



The Effect of Applying Liquid Organic Fertilizer Kasgot on the Growth and Weight of Kolesom Leaf Consumption (*Talinum triangulare* [Jacq.] Willd)

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Abstract. The purpose of the research was to determine the effect of kasgot liquid organic fertilizer on the growth and consumption weight of kolesom leaves (*Talinum triangulare* [Jacq.] Willd). The experiment was conducted in Babakan Jawa Village, Majalengka District, Majalengka Regency, from August to October. The land used for research has a clay texture. Rainfall at the research location is included in type C, which is rather wet. The research method used was a Randomized Complete Design (RCD). The treatment consisted of one factor with four replications. The factor in this study is the concentration of kasgot liquid organic fertilizer which consists of six treatment levels, namely: K1 (control/no treatment), K2 (5 ml l⁻¹), K3 (10 ml l⁻¹), K4 (15 ml l⁻¹), K5 (20 ml l⁻¹), K6 (25 ml l⁻¹) all treatment were repeated 4 replication. Variables observed were plant height (cm), number of leaves (strands), stem diameter (mm), number of shoots per plant of upright leaves (strands), shoot weight per plant (g), total shoot weight (g). The results showed that the application of kasgot liquid organic fertilizer had a significant effect on the growth of kolesom plants, namely on the diameter of the stem at the age of 6 MSPT and the number of leaves at the age of 7 MSPT. The application of liquid organic fertilizer Kasgot K2 5 ml l⁻¹ gave the best results on the diameter of the stem at the age of 6 MSPT and 5 20 ml l⁻¹ gave the best results on the number of leaves at the age of 7 MSPT.

Keywords : Cholesom, Kasgot, Liquid Organic Fertilizer.

INTRODUCTION

Waste is an important environmental problem to date. Every year organic waste in Indonesia increases. According to the National Waste Management Information System (SIPSN) (2021), the increase in organic waste is due to population growth every year. In 2021, the volume of organic waste in Indonesia reached 29.45%, the waste produced included food waste from household waste, market waste and residential waste. Processing organic waste can be done as a good alternative to be reused into organic fertilizer. Making organic fertilizers requires an effective composting process by adding biological agents of microorganisms such as bacteria, fungi, and insect larvae. Composting through

microorganisms can remodel faster because of its ability to have remodeling enzymes such as cellulase, pectinase, or other degrading enzymes (Fahmi, 2015).

Cholesom (*Talinum triangulare* [Jacq.] Willd) is an annual plant that is used as a medicinal plant and vegetable. In addition, cholesom can be used as a vegetable consumed by the shoots. Kolesom can also be called purslane landa or postelein (Ismail, 2017). Kolesom is one of the herbal plants that has many benefits for the health of the human body including roots that are efficacious to strengthen the lungs, to relieve coughs, prevent diarrhea, and facilitate menstruation. The leaves are efficacious for increasing appetite, launching breast milk, and anti-inflammatory swelling (Wulandari *et al.*, 2021).

Organic fertilizer is the result of the decomposition of organic matter that is broken down (overhauled) by microbes, the end result of which can provide nutrients needed by plants for plant growth and development. Organic fertilizer is very important as a buffer for the physical, chemical, and biological properties of the soil so that it can increase fertilizer efficiency and land productivity (Supartha *et al.*, 2012).

Organic fertilizers derived from organic waste are good to be applied to plants, including stimulating the growth of roots, stems, leaves, and flowers. Other benefits of organic fertilizers are that they can increase agricultural productivity both in terms of quality and quantity, consume nutrients, reduce environmental pollution, and improve land quality in a sustainable manner (Wiwik, 2012). One of them is Kasgot Liquid Organic Fertilizer (POC).

Kasgot is the residual result of biokenversi carried out by black soldier fly larvae or *Black Soldier Fly* (BSF) flies (Kastolani, 2019). Sabdo (2018) stated that the use of BSF insects or often called black flies is currently widely used as a producer of organic fertilizer, because it can decompose about 2 tons of organic waste in just 2-3 weeks the waste can decompose so as to reduce environmental pollution. BSF or Maggot larvae can secrete several *bacterial* compounds that can play a role in protecting from harmful microbes that disturb plants. Fertilizers resulting from the decomposition of BSF larvae have high NPK levels.

Colesom requires good cultivation techniques to be able to optimize growth, production and levels of metabolites contained in it. Knowledge of colesom cultivation techniques such as fertilization is very necessary for cholesom plants considering that these plants are still rarely cultivated intensively. Harvested cholesom plants are the shoots. To be able to stimulate the growth of shoots, sufficient nutrients are needed, including nitrogen

(N). Kasgots have a pH of 7.78 and high levels of element N reaching 3.36% (Zhu et al., 2015).

This study aims to find out:

1. To determine the effect of giving POC Kasgot on the growth and consumption weight of colesom leaves (*Talinum triangulare* [Jacq.] Willd).
2. To find out what is the best concentration on the growth and consumption weight of colesom leaves(*Talinum triangulare* [Jacq.] Willd).

This research is expected to be a source of scientific information about POC Kasgot on the growth and weight of consumption of cholesom leaves (*Talinum triangulare* [Jacq.] Willd).

METHOD

The research method used is the Complete Randomized Design (RAL) method, with 6 treatments, namely:

- K₁ = Treatment without POC Kasgot (control)
- K₂ = POC Treatment of Castots 5 ml/l of water
- K₃ = POC Treatment Kasgot 10 ml/l water
- K₄=POC Treatment of Kasgot 15 ml/l water
- K₅=POC Treatment of Kasgot 20 ml/l water
- K₆ = POC Treatment of Kasgot 25 ml / l water

Each treatment was repeated 4 times to get 24 trials.

DISCUSSION

Plant Height

After statistical tests of POC Kasgot's treatment of plant height at the age of 5 MSPT, 6 MSPT and 7 MSPT did not have a noticeable effect. Statistical test results can be seen in Table 1.

Table1. The Effect of Liquid Organic Fertilizer (POC) Kasgot on Plant Height at the age of 5, 6, and 7 MSPT (Weeks After Transplanting)

Treatment	Plant Height (cm)
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POC Kasgot (ml/l water)			
	5 MSPT	6 MSPT	7 MSPT
K1(0)	41.59 a	50.49 a	54.54 a
K2(5)	44.73 a	50.00 A	54.83 a
K3(10)	42.64 a	47.95 a	50.63 a
K4(15)	41.13 a	49.89 a	52.96 a
K5(20)	45.97 a	53.32 a	55.96 a
K6(25)	41.81 a	50.31 a	54.4 a

Remarks : The average number followed by the same letter in the same column shows no real difference according to the Duncan Multiple Distance Test at the level of 5%.

The absence of a real influence between treatments can be caused because It is alleged, the planting media used for research is a mixture of soil, husk, and goat manure so that the resulting soil is fertile soil with high nutrient content and good for plant growth, so that the provision of POC Kasgot does not have a real effect on the height of choleosomal plants. According to Ismail (2017) that the nutrient needs of choleosomal plants can be met without fertilization because the soil can produce sufficient nutrients for plants, especially N. Nitrogen (N) is the dominant element compared to other elements in vegetative growth. However, to achieve optimal growth, P and K elements are also needed. Another factor is that choleosomal plants derived from stem cuttings have initially experienced growth which will then experience apical dominance, which is growing rapidly upwards (Susanti, 2006)

Number of leaves

Statistical tests of POC Kasgot's treatment of leaf count at age 7 MSPT had a significant effect but at ages 5 and 6 MSPT did not have a significant effect on leaf count. Statistical test results can be seen in Table 2.

Table2. The Effect of Liquid Organic Fertilizer (POC) Kasgot on the Number of Leaves at the age of 5, 6, and 7 MSPT (Weeks After Transplanting)

Treatment	Number of Leaves (strands)
POC Kasgot	

(ml/l water)	5 MSPT	6 MSPT	7 MSPT
K1(0)	122.75 A	131.45 A	148.95 a
K2(5)	127.05 a	134.80 A	180.20 b
K3(10)	112.60 a	124.10 a	136.80 a
K4(15)	103.85 a	128.40 A	137.75 A
K5(20)	144.05 a	161.30 a	152.45 a
K6(25)	115.80 a	139.00 A	150.85 A

Remarks : The average number followed by the same letter in the same column shows a marked difference according to the Duncan Multiple Distance Test at the level of 5%.

Rod Diameter

Table 3 shows that the application of POC castor to stem diameter at the age of 5 MSPT, 6 MSPT and 7 MSPT has no noticeable effect. This is because the planting media used has very high N, P, and K nutrients, so that the nutritional needs of plants are fulfilled. If the element nitrogen (N) is fulfilled, then the formation of chlorophyll and the formation of new cells can be achieved so that the diameter of the rod increases. Element P will stimulate the growth of plant roots so that it can absorb nutrients that are used by plants in the formation of new tissue including the increase in stem diameter. Element K acts as a connecting tissue between roots and leaves so as to increase the diameter of the stem.

Table3. The Effect of Liquid Organic Fertilizer (POC) Kasgot on Stem Diameter at the age of 5, 6, and 7 MSPT (Weeks After Transplanting)

Treatment POC Kasgot (ml/l water)	Rod Diameter (mm)		
	5 MSPT	6 MSPT	7 MSPT
K1(0)	10.84 a	11.37 a	11.47 a
K2(5)	10.62 a	11.86 a	12.04 a
K3(10)	10.15a	11.15 a	11.39 a
K4(15)	9.37a	10.64 a	10.96 a
K5(20)	10.59a	11.61 a	12.16 a
K6(25)	10.11a	11.44 A	11.63 a

Remarks : The average number followed by the same letter in the same column shows no real difference according to Duncan's Multiple Distance Test at the level of 5%.

According to Benjamin (2015) stated that the growth of stem diameter is the same as the growth of plant height, due to the process of transferring nutrients from the soil to the leaf through the stem transported by xylem and phloem tissues. The transportation process that occurs through the rod can facilitate the process of transporting photosynthetes and nutrients so that the diameter of the rod continues to increase.

Number of Leaves on Harvested Shoots (strands)

The results of observations on the number of leaves on harvested shoots are presented in (Table 4). POC Kasgot's treatment of the number of leaves on harvested shoots has no noticeable effect on the number of leaves.

Table4. The Effect of Kasgot Liquid Organic Fertilizer on the Number of Leaves on Shoots Harvested at the Age of 7 and 9 MSPT (Weeks After Transplanting)

Treatment POC Kasgot (ml/l water)	Number of Leaves on Harvested Shoots (strands)	
	7 MSPT	9 MSPT
K1(0)	67.40 a	73.85 a
K2(5)	71.45 a	80.85 A
K3(10)	58, 60 A	73.85 a
K4(15)	61.55 a	81.30 a
K5(20)	78.65 a	86.15 a
K6(25)	71.00 A	79.10 a

Remarks : The average number followed by the same letter in the same column shows no real difference according to Duncan's Multiple Distance Test at the level of 5%.

Based on Table 4, different POC treatments of castot do not have a noticeable effect on the number of leaves on harvested shoots. It is suspected that pruning shoots can increase axillary shoot growth and increase dormancy (Marman, 2010). Shoots that have been

harvested continuously will produce new branches and leaves, this is because the nutrients absorbed by plants can be processed properly.

Another factor is the erratic environment so that some choleosom plants are less exposed to sunlight which results in a small number of shoots produced. According to research Rina (2018) states that shade provides less number of shoots per plant compared to no shade.

Shoot Weight Per Plant (grams)

Based on the results of statistical tests, the application of POC Kasgot on the weight of shoots per plant does not have a real effect.

Table5. The Effect of Liquid Organic Fertilizer (POC) Kasgot on Shoot Weight Per Plant at the Age of 7 and 9 MSPT (Weeks After Transplanting).

Treatment POC Kasgot (ml/l water)	Shoot Weight Per plant (grams)	
	7 MSPT	9 MSPT
K1(0)	41.71 a	37.30 a
K2(5)	40.60 a	40.67 a
K3(10)	33.20 a	31.75 a
K4(15)	34.83 a	33.64 a
K5(20)	43.66 a	38.12 a
K6(25)	43.44 a	43.59 a

Remarks : The average number followed by the same letter in the same column shows no real difference according to Duncan's Multiple Distance Test at the level of 5%.

Based on Table 5, the application of POC Kasgots with different treatments did not have a significant effect on the weight of shoots per Kolesom plant at the age of 7 and 9 MSPT. This is because it depends on the size and thickness of the leaves produced at the time of harvest. This difference in weight is because each clump of shoots that are pruned does not all have the same leaf size, there are several leaves that are small in size there are also thick and thin leaves but these leaves are suitable for consumption (Ismail, 2017).

Another factor affecting the weight of shoots per plant is the content of POC Kasgot which is very low in nutrients so that the nutrients absorbed by plants are small.

Total Weight of Shoots (grams)

Based on data analysis, there is no real effect of Kasgot's POC treatment on the total weight of cholesomal shoots.

Table6. The effect of castot liquid organic fertilizer (POC) on the total weight of shoots

Treatment POC Kasgot (ml/l water)	Total Weight of Shoots (grams)
K1(0)	80.00 A
K2(5)	84.32 a
K3(10)	67.45 a
K4(15)	70.21 a
K5(20)	84.54 a
K6(25)	86.69 a

Remarks : The average number followed by the same letter in the same column shows no real difference according to Duncan's Multiple Distance Test at the level of 5%.

different treatments of POC castot, do not have a noticeable effect on the total weight of cholesomal shoots. This is because colessomes harvested shoots repeatedly will lengthen the vegetative phase because the formation of flowers and seeds is inhibited so as to stimulate the formation of new shoots.

The number of shoots in each harvest is increasing but the weight of the shoots is decreasing. At the first harvest of 7 MSPT, the shoots harvested on average come from the primary branch. When the shoot is harvested, the apical dominance of the branch is lost, thus inducing the emergence of new branches on the harvested branch with a smaller size so that the size of the cholesomal shoots shrinks. The increase in the number of shoots results in smaller shoot sizes, this is due to competition for photosynthetic flow for shoot formation (Ismail, 2017)

CONCLUSION

Based on the results of the study, the treatment of Kasgot Liquid Organic Fertilizer on the Growth and Consumption Weight of Kolesom Leaves (*Talinum triangulare* [Jacq.] Willd) can be concluded:

1. The application of Kasgot Liquid Organic Fertilizer has a real effect on the growth of cholesom plants, namely on the number of leaves aged 7 MSPT (weeks after transplanting).
2. Treatment of Kasgot Liquid Organic Fertilizer Concentration of 5 ml/l of water gives the best results against the Number of Leaves aged 7 MSPT (Weeks After Transplanting)

SUGGESTION

Based on the above conclusions, the author suggests that:

1. The application of Kasgot Liquid Organic Fertilizer to the growth and consumption weight of cholesom leaves should be applied through the leaves so that it can increase the production of cholesomal shoot weight.
2. Further research needs to be done to get a more appropriate dose of castot liquid organic fertilizer.

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