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Article

Growth Studies of Cucumber (*Cucumis sativus L.*) Varieties Plants by Bamboo (*Dendrocalamus asper*) Flour Organic Fertilizer

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Abstract. The aim of the study was to analyze the interaction between the concentration of bamboo shoots of liquid organic fertilizer and cucumber plant varieties on the growth and yield of cucumber plants. This experiment used a Completely Randomized Design (CRD) with two factors. The first factor is the type of cucumber plant varieties, Wulan F1 variety and Mercy F1 variety. The second factor is the addition of Bamboo Shoots POC which consists of 4 levels, 0, 50, 75 and 100 ml/liter of water. The parameters observed were stem length, age of first flower appearance, age of first harvest, number of planting fruit, fruit diameter, fruit length, fruit weight of crop, fruit weight per plot and per hectare. Based on the results of the experiment, it can be concluded that giving bamboo shoots POC 100 ml/liter of water can increase the growth and yield of cucumber plants reaching 47.31 tons/ha.

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1. Introduction

Cucumber is one of the vegetables that are widely consumed by the people of Indonesia to fulfill nutrition for the body because it has a large amount of water in it so that it functions soothing and is also needed for the domestic cosmetic industry. Cucumber is believed to contain substances saponin, protein, fat, calcium, phosphorus, iron, sulfur, vitamins A, B1 and C. Raw cucumbers are lower body heat, also increase stamina. Cucumber also contains malonic acid which functions to suppress blood sugar so it does not turn into fat, both for weight loss. The high fiber content is useful for launching bowel movements, lowering cholesterol, and neutralizing toxins [1-2].

The nutritional value of cucumbers is quite good because this fruit vegetable is a source of minerals and vitamins. Nutrient content per 100 grams of cucumber consists of 15 calories, 0.8 grams of protein, 0.1 gram of starch, 3 grams of carbohydrates, 30 milligrams of phosphorus, 0.5 milligrams of iron, 0.02 milligrams of thianin, 0.01 milligrams of riboflavin, 14 milligrams of acid, 0.45 IU of vitamin A, 0.3 IU of vitamin B1 and 0.2 IU of vitamin B2 [2].

Cucumber is one of the important fruit commodities in Indonesia. The Central Bureau of Statistics and the Directorate General of Horticulture (2016) produce seasonal vegetables and fruits in Indonesia with a contribution of production of 477,976 tons or around 10.19% of national vegetable production with a land area of 48,578 ha. The cucumber production center in Indonesia is Java with a total production of 238,191 tons or around 13.67% of the national total while the second is followed by Sumatra with a total production of 154,498 tons or about 8.78% [3].

The largest cucumber producing province is West Java with a production of 155.882 tons or around 15.96% of the national cucumber production. Followed by East Java and Central Java, while the largest cucumber producing province outside Java is North Sumatra with production of 35.965% tons or around 13.63% of the total national cucumber production while West Sumatra province is 20,982 tons/ha. In detail the percentage of cucumber production in several production centers in Indonesia in 2016. Based on these data, the production of cucumber in West Sumatra province is still low compared to Java and North Sumatra. This may be caused by several factors including climate factors, farming techniques such as soil management, fertilization, irrigation, and the presence of pests and diseases. In the rainy season cucumber production is lower than the dry season, because rainfall that is too high can cause autumn cucumber plants to flower [4].

The effort that can be made to increase the production of cucumbers is by proper fertilization. Fertilization needs to be done because the nutrient content in the soil is always reduced due to being absorbed by the plants. The role of fertilizer is very large in fulfilling nutrients for the growth process of production and plants.

In general there are two types of fertilizers, namely inorganic fertilizers and organic fertilizers. At present the use of inorganic fertilizers in increasing productivity of agricultural products has been known to have a negative impact on agricultural land and result in environmental problems. In line with this, increasing public awareness of healthy lifestyles by adopting healthy eating patterns makes people pay more attention to organic food as a choice of food they will consume. So that efforts are needed to increase agricultural productivity that maintains environmental balance and sustainability, namely by using organic fertilizers. Liquid organic fertilizer derived from plants is one of the fertilizers applied to cucumber cultivation [5-6].

In addition to fertilizer, efforts can be made to increase the productivity of cucumbers by using hybrid cucumber varieties that have gnjah properties. The cucumber cultivation business begins by determining the cucumber varieties to be cultivated. Two types of cucumbers that are widely grown by farmers are hybrid cucumbers and OP (Open Pollinated). Some examples of hybrid varieties include: Asian Star 22, Farmer 368, Hercules 56, Spring Swallow, Pretty Swallow, Milk S251, Merry Swallow, and Shout Swallow. Whereas for example OP cucumber varieties are: Saturn,

Mars, Pluto, and Venus. In addition to the above types there are also cucumbers from local varieties [7-10].

Liquid organic fertilizer can be made using basic ingredients derived from bamboo shoots. Bamboo shoots are young bamboo shoots that emerge from the soil that grows from bamboo rhizomes. Bamboo shoots grow throughout the year and in the rainy season their abundance is very high. Bamboo shoots are widely used as vegetable plants although not all bamboo species can be eaten because they have high HCN level [11-14].

Bamboo shoots liquid organic fertilizer has high organic and giberelin content so that it can stimulate plant growth quickly and also contains microorganisms that are very important to help plant growth, namely Azotobacter and Azospirillum. Besides bamboo shoots also contain a lot of macro nutrients and micro nutrients to improve plant growth such as nitogen, phosphorus, potassium, calcium, magnesium, sodium, zinc, copper, manganese, selenium and iron. Nutrients contained in bamboo shoots liquid organic fertilizer are able to provide complete nutrition for the continuity of plant growth in the vegetative phase, so that its application is expected to increase the growth and yield of cucumber plants.

Based on the description above, an experiment was carried out with the title "Growth and yield of several cucumber plant varieties (Cucumis sativus L.) by giving bamboo shoots (Dendrocalamus asper) liquid organic fertilizer" with the aim of obtaining interactions between bamboo shoot POC concentrations and cucumber plant varieties on growth and the results of cucumber plants, get the right bamboo shoot POC concentrations on the growth and yield of cucumber plants, get the best growth and yield of varieties of cucumber plants.

2. Method

This experiment has been carried out in the lowlands located at Jalan Kodam Surau Gadang Sub-District Nanggalo Padang District, at altitude of ± 10 m asl with an average temperature of 22ºC-31ºC. The materials and tools in this experiment are cucumber seeds wulan F1 varieties and mercy varieties F1, urea, SP-36, KCl, black silver plastic mulch, Bamboo Shoot Bamboo POC, cow manure, insecticide and fungicide. While the equipment used is hoes, wood, bamboo, knives, buckets, ropes, scissors, stamps, labels, solo spayer 425, meters, rulers, calipers, scales, cameras, stationery and cups.

The experiment was carried out using a completely randomized design (CRD) in factorial with two factors. The first factor is the type of cucumber plant varieties, namely: Wulan varieties F1 (V1), varieties of Mercy F1 (V2). The second factor is the administration of Bamboo Shoots POC which consists of 4 levels, namely: without being given bamboo shoot POC 0 ml/liter of water (R0), 50 ml/liter of water (R1), 75 ml/liter of water (R2), 100 ml/liter water (R3). From these two factors, 2x4 = 8 treatment combinations were obtained and each was repeated 3 times and 24 experimental units were obtained, each experimental unit consisted of 8 plants and 4 plants were sampled. Data obtained from statistical analysis with F test, if F count is greater than F table at the level of 5% followed by Duncan 's New Multipe Range Test (DNMRT) at the level of 5%

3. Results and Discussion

Stem length

The results of the variance of the cucumber stem length by adding bamboo shoot POC differed significantly, but in the single factor the variety and interaction between the two different factors were not significant (Appendix 6a). Results of stem length are presented in Table 1.

Table 1 shows that giving bamboo shoots POC 100 ml/l of water is longer than 0 ml/l of water, 50 ml/l of water and 75 ml/l of water which is 182.78 cm. This is due to the high N content of bamboo shoots POC. According to Faridha Angraeni et al. (2018), that the total N contained in bamboo shoot POC as much as 0.72% and the high protein in bamboo shoots organic matter can increase the N content in the resulting liquid organic fertilizer, because the N element is the result of a change in protein metabolism. When viewed from the variety, the stem length of the F1 mercy variety is 173.13 cm longer than the F1 wulan variety, which is 169.09 cm. According to Suparyono and Setyono (1993), that each variety has its own characteristics and depends on the genetic nature of each variety in terms of ability to tolerate various growing environmental conditions [15].

Table 1. The length of the stem of several varieties of cucumbers with the addition of bamboo shoots POC

Variety	Bamboo Shoots POC (ml/l)				Average
	0	**50**	**75**	**100**	
			cm		
Wulan F1	148.33	166.39	178.76	182.89	169.09
Mercy F1	152.60	177.77	179.50	182.67	173.13
Average	150.46 c	172.08 b	179.13 ab	182.78 a	
KK	2.83%				

Numbers followed by the same lowercase letter on the same line differ not significantly according to α 5% DNMRT

POC with high N content is used to stimulate plant growth. Furthermore Salisbury and Ross (1995) explain that the function of nitrogen is important in the process of photosynthesis and the compilation of core cell components that determine the quality and quantity of crop yields. The more the amount of available chlorophyll in the leaves causes the green pigment to become thicker and the results of photosynthesis also increase. Chlorophyll content that can form or stimulate plant growth mainly stimulates vegetative organs of plants. Besides bamboo shoots also contain gibberellins as one of the growth regulating substances that can stimulate the growth of length between segments of the plant so that the plant becomes taller [16].

The age of the first flower appearance

The results of the age variance of the first flower appearing on the cucumber variety had a very significant effect, but on the single factor the addition of bamboo shoot POC and the interaction of the two influential factors were not significant (Appendix 6b). The results of the age of the first flower appearing are presented in Table 2.

Table 2. The age of the first flower appears several cucumber varieties with the addition of bamboo shoots POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	**50**	**75**	**100**	
	.....		HST	.....	
Wulan F1	23.33	22.67	22.67	22.00	22.67 A
Mercy F1	27.33	26.67	26.67	26.00	26.67 B

Average	25.33	24.67	24.67	24.00
KK	4.05%			

Numbers that are followed by uppercase letters are the same in the same column which is not significantly different according to α 5% DNMRT

Table 2 shows that the average age of the first flower appears in F1 wulan varieties which is 22.67 HST while in F1 mercy varieties is 26.67 HST. When viewed from the description (Appendix 2) the age starts flowering in the Wulan F1 variety, which is 20 HST while the age of the first flower appears in the Wulan F1 variety by giving several doses of POC bamboo shoots a few days later. The age of the first flower appearing F1 mercy varieties compared with the description (Appendix 2) is 26 HST, this is the same as the age of the first flower appears in the treatment of several doses of bamboo shoots POC. Table 2 also shows that the administration of POC 100 ml/l of water produces a flower emergence age of 24.00 HST faster than 0 ml/l of water, 50 ml/l of water and 75 ml/l of water. So the more doses given the more nutrients are donated to plant growth.

The age difference of the first flower appears one of which is influenced by the genetic factors of the plant itself. But the thing that is very influential in the process of flowering plants is the availability of nutrients in the soil, one of which is the element P (0.04%). P functions in plants can accelerate flowering and ripening of fruit and seeds and can increase grain production [17]. At the beginning of plant growth, phosphate fertilizer plays a role as a component of several enzymes and the availability of nucleic acids. While at the end of growth plays an important role in the formation of seeds and fruit.

Age of the first harvest

The results of the first harvest age variety on cucumber varieties had a very significant effect, but on the single factor the addition of bamboo shoot POC and the interaction of the two influential factors were not significant (Appendix 6c). The results of the first harvest age in Table 3.

Table 3. Age of the first harvest of several varieties of cucumbers with the addition of bamboo shoots POC.

Variety	**Bamboo Shoots POC (ml/l)**				**Average**
	0	**50**	**75**	**100**	
	.....		HST	.....	
Wulan F1	31.33	31.33	36.67	30.00	32.33 A
Mercy F1	37.33	36.67	36.67	36.67	36.83 B
Average	34.33	34.00	33.35	33.35	
KK	3.19%				

Numbers that are followed by uppercase letters are the same in the same column which is not significantly different according to α 5% DNMRT

Table 3 shows that the average age of the first flower appears in F1 Wulan varieties, which is 32.33 HST while in F1 Mercury varieties is 36.83 HST. When viewed from the description (Appendix 2) the age of the first harvest on F1 wulan varieties is 30 HST while the age of the first harvest in the Wulan F1 variety is by giving several doses of POC bamboo shoots a few days later. The first harvest age of F1 mercy varieties compared with the description (Appendix 2) 36 HST

equals the age of the first flower appears on the addition of several doses of bamboo shoot POC. Judging from the POC given, the age of the first harvest at giving POC 75 ml/l of water and 100 ml/l of water was the same or not significantly different, namely 33.35 cm, but significantly different from the administration of POC 0 ml/l water and 50 ml/l water. This shows that the administration of nutrients has an effect on the age of the harvest so that the different doses of liquid bamboo shoots of organic fertilizer show different results on the age of cucumber crop harvest.

Harvest age is closely related to the fulfillment of nutrient needs and sufficient level of moisture for plants when plants enter the growth and development phase until the plants produce fruit. Ariani (2009) states that better soil moisture and nutrient conditions available and can be utilized by plants will make the harvest age faster. The closed soil condition of mulch will maintain soil moisture, reduce evaporation so that the availability of water in the soil is more adequate for plants, both to dissolve fertilizer or nutrients, facilitate translocation and increase photosynthates that plants can use for plant formation and development.

Number of fruit crops

The results of the variance of the number of fruit crops with the addition of bamboo shoots POC have a very significant effect, but on a single factor variety and the interaction of the two influential factors are not significant (Appendix 6d). The results of the number of fruit crops are presented in Table 4.

Table 4. The number of fruit crops in several cucumber varieties with the addition of bamboo shoots POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	.....item/plant.....				
Wulan F1	19.33	21.00	22.00	24.00	21.58
Mercy F1	20.67	21.67	23.00	24.33	22.42
Average	20.00 c	21.33 bc	22.50 b	24.16 a	
KK	4.35%				

Numbers followed by the same lowercase letter on the same line differ not significantly according to α 5% DNMRT

Table 4 shows that giving bamboo shoots POC 100 ml/l of water produced the highest fruit, which was 24,16 plants. Whereas with the provision of bamboo shoots POC 0 ml/l of water, 50 ml/l of water and 75 ml/l of water produce a number of fruits in a row which is 20,00 planting fruits, 21,33 plantations and 22,50 plants. So the higher the bamboo shoot POC given, the more the number of fruit crops. This is due to the presence of nutrient P contained in bamboo shoots POC so as to produce better plant growth and development. According to Faridha Angraeni et al. (2018), that P elements contained in bamboo shoot POC are as much as 0.04%.

Availability of P nutrients in sufficient quantities will cause rapid cell formation, of course the results of photosynthesis are also getting bigger so that the results of photosynthesis translocated to all parts of the plant more and more including fruit formation.

When viewed from the variety, the number of fruit crops of F1 mercy varieties was 22.42 fruits/plant more than F1, which was 21.58 fruits/plants. The difference in crop fruit size from the two varieties is caused by the genetic characteristics of each variety and environment, so that it will have a different effect on the number of fruit crops. This is in accordance with the opinion of

Mackay et al (2011). It is each individual shows diverse growth and results as a result of genetic and environmental influences, where genetic influences are the influence of offspring possessed by each variety while environmental influences are the effects caused by habitat and environmental conditions [18-20].

Fruit diameter

The results of the variability of fruit diameter with the addition of bamboo shoots POC have a very significant effect, but on a single factor variety and the interaction of the two factors have no significant effect (Appendix 6e). The results of fruit diameter are presented in Table 5.

Table 5. Fruit diameter of several cucumber varieties with the addition of bamboo shoot POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	.....cm.....				
Wulan F1	4.08	4.25	4.49	5.02	4.46
Mercy F1	4.09	4.49	4.5	4.87	4.48
Average	4.08 c	4.37 b	4.49 b	4.94 a	
KK	3.70%				

Numbers followed by the same lowercase letter on the same line differ not significantly according to α 5% DNMRT.

Table 5 shows that the addition of 100 ml/l of bamboo shoot POC can increase the diameter of the cucumber plant fruit to 4.94 cm. This is because at these concentrations the nutrients needed by plants are available in a balanced state, so they can spur better growth and are supported by appropriate environmental conditions.

When compared with the description (Appendix 2) the fruit diameter of the F1 mercy variety is 6.5 cm and the results obtained have not reached the description. While the fruit diameter in the Wulan F1 variety which is 3.5 cm has reached the results obtained. The character appearance of each variety is determined by genetic factors of the variety. These genetic differences lead to the appearance of plant phenotypes with the appearance of specific traits and characteristics that differ from one another with environmental influences. This is in accordance with the opinion of Bradshaw (1965), which states that differences that can occur in each variety are caused by the presence of genetic variations that can differ from each of these varieties. The various genes of each variety are visualized in diverse characters. Diversity due to environmental factors and genetic diversity generally interact with each other in influencing the appearance of plant phenotypes. Genetic factors will not show the nature they carry except in the presence of appropriate environmental factors for plant growth and development [21-22].

The diameter of the fruit is closely related to the weight of the fruit of the crop, where a large diameter of fruit will give the results of a large fruit weight, while the small diameter of the fruit will give the results of the weight of small fruit. Fruit diameter is also influenced by the availability of nutrients in the soil and absorption by plants. Provision of fertilizers with the right dosage will provide good fruit production including diameter[23-24].

Fruit length

The results of the variance of fruit length on cucumber varieties had a very significant effect and by giving bamboo shoots POC also had a very significant effect but the interaction of the two factors was not significant (Annex 6f). The fruit length is presented in Table 6.

Table 6 shows that with the addition of bamboo shoot POC 100 ml/1 of water yields a cucumber fruit length of 18.06 cm which is in the F1 mercy variety. The results obtained were in accordance with the description (Appendix 2) that the F1 mercy variety had a longer fruit length than the F1 wulan variety, namely fruit length on F1 mercy varieties 22-24 cm and fruit length on F1 cmul varieties 14 cm. This is due to the provision of bamboo shoots POC can contribute nutrients to plants that are important for cucumber fruit. So the higher the dose of POC given, the longer the cucumber fruit is produced. Giving bamboo shoot POC can contribute enough nutrients for the growth and development of fruits, especially K elements which are quite high and balanced with other elements such as N and P.

Table 6. Fruit length of several varieties of cucumbers with the addition of bamboo shoots POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	.....cm.....				
Wulan F1	14.12	15.41	15.62	16.08	15.31 B
Mercy F1	16.66	18.12	19.42	20.04	18.56 A
Average	15.39 c	16.76 b	17.52 ab	18.06 a	
KK	2.97%				

The numbers followed by the same lowercase letters in the same row and uppercase letters are the same in the same column which is not significantly different according to α 5% DNMRT

Stitt et al (1994) stated that plant growth and production will be determined by the rate of photosynthesis that is controlled by the availability of nutrients and water. During the reproductive phase the area of reproductive utilization becomes very strong in utilizing photosynthesis results and limits the distribution of assimilation results to areas of vegetative growth. This states that the photosynthate produced is focused to be transferred to the fruit section for its development [25-26].

Fruit weight of plants

The results of the fingerprints of various fruit weights with the addition of bamboo shoots POC have a very significant effect, but on a single factor variety and the interaction of the two influential factors are not significant (attachment 6g). The results of the weight of fruit crops are presented in Table 7.

Table 7 shows that the addition of 100 ml/1 of bamboo shoots POC results in a plant fruit weight of 5.11 kg higher than 0 ml/1 of water, 50 ml/1 of water and 75 ml/1 of water. Whereas in the varieties, the yield of the heaviest fruit weight in the Wulan F1 variety was 4.36 kg and the fruit weight of the crop in the wulan variety was 4.06 kg. The difference in fruit weight from each variety due to the sweet differences in each of these varieties. The fruit weight of the crop is closely related to the diameter of the fruit, where a large fruit diameter will give the results of a large fruit weight, while the small diameter of the fruit will give the results of a small fruit weight. The higher the concentration of POC the higher the weight of the fruit produced. The process of forming nutrients

which is very important is P and K. According to Faridha Angraeni et al. (2018), that K elements contained in bamboo shoot POC are 0.12%.

Table 7. Fruit crop weight of several cucumber varieties with the addition of bamboo shoots POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	.....kg.....				
Wulan F1	3.37	3.77	5.10	5.20	4.36
Mercy F1	3.00	3.93	4.30	5.03	4.06
Average	3.18 c	3.85 bc	4.70 ab	5.11 a	
KK	7.84%				

Numbers followed by the same lowercase letters on the same line differ not significantly according to the α 5% DNMRT test

The increase in fruit weight is influenced by the adequacy of nutrient K because these nutrients play a role in carbohydrate translocation and starch formation. Novizan (2002), states that the size and quality of fruit in the generative phase will be influenced by nutrient availability K, while P plays a role in flower and fruit formation. In accordance with the opinion of Lingga and Marsono (2007), that potassium serves to help the formation of proteins and carbohydrates. Potassium also plays a role in strengthening the plant's body so that leaves, flowers and fruit do not fall easily. Plants that are deficient in potassium cause the fruit to grow imperfectly, small, poor quality, low yield and not hold up.

Fruit weights per plot and per hectare

The results of the prints of the variety of perplot fruit weights with the addition of bamboo shoots POC have a very real effect but the single factor variety and the interaction of the two influential factors are not significant (Appendix 6h). The results of perplot fruit weights presented in tables 8 and per hectare are presented in Table 9.

Table 8. Perplot fruit weights of several cucumber varieties with the addition of bamboo shoots POC.

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	.....kg.....				
Wulan F1	7.43	8.07	8.33	8.60	8.11
Mercy F1	7.17	8.00	8.03	8.43	7.91
Average	7.30 b	8.03 ab	8.18 ab	8.51 a	
KK	4.12%				

Numbers followed by the same lowercase letter on the same line differ not significantly according to α 5% DNMRT

Table 9. Fruit weight per hectare of several cucumber varieties with the addition of bamboo shoot POC

Variety	Bamboo Shoots POC (ml/l)				Average
	0	50	75	100	
	..... ton.....				
Wulan F1	41.29	44.81	46.29	47.77	45.05
Mercy F1	39.81	44.44	44.63	46.85	43.93
Average	40.55 b	44.62 ab	45.46 ab	47.31 a	
KK	4.12%				

Numbers followed by the same lowercase letter on the same line differ not significantly according to α 5% DNMRT

Table 8 shows that giving of bamboo shoots POC has a very significant effect while the varieties and interactions of the two influential factors are not significant. Giving bamboo shoot POC 100 ml/1 water was significantly different from 0 ml/1 water, 50 ml/1 water and 75 ml/1 water which produced 8.51 kg fruit weight. This is due to the provision of POC with a concentration of 100 ml/1 of water able to meet the nutrient requirements needed by cucumber plants in the fruit formation process, this is also related to the greater the fruit, the weight of the fruit will increase.

In Tables 8 and 9 seen from the average giving of bamboo shoots POC 0 ml/1 of water 7.30 kg is equivalent to 40.55 tons/ha, giving POC bamboo shoots 50 ml/1 water 8.03 kg is equivalent to 44.62 ton/ha, giving POC bamboo shoots 75 ml/1 water 8.18 kg is equivalent to 45.46 tons/ha, and the administration of bamboo shoot POC 100 ml/1 of water 8.51 kg is equivalent to 47.31 tons/ha. When viewed from the description (Appendix 2) fruit yields of Wulan F1 varieties as much as 45-50 tons/ha and the average fruit yield obtained as much as 45.05 tons/ha has been able to produce optimal fruit production. In F1 mercy varieties when compared with the description (Appendix 2) fruit yields are 60-70 tons/ha while the average fruit yield obtained has not been able to achieve optimal results as much as 43.93 tons/ha.

If seen from the influence of bamboo shoots POC which has been given by giving POC 100 ml/1 of water, it can produce cucumber plant production as much as 47.31 tons/ha. This is due to the provision of bamboo shoots POC can provide nutrients for growth and development of fruit weight, nutrients available in bamboo shoots POC such as N, P and K. Hara available from liquid organic fertilizer will be used to stimulate photosynthesis, photosynthesis results will translocated to all parts of the plant to stimulate vegetative and generative development of plants.

Plant yields will be optimal if conditions are met such as the availability of sufficient nutrients and appropriate environmental factors. Fageria et al (1987) stated that with sufficient plant nutrient needs both macro and micro nutrients, plant growth and productivity will run smoothly [27]. The results of broad unity were strongly influenced by variety, soil fertility and water conditions. Besides that the total population of unity plants also affects the results, with the growing population of plants will be able to provide higher yield increases [28-30].

4. Conclusions

Based on the results of experiments that have been carried out it can be concluded that the interaction of bamboo shoots POC with varieties did not significantly influence the growth and yield of cucumber plants, the concentration of bamboo shoots liquid organic fertilizer significantly

affected the growth and yield of cucumber plants. The best production was achieved by giving 100 ml/l water bamboo shoot POC namely 47.31 tons/ha, cucumber varieties affected the age of first flower appearance, first harvest age and fruit length in F1 wulan variety but had no effect on stem length observation, number of fruit cropping, fruit diameter, plant fruit weight, fruit weight per plot and per hectare. The best fruit length is obtained from F1 mercy varieties.

Based on the conclusions, it is suggested to get better growth and yield of cucumber plants using bamboo shoots POC 100 ml/l water and the varieties used are the two varieties, namely varieties of Wulan F1 and Mercury F1. Of the two varieties have their respective advantages.

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