reduce costs, so that farmers will get even more profits (Oktabriana, 2017). Liquid organic fertilizer is an alternative to inorganic fertilizer. The advantage of using liquid organic fertilizer is that if it is sprayed on the leaves and some of the fertilizer falls on the ground, it can still be used by the plants. Moringa leaves are one of the things that can be used as liquid organic fertilizer to fulfill the nutrients in the soil. Because it can stimulate growth and development for plants because Moringa leaf extract contains the hormone cytokinin (Tomia & Pelia, 2021). Liquid organic fertilizer is a solution resulting from the decomposition of organic materials originating from plant residues, animal and human waste which contain more than one nutrient element.

The advantages of this organic fertilizer are that it is able to overcome nutrient deficiencies quickly, has no problems in leaching nutrients, and is also able to provide nutrients quickly. Apart from that, this fertilizer also has a binding agent so that the fertilizer solution applied to the surface of the soil/water can be directly utilized by plants. Liquid organic fertilizer does not have a bad effect on plant health because the basic ingredients are natural, so it is easily absorbed completely by plants (Tanti et al., 2020). Moringa leaf waste is an example of organic fertilizer. Moringa leaf waste contains zeatin, cytokinin, ascorbate, phenolics and minerals such as Ca, K and Fe which can stimulate plant growth. The Moringa plant has many benefits, both economic and health. The Moringa plant is not only rich in nutrients but also has functional properties because this plant is used as a herbal medicine with many benefits for human health. The nutritional content and various active substances contained in Moringa can be utilized for the benefit of living creatures such as humans, animals and plants. The use of moringa in plants can be used as a basic ingredient for liquid organic fertilizer. In liquid organic fertilizer made from Moringa leaves, there are cytokinins whose main role is to regulate plant growth. Moringa leaves used to make liquid organic fertilizer are processed by extraction (Suhastyo & Raditya, 2021).

## II. METHODS

This research was conducted in Ujung Batu Hamlet, Tebing Tinggi Pangkaan Village, Pangkalan District, Labuhanbatu Regency, North Sumatra Province and was located at Ujung Batu. This implementation period lasts for 4 months, from 5 October 2022 - 5 February 2023. The research used a Completely Randomized Design (CRD). The factors observed were the growth of sweet mustard greens and seeing the different results from administering a dose of liquid organic fertilizer from Moringa leaves

This research used 3 treatments and 4 replications with a non-factorial completely randomized design (CRD), namely:

P0 = No treatment (control) P1 = 30 ml / Liter of water

P2 = 60 ml / Liter of water Poly bag size 25 x 20 cm

The parameters observed were the growth of sweet mustard plants which were implemented with Moringa leaf liquid organic fertilizer and saw the different results from giving different doses. The tools and materials used in this research are: 1.5 liter glass jar, bucket, knife, wood, tissue, rubber, and markers. The ingredients used are: moringa leaves 1 kg, palm sugar 1 kg, rice soaking water ½ liter, bear brand milk 1 can, duck egg 1 grain, green beans ¼, coconut water 2 glasses. This liquid organic fertilizer (POC) is made by fermenting for approximately a month. In this service activity, trials have been carried out on sweet mustard plants (*Brassica Juncea L*) using the Completely Randomized Design (RAL) method with 3 treatments and 4 replications, with the concentration of Moringa leaf liquid organic fertilizer, namely P0 = without Moringa leaf POC, P1 = 30 ml / Liter of water, P2 = 60 ml / Liter of water.

## III. RESULTS AND DISCUSSION

### Socialization Activities

This socialization activity begins with delivering material directly to farmer groups and village communities, this material includes a discussion of the use of liquid organic fertilizer, and with this socialization it helps farmer groups to reduce the use of chemical fertilizers and keep the environment clean by using organic materials to be used as POC

### Training on Making Moringa Leaf Liquid Organic Fertilizer

This training was carried out to increase public knowledge in order to use Moringa leaves as liquid organic fertilizer (POC), before conducting training to the community the results of making this POC were sent to the laboratory to find out the contents of liquid organic fertilizer Moringa leaves, after the Lab results This liquid organic fertilizer comes out containing: N = 3.18% P = 5.01% K = 2.15% pH = 5.34% The service team began to carry out training to farmers in the village of Tebing Tinggi, where Moringa leaves are underused by the local community, and while this training was taking place, the community was very

enthusiastic about making their own POC. With this training, the community made more use of Moringa leaves and maintained more sustainability in the area. village environment, after this socialization was held the farmer groups also held discussions and questions and answers, and this training activity was very useful. The process for making this liquid organic fertilizer is to start by preparing the materials and tools, namely 1 kg Moringa leaves, 1 can of Bear Brand milk, 1 kg of brown sugar, 1 duck egg, 2 glasses of coconut water, and rice washing water.

The first step is to crush the Moringa leaves, and continue by mashing  $\frac{1}{4}$  of the green beans which have been soaked for 1 night, when finished, mash 1 duck egg which has been washed before breaking it then mash it with the skin, after all the ingredients have been chopped. and mash it, put the Moringa leaves in a glass jar that has been chopped into a glass jar, then put 1 kg of brown sugar in the glass jar, and put in the rice soaking water that has been left overnight and stir until all the ingredients are evenly mixed, and after Then add the coconut water and Bear Brand milk, and after all the ingredients are put into the glass jar, stir using wood from right to left. Once finished, close the jar tightly using 5 layers of tissue and tie it with rubber. The function of covering it with a tissue is to keep it hollow and if you cover it with a cloth, bacteria will enter. Once finished, store the glass jar in a shady place, store it for 30 days.

#### IV. CONCLUSION

**Fig 1.** POC outreach and training to farmer groups



From the socialization and training activities for making Moringa Leaf Liquid Organic Fertilizer (POC), it shows that the community and farmer groups are greatly helped by this service activity, because it can help to increase the productivity of farmers' products and can reduce expenditure costs or what we could call saving expenses. , because as the motto of farmers is as little capital as possible and maximum profits, and we are very grateful to be able to carry out this event as expected by the community and farmer groups in Tebing Tinggi Pangkatan village, Pangkatan District.

#### REFERENCES

- [1] Arnett, D. (1989). *No Title*. 1–2.
- [2] Fuad, A. (2010). Cultivation Of Mustard (Brassica Juncea L.). *Faculty Of Agriculture Student Thesis. Surakarta University*, 3(May), 24.
- [3] Oktabriana, G. (2017). Efforts In Increasing The Growth Of Green Mustard Plants (Brassica Juncea L.) By Applying Liquid Organic Fertilizer. *Agrifo: Malikussaleh University Agribusiness Journal*, 2(1), 12. <https://doi.org/10.29103/Ag.V2i1.504>
- [5] Suhastyo, A. A., & Raditya, F. T. (2021). The Effect Of Administering Liquid Fertilizer From Moringa Leaves And Egg Shells On The Growth Of Samhong Mustard Greens (Brassica Juncea L.). *Journal Agrosience And Technology*, 6(1), 1. <https://doi.org/10.24853/Jat.6.1.1-6>
- [7] Tanti, N., Nurjannah, N., & Kalla, R. (2020). Making Liquid Organic Fertilizer Using Aerobic Methods. *Iltek: Technology Journal*, 14(2), 2053–2058. <https://doi.org/10.47398/Iltek.V14i2.415>
- [8] Tomia, L. M., & Pelia, L. (2021). The Effect Of Moringa Leaf Liquid Organic Fertilizer On Growth And

- [9] Purple Eggplant Plant Results. *Faculty Of Agriculture Student Scientific Journal*, 1(3), 77–81. <https://doi.org/10.52045/Jimfp.V1i3.193>.
- [10] S. Robayani And A. Kristantini, “Rancang Bangun Sistem Informasi Bimbingan Penasehat Akademik Berbasis Web (Studi Kasus Di Fakultas Ilmu Komputer Institut Bisnis Dan Informatika Kosgoro 1957),” *Jurnal Sistem Informasi Bisnis (Junsibi)*, Vol. 1, No. 2, 2020, Doi: 10.55122/Junsibi.V1i2.172.
- [11] S. B. Mir And G. F. Lluca, “Introduction To Programming Using Mobile Phones And Mit App Inventor,” *Revista Iberoamericana De Tecnologias Del Aprendizaje*, Vol. 15, No. 3, 2020, Doi: 10.1109/Rita.2020.3008110.
- [12] Top And M. Gökbulut, “Android Application Design With Mit App Inventor For Bluetooth Based Mobile Robot Control,” *Wirel Pers Commun*, 2022, Doi: 10.1007/S11277-022-09797-6.