

## **GROWTH AND PRODUCTION OF PAKCOY (*Brassica rapa* L) ON THE MIXTMENT OF PLANTING MEDIA AND GIVING LAMTORO LEAF LIQUID ORGANIC FERTILIZER**

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### **ABSTRACT**

Pakcoy is a leaf vegetable or annual plant that can only be harvested once. To get a good production of pakcoy plants, a mixture of planting media and liquid organic fertilizer of lamtoro leaves is carried out. This study aims are to determine the response of a mixture of planting media and liquid organic fertilizer of lamtoro leaves to the growth and production of pakcoy (*Brassica rapa* L). The parameters observed were plant height per sample, number of plant leaves per sample, plant leaf area per sample, weight of crop production per sample, weight of crop production per plot, weight of plant consumption per sample. The results showed that the response of the administration of the planting media mixture had a very significant effect on the plant production weight parameters per plot but did not significantly affect the plant height parameters per sample, number of plant leaves per sample, plant leaf area per sample, plant production weight per sample, consumption weight plants per sample. The results of research on the application of liquid organic fertilizer of lamtoro leaves did not have a significant effect on the observed parameters. Whereas the interaction between planting media and liquid organic fertilizer of lamtoro leaves gave no significant effect on all parameters observed.

**Keywords:** Pakcoy, Growing Media, POC Leaf Lamtoro

### **INTRODUCTION**

Pakcoy plant is a leaf vegetable plant that belongs to the Brassicaceae family and originates from China. Pakcoy (*Brassica rapa* L.) is a leaf vegetable that has high economic value. This plant can grow in the highlands and lowlands if viewed from an economic aspect and the business is feasible to develop or cultivate, to meet high consumer demand (Purba, 2017).

The planting medium functions as a place for roots to attach, and also as a provider of nutrients for plants. A mixture of several materials for planting media must produce an appropriate structure, because each type of media has a different effect on plants. Planting media can be improved by adding organic materials, such as compost, manure and other organic materials (Augustien and Suhardjono, 2017).

Manure is also called organic fertilizer derived from animal waste. Animals that are widely used for their manure include chickens, goats, cows and horses. The manure that is used can be in the form of solid or liquid manure which is used separately or together (Septiyanti, 2019).

One of the organic materials that can be used as a growing medium is coconut husk waste (cocopeat). Cocopeat is a growing medium produced from the crushing process of coconut coir, the coir crushing process produces fiber or fiber, fine powder or cocopeat. The advantages of cocopeat as a planting medium are its characteristics that are able to bind and store water strongly, and contain essential nutrient elements, such as calcium (Ca), magnesium (Mg), potassium (K), sodium (N), and phosphorus (P). (Ramadan et al., 2018).

The lamtoro plant (*L. leucocephala*) is a wild plant that lives in the tropics. The lamtoro plant is usually used by the community as animal feed, organic fertilizer and additional ingredients for making tempeh. The nutrient content in lamtoro leaves consists of 3.84% N, 0.2% P, 2.06% K, 1.31% Ca, 0.33% Mg. The nitrogen content of 3.84% in lamtoro leaf extract causes the initial growth of the mustard plant to be optimally accelerated so that fresh plant production is obtained at 2.29 g/tree, and mustard plant production can reach 250 tons/ha 1 year (Listiyana and Asngad, 2016).

## METHODS

### Materials and tools

The materials used in this study are compost of cow manure, cocopeat, lamtoro leaves, topsoil, brown sugar, EM4, dolomite, rice bran, pakcoy seeds and water. The tools used in this study were seedling trays, polybags measuring 30 cm x 30 cm, hoes, machetes, knives, rulers, tape measure, scales and stationery.

### Research Methodology

This research has been carried out on Jalan Sumarsono Pasar III, Helvetia Village, Medan Helvetia District, Medan City using a Factorial Randomized Design (RBD) consisting of 2 factors: 16 treatments and 2 replications, so that 32 plots were obtained overall. The first factor is giving a mixture of media consisting of 4 levels, namely M0 = Control (Topsoil), M1 = Cocopeat + Cow Manure Compost (1: 1), M2 = Cocopeat + Cow Manure Compost (1: 2), M3 = Cocopeat + Compost Cow Manure (1: 3). The second factor is the application of lamtoro leaf liquid organic fertilizer consisting of 4 levels, namely P0 = Control (Water), P1 = 60 ml / 500 ml / polybag, P2 = 120 ml / 500 ml / polybag, P3 = 180 ml / 500 ml / poly bag.

### Observation parameters

The parameters observed were plant height per sample, number of plant leaves per sample, plant leaf area per sample, weight of crop production per sample, weight of crop production per plot, weight of plant consumption per sample.

## RESULTS AND DISCUSSION

### Plant Height(cm)

Based on the results of statistical and analytical observations, it can be seen that the use of a mixture of cocopeat planting media and cow dung compost, the application of liquid organic fertilizer for lamtoro leaves and the interaction of treatments on the growth of pakcoy had no significant effect on the parameters of plant height (cm) aged 1, 2 and 3 weeks after planting .

The average yield of plant height (cm) at 1, 2 and 3 weeks after planting using a mixture of planting media and applying liquid organic fertilizer to lamtoro leaves which have been tested for different means using the Duncan distance test can be seen in Table 1.

In Table 1 it can be explained that the treatment of the planting media mixture did not significantly affect plant height. The highest mean at 3 weeks after planting was obtained in treatment M3 = Cocopeat + cow dung compost (1: 3) which was 19.02 cm and the lowest average was found in treatment M0 = Control, namely 16.02 cm.

**Table 1.** Mean Plant Height (cm) by Treating a Mixture of Cocopeat Growing Media with Cow Manure Compost and Applying Lamtoro Leaf Liquid Organic Fertilizer at 1, 2 and 3 Weeks After Planting.

Condition	Height (cm)		
	1 MST	2 MST	3 MST
<b>Media</b>			
M0	7,89 aA	12,19 aA	16,02 aA
M1	8,12 aA	14,52 aA	18,23 aA
M2	8,06 aA	14,58 aA	18,33 aA
M3	8,11 aA	14,58 aA	<b>19,02 aA</b>
<b>Treatment</b>			
P0	8,12 aA	13,73 aA	<b>18,88 aA</b>
P1	7,91 aA	13,83 aA	16,49 aA
P2	8,46 aA	14,63 aA	18,84 aA
P3	7,69 aA	13,69 aA	17,40 aA

In Table 1 it can be explained that the treatment of liquid organic fertilizer for lamtoro leaves had no significant effect on the height of the pakcoy plants, where the highest pakcoy plant height was in treatment P0 = (control) which was 18.88 cm and the lowest was in treatment P1 = 60 ml/ 500 ml of water/polybag is 16.49 cm.

#### Number of Plant Leaves Per Sample (pieces)

Based on the results of observations and statistical analysis, it can be seen that the treatment of a mixture of cocopeat planting media with cow dung compost, the application of lamtoro leaf liquid organic fertilizer and the interaction of cocopeat planting media with cow dung compost and the administration of lamtoro leaf liquid organic fertilizer showed no significant effect on the number of leaves (strands). ) pakcoy plants.

The results of the average number of leaves (strands) at the age of 1, 2 and 3 weeks after planting with the treatment of a mixture of planting media and lamtoro leaf liquid organic fertilizer, after being tested for the average difference using Duncan's Distance Test can be seen in Table 2.

**Table 2.** Mean Number of Plant Leaves (strands) with Mixed Treatment of Cocopeat Growing Media With Cow Manure Compost and Lamtoro Leaf Liquid Organic Fertilizer at 1, 2 and 3 Weeks After Planting

Treatment	Number of Plants (strands)		
	1 MST	2 MST	3 MST
<b>Growing media</b>			
M0	3,54 aA	5,79 aA	8,21 aA
M1	3,54 aA	6,29 aA	8,21 aA
M2	3,13 aA	6,54 aA	8,88 aA
M3	3,58 aA	6,63 aA	<b>9,38 aA</b>
<b>Pupuk Organik Cair Daun Lamtoro</b>			
P0	3,54 aA	6,5 aA	8,63 aA
P1	3,67 aA	6,04 aA	8,67 aA
P2	3,08 aA	6,63 aA	<b>9,04 aA</b>
P3	3,50 aA	6,08 aA	8,33 aA

Note: Numbers followed by the same letters in the same column are not significantly different at the 5% (lowercase) and 1% (uppercase) levels based on the Duncan's Range Test (DMRT)

In Table 2 it can be explained that the planting media mixture did not significantly affect the number of leaves (strands) at the age of 1, 2 and 3 weeks after planting. The highest mean at week 3 after planting was obtained in treatment M3 = (Cocopeat + cow dung compost 1: 3) namely 9.38 strands and the lowest average was found in treatment M0 = Control namely 8.21 strands and M1 = (cocopeat + manure compost cow 1:1) that is 8.21 pieces.

### Plant Leaf Area Per Sample (cm<sup>2</sup>)

Based on the observations of analysis of variance on the parameter of leaf area per sample (cm<sup>2</sup>) it can be seen that the treatment of cocopeat planting media with cow dung compost had no significant effect on leaf area per sample (cm<sup>2</sup>) and liquid organic fertilizer (POC) of lamtoro leaves had no significant effect on leaf area per sample (cm<sup>2</sup>) and the interaction between the treatment of a mixture of cocopeat growing media with composted cow dung and liquid organic fertilizer (POC) for lamtoro leaves had no significant effect on leaf area per sample (cm<sup>2</sup>) on Pakcoy plants.

The results of the average leaf area (cm<sup>2</sup>) on pakcoy plants with the treatment of giving a mixture of cocopeat planting media with cow manure compost and applying liquid organic fertilizer to lamtoro leaves which have been tested by Duncan's Distance can be seen in Table 3.

**Tabel 3.** Rataan Luas Daun Tanaman (cm<sup>2</sup>) dengan Perlakuan Campuran Media Tanam Cocopeat Dengan Kompos Kotoran Sapi dan Pemberian Pupuk Organik Cair Daun Lamtoro

Treatment	Treatment Number of Leaves (cm <sup>2</sup> ) (HST)
Media	
M0	3143,46 aA
M1	3129,58 aA
M2	2779,24 aA
M3	<b>3675,03 aA</b>
Treatment	
P0	3367,77 aA
P1	3481,08 aA
P2	2587,69 aA
P3	<b>3644,58 aA</b>

In Table 3 it can be explained that the mixture of cocopeat planting media with cow dung compost had no significant effect on leaf area (cm<sup>2</sup>). The highest average was found in treatment M3 = Cocopeat + cow dung compost (1:3) which was 3675.03 cm<sup>2</sup> and the lowest average was found in treatment M2 = Cocopeat + cow dung compost (1:2) which was 2779.24 cm<sup>2</sup>.

### CONCLUSION

The mixture of cocopeat growing media and cow dung compost did not significantly affect the parameters of plant height (cm), number of leaves (strands), leaf area (cm<sup>2</sup>). The best treatment for mixed growing media for all observation parameters was treatment M3 = Cocopeat + cow dung compost (1 : 3).

The application of lamtoro leaf liquid organic fertilizer had no significant effect on all observed parameters. The interaction between the planting media mixture and lamtoro leaf liquid organic fertilizer had no significant effect on all observed parameters.

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