



Effects of Applying Liquid Organic Fertilizer Kasgot on Growth and Weight of Kolesom Leaf Consumption (*Talinum Triangulare Jacq. Willd*)

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Abstract. The research aimed 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, which is rather wet, is included in type C. 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 was repeated four 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), and 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 a significant 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 yearly population growth. In 2021, organic waste in Indonesia reached 29.45%; the waste produced included food waste from households, markets, and residential. Processing organic waste can be an excellent alternative to be reused into organic fertilizer. Making organic fertilizers requires effective composting 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 medicinal plant and vegetable plant. 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 in strengthening the lungs, relieving coughs, preventing diarrhea, and facilitating menstruation. The leaves are efficacious for increasing appetite, launching breast milk, and anti-inflammatory swelling (Wulandari *et al.*, 2021).

Organic fertilizer results from decomposing organic matter that is broken down (overhauled) by microbes, which can provide the nutrients plants need for plant growth and development. Organic fertilizer is essential as a buffer for the soil's physical, chemical, and biological properties to increase fertilizer efficiency and land productivity (Supartha *et al.*, 2012). Organic fertilizers derived from organic waste are suitable for applying to plants, stimulating the growth of roots, stems, leaves, and flowers. Another benefit of organic fertilizer is that it can increase agricultural productivity in terms of quality and quantity, consume nutrients, reduce environmental pollution, and improve land quality sustainably (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) (Kastolani, 2019). Sabdo (2018) stated that BSF insects, often called black flies, are currently widely used as a producer of organic fertilizer because they can decompose about 2 tons of organic waste in just 2 to 3 weeks the waste can decompose to reduce environmental pollution. BSF or Maggot larvae can secrete several *bacterial* compounds that can protect them from harmful microbes that disturb plants. Fertilizers resulting from the decomposition of BSF larvae have high NPK levels.

Cholesom requires good cultivation techniques to optimize growth, production, and levels of metabolites contained in it. Knowledge of coliseum cultivation techniques, such as fertilization, is necessary for wholesome plants, considering these plants still need to be cultivated more intensively. Harvested wholesome plants are the shoots. To stimulate the growth of shoots, sufficient nutrients are needed, including nitrogen (N). Kasgots have a pH of 7.78, and high levels of N elements reach 3.36% (Zhu *et al.*, 2015).

This study aims to find out:

1. To determine the effect of giving POC Kasgot on wholesome leaves' growth and consumption weight (*Talinum triangulare* [Jacq.] Willd).

- To find out 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 wholesome 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= Behavior of POC Kasgot 5 ml/l of water
- K3 = Behavior of POC Kasgot 10 ml/l of water
- K4= Behavior of POC Kasgot 15 ml/l of water
- K5= Behavior of POC Kasgot 20 ml/l of water
- K6= Behavior of POC Kasgot 25 ml/ l of 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.

Table 1. Effect of Liquid Organic Fertilizer (POC) Kasgot Against Plant Height at the age of 5, 6, and 7 MSPT (Weeks After Transplanting)

Treatment POC Kasgot (ml/l water)	Plant Height (cm)		
	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

Description: 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%.

The absence of a real influence between treatments can be caused because It is alleged that 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 suitable for plant growth so that the provision of POC Kasgot does not have a natural effect on the height of wholesome plants. According to Ismail (2017), the nutrient needs of wholesome plants can be met without fertilization because the soil can produce sufficient nutrients for plants, especially nitrogen (N), which is the dominant element compared to other elements in vegetative growth. However, P and K elements are also needed to achieve optimal growth. Another factor is that wholesome plants derived from stem cuttings have initially experienced growth, which will then experience apical dominance, which proliferates 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.

Table 2. Effect of Liquid Organic Fertilizer (POC) Kasgot Against the Number of Leaves at the age of 5, 6, and 7 MSPT (Weeks After Transplanting)

Treatment POC Kasgot (ml/l water)	Number of Leaves (strands)		
	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

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

Rod Diameter

Table 3 shows that applying 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 the nutritional needs of plants are fulfilled. If the element nitrogen (N) is fulfilled, then the formation of chlorophyll and new cells can be achieved so that the diameter of the rod increases. Element P will stimulate the growth of plant roots so that they can absorb

nutrients plants use to form new tissue, including an increase in stem diameter. Element K acts as a connecting tissue between roots and leaves to increase the diameter of the stem.

Table 3. Effect of Liquid Organic Fertilizer (POC) Kasgot Against Stem Diameter at 5,6, and 7 MSPT (Week 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

Description: 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%.

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

Number of Leaves on Harvested Shoots

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.

Table 4. The effect of castot liquid organic fertilizer on the number of leaves on Shoots Harvested at 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

Description: 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 castor do not affect the number of leaves on harvested shoots. Pruning shoots are suspected to increase axillary shoot growth and dormancy (Marman, 2010). Shoots that have been harvested continuously will produce new branches and leaves because the nutrients absorbed by plants can be processed correctly. Another factor is the erratic environment, so some wholesome plants are less exposed to sunlight, producing fewer shoots. According to research, Rina (2018) states that shade provides fewer shoots per plant than no shade.

Shoot weight per plant.

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

Table 5. 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/1 water)	Shoot Weight Per Plant (gram)	
	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

Description: 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, applying POC Kasgots with different treatments did not significantly affect the weight of shoots per Kolesom plant at the age of 7 and 9 MSPT. This depends on the size and thickness of the leaves produced at harvest time. This difference in weight is because each clump of pruned shoots does not all have the same leaf size; several leaves are small in size. There are also thick and thin leaves 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 the nutrients absorbed by plants are small.

Total weight of shoots

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

Table 6. The effect of castor liquid organic fertilizer (POC) on the total weight of shoots

Treatment POC Kasgot (ml/l water)	Total weight of shoots (gram)
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

Description: 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%.

The application of different POC treatments of castor does not have a noticeable effect on the total weight of cholesomal shoots. This is because colessomes that are harvested shoots repeatedly will lengthen the vegetative phase. After all, the formation of flowers and seeds is inhibited 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 cholesomal shoots shrink. 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 natural effect on the growth of cholesom plants, namely on the number of leaves aged 7 MSPT (weeks after transplanting).
2. Treatment of Liquid Organic Fertilizer Kasgot Concentration of 5 ml/l of water gives the best results on Number of Leaves aged 7 MSPT (Weeks After Transplanting)

Based on the above conclusions, the author suggests that:

1. The use of Kasgot Liquid Organic Fertilizer to the growth and consumption weight of wholesome leaves should be applied through the leaves to increase the production of wholesome shoot weight.
2. Further research must be done to get a more appropriate castor liquid organic fertilizer dose.

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