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# Response of the growth and production Shallot (Allium ascalonicum L.) to the coconut Water POC treatment and Phosphorus Fertilizer

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**ABSTRACT**

This research was conducted from March - May 2023 until completion in Panombean Simalungun Village, Panombean Simalungun District. The purpose of this study was to determine the growth and production response of shallot plants (Allium ascalonicum L.) due to the concentration of coconut water POC and phosphorus. This study used a factorial Randomized Group Design (RAK), with two treatment factors, where the first factor is the application of coconut water POC (K) consisting of 3 levels, namely K1 = 10 ml, K2 = 15 ml, and K3 = 20 ml. The second factor is the dose of phosphorus fertilizer (P) consisting of 4 levels, namely P1 = 150 kg/ha, P2 = 200 kg/ha, P3 = 250 kg/ha and P4 = 300 kg/ha. The parameters observed were plant height (cm), number of leaves (strands), number of cloves per plant, weight of wet cloves per plant (g), weight of wet cloves per plot (kg), and weight of dry cloves per plot (kg). The best concentration for the application of coconut water POC is 20 ml dissolved into 1 liter of water. The best treatment combination for the application of coconut water POC is 20 ml dissolved into 1 liter of water and phosphorus fertilizer 300 kg/ha (30 gr/plot).



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## 1. INTRODUCTION

Shallots are a vegetable plant that is very popular with Indonesian people because it is one of the spices that is almost always present in every dish. According to Istina (2016) shallots are one of the superior horticultural commodities and have good prospects to meet national consumption, foreign exchange and farmer income. Shallots are not only a flavoring spice related to their aroma, but also have medicinal properties that come from the content of quercetin compounds which play a role in improving body health, anti-bacterial, anti-regeneration and anti-inflammatory substances.

Red onions contain nutritional value that is equal to the nutritional value of other vegetables. Bulbs of red onions are a potential source of vitamin A, vitamin C, pyridoxine, iron, copper and manganese to meet daily needs. The nutritional content of red onions in 100 g of bulbs is 72.00 calories; 16.80 g carbohydrates; 0.10 g total fat; 34.00 µg folate; 0.20 mg niacin and 0.290 mg pantothenic acid (Zulkarnain, 2013) .

According to Suryaman & Kirana (2015), red onion plants are thought to originate from Asia, some literature states that this plant comes from Central Asia, especially Palestine and India, but some others estimate its origin from Southeast Asia and the Mediterranean. Other sources speculate the origins of the onion red from Iran and the mountains of northern Pakistan, but there are also other origins This plant comes from West Asia and the Mediterranean and then developed into Egypt and Türkiye.

In Indonesia, the need for shallots continues to increase every year along with the increasing population, because shallots are inseparable from daily needs so that market demand for shallots is very high. According to Agriculture (2016) that shallot consumption in 2019 increased to 2,802 kg/capita/year compared to 2018 which was 2,758 kg/capita/year. Predictions for shallot consumption in 2023 will increase by 2,848 kg/capita/year.

Based on BPS data, North Sumatra's shallot production in 2019 was 18,072 tons with a harvest area of 2,246 hectares. Meanwhile, North Sumatra's shallot demand per month reaches 4,057 tons. Meanwhile, the total shallot planting area in Simalungun Regency reaches approximately 507 hectares. "Simalungun's shallot consumption needs are around 2,484 tons per year. Meanwhile, shallot production in 2021 is around 2,888 tons per year.

POC Coconut water contains zeatin which is known to be included in the cytokinin group. Cytokinins have the ability to encourage cell division and differentiation of certain tissues in the formation of shoot buds and root growth. However, the role of cytokinins in cell division depends on the presence of other phytohormones, especially auxin (Murniati, 2019) .

Giving old coconut water with a concentration of 25% can increase the growth and production of shallots. However, giving coconut water is not enough to help the growth and production of shallots, so it is necessary to add other nutrients in the form of compost or liquid fertilizer. Coconut water is an endosperm fluid that contains organic compounds, these organic compounds include auxin and cytokinin. Kristina and Syahid (2012) stated that coconut water contains minerals, especially macro N, P, K, Mg and Ca. The results of the analysis showed that old and young coconut water have different mineral compositions (Rajiman, 2015) .

According to Kristina & Syahid (2012) , every 100 ml of coconut water contains minerals including 43.00 mg nitrate, 13.17 mg phosphorus, 14.11 mg potassium, 9.11 mg magnesium, 0.25 mg iron, 21.07 mg sodium, 1.05 mg zinc, and 24.67 mg calcium. In addition to containing vitamins and minerals, coconut water contains auxin and cytokinin hormones that play a role in plant growth.

Phosphorus is one of the essential macronutrients and naturally phosphorus in the soil in the form of organic or inorganic compounds. Both forms are is an insoluble form of phosphorus, so its availability in the soil is very limited. limited. Inorganic phosphate minerals are generally bound as Aluminum Phosphate and Iron (Fe) Phosphate in acid soil and as Tricalcium Phosphate in soil base. Most of the phosphate forms are bound by soil colloids and are therefore unavailable. for plants. Soil with low organic content has a high phosphate content Organic matter varies depending on the type of soil. The P element is a macro nutrient which has an important function as a component of ATP and DNA (Islamiati & Zulaika, 2015) .

One of the single fertilizers circulating on the market and often used by farmers is TSP fertilizer. TSP (Triple Super Phosphate) is an inorganic fertilizer that has the highest phosphorus nutrient content of other types of phosphorus fertilizers such as SP-36 (Super Phosphorus-36) and CRP (Chrismast Rock Phosphorus) or RP (Rock Phosphorus). The phosphorus nutrient content in TSP is 46-52% and sulfur (S) 36% (Hamid, 2019) .

## 2. METHOD

This research will be conducted in Panombean Simalungun Village, Panombean Simalungun District, Simalungun Regency with an altitude of ± 562 m above sea level. This research will be conducted from March - May 2023.

The materials used in this study were local variety red onion seeds, coconut water POC, TSP fertilizer, chicken manure, pearl NPK, diazinon 60 EC insecticide, Dithane 45 fungicide. The tools used were hoes, machetes, meters, stakes, label boards, scales, watering cans, handsprayer, stationery and other tools needed during the research.

This study used a factorial Randomized Block Design (RAK), with two treatment factors, where the first factor was the administration of coconut water POC (K) consisting of 3 levels, namely K 1 = 10 ml, K 2 = 15 ml, and K 3 = 20 ml . The second factor was the dose of phosphorus fertilizer (P) consisting of 4 levels, namely P 1 = 150 kg / ha, P 2 = 200 kg / ha, P 3 = 250 kg / ha and P 4 = 300 kg / ha.

The parameters observed were plant height (cm), number of leaves (strands) , number of cloves per plant , weight of wet cloves per plant (g) , weight of wet cloves per plot (kg) , and weight of dry cloves per plot (kg) .

## 3. RESULTS AND DISCUSSION

### 3.1 Plant Height (cm )

Data on the average plant height at 2, 4 and 6 weeks after planting showed that plant height had a real response due to the treatment of coconut water POC and phosphorus fertilizer, but did not have a real response due to the interaction between the two treatments. To determine the differences between treatments, testing was carried out using the BNT average difference test at the 5% level, which can be seen in Table 1.

**Table 1.** Average Difference Test of Plant Height Due to Treatment of Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Plant Height (cm) | | |
|---|---|---|---|
| | 2 MST | 4 MST | 6 MST |
| K1 | 6.97 c | 17.09 c | 20.58 c |
| K2 | 8.35 b | 19.28 b | 24.36 b |
| K3 | 9.46 a | 21.10 a | 27.26 a |
| BNT 5% | 0.23 | 0.56 | 0.70 |
| P1 | 7.83 c | 18.15 c | 22.68 c |
| P2 | 8.07 c | 18.89 b | 23.65 b |
| P3 | 8.35 b | 19.44 b | 24.57 a |
| P4 | 8.79 a | 20.15 a | 25.38 a |
| BNT 5% | 0.26 | 0.65 | 0.80 |
| K1P1 | 6.50 | 15.58 | 18.96 |
| K1P2 | 6.67 | 16.92 | 19.92 |
| K1P3 | 7.00 | 17.71 | 21.38 |
| K1P4 | 7.71 | 18.17 | 22.08 |
| K2P1 | 8.17 | 18.54 | 22.79 |
| K2P2 | 8.29 | 19.04 | 23.92 |
| K2P3 | 8.42 | 19.50 | 24.92 |
| K2P4 | 8.54 | 20.04 | 25.83 |
| K3P1 | 8.83 | 20.33 | 26.29 |
| K3P2 | 9.25 | 20.71 | 27.13 |
| K3P3 | 9.63 | 21.13 | 27.42 |
| K3P4 | 10.13 | 22.25 | 28.21 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level*

Table 1 shows that the coconut water POC treatment (K3) produced the highest plants at the ages of 2, 4 and 6 MST which was significantly different from the K2 treatment, as was the case with the K2 treatment which was significantly different from the K1 treatment.

POC water treatment Coconut water with a concentration of 20 ml dissolved in 1 liter of water (K3 ) is thought to be able to help early growth. shallot shoots because coconut water contains cytokinin ZPT which has a function as a substance that can help in cell division and increase metabolism and protein synthesis which can stimulate shoot growth (Leovici et al., 2014).

Table 1 shows that the phosphorus fertilizer treatment (P4) produced the highest plants at the ages of 2 and 4 MST, which was significantly different from the P3, P2 and P3. $P_1$, but at the age of 6 MST, the P4 was not significantly different from the P3.

This is supported by the results of Karo's research (2017) , that phosphorus fertilizer can increase the vegetative growth of shallots, such as plant height. The results of the study indicate that phosphorus is one of the essential elements needed by plants for optimum growth and production. Phosphorus deficiency causes slow, weak, and stunted plant growth.

Table 1 shows that the interaction of coconut water POC and phosphorus fertilizer (K3P4) produced the highest plants at the ages of 2, 4 and 6 MST, respectively, namely (10.13 cm), (22.25 cm) and (28.21 cm), which were not significantly different from the other treatments.

This is due to the genetic factors of shallot plants that have not been able to support the role of both treatments to influence each other. In accordance with the opinion of Herman et al. (2016) , stating that plant yields are not only influenced by genotype factors but also by the ability to adapt to the environment.

### 3.2 Number of leaves (blades)

Data on the average number of leaves at the age of 2, 4 and 6, weeks after planting showed that the number of leaves had a real response due to the treatment of coconut water POC and phosphorus fertilizer, but did not have a real response due to the interaction between the two treatments.

To determine the differences between treatments, testing was carried out using the BNT average difference test at the 5% level, which can be seen in Table 2.

Table 2 shows that the coconut water POC treatment (K3) produced the highest number of leaves at the ages of 2, 4 and 6 MST, which was significantly different from the K2 treatment, as was the case with the K2 treatment, which was significantly different from the K1.

This shows that the higher the concentration of coconut water given in each fertilization treatment, the number of leaves also increases. This is in accordance with the opinion of Mardaleni & Sutriana (2014) who stated that providing sufficient nutrition during the vegetative period of plants will help in the development and plants, in addition, fertilization will stimulate the growth of growth hormones in these nutrients can regulate plant physiology.

**Table 2.** Average Difference Test for Number of Leaves Due to Treatment of Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Number of Leaves | | |
|---|---|---|---|
| | 2 MST | 4 MST | 6 MST |
| K1 | 7.25 c | 12.29 c | 15.35 c |
| K2 | 8.19 b | 15.17 b | 19.17 b |
| K3 | 9.06 a | 16.96 a | 23.98 a |
| BNT 5% | 0.21 | 0.55 | 0.60 |
| P1 | 7.69 c | 13.64 d | 17.83 d |
| P2 | 8.14 b | 14.39 c | 18.83 c |
| P3 | 8.28 b | 15.17 b | 20.22 b |
| P4 | 8.56 a | 16.03 a | 21.11 a |
| BNT 5% | 0.24 | 0.64 | 0.69 |
| K1P1 | 6.58 | 10.83 | 13.67 |
| K1P2 | 7.33 | 12.17 | 14.92 |
| K1P3 | 7.42 | 12.75 | 16.17 |
| K1P4 | 7.67 | 13.42 | 16.67 |
| K2P1 | 7.92 | 14.25 | 17.75 |
| K2P2 | 8.17 | 14.92 | 18.33 |
| K2P3 | 8.25 | 15.75 | 19.83 |
| K2P4 | 8.42 | 15.75 | 20.75 |
| K3P1 | 8.58 | 15.83 | 22.08 |
| K3P2 | 8.92 | 16.08 | 23.25 |
| K3P3 | 9.17 | 17.00 | 24.67 |
| K3P4 | 9.58 | 18.92 | 25.92 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level.*

Table 2 shows that the phosphorus fertilizer treatment (P4) produced the highest number of leaves at the ages of 2, 4 and 6 MST, which was significantly different from the P3 treatment and P3 was significantly different from the P2 treatment. Likewise, treatment P2 was significantly different from P1.

This gives an illustration that with a phosphorus fertilizer dose of 300 kg/ha (30 gr/plot) the phosphorus nutrient requirement has been met for leaf growth. This is in line with the opinion of Mustikawati et al. (2020) , that phosphorus is a part of the protoplasm and cell nucleus which is very important in the formation of cells and the development of apical meristem tissue, so that the provision of phosphorus fertilizer can increase the number of leaves.

Table 1 shows that the interaction of coconut water POC and phosphorus fertilizer (K3P4) treatments produced the highest number of leaves at ages 2, 4 and 6 MST, respectively, namely (9.58), (18.92) and (25.92), which were not significantly different from the other treatments.

There was no interaction between the administration of coconut water POC and phosphorus fertilizer on the observed number of leaves parameters. This shows that the influence of each factor tested does not depend on the other factors.

### 3.3 Number of Cloves Per Plant

Data on the average number of cloves per plant showed that the number of cloves per plant had a real response due to the coconut water POC treatment, but did not have a real response due to the phosphorus fertilizer treatment and the interaction between the two treatments.

To determine the differences between treatments, testing was carried out using the BNT average difference test at the 5% level, which can be seen in Table 3.

**Table 3.** Average Difference Test for Number of Cloves Per Plant Effects of Giving Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Number of Cloves Per Plant |
|---|---|
| K1 | 5.17 b |
| K2 | 5.48 b |
| K3 | 6.58 a |
| BNT 5% | 0.94 |

| | |
|---|---|
| P1 | 5.58 |
| P2 | 5.58 |
| P3 | 5.61 |
| P4 | 6.19 |
| K1P1 | 5.67 |
| K1P2 | 4.58 |
| K1P3 | 4.58 |
| K1P4 | 5.83 |
| K2P1 | 5.25 |
| K2P2 | 5.50 |
| K2P3 | 5.33 |
| K2P4 | 5.83 |
| K3P1 | 5.83 |
| K3P2 | 6.67 |
| K3P3 | 6.92 |
| K3P4 | 6.92 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level.*

Table 3 shows that the number of cloves per plant had a significant response due to the coconut water POC treatment, the average number of cloves per plant was highest in the K3 treatment (6.58) which was significantly different from the K2 treatment, but the K2 was not significantly different from the K1.

The more leaves produced by the shallot plant, the more cloves will be produced. The larger the cloves and the larger the shallots identify the food reserves contained in the cloves, the larger the shallot plant cloves are, the heavier they are. According to Mukhlis et al. (2011) , the greater the number of leaves formed means the leaf area becomes wider, so the ability of the leaves to receive light for the photosynthesis process becomes greater in producing carbohydrates and will be translocated to the clove section, thus affecting the size and weight of the cloves.

Table 3 shows that the number of cloves per plant has no significant response due to phosphorus fertilizer treatment. The average number of cloves per plant was highest in the P4 (6.19) and the lowest was in the P 1 (5.58). Fertilizing with too high a dose reduces the process of food cycle movement which can suppress the growth of the number of cloves. per plant. This is in accordance with the opinion of Fajjriyah (2017) , that increasing the number of cloves also influenced by the factor of providing appropriate fertilizer and additional fertilizer so as to help the process of food cycle movement for clove growth per plant, on the other hand, excessive application can suppress clove growth. per plant.

Table 3 shows that the number of cloves per plant had no significant response due to the interaction of coconut water POC and phosphorus fertilizer treatments, the average number of cloves per plant was highest in the K 3 P 4 (6.92) and the lowest in the K 1 P 2 (4.58). There was no interaction between the treatment of coconut water POC and phosphorus fertilizer on the parameter of the number of cloves per plant. This shows that the influence of each factor tested does not depend on other factors.

### 3.4 Weight of Wet Cloves Per Plant (g)

Data on the average weight of wet cloves per plant showed that the weight of wet cloves per plant had a real response due to the treatment of coconut water POC, phosphorus fertilizer and the interaction between the two treatments. To find out the differences between treatments, testing was carried out with the BNT mean difference test at the 5% level which can be seen in table 4.

**Table 4.** Average Difference Test of Wet Clove Weight Per Plant Effects of Giving Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Wet Clove Weight Per Plant (g) |
|---|---|
| K1 | 28.19 c |
| K2 | 42.29 b |
| K3 | 58.96 a |
| BNT 5% | 2.12 |
| P1 | 36.19 d |
| P2 | 40.83 c |
| P3 | 45.42 b |
| P4 | 50.14 a |
| BNT 5% | 2.44 |
| K1P1 | 22.33 g |
| K1P2 | 25.00 g |
| K1P3 | 32.50 f |
| K1P4 | 32.92 ef |
| K2P1 | 37.08 e |
| K2P2 | 40.00 with |

| | |
|---|---|
| K2P3 | 43.33 d |
| K2P4 | 48.75 c |
| K3P1 | 49.17 c |
| K3P2 | 57.50 b |
| K3P3 | 60.42 b |
| K3P4 | 68.75 a |
| BNT 5% | 4.23 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level.*

Table 4 shows that the weight of wet cloves per plant had a significant response due to the coconut water POC treatment, the average weight of wet cloves per plant was the largest in the K3 treatment (58.96 g) which was significantly different from the K2 treatment, as well as the K2 treatment which was significantly different from the K1 treatment.

This is in accordance with the opinion of Ariyanti et al. (2020) who stated that coconut water is one of the natural ingredients, it contains ZPT such as cytokinin and auxin. ZPT cytokinin functions to influence root growth and differentiation, encourage cell division and growth in general, encourage germination aging. Auxin can stimulate the growth of apical shoots and roots to accelerate plant growth . In addition to containing ZPT, coconut water also contains nutrients, namely P and K, where the P nutrient element functions as a storage and channeling energy for all plant metabolic activities, while the K nutrient element in plants, one of which is as an enzyme activator that participates in the plant metabolism process.

Table 4 shows that the weight of wet cloves per plant has a significant response due to phosphorus fertilizer treatment. The average weight of wet cloves per plant was the largest in the P 4 treatment (50.14 g) which was significantly different from the P 3 treatment and P 3 was significantly different from the P 2 treatment, Likewise, treatment P2 was significantly different from treatment P1.

The element P plays a role in stimulating root growth and development, as a basic material (ATP and ADP), helping assimilation and respiration, accelerating the flowering and fruiting process, and ripening seeds and fruits. Hasibuan (2021) added that phosphorus plays a role in stimulating root growth, helping seed formation, playing a role in the process of photosynthesis and respiration. Phosphorus also plays a role in protein synthesis, especially that found in green tissue, carbohydrate synthesis, stimulating the formation of flowers and seeds and determining the germination ability of seeds used as seeds.

Table 4 shows that the weight of wet cloves per plant has a real response due to the interaction of coconut water POC and phosphorus fertilizer treatments, the average weight of wet cloves per plant is the largest in the K3P4 treatment (68.75 g) and the lowest is in the K1P1 treatment (22.33 g).

This is due to the interaction between the treatment of coconut water POC and phosphorus fertilizer was able to provide a good effect on the weight of wet cloves per plant. The availability of nutrients that sufficient and genetically capable to grow and develop. This is in line with Utami & Wulandari (2011) who stated that sufficient nutrient availability is related with the ability to produce production under certain circumstances.

### 3.5 Weight of Wet Cloves Per Plot (kg)

Data on the average weight of wet cloves per plot showed that the weight of wet cloves per plot had a real response due to the treatment of coconut water POC and phosphorus fertilizer, but did not have a real response due to the interaction between the two treatments. To find out the differences between treatments, testing was carried out with the BNT mean difference test at the 5% level which can be seen in Table 5.

**Table 5.** Average Difference Test of Wet Clove Weight Per Plot Effects of Giving Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Weight of Wet Cloves Per Plot (kg) |
|---|---|
| K1 | 0.98 c |
| K2 | 1.32 b |
| K3 | 1.62 a |
| BNT 5% | 0.09 |
| P1 | 1.18 c |
| P2 | 1.27 bc |
| P3 | 1.34 ab |
| P4 | 1.43 a |
| K1P1 | 0.85 |
| K1P2 | 0.98 |
| K1P3 | 0.99 |

| | |
|---|---|
| K1P4 | 1.09 |
| K2P1 | 1.17 |
| K2P2 | 1.30 |
| K2P3 | 1.37 |
| K2P4 | 1.43 |
| K3P1 | 1.51 |
| K3P2 | 1.53 |
| K3P3 | 1.67 |
| K3P4 | 1.77 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level.*

Table 5 shows that the weight of wet cloves per plot had a significant response due to the coconut water POC treatment, the largest average weight of wet cloves per plot was in the K3 ( 1.62 kg) which was significantly different from the K2, as well as with K 2 which was significantly different from the K1.

The composition of coconut water which is around 25 percent of the coconut fruit components. According to Lawalata (2011) that coconut water contains auxin and cytokinin hormones. Both hormones are used to support the division of coconut embryo cells. Coconut water has a fairly high potassium content of up to 17%. The presence of auxin and cytokinin content as well as macro and micro elements, vitamins, minerals and important amino acids are very beneficial for vegetative growth and plant productivity.

Table 5 shows that the weight of wet cloves per plot has a significant response due to phosphorus fertilizer treatment. The largest average weight of wet cloves per plot was in the P4 (1.43 kg) which was not significantly different from the P3, but significantly different from the P 2 and P1.This shows that the availability of sufficient P in the soil is very important to increase crop yields, because P is needed to improve the carbohydrate content of plants and the development of plant roots, and ultimately there is an increase in crop yields or growth of seeds, roots, flowers, and fruits. Together with the element Potassium, Phosphorus is used to stimulate the flowering process (Islamiati & Zulaika, 2015) .

Table 5 shows that the weight of wet cloves per plot had no significant response due to the interaction of coconut water POC and phosphorus fertilizer treatments, the average weight of wet cloves per plot was highest in the K3P4 (1.77 kg) and the lowest was in the K1P1 (0.85 kg). This shows that shallot plants will not produce maximum results when the required nutrients are not sufficiently available. Hariani & others (2016) stated that fertilizer is the key to soil fertility because it contains one or more elements to replace elements that have been absorbed by plants. However, excessive and uncontrolled use can have a negative impact on soil fertility, plant growth, the environment and the balance of soil microorganisms.

### 3.6 Weight of Dry Cloves Per Plot (kg)

Data on the average weight of dry cloves per plot showed that the weight of dry cloves per plot had a real response due to the treatment of coconut water POC and phosphorus fertilizer, but did not have a real response due to the interaction between the two treatments. To find out the differences between treatments, testing was carried out with the BNT mean difference test at the 5% level which can be seen in Table 6.

**Table 6.** Average Difference Test of Dry Clove Weight Per Plot Effects of Giving Coconut Water POC and Phosphorus Fertilizer

| Treatment | Average Weight of Dry Cloves Per Plot (kg) | | Conversion (Ton/Ha) |
|---|---|---|---|
| K1 | 0.78 | c | 7.81 |
| K2 | 1.05 | b | 10.54 |
| K3 | 1.31 | a | 13.08 |
| BNT 5% | 0.07 | | |
| P1 | 0.94 | c | 9.43 |
| P2 | 1.02 | bc | 10.22 |
| P3 | 1.08 | ab | 10.78 |
| P4 | 1.15 | a | 11.49 |
| K1P1 | 0.68 | | 6.83 |
| K1P2 | 0.78 | | 7.81 |
| K1P3 | 0.79 | | 7.89 |
| K1P4 | 0.87 | | 8.72 |
| K2P1 | 0.94 | | 9.39 |
| K2P2 | 1.04 | | 10.41 |
| K2P3 | 1.09 | | 10.93 |
| K2P4 | 1.14 | | 11.44 |
| K3P1 | 1.21 | | 12.08 |
| K3P2 | 1.24 | | 12.42 |

| | | |
|---|---|---|
| K3P3 | 1.35 | 13.53 |
| K3P4 | 1.43 | 14.31 |

*Description: Numbers followed by different notations in the same column are significantly different at the 5% BNT level.*

Table 6 shows that the weight of dry cloves per plot had a significant response due to the coconut water POC treatment, the average weight of dry cloves per plot was the largest in the K3 (1.31 kg) which was significantly different from the K2, as well as K2 which was significantly different from the K1. This is thought to be due to differences in clove diameter so that the reduced water content is different. Weight gain is influenced by the process of cell division followed by cell enlargement. Auxin is a growth substance that encourages cell elongation and enlargement, so auxin also affects dry weight gain. This is in accordance with the opinion of Rahmatan (2016) who stated that achieving higher dry weight by watering coconut water is due to the availability of nutrients for plants that are important for the growth process and the presence of ZPT that triggers cell division and enlargement.

Table 6 shows that the dry clove weight per plot has no significant response due to phosphorus fertilizer treatment. The largest average dry clove weight per plot was in the P4 (1.15 kg) which was not significantly different from the P 3, but significantly different from the P2 and P1. In addition to supporting growth roots, phosphorus nutrients also play a role in distributing and storing energy for the growth process and plant development, the function of the nutrient P as carbohydrate and amino acid components which is an internal factor affect growth and plant development, deficiencies carbohydrates in plants can inhibits the formation of fruit or tubers.

Table 6 shows that the weight of dry cloves per plot had no significant response due to the interaction of coconut water POC and phosphorus fertilizer treatments, the average weight of dry cloves per plot was highest in the K3P4 treatment (1.43 kg) and the lowest was in the K1P1 treatment (0.68 kg). Matter This is thought to be an element of physical condition or soil type. which influences growth plant. If the soil fertility is low additional nutrients are required Fertilization. Determination of recommended fertilizer dosage for shallot plants must be based on results of analysis of nutrient levels in the soil, new determine the appropriate dosage so that obtain certain production results.

## 4. CONCLUSION

The coconut water POC treatment had a real response to the height of plants aged 2, 4, 6 M ST , the number of leaves aged 2, 4, 6 M ST , the number of cloves per plant , the weight of wet cloves per plant, weight of wet cloves per plot and weight of dry cloves per plot . The best concentration for administering coconut water POC is 20 ml dissolved in 1 liter of water. Phosphorus fertilizer treatment had a real response to plant height at 2, 4, and 6 M ST , number of leaves at 2, 4, and 6 M ST , wet clove weight per plant, wet clove weight per plot and dry clove weight per plot, but did not have a significant response to the number of cloves per plant. The best dose for phosphorus fertilizer application is 300 kg/ha (30 gr/plot). The interaction of coconut water POC treatment and phosphorus fertilizer had a significant response to the weight of wet cloves per plant, but did not have a significant response to plant height at 2, 4, 6 M ST , number of leaves at 2, 4, 6 M ST , number of cloves per plant, weight of wet cloves per plot and weight of dry cloves per plot. The best combination of treatments for administering coconut water POC was 20 ml dissolved in 1 liter of water and phosphorus fertilizer 300 kg/ha (30 gr/plot). To obtain optimal growth and production results of shallots ( Allium ascalonicum L.), it is recommended to conduct further research to obtain the best dosage.

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