INCREASING AWARENESS AND SKILLS OF FARMERS IN THE USE OF LIQUID PLANT PESTICIDES THROUGH EXTENSION IN BALOREJO VILLAGE

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Abstract - *Fertilizer use is increasing globally, in line with people's need for food, acceleration of harvest time, and efforts to increase agricultural productivity. Many farmers tend to use chemical fertilizers and pesticides excessively, which can cause damage to the environment and natural resources. Therefore, it is important to implement effective outreach in Balorejo Village to increase farmers' awareness and skills in using botanical pesticides. This research uses assistance method (Assistance) and Participatory Learning and Action (PLA) methods. The results of this research are that education on vegetable pesticides is carried out as an alternative for farmers who experience anxiety in dealing with the emergence of pests on agricultural land. Apart from that, this outreach was carried out as an effort to increase farmers' awareness and skills in using liquid vegetable pesticides in Balorejo village because it was not only a presentation of material, but also included practices in making vegetable pesticides. Therefore, with this extension, the people of Balorejo have broad insight, so it is hoped that farmers in Balorejo Village can continue to develop it*.

Keywords: *Botanical Pesticides, Extension, Farmers, Pests*

1. INTRODUCTION

The use of fertilizers is increasing globally, in line with society's demand for food, the acceleration of harvest times, and efforts to enhance agricultural productivity (Roidah, 2013). Many farmers tend to use chemical fertilizers and pesticides excessively, which can cause damage to the environment and natural resources (Sinambela, 2024). In this context, the impetus from international policies has led the Indonesian government to design a national policy for plant protection (Finger et al., 2024).

One of the steps is to establish an Integrated Pest Management (IPM) program that utilizes biological control agents or biopesticides, where plant-based pesticides serve as a key component in the IPM system, by Government Regulation No. 6 of 1995. As an effort to emphasize the excessive use of chemical fertilizers, the government has established a policy that provides recommendations for fertilizer use, as regulated in Regulation No. 40 of 2007.

Indonesia is a country rich in biodiversity, which greatly supports human life. Many types of plants in this country have the potential to be used as fertilizers and botanical pesticides. Examples of plants that can be used as botanical pesticides include the maja fruit, bitter vine, neem leaves, and several other types. The utilization of various plant-based pesticides is one step to support the concept of sustainable agriculture (Yuriansyah et al., 2020). Sustainable agricultural systems are farming methods that focus on producing healthy and high-quality food while considering economic, social, and environmental aspects (Emanuel Omedetho Jermias et al., 2023).

Agriculture is a crucial sector that supports the livelihoods of the community, especially in villages like Balorejo Village, Bonorowo District, Kebumen. With an agricultural land area of 89 hectares, the community relies on agricultural production for economic welfare and food security. However, the challenge of increasing pests and plant diseases often forces farmers to resort to chemical pesticides that pose risks to human health and the environment. The discovery of liquid plant-based pesticides as an alternative offers new hope in addressing this issue.

The village of Balorejo, with a majority of farmers, still relies on chemical pesticides that bring many negative consequences. The limited understanding of botanical pesticides and their benefits is one of the factors hindering the adoption of sustainable agricultural practices. Therefore, it is important to enhance farmers' awareness and skills in the use of plant-based pesticides through effective extension services.

Liquid plant-based pesticides, made from natural ingredients by utilizing nearby plants, create a substance that is not only environmentally friendly but also safe for human health (Trijayanthi Utama et al., 2022). The utilization of locally accessible materials becomes a distinct advantage for farmers in the village. The program for socialization and outreach on the methods of making and applying

botanical pesticides is essential so that farmers feel confident in transitioning away from the use of harmful chemical substances.

Through a well-planned extension program, it is hoped that farmers in Balorejo will be able to understand and implement more environmentally friendly farming methods. This extension not only provides knowledge but also practical skills that can sustainably improve agricultural outcomes. Success in this program can demonstrate that local farmers can play an active role in maintaining environmental health and improving the quality of their products.

By raising farmers' awareness, and contributing to the improvement of soil quality and the health of agricultural ecosystems. This is a strategic step, considering that the sustainability of agriculture is not only the farmers' task but also a shared responsibility of the community. Fostering awareness of the importance of sustainable agriculture is part of a larger mission, which is to create a balanced and productive environment. The village of Balorejo has rich agricultural potential, but it requires guidance and support in implementing better farming practices. With the right approach, this village could become a model for other villages in the use of plant-based pesticides. It is hoped that this effort will not only bring positive changes at the local level but also inspire more farmers in other areas.

2. METHOD

In the process of implementing the work program carried out by the students of KKN 114 klp 199 Balorejo Village Bonorowo District, in the implementation of this work program combines two methods, namely the assistance method (Assistance) and the Participatory Learning and Action (PLA) method. The selection of the use of assistance methods aims to increase and grow the awareness and understanding of farmers about the benefits and usefulness of various plants around the environment that can be processed into environmentally friendly plantbased pesticides, and also help farmers in facilitating cooperation partners in the manufacture of plant-based pesticides. The selection of the PLA method aims to be able to revive the sense of belonging (sense of belonging) towards the product that will then be developed as well as a sense of responsibility (sense of responsibility) towards the products that are around the environment.

A. Tools and materials

This section contains a list of ingredients and tools that will be used in the practice of making plant-based pesticides, which are as follows:

- **Ingredients :**
  a. Maja fruit,
  b. Bitter grape,
  c. Galangal,Margosier, and
  d. Lemonggras
- **Tools**
  a. Bucket,
  b. Fisting,

c. Knife,
d. Cutting board,
e. Strainer, and
f. stirrer

B. Work procedures

The process of making environmentally friendly plant-based pesticides is usually through various manufacturing steps that are carried out gradually and structured so as to produce high-quality plant-based pesticides. The first step is to collect all the ingredients and tools needed in the manufacture of plant-based pesticides, next when all the ingredients and tools have been collected, then for the ingredients that will be used such as maja fruit, brotowali, lengkuas, mimba leaves and lemongrass then all the ingredients are put in a lumpang (plunder) then all the ingredients are coarsely crushed until all the ingredients are mixed. After all the ingredients have been roughly ground into lumpang, then the result of the collision is put into a large bucket and continued by adding 5 liters of water, after that the ingredients that have been soaked with water are then left to stand for 24 hours and then filtered to separate the pulp and water, because what is needed is the water from the soaking of these ingredients which can then be sprayed by the farmers to spray on the rice that is affected by pests.

3. RESULTS AND DISCUSSION

Counseling on the use of botanical pesticides is an activity carried out with the aim of making farmers aware that there are pesticides that can be produced independently by utilizing plants around them. This is as explained by Asfar, Arifuddin and Rahman inRosdaliani et al., (2023)that extension is a socialization activity regarding community service activities carried out with the aim of enabling farmers to understand all the stages carried out(Rosdaliani et al., 2023). The extension activities began with the presentation of material on plants that can be used as botanical pesticides and their benefits. The presentation of this material was carried out in order to provide farmers with broad insight into what plants can be used as botanical pesticides. As expressed by Laba et al. inSutriadi et al., (2020)Botanical pesticides use natural ingredients as control components, so they are safe for the environment and safe for consumers.(Sutriadi et al., 2020).

The implementation of this botanical pesticide extension activity is an alternative for farmers who are worried about the emergence of pests on agricultural land so that they do not only rely on chemical pesticides. This is because the use of botanical pesticides can inhibit or prevent the development of plant-disturbing organisms. Botanical pesticides can function as repellents, namely repellent to the presence of insects because they cause

a pungent odor; antidotes, namely preventing insects from wanting to eat sprayed plants because they are bitter; nerve poisons; and disrupt the hormone system in the insect's body(Haerul et al., 2016). In addition, according to Baharuddin inSutriadi et al., (2020)explains that botanical pesticides have great potential as environmentally friendly OTP controllers, including being able to prevent, repel, repel, trap, inhibit growth, sporulation and rumination, reduce body weight and hormonal activity, interfere with communication, skin changes, cause stress to death. The great potentials contained in botanical pesticides that have been explained in extension activities can increase awareness and provide an overview and considerations for farmers in eradicating pests that attack agricultural land.

Extension activities are not only in the form of material presentation, but also include practices in making botanical pesticides.In the practical activities of making botanical pesticides, of course, supporting tools and materials are also needed to help the process of making botanical pesticides. The process of making botanical pesticides that we do is of course also accompanied and filled with speakers from the Department of Agriculture and Plantations of Central Java Province.

A. Tools and Materials for Making Botanical Pesticides

Practical activities carried out together with the Balorejo community certainly also require tools and materials used to make botanical pesticides. The following are the tools used to make botanical pesticides, then introduce some of the materials that will be used in the process of making botanical pesticides in this counseling event.

Figure 1. Tools used to make botanical pesticides

Figure 2. Materials used to make botanical pesticides

B. Activity Results

In the practical activity of making botanical pesticides that we did, it was filled by resource person Mrs. Ali Suheti from the Department of Agriculture and Plantations of Central Java Province. In the delivery of the material she gave about making botanical pesticides by utilizing the results of the surrounding environment into something useful such as ingredients for making botanical pesticides.

The process of community service activities that we do can solve the pest problems experienced by farmers in Balorejo Village. In the practical activities of making botanical pesticides, the Balorejo community was very enthusiastic about participating in the counseling and practice of making botanical pesticides because the material presented by the resource person was very helpful for the Balorejo village community in expanding and increasing their knowledge of how to utilize the results of the surrounding environment into a natural botanical pesticide that has many benefits and does not rely on chemical pesticides. The results of the activities that have been carried out during the practical process of making botanical pesticides are as follows:

1. The materials used to make herbal pesticides use natural ingredients including maja fruit, brotowali, galangal, lemongrass and neem leaves.
2. The ingredients used are then cut into small pieces then pounded using a mortar until smooth, after all the ingredients are smooth, they are transferred into a bucket. Then clean water is added to a quarter of

the bucket height, then covered and left for a day. After being left for a day, the herbal pesticide is ready to use.

3. Making herbal pesticides using these ingredients has many benefits because it reduces the use of chemical fertilizers which are harmful to the environment and in the long term.

4. Participants were very enthusiastic and motivated in following a series of activities in the botanical pesticide production extension program from the beginning to the end of the activity.

Figure 3. Counseling on making botanical pesticides

Figure 4. Cutting of materials used for manufacturing botanical pesticide

Figure 5. Refinement of the materials used

Figure 6. Community enthusiasm in attending counseling on making botanical pesticides

4. CONCLUSION

From the results of the activities of the real work lecture program (KKN) 114 klp 199 in Balorejo Village, Balosari hamlet 1 in the practice of making environmentally friendly plant-based pesticides, it can be concluded that:

1. Overall, the farmers in Balorejo Village already have insight into the utilization of maja fruit, brotowali, etc. as well as the processing of maja fruit to be able to produce environmentally friendly plant-based pesticides.

2. The existence of a practical work program for making plant-based pesticides using maja fruit is very helpful for farmers in reducing the cost of purchasing and applying chemical fertilizers massively which can have a very bad impact on the environment and is also dangerous if consumed in the long term
3. With the practice of making environmentally friendly plant-based pesticides, it is hoped that it can continue to be developed by farmers in Balorejo Village so that they can support the sustainability of a healthy and safe environment and can reduce the use of chemicals in agricultural products as one of the ways to maintain health.
4. For the next researcher, it is hoped that they can discuss more broadly about the use of plant-based pesticides for the general public, then they can add further research by researching other ingredients that can be used to make plant-based pesticides as another option that is easier to obtain for farmers.

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