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Dry Leaf-Composting Using M-Bio Activator: A Training Program for Senior High School Students in Ciamis

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ABSTRACT

Education on waste management during the Limited face to Face Learning needs to emphasize more to school residents. Schools environments with lots of trees produce a lot of dry leaf organic waste. The solution related to this issue is to eliminate dry leaf organic waste with the least damaging effect on the environment and make it valuable. The innovation that can be offered is dry leaf composting using an M-BIO activator. Partners in this community service are students of SMAN 1 Baregbeg and SMAN 2 Ciamis. The method used is lectures, discussion, questions &answers, and training in composting practice. Based on the evaluation, 67% of the participants experienced increased knowledge about dry leaf organic waste composting. In addition, regarding the sustainability of independent composting, 83% of the participant were interested. The program opens up insights and changes participants' mindsets towards organic waste. In the future, this program will be school routine programs. Compost produced from students' practical activities during training and counseling can be used as plant fertilizer in school greening areas.
Keywords: dry leaf composting, organic waste, M-BIO activator, students

INTRODUCTION

Covid-19 has changed people's habits related to work-life, school-life, eating habits, physical activities, etc. The government imposes restrictions on community activities due to the fast transmission of the virus in all regions in Indonesia. The human mobility restriction somehow makes people's productivity levels decrease. The wheels of the economy must keep turning, people must continue to work, education must not stop, and social and cultural life continues. Therefore, the way to get out of this pandemic is to make peace with COVID-19 and continue living with a new life called New Normal. The New Normal term is in line with the official speech of the President of the Republic of Indonesia, Joko Widodo, at the Istana Merdeka on May 15, 2020 (Irawati, 2020). The purpose of the new normal is to keep people productive and safe from Covid-19 during the pandemic. The New Normal is narrated as an Adaptation of New Habits, which means that we can work, study, and do activities productively in the era of the Covid-19 Pandemic.

The COVID-19 pandemic has given wisdom to the community, one of which is increasing attention to environmental sustainability and health. Awareness of the importance of healthy living in a clean environment leads us to change for a better life. New habits for a healthier life must be continuously carried out in society and every individual to become a new social norm and individual norm in everyday life. We are required to adopt new habits wherever we are, such as at home, in the office, at school, in places of worship and in public areas. It is hoped that by frequently applying new habits anywhere, it will become easier and faster to become individual norms and societal norms.

Healthy living behaviours, such as the 5M movement (Wearing Masks, Washing Hands, Keeping Distance, Staying Away from Crowds, and Reducing Mobility) are highly recommended by the Indonesian Ministry of Health to reduce the rate of transmission of COVID-19 during the Adaptation of New Habits (Alfarizi, 2021). 5M behaviour, the community should also pay attention

to the conditions of the surrounding environment because the environmental conditions in which individuals work affect their health conditions. According to Blum (1974), four factors influence a person's health status: environment, community behaviour, health services, and heredity. The definition of the environment itself can be the environment in the context of an individual's interaction with other individuals or the environment in the context of everything that is physically around the individual. According to Adliyani (2015), the physical environment is related to physical aspects such as waste, water, air, soil, climate, housing, etc.

In the Adaptation to New Habits period, the physical environment, such as garbage, should be considered. Unresolved issues concerning waste challenge people to innovate about waste processing into something valuable in society is needed. With this innovation in managing waste, especially organic waste, the community can reduce waste accumulation and air pollution.

Regarding waste management, Surahman & Hermawan (2011) consider it necessary for parties who want to manage waste to be made into compost with a fast and odour-free manufacturing process, including using M-BIO Surahman & Hermawan (2011). Research on the use of M-BIO as an activator for composting has been carried out. The most appropriate concentration of M-BIO to accelerate the composting process is 10 ml of M-BIO per 100 ml of sugar (Surahman et al., 2019).

Issues related to the waste are caused by several factors: 1) no final waste disposal site, 2) lack of public awareness, 3) lack of knowledge of managing waste, and 4) lack of knowledge to reprocess waste into something useful (Surahman et al., 2019). Among these factors, one solution that can offer is training for society about waste processing involved experts and environmental activities. Lando et al., (2019) provided assistance in the management of organic waste into compost for teachers and elementary school students and succeeded in creating improved values regarding the point of view of organic waste (Lando et al., 2019).

Assistance in managing organic waste during the Adaptation of New Habits needs to be emphasized more on school residents. One example of organic waste that cannot avoid is dry leaf waste. Schools with geographical conditions with lots of trees produce a lot of dry leaf organic waste. Processing of dry leaf has been routinely carried out in several schools in Ciamis, but by burning. The residue of burning organic waste causes air pollution that affects health. As announced in the Ciamis Regent's Circular Letter, some schools have begun to prepare Limited Face-to-face Learning, and some have even started implementing it in mid-April 2021. Therefore, during the implementation of Limited Face-to-Face Learning, air conditions and other environmental conditions must be considered so that the health of residents schools is maintained in the Adaptation of New Habits.

Law No. 18 of 2008 states that everyone's right to foster proper and environmentally sound waste management. The target of assisting dry leaf organic waste management will be more effective for school residents interested in the environmental field, for example, students who love nature. Assistance in processing leaf organic waste using M-Bio Activator can be used as an alternative way to process waste that has use value and does not cause air pollution. Providing organic waste processing using the M-Bio Activator can also be a productive activity for students during the limited face-to-face learning period.

METHOD

The community service implementation location is at SMAN 1 Baregbeg and SMAN 2 Ciamis. The organic waste composting training activity was held on September 1, 2021. The team assisted at least once every three days after composting activity. The target of the training activity is high school students from two schools. These students are members of the Pencinta Alam extracurricular and Karya Ilmiah Remaja, and Biology intracurricular. The participants who were directly involved in the counselling were 20 people. This number meets the maximum crowd limit according to the Covid-19 protocol.

The implementation method used in the training activities is the lecture method, discussion, question and answer, and continued with composting organic waste (learning by doing). The counselling materials include an introduction to the types of waste in the school environment, sorting garbage by type of waste, and the procedure for composting dry leaf organic waste with an M-BIO activator. In addition to being given material through lectures and discussions, participants were also given booklets on waste composting. This booklet is expected to help strengthen the understanding of participants/partners during and after training. Furthermore, the participants/partners carried out the practice of composting dry leaf organic waste under the guidance of the service team. This training activity is followed up with mentoring, which is carried out at least once every three days. This assistance aims to ensure the development of the compost that has been made, one of which is checking the temperature.

The success indicator of this community service activity is increasing the knowledge of participants/partners about composting dry leaf organic waste with M-BIO activator as well as the skills of participants in making compost, both skills in determining the dose of compost materials, skills in mixing compost materials, and skills in controlling the development of compost regularly.

The method used to measure the indicators of success is a survey method through a questionnaire instrument. The questions in the questionnaire consist of two parts: the perception of participants/partners towards the instructor/service team and the perception of participants on the composting of dry leaf organic waste. The data processing of the survey results is carried out statistically to obtain the percentage of participant responses to the activity.

RESULTS AND DISCUSSION

1. Experts' Explanation Stage

The training activities were carried out to coincide with the beginning of the enactment of the rules on Face-to-face Learning for secondary schools in Ciamis. School residents as service partners welcomed the activity. The training and counselling can support creating a clean and healthy environment during the adjustment period for school residents during the Adaptation of New Habits. Submission of material in this activity is carried out through training and counselling to increase the partner's knowledge. This is a step taken by the service team in changing the partner's perception of the use of dry leaf organic waste into compost with appropriate technology. During the presentation of the material, the participants were very enthusiastic because the composting material was a new insight for the participants.

Moreover, participants are extracurricular and intracurricular related to the environment, so that participants are more interested in the material presented. The insights obtained can be immediately put back into practice in their respective schools. Actions during counselling and material delivery can be seen in Figure 1.

Figure 1. Experts' explanation

The enthusiasm shown by the participants was not only when listening to the material but also during the discussion session. The participants actively asked several questions related to the length of the composting process, the technique of controlling until the compost was finished, the composition of compost materials, and other questions. Responding to participants' questions,

the service team tried to answer and explain well to understand better.

2. Training and Practice Stage

The practice of composting dry leaf organic waste begins with giving an example first by the service instructor. The instructor first showed the tools and materials that will use in composting, made the first layer with dry leaves on the top of a plastic sheet, sprinkled manure and rice bran evenly on a dry leaver layer, made molasses solution, poured molasses solution on dry leaves layer, adjusted the humidity of the organic matter, covered organic matter using plastic sheet. After observing the example of composting from the instructor, the participants started to make compost from dry leaf organic matter, as shown in Figure 2.

Figure 2. Training and Practice Stage

3. Evaluation Stage

The activity's success is seen from the participants' responses, which were measured using a questionnaire. The questionnaire consists of two parts: the perceptions of participants towards the instructor/service team and the perceptions of participants towards composting dry leaf organic waste. Participants' perceptions of the instructor/service team consist of 8 statements. Meanwhile, participants' perceptions of dry leaf organic waste composting consist of 4 statements. The results of participant/partner responses can be seen in Table 1 and Table 2.

Table 1. Participants' perceptions of the instructor/service team

Statement	SA (%)	A (%)	N (%)	D (%)
1	33	67	0	0

2	33	67	0	0
3	33	67	0	0
4	33	67	0	0
5	42	50	8	0
6	33	67	0	0
7	67	33	0	0
8	17	67	17	0
note: SA= strongly agree; A=agree; N= neutral; D= disagree. The ability of the instructor/service team regarding composting (statements 1-3); service (hospitality, fast and responsive, quality of facilities and infrastructure) instructor/service team (statements 4-8)				

Based on Table 1, most participants agree that the service team already has good capabilities in providing counseling and training. In addition, most participants also agreed that the service team was good because the team was friendly and responsive during service activities.

Table 2. Participants' perceptions of dry leaf organic waste composting

Statement	SA (%)	A (%)	N (%)	D (%)
9	83	17	0	0
10	33	67	0	0
11	25	58	17	0
12	8	83	8	0
note: SA= strongly agree; A=agree; N= neutral; D= disagree. New insight for participants (statement 9), increased knowledge about composting (statement 10), ability to do composting (statement 11), and sustainability to do composting independently (statement 12)				

In addition to giving a positive response to the service team, participants also responded positively to the composting of dry leaf organic waste. This is shown by the perception data of participants/partners in Table 2. This composting material is a new insight for participants so that more than 80% of participants strongly agree with Question 9. Regarding the sustainability of independent composting, participants gave their approval about 83%. To strengthen the understanding and skills of participants, the service team made a booklet on composting made from dry leaves. Booklets were distributed to all participants who attended the service activities. The display of the booklet can be seen in Figure 3.

Figure 3. Composting Booklet

CONCLUSION AND RECOMENDATION

With the service activities, the understanding and skills of state high school students and teachers in Ciamis in utilizing dry leaf waste in the school environment to be used as compost with the help of the M-BIO activator has increased. The program's success in opening up insights and changing partners' mindsets towards organic waste processing is evident by adapting this

activity into routine programs and school flagship programs. Compost produced from students' practical activities during training and counseling can be used as plant fertilizer in school greening areas.

The suggestions from the service team for the sustainability of this program include: partners can implement this organic waste processing program independently and sustainably; partners can become pilot schools at the district level as drivers of processing organic waste into compost; and the training and counseling program on composting from organic waste can continue to be disseminated in secondary schools.

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