

Green Beans Cultivation Using Mice Pets Control to Improve the Quality of Bintaro Fruit Extract

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Abstract

Green beans cultivation technology using mice pets control has been implemented in the Gluranploso village, Benjeng Gresik. The implementation of the technology performed for 2.5 months from August to October 2017. The purpose of the implementation is aimed to reduce the dependence of farmers on the use of chemical pesticides so that the farmers are aware of the negative impact of chemical pesticides. Assessing the impact of the utilization of Bintaro fruit and fruit extracts to explore ways of making Bintaro as a natural biopesticide to overcome rat attack on green bean plants in the Gluranploso village. Pest control mice can reduce the rate of loss of the crops more effectively and efficiently. Finally, with the use of those natural resources as a biopesticide material can also maintain the environmental balance.

Keywords: Fruit Bintaro, biopesticides, green bean plants, mice pests

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Introduction

Gluranploso village is one of the villages in the district of Benjeng Gresik. Gluran Ploso village has four backwoods hamlets namely Gluran, Lempit, Bengkelo Kidul and Ploso. Ploso Gluran majority of villagers are farmers. The income of farmers in the village Gluranploso obtained from the agricultural sector. In the growing season to 3rd, green bean plant became a major crop in this village. The green beans are easily cultivated plants and is a drought resistant plant that is cultivated in the village according Gluranploso belonging rainfed areas.

The problems faced by farmers is declining productivity of green beans caused by pest's rats. Rat is one type of pest that is often found in rice fields and housing. Rat attack by destroying the seeds and stems of plants, causing losses for farmers. One farmer against pests handling of mice that use chemical pesticides.

The use of chemical pesticides causes many negative impact and require very expensive. Examples of the danger resulting from the use of chemical pesticides can cause cancer is caused by chemical substances on the drug and when inhaled by humans when their application. Therefore, to reduce the dependence of farmers on use chemical

is to start applying organic agriculture for example is the use of natural ingredients in pest and disease control.

Literature Review

1. Organic Pesticides

Organic pesticides are ingredients derived from nature, such as herbs which are used to control the Plant Pest Organisms or also referred to as biological pesticides. The use of organic pesticides can reduce the negative impact of non-biological pesticides are very dangerous. Currently organic pesticides have been widely developed in the community, especially farmers. However, not farmer make organic pesticides as an antidote and control pest for maintaining production. Organic pesticides are not toxic as inorganic pesticides that are safe for the environment (Sarah, 2016).

2. Green beans,

Green beans (*Vigna rodiata*) is a drought resistant plant so that it fits on the rainfed cultivated, grown either dilahan less fertile, easy cultivation way and has a relatively high economic value compared with other pea plants (Radjit and Prasetiaswati, 2012).

3. Mice Pests

Mouse is a very difficult crop pest controlled by the farmers because it is having the ability to adapt, multiply quickly and the mobility and the very high destructive power. Potential breeding amount mice strongly influenced by the quality of food available. Rat attack plants that are rich in carbohydrates such as rice, tubers and legumes (Fuel and Aziz, 2008).

Pest control mice that do farmer is applied the chemicals that would make the rat develop resistance to the next offspring. Integrated pest management is the proper control techniques because it is relatively safe for the environment.

4. Bintaro (*Cerberamanghas*)

Different types of plants that has potential as botanical pesticides because they contain bioactive compounds include saponins, tannins, alkaloids, flavonoids and terpenoids alkenyl phenol. One example of plants that contain these compounds are plant Bintaro (Sa'diyah, Purwani and Wijayawati, 2013).



Figure 1. Bintaro fruit

Bintaro are plants (trees) Latin *manghas Cerberaname*, is part of the mangrove forest. Bintaro plant is widely available around the coastal areas. Bintaro known as an annual plant that is widely used as greening, decorate the city, botanical pesticides, and others (Kartimi, 2015). Tarmadi, (2014) explains that the chemical compounds contained in Bintaro extract contains compounds which have the effect of inhibiting the development of the rat. All parts of the plant Bintaro have useful content as pest's controller. Bintaro bark of plants contain saponins, leaves and fruit contain polyphenols can inhibit the activity of eating pests, and bark contain tannins.

The research result Utami (2010), showed that Bintaro seed extract is more effective than Bintaro leaf extracts to be used as control against pests because in the more seeds contain compounds that are toxic to pests that attack. Bintaro seed extract

capable a able to diminish the larvae *P.plagiophleps* by 36% - 100%, extract flesh with a mortality of 26% - 96% and Bintaro leaf extract with molarities effectiveness of 20% - 93.33%. Research conducted by Yudha (2013) showed that the results of Bintaro seed extract is more potential in killing the larvae as compared to the fruit skin extracts of Bintaro. It happened because the compounds in seeds Bintaro is greater than the skin and also the leaves.

Table 1. Test results leaf extract phytochemicals

Secondary Compounds Group	Response
Alkaloid	
• Dragendorf Pre-reaction	Negative
• Wagner Pre-reaction	Negative
Flavonoid	Positive
Triterpenoid	Negative
Steroid	Positive
Saponin	Positive
Tannin	Positive

Source: Utami, 2010.

Extracts of the leaves were tested give a positive response to the flavonoids, steroids, saponins and tannins. The flavonoids are compounds found in nature as possessed of toxic effects/antimicrobial that protects plants from pathogens and *antifeedant* (Utami, 2010). As for the seed Bintaro containing toxic substances called *Cerberrin* that taste bitter and works as a poison heart is very strong, so the pungent smell of the fruit or seeds Bintaro can keep vermin land such as rat (Wahyuno, Manohara, Munarso, probadi, and trisilawati, 2011).

Table 2. Analysis of Bintaro fruit phytochemicals

No	Extract Types	Compounds Content
1	Methanol Extract	Saponin, alkaloid, flavonoid, triterpenoid glycoside, steroid
2	n-hexane Fraction	Saponin, alkaloid, flavonoid, triterpenoid glycoside
3	Ethyl Acetate Fraction	Alkaloid, flavonoid, triterpenoid, steroid, glycoside

Source: Guswerivo, 2013.

The results of Bintaro fruit extracts with 3 types of solvents (methanol, n-hexane fraction and a fraction of ethyl acetate) showed slightly different content. The type of solvent used will influence the mortality of the pest attack (Guswerivo, 2013).

Problem Formulation

The above description can be formulated into:

- How can farmers reduce the negative impact of

the use of chemical pesticides?

- b. How can farmers utilize Bintaro fruit as a pesticide plant in tackling the pest rodents?

From the above description, KKN Team 6 of Agrotechnology department group wants to do socialization about the use of the fruit as a pesticide plant Bintaro to overcome rat. So, farmers can reduce the number of losses at harvest time and to pest the mouse in an environmentally friendly way.

The Purpose

The purpose of the community service is aimed at solving the following issues, they are:

- a. To provide awareness to farmers on the negative impact of the use of chemical pesticides.
- b. Utilization of fruit Bintaro as botanical pesticides for pest control rats on green bean plants.

Community Service Restrictions

Associated Reminds scope of the problem in this paper, the author will only be discussing:

- a. Negative impact of chemical pesticide use.
- b. Natural pesticide alternative from Bintaro fruit.

Implementation

Table 3. Socialization and counseling

Activity	Description
Objectives	Expected to assist farmers in tackling rodent pests and reduce harvest losses.
Benefits	Adding farmers knowledge about the negative hazards of using chemical pesticides. Utilization of Bintaro fruit as a biopesticides to cope with rat pest, so it can eat the losses of the harvest.
Target	Green bean farmers in the village of the District Gluranploso, Benjeng
Participants	Farmers and villagers Gluranploso
Event Activities	Socialization Extension Hama Rat Green Beans in the village of the District Gluranploso, Benjeng.
Evaluation of Result	Participants showed a good response to some questions concerning the use of the fruit as a pesticide plant Bintaro

The targets of this program that the farmers in the villages Gluranploso green beans. To carry out these activities well and focused then the method of

the activities carried out and systematically designed. The stages that must be prepared are:

Table 4. Setting up tools and materials

Tools	Materials
The collision	Bintaro fruit
Strainer	Bintaro leaf
Knife	Soap cream
Basin plastic	Mineral water
Plastic gloves	

Next is the stage of making the extract Bintaro as biopesticides naturally are as follows:

- a. Prepare 50 grams Bintaro leaf and 1-liter water mixed with 2 grams of soap cream.
- b. Blend or mash and squeeze using a sieve to produce a concentrated solution
- c. Save the concentrated solution over 2 days to fermentation process.
- d. Biopesticides ready to be applied with a dosage of 10-20 cc per liter of water.

Method

To arrange this work program, writer use method as follows:

1. Literature
Reading books and seek international journal references related to biopesticide and fruit Bintaro.
2. Interview
Hold consultations associated with titles that have been taken by the field supervisor.
3. Discussion method with green bean farmers.

Time and Place

This work program is the first implementation in Gluranploso Village through socialization in the Gluranploso Meeting Room to align their thinking and understanding of the dangers of the use of chemical pesticides and utilization Bintaro fruit extracts.

- The preparation of extracts Bintaro held on:

Date : Thursday
Date : 27 September 2017
Time : 08.00 - finish
Venue : Base camp

- Socialization extension rodent pest on plants green beans do:

Day : Saturday
Date : 30 September 2017
Time : 19:00 - finish

Venue : Gluranploso Meeting Room



Figure 2. Harvest of green beans

Troubleshooting

In the Gluranploso village many green bean farmers whose farmland is attacked by rat pests. Most green bean farmers use chemical pesticides to overcome those pests. Not many farmers are aware of the dangers of using chemical pesticides, because of its necessary safer alternatives to combat the pest rodents. The alternative biopesticide use of vegetable extracts of Bintaro. The advantages of plant biopesticide from Bintaro fruit extract are among others:

- a. Alternative environmentally friendly pest control
- b. Cost-free
- c. Residue-free

Gluranploso farmers in the village who do not know the important benefits of fruit extracts Bintaro then Team KKN 6 Agrotechnology department group provides an understanding of the benefits of Bintaro fruit extracts.

Step by step analysis measures undertaken:

- a. Conducting observations green bean farmer pest's rats.
- b. Analyzing the constraints faced by farmers green beans in tackling the pest rodents.
- c. Process the data and make overall conclusions based on the data obtained.

Results

The results of the work program which was held by Agro-group study program 6 with the dissemination of counseling rat on green bean plants. Before the dissemination of counseling rat on green bean plants that were observed in the agricultural land affected by the rat. After the observation is done then the next step is the

preparation of tools and materials for the manufacture of fruit extracts Bintaro.

After setting up tools and materials so does the manufacture of fruit extracts Bintaro held on Thursday, September 27, 2017. Based on data collected from the Team KKN Agrotechnology department show that in the village there is a Farmer's Gluranploso green beans where farmers when tackling the rat using chemical pesticides. This is not realized by the farmers have negative impacts that harm the environment. Then found another secure alternative is to use fruit extracts for environmentally friendly Bintaro. In addition, Bintaro fruit extract also very easy to manufacture. The material can be found all around and how to make it very easy. Moreover, cost-effective pesticide plant of Bintaro fruit extracts also contain no residues in the soil because it is made from natural ingredients.



Figure 3. Pest Rat repellent products

Conclusion

Pest control on green bean plants in the village Gluranploso generally still use chemical control or farmers still use chemical pesticides that are not good and harmful to the environment. Therefore, the KKN team providing insight and knowledge through socialization to improve rice paddy ecosystem and the environment.

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