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Land Productivity Of The Intercropping Shallot (*Allium Ascalonicum* L) And Chili Pepper (*Capsicum Frutescens* L) With Liquid Organic Fertilizer And Solid Organic Fertilizer

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ABSTRACT

Shallots and cayenne pepper are two seasonal vegetable commodities that must continue to be cultivated to meet the community's daily needs. The purpose of the study was to determine the productivity of the intercropping system of shallots and cayenne peppers with the treatment of organic liquid and solid organic fertilizers. The study used a completely randomized design with two factors. Observational data were analyzed statistically and continued with the further BNJ test at the 5% level. The results showed that the biological liquid organic fertilizer and solid organic fertilizers significantly affected shallot plants, with the best treatment being 4 ml l water^{-1} and 10 tons ha^{-1}. Meanwhile, the cayenne pepper plant has no effect except for plant height. Likewise, both onion and cayenne pepper have no significant effect in terms of interaction.

Keywords*: shallots, chili pepper, liquid organic fertilizer, productivity, solid organic fertilizer, intercropping*

1. INTRODUCTION

Shallots (*Allium ascalonicum* L) and Cayenne pepper (*Capsicum frutescens* L) are the highest horticulture commodities in Indonesia in 2020, with the production of, subsequently, 1,815,445 tons and 1,508,404 tons (Central Bureau of Statistics, 2021). People require shallots and cayenne pepper to meet their daily needs as ingredients for various kinds of food.

Due to the wide application of shallots and chili pepper for society, it is needed to develop cultivation intensively to prevent production shortage. Hence, an effort must be made to increase the productivity of those horticulture commodities by employing an intercropping system. Intercropping is by planting two crops in one plantation area. This plantation technology is very suitable to be applied. After all, it has advantages, such as producing two commodities in one plantation area, decreasing failure risk because it is divided on every plant, and increasing farmers' income.

Despita et al., (2020) reveal that the intercropping planting pattern of shallots with cayenne pepper generates the same result as the monoculture plantation pattern, by planting distance of 15 x 15 cm. it means that the intercropping plantation pattern can be advised for farmers to increase planting area and shallots' productivity.

In plants cultivation, it is important to add nutrients in supporting the plant's productivity by monoculture or intercropping.

Utilizing organic fertilizer is one of the efforts to increase nutrients within the soil, capable of improving the soil's physical, chemical, and biological traits, both liquid organic fertilizer, and solid organic fertilizer.

Bio-liquid organic fertilizer (POC) comes from the remnants of plants and animal waste fermented and is applied through the leaves. The function of loosening soil is to rectify drainage and aeration, increase the capacity to contain water, minimize erosion, increase cation exchange capacity, and improve the weathering process of mineral and sustenance sources for soil microorganisms (Siboro, 2013). Bio-POC also increases indigenous bacteria as a biological fertilization technology and creates stimulants by collecting numerous specific microbes, i.e., Nitrogen mixer bacteria, phosphate solubilizing microbes, cellulose-degrading microbes, indole acetic acid growth hormone (IAA). This bacteria is active and aggressive, infecting the roots to avoid being infected by other bacteria harming plants (Purba et al., 2020).

Based on the research result (Suprapto et al., 2019), it is found that in shallots plant of planting distance combination by 20 cm x 20 cm with 4 ml l-1 liquid organic fertilizer concentration generates the immense dry tuber weight of 45,58 g.

Solid organic fertilizer, such as Solid, results from palm oil mills processing that still has nutrients. On average, 1 ton contains nutrients equivalent to 10,3 kg N, 3,3 kg P, 6,1 kg K, and 4,5 kg Mg (Pahan, 2006). The Solid fertilizer is highly potential to increase solid organic substance, generate sound soil physical properties, and create biological conditions capable of increasing decomposing microorganisms population.

(Gultom et al., 2019) research results show that solid plus (Kos plus) compost fertilizer provides the best result on the fruit's quantity and weight observation with the best treatment using a 20 tons/ha dose.

2. RESEARCH METHODS

The research was conducted in the Experimental Garden, Agriculture Faculty, Riau Islamic University, for six months, starting from October 2020 until March 2021.

The materials used in this research were, *Bima Brebes* variety of shallot seeds which is the 3rd generation, the *Sigantung* variety of Chili pepper seeds, 'Solid' solid organic fertilizer obtained from PT. ADEI P & I of Pelalawan Regency, Riau Province (solid was produced from the filtering result of crude palm oil (CPO)), Bio-liquid organic fertilizer (POC) comes from the fermented plants' remnants, NPK 16:16:16, Trichoderma, Dithane M45, Curaccron, Antracol, Agrostick (adhesive), Sibutox, furadan, compost, and 5 cm x 10 cm polybag size. Meanwhile, the tools used in this research were hand tractor, hoe, roll meter, hand sprayer, and analytical balance.

The design used in this research was Complete Random Design using two factorial. The first factor was Bio-POC concentration using 5 degrees of treatments, e.g., 0, 2, 4, 6, 8 ml l^{-1} and the second factor was the dose of 'Solid' solid organic fertilizer dose using 4 degrees of treatments, e.g., 0, 5, 10, and 15-ton ha^{-1}. The shallots intercropping population quantity per plot was 12 plants, and the quantity of cayenne pepper per plot on intercropping was four plants. The plot size of 100 cm x 100 cm is as much as 48 plots.

This research implementation includes raising cayenne pepper seedlings in 5 cm x 10 cm polybag size with topsoil mixed seedling, 0-25 cm depth, and 1:1

corn crop residue compost. Before it shallots were planted, the seeds were cut 1/3 to the part of tuber tip, which was carried out 3 hours prior to the plantation, and later on, it was mixed using Dithane M45 with the dose of 20 gr per kg of shallots to prevent any mushroom growing in the tuber. The seeds are planted between the cayenne pepper spacing with a spacing of 20 cm x 20 cm. The cayenne pepper seeds were moved to the field at the age of 21 days after the seedlings. The seeds were moved to the plot within two weeks right after planting the shallots, with the spacing of 60 cm x 60 cm. The application of Bio-POC treatment was carried out four times at the same time for both plants, shallots at the age of 21, 28, 35, and 40 days after planting, and cayenne pepper at the age of 7, 15, 21, and 30 days after planting. The concentration provided corresponded to the treatment, 0, 2, 4, 6, 8 ml l^{-1}. The watering volume in the first and second periods was 62,5 ml/plant, watering volume in the third and fourth periods was 125 ml/plant. 'Solid' solid organic fertilizer was given before planting the shallots by mixing and stern equally between the soil and fertilizer. The distribution was conducted conforming to the treatment, that is, 0, 5, 10, and 15-ton ha^{-1} (per plot dose was 0, 500, 1000, and 1500 g plot). Maintenance was carried out by watering, weeding, removing cayenne pepper shoots, and controlling plant pests and diseases.

The observed parameters in the shallot plants are plants' height, the tubers quantity per clump, wet tuber weight per clump, and dry tuber weight per clump. Meanwhile, the observed parameters in the cayenne pepper plants are plants' height, quantity, and weight of chili pepper fruit per plant. From the observation result, each treatment was analyzed statistically. If F-count is larger than F-table, afterward, it is continued using on a 5% level of Honestly Significant Difference (BNJ) advance Test. In cayenne pepper, the parameters of the fruit's quantity per plant and fruit's weight per plant were transformed $\sqrt{x}$.

3. RESULT AND DISCUSSION

A. Shallot

1. Plants' Height

The results of the analysis of variance showed that the interaction of biological liquid organic fertilizer and 'Solid' solid organic fertilizer had no significant effect on the height of 30-day-old shallot plants. The main effect of the biological liquid organic fertilizer has no significant effect, while 'Solid' solid organic fertilizer has a significant effect on the height of 30-day-old shallot plants. The observation result is that the average of 30 day-old shallot plant heights after the 5% level of BNJ test can be seen in Table 1.

Table 1. The average height of shallot plants at the age of 30 days using biological liquid organic fertilizer and solid organic fertilizer treatment in an intercropping method (cm)

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	32,65	36,30	37,88	40,54	36,84
2 (P1)	35,99	37,13	41,19	41,96	39,07
4 (P2)	39,80	36,03	41,33	40,07	39,31
6 (P3)	37,05	38,76	40,90	40,67	39,35
8 (P4)	36,85	35,37	40,44	41,29	38,49
Average	36,47 b	36,72 b	40,35 a	40,91 a	
KK= 7,38% BNJ S = 2,10					

Numbers followed by the same letter in the row are not significantly different based on the 5% level BNJ test
Remark :
KK : Coefficient of Diversity
BNJ S : Honestly Significant Different of Solid Fertilizer Treatment

Based on the data in Table 1, it shows that the main effect of 'Solid' solid organic fertilizer on shallot plants height at the age of 30 days with the best treatment dose are 10 – 15 ton ha^{-1}. The high yield in this treatment provides sufficient nutrients to increase soil fertility and increase plant growth. (Pingko Abdianta Tarigan et al., 2017) state that Solid contains nutrients required by the plants such as N, P, K, and Mg. In cell division, the availability of nutrients is crucial because cell division contributes to supporting plants' growth. On average, 1 ton of solid contains nutrients proportional to 10,3 kg N, 3,3 kg P, 6,1 kg K, and 4,5 kg Mg.

When viewed from the *Bima Brebes* shallots variety description, the plant height is 25 cm - 44 cm, the plant height yields obtained have reached the description criteria, 40.35 cm and 40.91 cm (Anonym, 2020). Meanwhile, research by (Baharuddin R & Sutriana S., 2019) stated that shallot plant height at 8 MST using the intercropping pattern gave the best yield of 34.56 cm. Based on these two comparisons, the results of this study can be considered as reaching the best plant height.

Tuber Quantity

The analysis of variance result shows that interactively, Bio-POC and 'Solid' solid organic fertilizer has no significant influence on the shallots' tuber quantity. Nonetheless, the main effect of Bio-POC and 'Solid' solid organic fertilizer significantly influence shallots' tuber quantity. On average, the observation result of tuber quantity after conducting the BNJ test on a 5% level can be seen in table 2.

Table 2. the average of shallots' tuber quantity using Bio-POC and 'Solid' solid organic fertilizer treatment using intercropping

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	5.78	8.56	8.89	10.22	8.36 c
2 (P1)	7.67	7.78	11.44	10.45	9.33 bc
4 (P2)	9.33	8.89	10.04	10.67	9.73 ab
6 (P3)	9.45	9.56	11.11	11.78	10.47a
8 (P4)	9.03	9.71	11.02	9.44	9.80 ab
Average	8.25 b	8.90 b	10.50 a	10.51 a	
KK= 12.64% BNJ P = 0.99 BNJ S = 0.89					

Numbers followed by the same letters in rows and columns are not significantly different based on the 5% level BNJ test
Remark :
KK : Coefficient of Diversity
BNJ P : Honestly Significant Different of Bio-POC treatment
BNJ S : Honestly Significant Different of Solid fertilizer treatment

Based on the data in Table 2, it shows that the main effect of Bio-POC was significant on the tubers quantity with the highest yield at the concentration treatment of 4-8 ml l^{-1}, with an average of 9.73., 10.47., 9.80 tuber quantity. The

main effect of Solid was significant on the shallot tuber quantity. The highest yield of the tubers quantity with an average tuber 10.50 and 10.51 was at 10-15 tons ha^{-1} dose. The results obtained can be considered high for the intercropping pattern because the nutrients provided are divided for two plants.

Shallots' tuber quantity was influenced by the planting medium, which was marked by the availability of nutrients within the soil. The soil texture also influences rooting and shallots' bulbs quantity. The better the rooting, it will cause the tuber saplings' growth become better.

The environmental condition also contributes to forming and developing the tuber saplings; based on BMKG data, the average daily temperature from November until January at the research site was 25 °C – 28 °C. The optimum temperature for forming and growing shallot is 25-32 °C (Anonim, 2021).

In (Hidayatullah et al., 2020) research, onion intercropped with okra plant produces lesser tuber than the monoculture planting.

Research by (Anisyah et al., 2014) states that adding Solid to the shallot produces a better yield than other organic fertilizers. Meanwhile, research results by (Tarigan et al., 2017) stated that given 1500 g/plot solid only produce 8.56 tubers. The sound yield increment in onion tuber quantity was due to nitrogen availability in the soil is increasing toward the plant. For forming the tuber saplings, nitrogen nutrient is required to increase the rate of photosynthate and increase protein synthesis to form the cells.

Wet Tuber Weight Per Clump

The analysis of variance result shows that interactively, Bio-POC and Solid organic fertilizer treatment did not significantly influence shallots' wet tuber weight per clump. The main effect of Bio-POC and 'Solid' solid-liquid fertilizer influence significantly on the shallots' wet weight per clump parameter. The average of shallots' observation results after conducting the BNJ test on a 5% level can be seen in Table 3.

Table 3. Average of shallots' wet weight per clump in Bio-POC and Solid fertilizer treatment using Intercropping (g)

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	55.72	64.73	90.60	96.42	76.87 c
2 (P1)	69.45	74.48	94.40	104.61	85.73 b
4 (P2)	93.90	72.60	106.88	104.39	94.44 a
6 (P3)	79.58	90.99	105.58	100.70	94.21 a
8 (P4)	64.09	69.51	97.66	92.23	80.87 bc
Average	72.55 b	74.46 b	99.02 a	99.67 a	
KK= 10.11% BNJ P = 7.21 BNJ S = 6.45					

Numbers followed by the same letter in rows and columns are not significantly different based on the 5% level BNJ test

Remark :

KK : Coefficient of Diversity

BNJ P : Honestly Significant Different of Bio-POC treatment

BNJ S : Honestly Significant Different of Solid fertilizer treatment

Given the data, Table 3 shows that the main effect of the best treatment using Bio-POC is 4-6 ml l water^{-1} concentration, with 94.44 g and 94.21 g tuber weights. Solid fertilizer was significant on the shallot wet tuber weight per clump, with the best treatment by 10-15 tons ha^{-1} dose and tuber weight of 99.02 g and 99.67 g. The high yield of wet tuber weight in this treatment was due to giving the correct dose of nutrients, and the target was able to accelerate the plant development and production process.

Soil conditions that lack K can trigger shallots' shallot wet weight yield because soil's deficit in this nutrient will trigger the plants' wet weight being low (Sumarni et al., 2012). K contained in the Solid contribute as an enzymes activator in forming carbohydrate. Photosynthetic translocation products from leaves to other parts trigger increasing size, quantity, and shallots' wet weight yield.

Dry Tuber Weight per Clump

The analysis of variance shows that interactively, Bio-POC and Solid fertilizer treatment do not significantly influence the shallots' dry weight per clump. Bio-POC and Solid fertilizer's main effect significantly influences the parameter of shallots' dry weight per clump. The average observation result in shallots' dry weight per clump on the 5% level BNJ test can be seen in Table 4.

Tabel 4. Average of shallots' dry weight per clump with Bio-POC and Solid fertilizer treatment using Intercropping

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	47.96	53.50	74.31	78.62	63.60 c
2 (P1)	57.86	60.79	76.84	83.56	69.76 b
4 (P2)	78.35	59.36	86.55	84.73	77.25 a
6 (P3)	65.56	73.00	84.65	81.05	76.07 a
8 (P4)	56.07	60.62	82.68	77.12	69.12 bc
Average	61.16 b	61.45 b	81.01 a	81.02 a	
KK= 9.98% BNJ P = 5.86 BNJ S = 5.24					

Numbers followed by the same letter in rows and columns are not significantly different based on the 5% BNJ test

Remark :

KK : Coefficient of Diversity

BNJ P : Honestly Significant Different of Bio-POC treatment

BNJ S : Honestly Significant Different of Solid fertilizer treatment

Given the data, Table 4 shows that Bio-POC and Solid fertilizer's main effect significantly influences the shallots' dry tuber weight per clump. The best Bio-POC treatment was on 4 – 6 ml l water^{-1} concentration with the dry weight yield of 77.25 g and 76.07 g, while the best Solid treatment was on 10 – 15 ton ha^{-1} dose with the dry weight yield of 81.01 g and 81.02 g.

The high result of this treatment was due to the K nutrient contained in Bio-POC, and Solid fertilizer can provide K element for the shallots. In which the formation and the enlargement of shallots cannot be separated from the K nutrients within the soil. According to (Kalwia H.Y Uke et al., 2015), photosynthesis results will stimulate the formation of tubers to become more prominent, thereby

increasing the plants' dry weight. Sufficient K nutrients for shallot plants will produce optimum dry weight. Furthermore, sufficient nutrients for plants support filling food reserves to tubers. The amount of assimilating produced and stored in plants will increase plant weight (Tuhuteru et al., 2020).

In research by (Baharuddin R & Sutriana S., 2019), the best dry weight per clump was 28,43 g per clump. Compared with the result in table 4, it shows significant amount differences. The result differences obtained using the same plantation pattern were alleged that the soil fertility become one of the factors producing the plants. The shallots' dry weight in the application of Solid fertilizer by 10-15 tons ha^{-1} is assumed during the vegetative nutrients formation process are sufficient so that the results obtained are optimal. The nutrients obtained by the roots from the soil determine shallots' development; the better the nutrients, the better the plant growth.

Chili Pepper

Plant Height

The analysis of variance result shows that interactively and primarily, Bio-POC and 'Solid' solid organic fertilizer influence was significant on the chili pepper plants' height. The average observations results of cayenne pepper plant height after an advanced BNJ test at a 5% level can be seen in Table 4.

Table 5. The average chili pepper plant height in 40 days after planting using Bio-POC and Solid fertilizer treatment by intercropping (cm)

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	42.73 h	60.10 abc	52.35 c-g	56.25 b-f	52.86 b
2 (P1)	59.97 abc	45.83 gh	48.50 e-h	60.00 abc	53.58 b
4 (P2)	47.73 fgh	54.38 b-g	63.78 ab	56.28 b-f	55.55 b
6 (P3)	47.13 fgh	50.33 d-h	55.15 b-g	62.17 ab	53.70 b
8 (P4)	59.08 a-d	57.98 a-e	65.83 a	67.30 a	62.55 a
Average	51.33 c	53.73 bc	57.12 ab	60.40 a	
KK= 10.35% BNJ PS = 9.50 BNJ P = 4.75 BNJ S = 4.25					

Numbers followed by the same letter in rows and columns are not significantly different based on the 5% BNJ test

Remark :

KK : Coefficient of Diversity

BNJ PS: Honestly Significant Different of Bio-POC and Solid treatment Interaction

BNJ P : Honestly Significant Different of Bio-POC treatment

BNJ S : Honestly Significant Different of Solid fertilizer treatment

Based on the data in Table 5, the interaction of Bio-POC and 'Solid' solid organic fertilizer has a significant effect on cayenne pepper plants' height at the age of 40 days after planting. The best plant height yield was 67.30 cm with the best treatment of 1500 g/plot Solid fertilizer and 8 ml l^{-1} concentration. Bio-POC (S3P4) was not significantly different from S2P4, S2P2, S3P3, S1P0, S3P1, S0P1, S0P4, and S1P4; however, it is different significantly with other interactions. The factors influencing chili pepper plants' height are nutrient availability in the soil, hormone, and environmental growth. The nitrogen nutrient content in the Solid fertilizer contributes to triggering cayenne pepper growth. This result conforms to (Suryawaty & Hafiz's, 2015) research that

providing a 6000 g/plot dose of Solid fertilizer to tomato plants generates plants' height up to 53,78 cm at the age 5 MST.

Nutrient content absorbed by the plants influences growth and plants development. Bio-POC and Solid fertilizer interaction on the plant provide excellent growth impact. It is assumed that the nutrient increment absorbed by the plants becomes better because the plants' root gets optimum nutrition. The increasing nutrient absorption by the plants will improve plants' vegetative growth. (Idaryani & Warda, 2018) say that the nutrient amount absorbed by the plants, particularly nitrogen, will impact the growth in roots, stems, leaves, and plants height becomes much better.

Fruits' Quantity per Plant

The analysis of variance investigation results showed that the Bio-POC and solid fertilizer interaction and main effects were not significant on the cayenne pepper plant's fruits quantity. The average observation result for chili pepper fruit quantity per plant after the F-test is shown in Table 6.

Table 6. the average of cayenne pepper fruits per plant using Bio-POC and Solid fertilizer treatment by intercropping

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	59.83	90.00	95.67	114.67	90.04
2 (P1)	139.00	89.17	93.17	108.50	107.46
4 (P2)	170.23	101.00	102.33	95.33	117.23
6 (P3)	83.50	116.67	99.33	116.50	104.00
8 (P4)	128.83	100.17	129.33	123.50	120.46
Average	116.28	99.40	103.97	111.70	
KK= 37.43%					

numbers in the rows and columns are not significantly different based on the F-test

Remark:

KK : Coefficient of Diversity

Given the data, Table 6 shows that interactively and primarily, Bio-POC and Solid fertilizer did not significantly influence the parameter of cayenne pepper fruit. When observed in detail, the highest result of cayenne pepper fruits' quantity interactively was 172.23 fruits using 4 ml l^{-1} concentration of Bio-POC and 0 ton ha^{-1} solid.

The fruits produced by the cayenne pepper plant interactively and primarily were included as the best yield, although it was not optimum after it was analyzed. The best result was assumed that the plant's nutrition and biological and physical soil conditions were good. The sound physical condition will affect nutrients' availability within the soil so that the requirement for photosynthesis increases. (Yiyik Ageng Pranoto et al., 2020) research convey that the soil's physical condition will cause the absorption of nitrogen and oxygen nutrients within the root to increase to stimulate the plants' growth and accelerate the flower and fruit growth.

Fruits Weight Per Plant

The analysis of variance result shows that the primary influence and interaction of Bio-POC and Solid fertilizer was not significant on the fruit weight per plant. The average observation result of cayenne pepper fruit weight per plant after being conducted by the F-test can be seen in Table 7.

Table 7 shows that interactively and primarily, Bio-POC and Solid fertilizer did not significantly influence the parameter of cayenne pepper plants' fruit weight. When observed in detail, the best result of chili pepper plants' fruit weight interactively was 345.15-gram using treatment of 4 ml l water^{-1} concentration of Bio-POC and 0 ml l water^{-1} solid. The chili pepper planted by intercropping influences the cayenne pepper yield. The plant planted using monoculture would produce better fruits if planted in intercropping. In (Hidayatullah et al., 2020) research, the amount of okra plant fruit planted using monoculture was better than the intercropping plantation system. The result assumed that the nutrient element absorption was more competitive in the intercropping plantation pattern.

Table 7. the average of chili pepper fruit weight per plant using Bio-POC and Solid Fertilizer treatment by Intercropping

Bio-POC (ml l^{-1})	'Solid' solid organic fertilizer (ton ha^{-1})				Average
	0 (S0)	5 (S1)	10 (S2)	15 (S3)	
0 (P0)	116.75	171.52	174.92	259.28	180.62
2 (P1)	239.02	169.90	184.48	199.67	198.27
4 (P2)	345.15	195.53	194.75	179.50	228.73
6 (P3)	164.93	217.80	99.33	234.18	203.29
8 (P4)	249.27	200.80	245.93	225.47	230.37
Average	223.02	191.11	199.26	219.62	
KK= 37.31%					

numbers in the rows and columns are not significantly different based on the F-test

Cayenne pepper fruit weight was significantly influenced by photosynthates accumulated in the fresh fruit through the photosynthesis process. Parallel to (Idaryani & Warda, 2018) research, nutrient element absorption in the photosynthesis process can generate carbohydrates to increase the fresh fruit weight. The essential nutrient elements, such as nitrogen, potassium, and phosphorus, become inseparable substances. The nitrogen element works to form protein, phosphorus element building fat, while potassium increases the carbohydrate rates, and the substances will be stored within the fruit.

4. CONCLUSION

The research result can be concluded that the interaction of Biological liquid organic fertilizer and 'Solid' solid organic fertilizer did not significantly influence the shallots and cayenne pepper plant unless for the plants' height parameter. The main effect of Bio-POC was significant on shallots plants, with the best concentration of 4 – 6 ml l water^{-1}. In cayenne pepper plants, the treatment does not affect except for the plants' height. Meanwhile, the main effect of solid powder was influenced significantly on shallot plants with the best treatment dose by 10 – 15 ton ha^{-1}. Nevertheless, it does not affect the cayenne pepper plants unless on the plants' height.

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