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# Education and Utilization of Straw as Organic Fertilizer in Mergosingo Village Jatirejoyoso

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**Abstract**

**Purpose:** This study enhances sustainable agricultural practices by addressing straw waste management issues in Mergosingo Hamlet, Jatirejoyoso village. The aim is to promote the utilization of straw as an organic fertilizer and highlight its relevance within the agricultural sector.

**Method:** Using a qualitative approach, we conducted a one-day educational program for Mergosingo's farming community. Data collected from instructional sessions and discussions were analyzed to explore the adoption of straw as an organic fertilizer for sustainable land management.

**Practical Applications:** This research benefits farmers, practitioners, and policymakers by offering a solution to curb environmental pollution from conventional waste practices. Embracing straw as organic fertilizer could increase crop yields, reduce environmental impact, and improve soil health.

**Conclusion:** This study addresses straw waste and the transition to sustainable agricultural practices. The advocacy for straw's use as organic fertilizer contributes practical insights, advancing agricultural sustainability and environmental awareness.

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## Introduction

Agriculture is one of the development sectors that receives special attention from the government. This is due to agriculture's significant role in building the economy, especially in Indonesia. In this agrarian nation, a substantial portion of the population relies on farming as their livelihood (Yunindanova, 2022) (Amam & Rusdiana, 2021). This is manifested in data from the Central Statistics Agency, which indicates that the agricultural sector grew by 1.75 percent in 2020 and 3.51 percent in 2021 (Sadiyah et al.., 2021). The increase in agricultural yields also has a substantial impact on national food security, as emphasized by the agency's report that rice stocks reached 7.60 million tons, and total agricultural exports for the January-July 2021 period amounted to 2.24 billion US dollars, reflecting an 8.72 percent increase compared to the previous period (BPS, 2020). The agricultural, forestry, and fisheries sectors reported the highest workforce absorption rate at 29.59 percent (Putra, 2021).

Agriculture is highly significant in Indonesia due to its abundant resource potential, substantial contribution to national income, and the fact that a significant portion of the population derives their livelihoods from the agricultural sector (Fadillah dkk., 2022). Moreover, the agricultural sector forms the basis for rural growth. The role of agriculture is pivotal in regional development, as increased agricultural output enhances food security, employment within the sector, and consequently, the welfare of communities in each area (Grebeníček, 2012) (Harsányi dkk., 2014).

Data from the Malang Regency Central Statistics Agency (2021) elucidates the growth of agriculture in the subsector of food crops (rice), which experienced a 3.68 percent increase from the preceding period. This increase was driven by a rice harvest area of 38,238 hectares in the Malang Regency. The Jatirejoyoso Subdistrict, Mergosingo Hamlet, is one of the productive areas in the Malang Regency that generates food crops, primarily rice. The region possesses a rice paddy area of 8.34 hectares and consistently yields food crops annually, thereby contributing to the welfare of the surrounding community.

The productivity and improved agricultural output in Mergosingo Hamlet are not unrelated to the role of the government in supporting farmer groups. Government support entails providing fertilizer subsidies during each planting season. Fertilizer distribution occurs through local village farmer groups, evenly distributing these resources among the farmers. Using fertilizers yields numerous benefits, primarily evident in increased agricultural output. However, such improved yields also have specific environmental repercussions, chiefly a rise in straw waste – a residue from the harvest that remains unused.

Straw waste management within the farmer community involves burning straw in the fields and letting it decompose before the next planting season. Specific straw burning poses various environmental impacts, including pollution and the risk of land fires if not carefully monitored (Amk, 2020) (Shang dkk., 2020). This underscores the need for farmer groups to grasp the principles of environmentally friendly farming practices. The significance of environmentally friendly farming practices to harness non-renewable resources for agricultural production with minimal adverse environmental impacts. Strategies include soil conservation, restrained use of chemicals, and prevention of significant environmental disturbances (Hazmi dkk., 2023) (Platis dkk., 2019).

The utilization of straw as organic fertilizer is an endeavor that can enhance land productivity, reduce farmers' land management expenses, and mitigate air, water, and soil pollution (Wihardjaka, 2021) (Hasan & Osronita, 2021). Incorporating straw as organic fertilizer enhances the nutrient content in the soil. Consistent use of straw compost can raise soil organic matter content and restore soil fertility through increased water-holding capacity, enhanced nutrient supply, and improved soil structure and physical properties (Hakim, 2018). The exploitation of agricultural waste, particularly straw, as organic fertilizer, represents a feasible endeavor for dissemination, given the substantial volume of straw waste generated (Wahyuni & Yani, 2019). For instance, for each rice planting with a 6 tons/hectare production rate, approximately 6 tons of rice straw are produced. Consequently, rice straw can be

converted into environmentally friendly organic fertilizer.

Based on the context, the author is inclined to conduct education on converting straw waste into environmentally friendly organic fertilizer. This education is intended for all farmers within the Jatirejoyoso Subdistrict, specifically in Mergosingo Hamlet, who are members of the farmer group. The educational objective is to raise farmers' awareness regarding the environmental impacts of conventional straw waste management and to enhance the value of straw as a beneficial resource for sustainable and environmentally friendly land management practices.

**Method**

The educational activity was conducted in Jatirejoyoso Village, Mergosingo Hamlet, by inviting farmer group members to participate. The direct involvement of farmer group members is expected to enhance farmers' knowledge and skills in processing straw waste. Furthermore, the processed rice straw is also anticipated to assist farmers in addressing chemical fertilizers with negative environmental impacts. The method employed in the educational activity consisted of a presentation on bio-fermentation technology involving a rice straw processing plot. The stages of rice waste processing encompassed preparation, treatment, and utilization.

**Result**

The educational activity took place for a day, inviting members of the farmer group from Jatirejoyoso Village, Mergosingo Hamlet. This activity was conducted to address the need for more understanding among the community regarding environmentally friendly farming practices. The education commenced with soil management strategies to preserve soil fertility and nutrient content without causing adverse environmental impacts. Farmers were also encouraged to reduce the use of chemical fertilizers that the government has subsidized.

Farmers, the primary partners in this activity, require guidance, information, and support as activities like this can enhance their capacity to implement innovations. This educational initiative aims to equip farmers with knowledge and skills in processing straw waste. This way, farmers comprehend the consequences of unwise straw waste management. Environmentally friendly land management practices also need to be introduced to farmers. Hence, they understand the sustainable conservation of natural resources that are ecologically appropriate, economically beneficial, socially accepted, and feasible. Environmental-friendly agricultural programs adhere to the principle of minimizing the use of chemicals. Hence, the utilization of inorganic fertilizers, pesticides, herbicides, fungicides, and other chemical substances needs to be limited.

The conversion of rice straw waste into fertilizer is an environmentally friendly land management endeavor that employs organic fertilizers. Self-produced organic fertilizers by farmer groups can replace the need for inorganic fertilizers, which the government has consistently subsidized. Distribution of inorganic fertilizers occurs periodically with each planting season. The gap between fertilizer needs and the availability of government-subsidized fertilizers results in fertilizer scarcity for farmers. This challenge can be mitigated by processing rice straw waste, which is also expected to help farmers counter the shortage of chemical fertilizers. Processed straw waste can be stored for up to three months and used in the subsequent planting season. Hopefully, this program can be implemented sustainably, thereby positively impacting the agricultural quality in Mergosingo Hamlet.

The conversion of rice straw into organic fertilizer can be carried out through several stages. The presentation explains the procedure for processing straw waste, delineating various stages as illustrated in the diagram below:

*Figure 1*. Process of Straw Waste Treatment

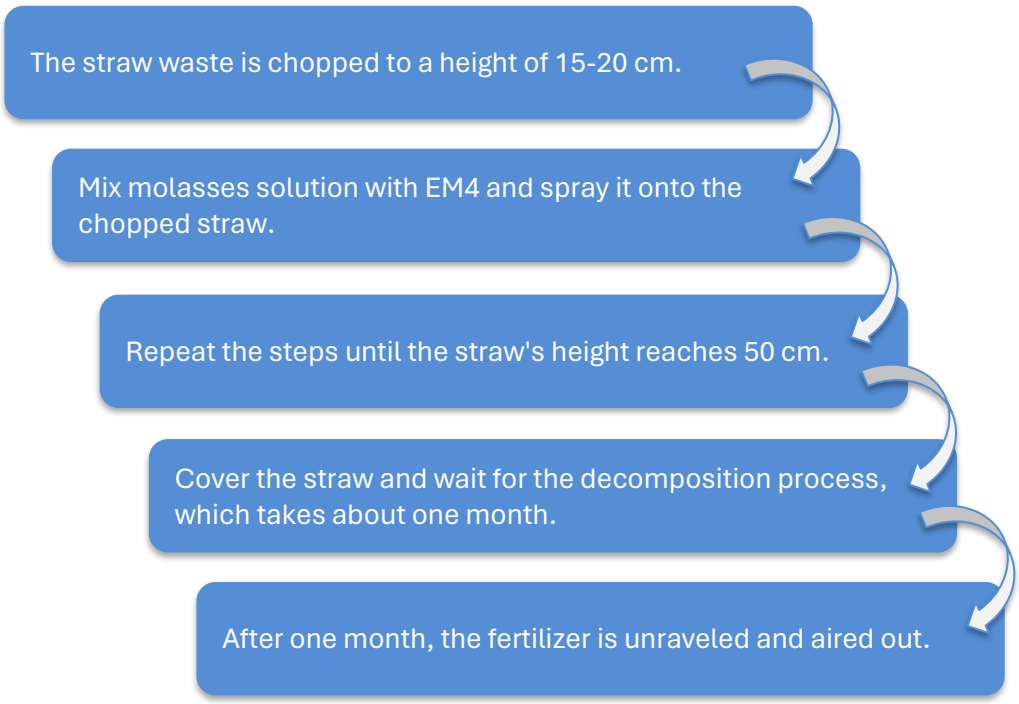


*Figure 2.* Briefing Process


*Figure 3.* Process of Straw Retrieval

During the implementation of this educational activity, all members of the farmer group were present and actively participated in the discussions. This activity was engaging for the farmer group members as it introduced practical technology to help them address agricultural waste issues that could harm the environment. The farmer group hopes to receive more education in the future from the government and institutions that care about the well-being of farmers and the environment.

*Figure 4.* Photo with the farmer group

**Discussion**

Farmers today have yet to understand the application of environmentally friendly farming practices widely. In response, empowerment of the Mergosingo Hamlet farmer group is necessary, carried out as a presentation on bio-fermentation technology in the context of rice straw processing plots. Farmers, as the target group of the educational activity, need to receive guidance and support through empowerment and educational programs. Through this educational initiative, a new understanding will be fostered, manifested in managing environmentally friendly farming practices and processing straw waste into organic fertilizer that the farmer group can utilize.

The previous straw waste management process in agricultural land solely involved burning. This was done because farmers perceived burning to be less time-consuming, and the resulting straw ash would be mixed with the soil before the planting season. However, the burning process by farmers would undoubtedly lead to several negative environmental impacts, including pollution, land fires, and depleted soil nutrients. Hence, to utilize the abundant straw waste, composting technology is needed to prevent wastage and transform it into environmentally friendly organic fertilizer. Farmers' knowledge and skills regarding straw utilization need to be improved; therefore, the agreed-upon program by the farmer group is an educational initiative on producing organic fertilizer from straw waste.

This educational activity garnered significant attention from all farmer group members, as the innovation of transforming straw waste into organic fertilizer had not been presented before. Throughout this educational event, all farmer group members actively engaged in discussions and provided insights into the agricultural conditions in Mergosingo Hamlet.

Several obstacles were encountered during this educational activity, mainly due to the limited time available because of local area restrictions due to the PPKM (Community Activity Restrictions) policy. Hopefully, this educational initiative will not halt here but will continue to be sustained, enabling the farmer group to innovate and thrive in implementing environmentally friendly farming practices.

## Conclusion

Farmers consistently face the issue of agricultural waste in the form of straw with the arrival of each harvesting season. The accumulated straw is often managed practically by burning and mixing it with soil. However, such processing methods can result in adverse environmental impacts and jeopardize sustainable and environmentally friendly land management practices. To address this issue, it is crucial to introduce the bio-fermentation process for transforming straw waste into environmentally friendly and economically beneficial organic fertilizer. Farmers, as partners in this educational activity, need to receive guidance, support, and direction, as they can enhance their capacity and adopt innovations to improve the quality of agricultural management. This educational initiative spans a day and is attended by all Mergosingo Village farmer group members. The group members appear enthusiastic during discussions, as this knowledge offers a new and practical solution to tackle agricultural waste issues effectively.

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