

Environmentally Friendly Coconut Water Biofungicide As a Control of Fungal Diseases

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ABSTRACT

Biofungicides are all types of living organisms that can be used to control fungi. Biofungicides are biological products that are used to control plant diseases caused by fungi. This Community Partnership Program aims to provide an understanding of the cultivation, application and use of coconut water biofungicide, with partners from the Lestari I Farmers Group and the Lestari II Farmers Group in Paluh Manan Village, Hamparan Perak Sub-district, Deli Serdang Regency. This activity is carried out so that the public's understanding is aware of the importance of processing biological or organic materials to replace chemical fungicides. Based on the results of a field survey to Paluh Manan Village, Hamparan Perak Subdistrict, Deli Serdang District, it can be concluded that the problems faced by farmers are: the high price of chemical biofungicides needed by lowland rice and chili farmers, very minimal knowledge about the use of coconut water waste, skills in processing coconut water as a biofungicide has not been obtained. Muhammadiyah University of North Sumatra provides training and understanding of this environmentally friendly coconut water biofungicide in order to reduce production costs and also farmers' skills on coconut water waste treatment and most importantly for the health of farmers and consumers.

Keywords: biofungicide, coconut water, fungal disease

INTRODUCTION

Biofungicides are all types of living organisms that can be used to control fungi. Biofungicides are biological products that are used to control plant diseases caused by fungi. Biofungicides are grouped into two, namely vegetable (plant-based) and biological fungicides (derived from microorganisms such as viruses, bacteria, and fungi) which have the ability to suppress or control other microbes which are plant pathogens.

In order to reduce the cost of input production, an innovation was introduced to make its own biofungicide. Biofungicides made from coconut water waste are cheap and safe for consumers to consume rice. Apart from the utilization of coconut water waste which is always thrown away, materials from biofungicides are easy to obtain. This innovation has the potential to overcome blast fungus in paddy fields in Paluh Manan Village, which has a fairly large rice field area.

Paluh Manan Village is an agricultural area, especially rice and chili farming. So that farmers prioritize the two plants to increase farmers' income. The success of a farmer is seen from the quality of plant growth. The better the quality of growth, the higher the production and the maximum farmer's income. This must be considered by farmers to maintain the quality of their plants.

Rice and chili plants in Paluh Manan Village, Hamparan Perak Subdistrict, Deli Serdang District are currently experiencing a decrease in productivity, marked by not achieving a maximum production of 6 to 7 tons of dry unhulled rice per hectare. The decrease in lowland rice productivity is due to the emergence of fungi on the rice plant which interferes with the growth of these crops and so is the chili. *Pyricularia grisea* blast fungus can infect all phases of growth of rice plants from nurseries to before harvest. In the generative growth phase of rice plants, symptoms of blast disease develop on the stem / neck of the panicle.

Armed with this information, the community partnership program activities of the Universitas Muhammadiyah Sumatera Utara (UMSU) were carried out to provide more insight and knowledge to the community in Paluh Manan Village, Hamparan Perak District, Deli Serdang Regency, North Sumatra so that the community partnership program through continuous outreach to the community and farmer groups Understanding the importance of management efforts for Biofungicide based on coconut water is very important in supporting the productivity of lowland rice plants because it plays a role in improving plant growth.

Armed with this information, the community partnership program of the Muhammadiyah University of North Sumatra (UMSU) was carried out to provide more insight and knowledge to the community in Paluh Manan Village, Hamparan Perak Subdistrict, Deli Serdang District, North Sumatra so that the community partnership program through continuous outreach to the community and farmer groups in order to understand the importance of efforts to manage biofungicides made from coconut water is very important in supporting the productivity of lowland rice plants because it plays a role in improving plant growth.

METHOD

This Community Partnership Program is carried out by means of two-way communication and direct practice where the community asks questions and the presenter answers as the biofungicide manufacturing practice progresses. The enthusiasm of the community raises the enthusiasm to share about the knowledge in the manufacture and benefits of biofungicides, which so far farmers have always used chemical products that are not good for the body of consumers of rice and chilies which are food ingredients. And after the presenter gave a tutorial on making biofungicides made from environmentally friendly coconut water, the farmer continued to see the understanding of farmers in making biofungicides until the application later.

RESULT AND DISCUSSION

Community Partnership Program Activities in controlling fungal diseases in rice and chili plants using environmentally friendly coconut water biofungicides which were carried out in Paluh Manan village, Hamparan Perak sub-district. This activity was attended by the Lestari I Farmers Group chaired by Mr. Syawal Nainggolan and the Lestari II Farmers Group chaired by Mr. Kairul Rizwan, S.P who is an alumni of the Faculty of Agriculture, Muhammadiyah University of North Sumatra and also the Paloh Manan Village Consultative Body Mr. Muhammad Latif. Most of the people in Paluh Manan Village are Banjarese. This meeting was held to make biofungicides made from environmentally friendly coconut water to be applied by farmer groups because it can be used for fungal control in rice and chili plants using organic methods.

This Community Partnership Program activity was held on Sunday, June 14, 2020 which was attended by representatives of farmer groups and village officials. This activity was carried out at noon when the farmers were taking a break and a coffee shop owned by Mr. Syawal Nainggolan, who was the chairman of the Lestari I Farmers Group, and the gathering place for the farmers came home from their respective fields. The farmers enthusiastically listened to the explanation and listened to the manufacture of biofungicides, which in fact the distance was done especially for practitioners.

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This Community Partnership Program was created and planned because it was seen from the number of chemical fungicides that were produced and used by farmers. And there have been many researchers and inventors for the manufacture of biofungicides including coconut water. Meanwhile, in terms of health, it is not very good for consumers. So that this biofungicide is very helpful for farmers both in terms of consumer and consumer health. Furthermore, Paluh Manan Village was chosen because it is one of the agricultural villages which is quite large in rice and chili fields. Almost most of the people work in farming activities.

Biofungicides are a type of pesticide that are used to control diseases caused by fungi. The types of fungi include *Trichoderma* sp. and *Gliocladium* sp. The two fungi help control clubroot disease or wilt disease caused by the fungus *Fusarium* sp (Meidiantie S, Muanis Nur A, 2010). The benefits of biofungicides in terms of economic aspects have an effect on lower production costs and increase farmers' income. From an environmental perspective, biofungicides have more influence on the protection of biological and environmental safety. Biofungicides are environmentally friendly and do not damage other biologics, including humans or animals (Bioindustry, n.d.). Biofungisida sangat membantu petani maupun tanaman petani dalam keberhasilan kegiatan usahatani petani dan harus diterapkan oleh petani.

The results of control are generally not satisfactory due to several technical and non-technical constraints. One disturbing obstacle is the high cost, especially for smallholder rubber farmers. As one of the elements in integrated control, biological control is a method with great potential. Biological control using *Trichoderma* sp. has been used widely and proven its effectiveness. This method is not only effective as a preventive measure, but also cheap, easy to apply, and friendly to the environment (Setyawan et al., 2013).

The results also showed that the biofungicide with the highest concentration of active ingredients was proven to inhibit the growth of plant-disturbing fungi. So that it is beneficial for farmers and also for special productive crops (Nawfetrias et al., 2016).

The result of the Community Partnership Program, which is abbreviated as community service, is that the farmers have understood and are able to make this biofungicide made from coconut water. Farmers are aware of the benefits from an economic, environmental and health perspective. The enthusiasm of some farmers was also seen when the activity was planning to directly apply it to their rice and chili plants.



Figure 1. Socialization of making environmentally friendly coconut water biofungicide

From the results of the field that we have encountered, there are several obstacles both in terms of the very short meeting time with farmers in the explanation due to the many other activities of the farmers. In addition, there are also some farmers who still depend on chemical pesticide products without thinking from the economic, environmental and health aspects. Because some of the farmers prefer practical products that are ready for use in crops and that are often found in chemical agricultural products. The obstacles faced in the field are also closely related to the Covid-19 pandemic, which makes the service team more careful, and farmers are also afraid to participate in activities because they carry out association activities and only a few of the farmers are present even though they still apply the recommended health protocol by the government.

CONCLUSION

The implementation of this service resulted in the conclusion that the communities of the Lestari I Farmers Group and Lestari II had understood and were motivated to make and apply biofungicides made from environmentally friendly coconut water. In essence, this service activity has a positive impact on farmers' awareness of the high value of chemical fungicides, environmentally friendly, and health, both from farmers themselves and consumers.

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