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Based on Fermentation Technology, Compost Waste Processing uses Effective Microorganisms to Manufacture Organic Fertilisers

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ABSTRACT

Aims to teach and prepare farming communities to use natural resources, particularly household vegetable and fruit waste that hasn't been used effectively, by applying fermentation technology, which is still unfamiliar to many, to turn it into more useful and eco-friendly products using effective microorganisms. So far, the community has not gotten any intense attention or understanding about discovering alternate solutions that can be applied to trash, notably domestic organic waste. Bokashi fertiliser is an organic fertiliser created from the fermentation of organic resources, such as compost, and utilises microorganisms like bacteria or fermenting fungus. The outcome is a solid fertiliser that includes more nutrients, both macro and micro, which are ready to be taken by plant roots. The purpose of the fertiliser activity is to provide training and build community skills in processing organic materials from home garbage. The programme also seeks to introduce the community to fermentation technology for the disposal of organic waste. The effort empowers the community, particularly farmers, to cultivate an inventive mentality in solving environmental concerns, which covers activities such as mentoring, group involvement, and innovation. The results of this analysis have a favourable impact on the knowledge and abilities of the farming community regarding the use of domestic organic waste. The findings of the evaluation of the questionnaire suggested that participants felt the benefits of the activity, exhibited curiosity, received new knowledge, and were willing to implement it in their daily life

Keywords: Effective Microorganisms; Compost Fertilizer Technology; Organic Fertilizer

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INTRODUCTION

The majority of chemical fertilizers used in farming have shown efficacy in enhancing plant growth. It continues to survive until now. However, lately, the adverse impact of excessive use of chemical period of time has been felt, namely the impact on soil conditions becoming harder and less fertile. Not only do natural processes produce organic waste, but human activities also contribute to it. Along with the increase inpopulatiber othopopulatthe ittion, it greatly affects the amount of waste generated (SI, 2016). There are many ways we can overcome this waste problem.

We can start with the simplest sector, namely the household sector, by applying the 3R (reuse, recycle, reduce) principle. We can utilize household waste in a variety of ways. The production of liquid and solid uses alternative methods to create economic value from waste. The most common sources of waste come from settlements, from food scraps, vegetables, and fruits. This group falls under the category of organic waste due to its recyclable nature (Hidalgo et al., 2022). One of the effortsorganicc waste bokashi. fertilizer is utilizedely in its Bokashi fertilizer is organic Bokashi fertilizer is anti-lize.Bokashi fertilizer is an organic fertilizer made from compost and utilizes decomposing microorganisms, including microbes and fermented fungi (Sánchez et al., 2017). The result of the composting process is that the fertilizer contains more nutrients, both macro and micro, which are ready to be immediately absorbed by plant roots.

The average nutrient content of the fertilizer includes N, P, K, Mg, Zn, B, Mo, Cu, Mn, and Cl. The advantage of solid organic fertilizer is that its nutrient content is higher and has decomposed, making it ready to be absorbed by plant roots. In addition, sofertilizer containsontains effective microorganisms that are useful for suppressing the growth of pathogens in the soil (Chen et al., 2020).The initial step involves the preparation of decomposer microorganisms. One of the most popular bokashi decomposers is Effective Microorganisms 4 (EM4). The EM4 solution consists of microorganisms that are specifically isolated to decompose organic waste quickly. The microorganisms contained in EM4 include photosynthetic bacteria, lactic acid bacteria (such as Lasp.obaActinomsp.etes and inomyctes), and yeast. EM4 is sold in various sizes as a condensed liquid. To make a bokashi decomposer, we simply dilute the liquid and mix it with the raw materials of bokashi.

If it is difficult to othey also4, they also make effective microorganism (EM) fluiownheir own by mashing papaya with 0.5 kg of skin, peel (as akgapeel (kgoflesegetablesch) (le/spinach) (0.25 kg), using a blender or other tools. Put the crushed ingredients in a bucket with a lid. Add 1 liter of water, 1 kg of granulated sugar, and pieces of cake yeast. Stir gently until evenly distributed. Then close the container tightly and let it sit for 7 days. After seven days, a dark brown liquid will form. Filtering the liquid, the filtered water is an effective solution of

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microorganisms (EM) that can be used as a decomposerfertilizer. The liquid is in a container/bottle. The EM solution lasts 6 months, and the pulp can be composted (SI, 2016).

The community needs to be equipped with skills to process household organic waste into innovative, life-saving, and environmentally friendly products. So far, it is still rare and can bea newnsidered a newtivityg activity for the community in training activities to mfertilizer fromzer from household organic waste from settlements. So it is important that this activity is provided to the community, in this case community, to pickty, to pick up insights and apply science related to the application of fermentation technology among farming communities, at least to be able to handle organic waste on a small scale in the environment in which they live and reduce dependence on chemical fertilifertilisersse not environmentally friendly and not beneficial for aoductivity. ty. ity.productivity.

RESEARCH ELABORATIONS

This community service program focuses on empowering farmers and the general public in rural areas through the transfer of simple fermentation technology. The main objective is to equip participants with the knowledge and practical skills to process household organic waste into bokashi fertilizer and local microorganisms (EM4/Mol). The initiative is based on the need for more sustainable agricultural solutions, which not only improve soil fertility and crop yields, but also reduce dependence on chemical fertilizers and minimize the negative impact of waste on the environment. Thus, the program serves as a bridge between scientific innovation and community needs, creating a more self-reliant and environmentally friendly agricultural ecosystem.

The method of implementing the activity is comprehensively, starting with careful preparation which includes a survey of community needs, the formation of an expert team, the preparation of easy-to-understand training modules, and the procurement of tools and materials. Core training is conducted for a minimum of one full day, integrating an interactive lecture model, live demonstrations, and guided self-practice sessions. In the lecture session, participants will understand the basic principles of fermentation and the role of microorganisms in agriculture. The demonstration will then show the step by step making bokashi fertilizer from different types of organic waste. A crucial part was a guided self-practice session of local EM4/Mol manufacturing that lasted 1-4 hours, ensuring each participant mastered the process under the guidance of the facilitator, so they could produce the required microbial starter themselves (Sánchez et al., 2017)

Participants in this program are not limited to active farmers; Housewives, youth, and the general public who are interested in organic farming are also targeted. This inclusive approach aims to disseminate knowledge widely, transforming the perspective of waste from a problem

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to a valuable resource. The involvement of various levels of society is also expected to trigger collective initiatives in organic waste management at the village level, encouraging the creation of a cleaner and healthier environment. Thus, the program focuses not only on improving technical skills, but also on building collective awareness of the importance of resource management and sustainability.

To measure the success and impact of the program, a thorough evaluation is conducted. Before and after the training, pre-tests and post-tests are given to measure the increase in participants' knowledge. Evaluation questionnaires are distributed at the end of the session to assess participant satisfaction, material relevance, and facilitator quality. Furthermore, direct observation and structured interviews were conducted some time after the training to see real applications in the field, identify behavioral changes in waste management, and measure the economic and environmental impact felt by the participants. The data from this evaluation is critical for future program refinement and the development of more effective community service models (Hidalgo et al., 2022).

As a follow-up, post-training mentoring is an important element to ensure the sustainability of the adoption of this technology. The community service team will provide regular consultations through field visits or online communication channels, answer questions, and help address any challenges participants may face. The formation of farmer groups or waste management groups is also encouraged as a forum for collaboration and sharing of experiences. Thus, the program is expected to not only end after the training, but become a starting point for communities to independently implement and develop their organic farms , creating a long-term positive impact on farmers' welfare and the sustainability of the village environment.

RESULTS AND DISCUSSIONS

This activity is an effort to disseminate science, technology, and art to the community. The activities aimed at the farming community focus on addressing the initial problems. The. Knowledge identifies the issues and potential that underpin this activity. Knowledge and skills of organic waste processing and the application of simple technology owned by thare inadequate inadequate, farmer groups in the village have the potential to devefertilizer activitiesand there is community enthusiasm ithe program.rogram. This activity is directly and indirectly able to provide changes for individuals/communities and institutions both in the short and long term. The changes that can be observed from the participants of the activity, namely the farming community from this activity, include pgainingcipants gaining new knowledge and skills in processing organic waste with the application of fermentation technology.

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Through the use of effective microorganisms in the of bokashinfertilizeof bokashi, sticipants get added value in the form of innovative skills that can be used in solving problems faced in theThisity, This activity can have a social impact, especially on community groups, especially farmers and, in general, general, in the community, both for institutions and partners, namely cooperation between institutions, namely institutions and partners, in this case villagesthe village the village as a partner and an institution both have a positive impact, especially in terms of quality improvement. To achieve this goal, the training activities in bokashi fertilizer production using microorganisms are effectively carried out through the following procedures.the followingesng: Training: Activities in the training are carried out using a lecture model and demonstration of the practice of processing household orinto bokashi fertilizer.

The results of this training session showed that the participants were enthusiastic about receiving the training material. This the enthusiasm of theparticipanthe participantsuestions and responded to the materialpthe materialepresented.ded practice of making bokashmaking bokashiilizer utilizesve microorganisms (EM4) through the fermentation techniqe/method. Duringvthe activities, the participantsy enthusiastic and skilled skilled inipracticingufacture of bokasof bokashiffertilizers from household organic waste according to the instructions and directions of thetrainthe trainer.The activities are evaluated based on the monitored time. The evaluation results of the training activities and mentoring practices, based on questionnaire data, indicated that nearly all participants felt they had gained new knowledge and experience. During the implementation of the service program for training participants in making bokashi organic fertilizer, both the writing team, who initiated the program, and the village partner did not encounter significant difficulties; thus, the implementation proceeded smoothly and effectively. All activities can run smoothly as planned. Everything related to the preparation, impleimplementation,reporting process can run smoothly. In the future, plans that can be carried out in partnership with villages will be carried out with similar activities and broader targets that require insight and skills regarding household waste treatment that apply fermentation technology that is still unknown to the general public.

CONCLUSIONS

Community service activities through the training program on making organic fertilizers using fermentation technology and beneficial microorganisms in farming communities have met their goals, and evaluations show that this activity is very helpful for the community. It offers new experiences and life skills to tackle real-life issues, especially in using household waste to create eco-friendly bokashi fertilizer.

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REFERENCES

Chen, T., Zhang, S., & Yuan, Z. (2020). Adoption of solid organic waste composting products: A critical review. *Journal of Cleaner Production*, *272*, 122712.

Hidalgo, D., Corona, F., & Martín-Marroquín, J. M. (2022). Manure biostabilization by effective microorganisms as a way to improve its agronomic value. *Biomass Conversion and Biorefinery*, *12*(10), 4649–4664.

Sánchez, Ó. J., Ospina, D. A., & Montoya, S. (2017). Compost supplementation with nutrients and microorganisms in composting process. *Waste Management*, *69*, 136–153.

SI, S. N. (2016). Application of effective microorganism (EM) in food waste composting: A review. *Asia Pacific Environmental and Occupational Health Journal*, *2*(1).