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Growth Response and Results of Onion Plants Dayak (Eleuthereamericanamerr) in Various Concentrations of Poc Green Tonics and Tuber Cutting Levels

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Abstract: *Dayak onions are a variety of biological plants that canbe used as a natural medicine by some Indonesian people. The use of liquid organic fertilizer is one way to overcome the lack of nutrients in plants. Green Liquid Organic Tonic Fertilizer is useful for stimulating and accelerating plant growth. Cutting the tip of the seed tuber aims to grow the bulbs evenly and can stimulate the growth of shoots, and accelerate the growth of plants. The study was hold from November 2018 to March 2019. The research location was in Sebakung Taka Village, Longkali District, Paser Regency. This study aims to analyze the effect of interactions between various concentrations of green tonic POC and tuber cutting rates as well as a single factor of various concentrations of green tonic POC and tuber cutting rates on the growth and yield of Dayak onions. The design used in this study was a Randomized Block Design (RBD) arranged in factorial 2 factors. The first factor is the provision of Green Organic Liquid Tonic Fertilizer concentration (K) consisting of 3 levels, they are k1 = control, k2 = 3 ml / liter of water, and k3 = 6 ml / liter of water.*
The second factor is the cutting of the Dayak onion tuber (P) consists of 3 levels, they are p1 = control, p2 = 25% cutting rate, and p3 = 50% cutting rate. The results showed that the interaction treatment between the Green Tonic Liquid Organic Fertilizer concentration test and the tuber cutting rate (K x P) had no significant effect on all observed parameters. The green tonic POC concentration significantly affected the average parameters of the number of leaves aged 6 MST and 8 MST. The level of tuber cutting significantly affected the average height of plants aged 6 MST and 8 MST.
Keywords: *Dayak Onions, POC Green Tonic, Cutting Tubers*

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I. Introduction

Dayak onion plant is a typical plant from Central Kalimantan.Many societies of Kalimantan use Dayak onions for consumptiontraditional medicine which is efficacious to cure various minor illnesses, such as diarrhea, fever, and cough. Dayak onions are also known to treat cancer, heart disease, anti-inflammatory, anti bleeding, enhance immunity or the immune system, treat constipation, dysentery, boils, wounds, breast cancer, diabetes, hypertension, vomiting, diabetes (diabetesmiliatus), and hypercholesterolemia (Galingging, 2009). Green Tonic is a liquid organic fertilizer formula containing macro and micro nutrients which is made specifically to stimulate plant growth and production and increase soil fertility. Using the right concentration of liquid organic fertilizer can improve growth, accelerate harvest, prolong the production life and can increase crop yields (Rizqiani and Fitri N, 2007). In the business of cultivating Dayak onions plants can be developed vegetatively by using tubers that were previously cut into the tubers by a quarter of the tuber tip (Fatmawaty, Ritawati, Said, 2015). Cutting the tip of the seed tuber aims to grow the bulbs evenly and can stimulate the growth of shoots, and accelerate the growth of plants (Wibowo, 2005).

Aims of this studyfor analyzing the effect of interactions between various concentrations of green tonic POC and tuber cutting rates as well as a single factor of various concentrations of green tonic POC and tuber cutting rates on the growth and yield of Dayak onions.

II. Materials and Methods

Time and place

The research was conducted from November 2018 to March 2019. The research location was in Sebakung Taka Village, Longkali District, Paser Regency, with a height of about 20-30 m above sea level, average daily temperature of24^{o}C - 32^{o}C, and soil pH around 6.

Materials and Tools

The ingredients used are Dayak onion seeds, Green Tonic POC, antracol fungicide, Marshal insecticide, and cow manure.

The tools used are knives, buckets, rulers, stationery, cellphone cameras, digital scales, cultivators, hoes, machetes, treatment labels, gauges, hammers, nails, and rapia straps.

Research methods

The study used a Randomized Block Design (RBD) arranged in factorial with 2 factors. The first factor is the provision of POC Green Tonic (K) concentrations consisting of 3 levels, they are :

k1: Control
k2: 3 ml / liter of water
K3: 6 ml / liter of water

The second factor is cutting of the Dayak onion tubers (P) consisting of 3 levels, they are :

p1: Control
p2: 25% cutting rate
p3: 50% cutting rate

Research Implementation

1. Land Preparation
2. Seedling Selection
3. Planting
4. Plant maintenance

- Sprinkling
- Embroidery
- Weeding
- Fertilizing
- control of pests and diseases.

5. Harvest

Data Understanding

1. Plant Height (cm)
2. Number of Leaves (strands)
3. Root Length (cm)
4. Wet Weight of tubers Per Clump (grams)
5. Wet weight of tubers Per plot (grams)

Data analysis

The additive linear model used in analyzing each observed variable is:

$$\mathbf{Yijk = \mu + \alpha i + \beta j + \sigma k + (\beta\sigma)\, jk + \varepsilon ijk}$$

They are :

I = 1,2,3 (groups)
j = 1,2,3 (green tonic POC concentration treatment)
k = 1,2,3 (tuber cutting treatment)
Yijk = observation response in the i experimental unit which obtained a combination of j-level treatment from factor I and k-level from factor II
μ= general midpoint
αi = the influence of the i group
βj = j-level effect of the green tonic POC concentration treatment
σk = the k-level effect of the tuber cutting treatment
(βσ) jk = the influence of the j-level factor I speculation of the green tonic POC concentration treatment and factor II of the tuber cutting treatment
εijk = random effect of the experimental unit receiving the j-I and k-II factors in the i group

To find out the growth and yield of Dayak onions with the treatment of green tonic POC concentrations and the level of tuber cutting, data analysis was performed using variance analysis. If the F calculated treatment <from the F table at the 0.05 level is not carried out further tests, but if the F calculated treatment> from the F table at the 0.05 level then a further test is performed using the 0.05 BNT test.

III. Result

Plant height

Results of analysis of variance showed that the treatment of tuber cutting (P) significantly affected, while the treatment of green tonic (K) POC concentrations and their interactions (K x P) had no significant effect on average plant height at 12 MST, more details can be seen in the table 1

Table 1. Average Plant Height (cm) Age 12 MST in Fertilizer Concentration Treatment Organic Liquid Green Tonic and Cutting Tubers .

POC Green Concentration (K)	Cutting Tuber (P)			Average
	p1 (Control)	p2 (25%)	p3 (50%)	
k1 (0ml)	32.90	32.79	31.51	32.40
k2 (3ml)	33.47	34.07	31.63	33.05
k3 (6ml)	34.23	34.23	31.66	33.37
Average	33.53[a]	33.70[a]	31.60[b]	

* The average number followed by the same letter indicates different notsignificantly in the BNT test 5% (BNT P = 1.66).

Based on 5% BNT test on tuber cutting treatment (P) treatment p2 has the highest average plant height of 33.70 cm and is significantly different from treatment p3, but the treatment of p2 is not significantly different from treatment p1.

Number of Leaves

Results of analysis of variance showed that the treatment of green tonic POC concentrations (K) significantly affected the average number of leaves, while the treatment of tuber cutting (P) and their interactions (K x P) had no significant effect on the average number of leaves aged 8 MST, More details can be seen in table 2.

Table 2. Average Number of Leaves (strands) Age of 8 MST in Fertilizer Concentration Treatment. Organic Liquid Green Tonic and Cutting Tubers

POC Green Concentration (K)	Cutting Tuber (P)			Average
	p1 (kontrol)	p2 (25%)	p3 (50%)	
k1 (0ml)	2.78	2.89	2.67	2.78[b]
k2 (3ml)	2.94	3.00	2.78	2.91[b]
k3 (6ml)	3.28	3.17	3.21	3.22[a]
Average	3.00	3.02	2.89	

The average number followed by the same letter indicates different not significantly in the BNT test 5% (BNT K = 0.26).

Based on the 5% BNT test on the green tonic (K) POC concentration showed that the K3 treatment had the highest average number of leaves, 3.22 strands significantly different from the k2 and k1 treatments, but the k2 treatment was not significantly different from the k1 treatment.

Root Length (cm)

The results of analysis of variance showed that the treatment of green tonic (K) POC concentration, cutting of tuber g (P) and its interaction (K x P) had no significant effect on the average root length. However, there was a tendency for the k3p2 treatment to show the longest root length of 6.29 cm while the k1p3 treatment showed the shortest root length of 5.55cm.

Wet Weight of Sample Planting

The analysis of variance analysis showed that the treatment of green tonic (K) POC concentration, cutting of tuber (P) and its interaction (K x P) had no significant effect on the average wet weight of the sample

crop. However, there was a tendency for the k3p2 treatment to show the heaviest wet weight of 17.28 g while the k1p3 treatment showed a wet weight of 14.33 g.

Wet Wet Weight (kg)

The analysis of variance showed that the treatment of green tonic (K) POC concentrations, tuber cutting (P) and their interactions (K x P) had no significant effect on the average wet weight of the plots. However, there was a tendency for the k3p2 treatment to show the heaviest wet weight of 0.55 tons while the k1p3 treatment showed a wet weight of 0.49 tons.

IV. Discussion

Based on the analysis of variance showed that the treatment of green tonic POC concentrations significantly affected the observed parameters, namely the average number of leaves aged 8 MST. The BNT 0.05 showed that the green tonic POC treatment with a concentration of 6ml / lt of water was significantly different from the other treatments. It is assumed that at the age of 8 MST the plant is able to absorb nutrients present in fertilizers such as N, P, K, S and micro nutrients well.

This is according to the opinion of Sutejo (2002) which states that for vegetative growth, plants really need nutrients such as N, P and K as well as other elements in sufficient and balanced amounts. High nitrogen content in POC green tonic fertilizer is thought to be able to encourage leaf formation well, because the nitrogen element itself functions as a chlorophyll maker. Nitrogen is needed by plants in the formation of vegetative parts of plants, such as leaves, stems, and roots. Furthermore Wijaya (2008) said, plants really need the element of nitrogen for the formation of broad leaf strands with high chlorophyll content, so that plants can produce assimilates in sufficient quantities for their vegetative growth.

Jumini, Sufyati Y and Fajri N (2010), they added that nitrogen is needed more in the vegetative phase, as a material for forming amino acids, proteins, chlorophyll formation and enzymes. Nitrogen is useful for the formation of leaf buds. In addition, it is suspected that the micro nutrients in the green tonic also play a role in the formation of proteins, carbohydrates and chlorophyll. Parman (2007) said that protein is the main constituent of protoplasm which functions as the center of metabolic processes in plants which in turn stimulates cell division and elongation, the micro nutrients act as a constituent of chlorophyll thereby increasing photosynthetic activity which in turn produces photosynthates which results in the development of meristematic tissue shoots.

While the root length, tuber wet weight of sample plantations, and tuber wet weight of treatment of green tonic POC concentration did not significantly influence. This is presumably because at the time of harvesting the rainfall was very high and almost submerged the plant. As a result, existing nutrients dissolve and are washed away by high rain water so that the nutrients provided cannot be absorbed by the roots of the plant optimally, causing the formation of tubers is not optimal. As said by RiriAzyyati (2016) fertilizer application is closely related to environmental factors. Because if it rains the fertilizer will be washed so that the absorption of nutrients is not optimal.

High rainfall causes nutrients to be washed away by rain water which is the cause of nutrient drift so that it is not utilized by plants (Yartiwi 2014). Furthermore Aprianto (2017) added that rainfall at the beginning of growth is needed, but if excessive rainfall causes high soil moisture, rotten plant roots and result in death of plants. If excessive rainfall in the cooking phase of the leaves and at harvest it can reduce yields and quality of crop production.

The results of analysis of variance showed that the treatment of tuber cutting rates significantly affected the plant height parameters at the age of 12 MST. Based on the BNT 0.05 test showed that a 25% cutting rate provides better plant growth. It is suspected that 25% tuber cutting can stimulate the formation of growth hormones without disturbing the budding eyes. According to Syahir et al, (2018) Cutting tubers is able to induce the hormone ethylene so as to encourage the breakdown of bud dormancy. Termination of tuber dormancy is correlated with budding, this is due to a balance between growth regulators and carbohydrate content in the tuber during the process of the tuber metabolism itself. In the Fatmawaty Research, Ritawati, Said, (2015) also showed that the tuber cutting of 25% gave a significantly higher plant height increase than without cutting the tuber.

Wibowo (2005) states that cutting tubers can accelerate plant growth and the number of tillers, and can encourage the growth of side tubers. Arif Safrudin (2015) added that cutting seed bulbs will stimulate bud growth, accelerate plant growth, and stimulate sapling formation.

Variance results showed that the interaction of the green tonic POC concentration and the rate of cutting of the tuber tubers did not significantly affect all observed parameters. It is assumed that the difference in the response of Dayak onions to the green tonic POC concentration does not depend on the level of seed cutting and vice versa so that when combined it does not affect each other. If the treatment does not show interaction, then the treatment does not synergize with each other, meaning that the treatment does not depend

on two factors given. This is consistent with the opinion of Steel and Torrie (1993) if the interaction of treatment is not real it can be concluded that these factors only encourage the growth of each.

V. Conclusion

Based on the results of the study can be concluded as follows:

1. The treatment of green tonic (K) POC concentrations significantly affected the average parameters of the number of leaves aged 6 MST and 8 MST.
2. The treatment of tuber cutting rate (P) has a very significant effect on the average height parameters of plants aged 2 MST and 4 MST, and significantly affects the average height of plants aged 6 MST, 8 MST, 10 MST, and 12 MST.
3. There is no interaction between the green tonic POC concentration and the tuber cutting rate (K x P).

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