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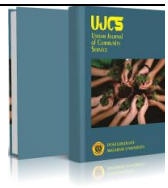

Production of Organic Fertilizer from Rice Husks and Cow Manure to Increase Crop Production in Leming Village

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Abstract: Chemical-based fertilizers have become a significant issue in the agricultural sector of Leming Village, Terara District, East Lombok Regency. Excessive use of chemical fertilizers can lead to various negative impacts on the environment, human health, and agricultural sustainability. Observations on the use of chemical fertilizers in Leming Village indicate that the number of chemical fertilizer users remains high, along with a low level of public awareness regarding the harmful effects of these fertilizers. The 2025 KKN PMD Program of Mataram University in Leming Village aims to educate the community about the dangers of chemical fertilizers, provide an alternative in the form of organic fertilizer made from a combination of rice husks and livestock manure (cow dung), and train the community in producing organic fertilizer using these materials. In addition to these initiatives, the KKN PMD program also includes tree planting and seedling distribution, which will be utilized for compost application.

Keywords: Organic fertilizer; Rice husk; Cow dung; Plant nutrition; Sustainable agriculture.

Introduction

Leming Village is administratively located in Terara Sub-district, East Lombok Regency, West Nusa Tenggara Province. Leming Village consists of 6 hamlets with a large area consisting of Leming, Wisa, North Karmela, South Karmela, Lingkok Kolo and Piling hamlets. Most of the people of Leming Village work as farmers and breeders. In the agricultural sector, the community produces rice, corn, tobacco, chilies and so on as the main commodities. In addition, some residents have livestock in the form of cows.

Agriculture is a very vital sector in human life, especially in meeting food needs (Viana et al., 2022). The growing demand for food often has an impact on soil quality and fertility which is decreasing (Kopittke et al., 2019). One of the factors contributing to the decline in soil fertility is the overuse of chemical fertilizers, which can damage soil structure, pollute water, and reduce soil biodiversity (Pandian et al., 2024). In response to these problems, the use of environmentally friendly organic fertilizers is an attractive alternative solution (Supriatna et al., 2023).

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According to the American Plant Food Control Officials (AAPFCO), organic fertilizer is manure that contains carbon and one or more nutrients other than H and O that are essential for plant growth. However, the National Organic Program of the USDA says that organic fertilizers are all organic fertilizers that do not contain prohibited materials and come from natural materials, including animals or plants, garbage, and non-organic materials (Nagarajan et al., 2023). Organic fertilizer is the result of fermentation of organic materials (manure, bran, husks, and water) with EM4 technology. This organic fertilizer contains alcohol, amino acids, protein, carbohydrate, and vitamins. Organic fertilizer extracts can be used to control pests and plant diseases (Sastro et al., 2013).

The utilization of local organic materials such as rice husks and cow dung as raw materials for organic fertilizers is still not optimal. The use of organic fertilizers such as cow dung fertilizers can increase the amount of nutrients needed by the soil for plant growth. Due to its high N, P, and K content, cow dung fertilizer can supply the nutrients needed by the soil and improve soil structure (Atman et al., 2018). In fact, these two materials are easily found in many areas, including in Leming Village, Terara Subdistrict, and East Lombok District. Rice husk produced from rice milling and cow dung which are abundant in rural areas have great potential to be developed into quality organic fertilizer. Processing these two materials through a fermentation process can produce organic fertilizers that are rich in nutrients needed by plants. Therefore, this KKN activity was carried out to provide solutions in the form of actions that need to be taken in dealing with the problem of excessive use of chemical fertilizers in Leming Village.

Method

Time and Place

This research was conducted in Leming Village, Terara District, East Lombok Regency, West Nusa Tenggara. On Monday, January 20, 2025.

Tools and materials

The tools and materials used in this study were rice husks, EM4, cow dung, agricultural lime, drim, hoe, clean water, sacks, tarpaulin, cepang, buckets.

Data collection

The data were collected through field observation methods where we observed the conditions of agriculture and livestock in Leming Village, especially regarding the use of chemical fertilizers and the potential for organic fertilizer raw materials, then we observed the response of plants after the application of organic fertilizers.

Results and Discussion

Socialization of Compost Fertilizer Making

The Real Work Lecture (known with KKN) group from Mataram University in Leming Village successfully held a work program (proker) to socialize the making of compost made from rice husks and cow dung. The activity, which was attended by dozens of people, aims to increase the knowledge and skills of the community to utilize the waste that is commonly found in the surrounding environment. Moreover, in Leming Village, the majority of people are farmers and cattle breeders.

The socialization which took place at the Leming Village Office presented competent resource persons in their fields, namely one of the lecturers of Soil Science at the University of Mataram, Fahrudin S. P. M. Si. In his presentation, Fahrudin explained the various types of organic fertilizers, the materials needed, and even directly practiced making fertilizers. The community also seemed enthusiastic about the presentation and direct practice of compost fertilizer making.

Figure 1. KKN PMD Leming held a Compost Fertilizer Making Socialization with speakers from Mataram University

Figure 2. Demonstration of Making Compost Fertilizer by Mr. Fahrudin S.P. M.Si.

Dividing and Planting Tree Seeds

In Leming Village, Terara sub-district, East Lombok district, as an effort to maintain environmental sustainability, UNRAM PMD KKN students educated the community by distributing and planting tree seedlings supported by the West Nusa Tenggara Provincial Forestry Service.

Figure 3. Distribution of Tree Seedlings.

The distribution and planting of tree seedlings were carried out around the village's vacant land and the community's yard, this aims to preserve the environment around Leming Village.

Figure 4. Delivery of Tree Seedlings to People's Homes

Through the distribution and planting of seedlings, Leming Village has succeeded in building positive environmental awareness. This success is supported by the active involvement of the community and collaboration with various parties. We hope that this initiative can continue and inspire other communities to preserve the environment for future generations.

Figure 5. Planting Tree Seedlings on Village Land

This activity aims to encourage the active participation of the Leming Village community in environmental conservation efforts. Through seedling planting and socialization activities, we hope to increase residents' awareness of the benefits of protecting the environment and inspire changes in behavior that are more sustainable and environmentally friendly.

Support Program

The supporting work program carried out is teaching and learning at SDN 1 Leming. The teaching and learning program are held four days a week. The teaching and learning program at school is carried out to assist teachers at school in providing understanding to their students. The next work program is a clean Friday which is carried out every Friday. The activity is also attended by village officials and the local community. Clean Friday is carried out as an effort to familiarize clean and healthy living that can start from the surrounding environment. Then the next program is helping with the posyandu activities which are held once a month.

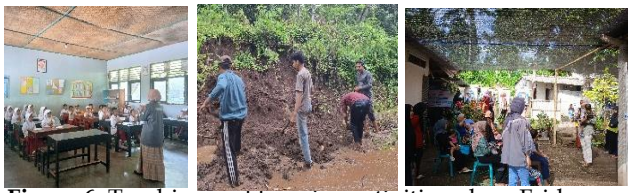

Figure 6. Teaching and learning activities, clean Friday, and integrated health posts

Conclusion

The KKN PMD of University of Mataram in Leming Village has been carried out well. The community is very enthusiastic about participating in the Compost Fertilizer Making program for the development of sustainable agriculture in the village. The results of this activity show that the community is very enthusiastic

about participating in the activities, this is shown by their presence in every activity held.

Acknowledgments
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