THE GROWTH RESPONSE OF CAULIFLOWER PLANTS (*BRASSICA OLERACEA*) USING OF BOTANICAL PESTICIDE

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Abstract

Cauliflower (*Brassica oleracea*) is one of the most widely cultivated and profitable horticultural plants. During the growth of cauliflower plants, various pest attacks can disrupt the harvest. This study examines the growth response of cauliflower plants to the use of botanical pesticides (*Azadiractica indica*) for pest control. In this study, a Randomized Block Design (RBD) was used, which had five treatments and five replications, namely: P0 as the control (without applying neem leaf solution), P1 provides a neem leaf solution of 300 ml/1000 ml of water (30%), P2 provides a neem leaf solution of 500 ml/1000 ml of water (50%), P3 provides a neem leaf solution of 700 ml/1000 ml of water (70%), and P4 provides a neem leaf solution of 900 ml/1000 ml of water (90%). The highest damage from the *Plutella xylostella* caterpillar attack was observed in the P0 (Control) treatment, because in this treatment, no spraying of neem leaf pesticide solution was conducted, causing the *Plutella xylostella* caterpillar to continuously attack the cauliflower plants, resulting in severe damage to the leaves and stems of the cauliflower plants.The cauliflower plants that were not treated experienced damage to their leaves, with the leaves being completely eaten and a large number of pests continuously attacking the untreated cauliflower plants.

Keyword: *Growth response, Cauliflower, botanical Pesticide*

INTRODUCTION

Cauliflower (*Brassica oleracea*) is one type of horticulture that is very profitable and widely cultivated in many places. This plant is usually consumed as fresh vegetables, salads, or processed into various types of dishes. However, during the cultivation process, cauliflower plants can be attacked by pests which can reduce the harvest.

So far, synthetic chemical pesticides have been widely used to control pests. Although effective, excessive use of synthetic chemical pesticides can harm the environment and human health, as well as trigger pest resistance. Therefore, an alternative that is more environmentally friendly and sustainable is needed, one of which is botanical pesticides or plant-based pesticides.

Known as *Azadirachta indica*, neem leaves contain active compounds such as azadirachtin, which is a natural insecticide. Neem leaf extracts also possess antimicrobial and antifungal properties, which may help in plant growth.The use of neem leaves as a natural remedy to control pests and enhance plant growth needs further research, especially on cauliflower plants.

Warsa (2019) found that consuming mengkudu root extract can reduce symptoms of the diamondback moth pest.The diamondback moth (*Plutella xylostella*) is a type of pest that causes crop failure and damage to cauliflower plants, resulting in holes in the leaves and making them unfit for consumption.

This study aims to determine the reaction of cauliflower plants (*Brassica oleracea*) to pest attacks and how neem leaf solution aids in the growth and development of the plants.The results of this study are expected to offer an effective and environmentally friendly alternative for biological control in the growth of cauliflower plants.

METHOD

Randomized Block Design (RBD) is the design technique used. In this study, there are five treatments with five replications each: P0 is the control (no neem leaf solution), P1 provides a neem leaf solution of 300 ml/1000 ml of water (30%), P2 provides a neem leaf solution of 500 ml/1000 ml of water (50%), P3 provides a neem leaf solution of 700 ml/1000 ml of water (70%), and P4 provides a neem leaf solution of 900 ml/1000 ml of water (90%).

Based on Sunarti (2015), seed preparation is carried out by cleaning cauliflower seeds with hot water for twenty to thirty minutes. After that, the cauliflower seeds are sown in a seedbed or in containers filled with fertilizer or compost in a 1:1 ratio.

Plant-based insecticide from neem leaf solution can be made by grinding 1 kg of neem leaves with a blender. Then, the leaves are ground and filtered using a sieve or fine-pored cloth (Fitrianti, 2020).This study uses the parameter the level of leaf damage in cauliflower plants.

RESULTS AND DISCUSSION

The condition of the cauliflower plants that were subjected to various spraying treatments shows the damage rate of cauliflower leaf. As may be shown in the table below with regard to the damage produced by the *Plutella xylostella* pest, the treatments applied to the cauliflower plants will also provide various results since pest-affected cauliflower plants will exhibit varying degrees of damage.

Table 1.The level of leaf damage in cauliflower plants

Treatment	1	2	3	4	5	Number of damaged leaves
P0	24	24	24	-	20	**92**
P1	14	13	15	-	15	**57**
P2	15	14	15	13	-	**57**
P3	6	6	10	6	6	**34**
P4	3	2	3	3	5	**16**

The parameter of the frequency of *Plutella xylostella* pest attacks on cauliflower plants shows that the highest pest attack treatment in the P0 (control) treatment. This is caused by the relatively large and difficult-to-control *Plutella xylostella* caterpillars because no insecticide was used in the P0 treatment, resulting in the most severe damage compared to other cauliflower plants that received the P0 treatment.

The highest damage from the *Plutella xylostella* caterpillar attack was observed in the P0 (Control) treatment, because in this treatment, no spraying of neem leaf pesticide solution was conducted, causing the caterpillar to continuously attack the cauliflower plants, resulting in severe damage to the leaves and stems of the cauliflower plants.The cauliflower plants that were not treated experienced damage to their leaves, with the leaves being completely eaten and a large number of pests continuously attacking the untreated cauliflower plants.

CONCLUSION

The growth response of cauliflower plants (*Brassica oreceae*) to the use of botanical pesticide *Azadiractica indica* for pest control shows that the highest damage from the *Plutella xylostella* caterpillar attack was observed in the P0 (without applying a neem leaf solution). The reaction of cauliflower plants (*Brassica oleracea*) to pest attacks shows that neem leaf solution aids in the growth and development of the plants.

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