

EKOENZIMM FOR AGRICULTURAL WASTE TREATMENT IN SELODUWUR HAMLET, BATUR VILLAGE, GETASAN DISTRICT

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Abstract

Organic farming is one of the proponents of food resistance, economic resilience, and human health, especially during the COVID 19 pandemic. The sustainability of organic farming must be supported by the availability of fertilizer, pesticides, and sufficient financial capital. Ecoenzym is one of the easy and inexpensive agricultural waste fermentation products. Ecoenzyme can be one of the solutions to increase the availability of fertilizer, pesticides and can be used to reduce the economic burden due to financial spending on soap, shampoo and household hygiene. In addition, ecoenzymes are also beneficial in restoring fertility and repairing the quality of soil damaged by conventional agriculture using chemical fertilizers and pesticides. Batur Village is one of the villages with an organic farming community that is affiliated with the Minang Bangkit Merbabu farming group. Currently, the organic fertilizer used is the fertilizer and compost that comes from agricultural waste only. Its availability is highly dependent on the limited number of livestock, and not all farmers have livestock. Ecoenzyme training is one of the activities that is expected to be a solution for farmers to jointly produce fertilizer and pesticides, thus increasing the economic level of agricultural waste that is processed into ecoenzymes.

Keywords: agriculture waste, ecoenzym, fertilizer, organic, pesticides.

INTRODUCTION

The current Covid-19 pandemic is a global problem that has an impact not only on the world of health but also on economic security and community food security. During this pandemic, people must get a supply of healthy food that is free of harmful chemicals, especially since Covid 19 is known to be a disease related to one of the community's intestinal health (Aktas and Aslim, 2020).

On the other hand, nowadays it is more difficult for people to get organic food due to the relatively high price of organic food and the inadequate supply of organic food. One of the problems in organic farming is that the required land must be processed to get rid of residues of pesticides and chemical fertilizers used in the previous agricultural stage (Widiarta et al, 2011). to do. There are several organic farmer groups that are able to produce organic vegetables, but these farmer groups need to be nurtured so that during the pandemic they can be more productive and survive so that the supply of organic food is sufficient and the price is cheaper. Agricultural waste is currently one of the wastes that have the potential not only to be

processed into organic fertilizer that can support the development of organic agriculture but this waste can be used as a multipurpose liquid called ecoenzyme that can overcome health problems, polluted land problems and reduce the economic burden on the community. to the need for cleaning fluids, soaps, shampoos, and disinfectants (Rahayu et al 2021).

Ecoenzymes are fermented products from the daily kitchen and agricultural waste including fruits and vegetables. This ecoenzyme is biodegradable and environmentally friendly. Ecoenzymes contain good bacteria, namely bacteria that produce lactic acid and acetic acid which can be useful in the bioremediation of soil contaminated with chemical and metal pollutants. In addition, it also has natural antimicrobial properties so that it can be used as a biopesticide (Arifin et al, 2009).

This ecoenzyme is a liquid that comes from fermenting fresh organic waste.

Minang Bangkit Merbabu Farmers Group is one of the potential farmer groups in Batur village, which consists of 21 organic farmers. Batur Village is a village located in Getasan District, Semarang Regency. This village has an area of about 1,087.73 ha. The location of the village is at an altitude of 1,350 m above sea level. This village is known to have a large area of organic farming land and farmers are involved in several farmer groups, one of which is the Mina Merapi Merbabu organic farmer group. Villages bordering Batur village include:

- North: Sumogawe Village
- East: Tajuk Desa Village
- South: Mount Merbabu
- West: Kopeng Village

Batur village is composed of 19 hamlets including Thekelan, Seloduwur, Nglelo, Tawang, Batur Kidul, Batur Wetan, Gondang, Hamlet, Selongisor, Kaliduren, Madu, Ngiringin, Kalitengah, Sanggar, Diwak, Senden, Rejosari, Wonosari, and Krangkeng. In this village there are 19 Rukun Warga (RW) and 55 Rukun Tetangga (RT). To overcome the problems of organic farmers in the Minang Bangkit Merbabu farmer group, various activities were carried out including, counseling, training and making ecoenzyme houses. The training program will also create a sense of togetherness in solving problems.

IMPLEMENTATION METHOD

The training was held in Pak Min's organic vegetable garden, Seloduwur hamlet, Batur Village, Getasan District, Regency, Semarang. Making ecoenzymes is relatively simple and inexpensive with materials that are also easily available. The formulation requires raw materials in the form of fresh organic waste, palm sugar/ palm sugar/ molasses, and water which is fermented anaerobically for 3 months with a ratio of organic waste: water: palm sugar/palm = 1: 10:3. (Vama R and Erekar, 2020). The implementation method is through several approaches including:

1. Based on farmer groups, all community service activities use group learning methods with assistance, planning, and program monitoring.
2. Comprehensive and gradual, all community service activities are carried out simultaneously which are carried out through counseling, training and assistance so that products are produced that can be implemented in the community.

3. Based on local agricultural potential and local wisdom by utilizing waste into superior products that can be a solution for the availability of fertilizers, pesticides and improve the economic level of farmers.

The three methods above are carried out in 4 (four) stages of activity:

1. Counseling
2. Training
3. The establishment of the ecoenzyme housing and the formation of its organizational structure
4. Assistance so that it can provide an output in the form of a patented product.

RESULTS AND DISCUSSION

Phase 1 training has been carried out by training theoretically and demonstratively on representatives of 15 village youth organizations and farmers. The training will be held on March 25, 2021. The training event will be held from 10.00 to 12.00.

The training materials were taken from agricultural waste in Pak Min's organic vegetable garden, in the form of fresh leaf waste. Furthermore, the waste is processed by fermentation using water and brown sugar. This organic material is fermented for 3 months. After 3 months the fermented products are harvested and used as organic liquid fertilizer and natural pesticides. The results of the training were harvested on May 25, 2021, after being filtered in the form of a brownish yellow liquid, smelling like tape. This harvest is stored in gallons of mineral water in a place that is not exposed to direct sunlight.

Currently, agricultural waste in Batur Village is only used as compost, even though if it is used as an ecoenzyme, this waste has more benefits. Currently, it is known that ecoenzymes can be used as a substitute for chemical fertilizers and pesticides, as well as in processing soil and water contaminated with pesticides and other hazardous chemicals. (Widiarta et al., 2011; Nazaitulshila et al, 2019).

The content of ecoenzymes works through several processes of decomposition, composition, and transformation of organic materials into useful materials that are simpler and safer. The ingredients include enzymes (amylase, protease and lipase), acetic acid, propionic acid, nitric, and carbonate. Enzymes are useful in the degradation of organic matter. Acetic acid is useful as an insecticide and pesticide. Nitrates and carbonates are useful as organic fertilizers (Arifin et al. 2009).

For processing soil/water contaminated with ecoenzymes, especially those high in acid originating from fermentation of fruit waste such as oranges and tomatoes, has been shown to reduce pollutant levels in the 10-day treatment (Nazaitulshila et al, 2019).



Figure 1. Ecoenzyme yield



Figure 2. Ecoenzyme training in the organic vegetable garden of Seloduwur hamlet, Batur Village, Getasan District

CONCLUSION

Organic agriculture is indispensable for food security and maintaining public health. One of the obstacles to the development of organic agriculture is the need for organic fertilizers, pesticides, and the processing of polluted soil/water that must be organized first. Ecoenzymes are the right, cheap and easy solution and provide a solution for the accumulation of agricultural waste. The use of ecoenzymes can reduce the need for capital for organic farming for farmers so that the price of organic vegetables is expected to be more affordable to the community.

THANK-YOU NOTE

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REFERENCES

- Arifin L.W., Syambarkah A., Purbasari H.S, Ria R, Puspita V.A. (2009). Introduction of eco-enzyme to support organic farming in Indonesia. *As. J. Food Ag-Ind. Special Issue*, S356-S359.
- Aktas B and Aslim B. (2020). Gut-lung axis and dysbiosis in COVID-19. *Turk J Biol.* 44: 265-272.
- Rahayu M.,R. , Muliarta N.,I., Situmeang Y.,P., (2021). Acceleration of Production Natural Disinfectants from the Combination of Eco-Enzyme Domestic Organic Waste and Frangipani Flowers (*Plumeria alba*). 05/1: 15~21
- Widiarta A, Adiwibowo S, dan Widodo.,(2011). Analysis of Sustainability Organic Farming Practise on Farmer. *Sodality: Jurnal Transdisiplin Sosiologi, Komunikasi, dan Ekologi Manusia.* 5/01:71-89.
- Vama R and Cherekar M.N. (2020).Production, Extraction And Uses Of Eco-Enzyme Using Citrus Fruit Waste: Wealth From Waste. *Asian Jr. of Microbiol. Biotech. Env. Sc.* 22 (2) : 346-351.
- Nazaitulshila R, Lim Hwe F and Wan Azlina W Ab. K.G. (2019). Production And Characterization Of Eco Enzyme Produced From Tomato And Orange Wastes And Its Influence On The Aquaculture Sludge *International Journal of Civil Engineering and Technology (IJCIET)* 10:03: 967-980.