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Effect of applying NPK 17+17+17 fertilizer and GDM liquid organic fertilizer (POC) on growth and production of cucumber (Cucumis sativus L.)

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ABSTRACT

This research used a factorial Randomized Block Design (RAK), with two treatment factors, where the first factor was the administration of a dose of NPK 17+17+17 Kuda Sakti (N) fertilizer consisting of 4 levels, namely, N0 = No Treatment, N1 = 150 kg /ha (60 g/plot), N2 = 300 kg/ha (120 g/plot), N3 = 450 kg/ha (180 g/plot). The second factor is the dose of liquid organic fertilizer (POC) GDM (G) which consists of 4 levels, namely, G0 = No Treatment, G1 = 6.7 ml POC GDM/1 liter of water, G2 = 13.4 ml POC GDM/1 liter of water, G3 = 20 ml POC GDM/ 1 liter of water. The parameters observed were primary stem length (cm), number of fruit per plant (fruit), number of fruit per plot (fruit), fruit weight per plant (kg), and fruit weight per plot (kg). The interaction of NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC) had a significant effect on primary stem length at 14, 28, and 42 DAT, number of fruit per plant, fruit weight per sample, and fruit weight per plot, but had no effect real impact on the number of fruits per plot. The interaction between the two treatments with the highest mean for each parameter, namely primary stem length at 14, 28, and 42 HST respectively, was highest at N3G3 (15.14 cm), (120.08 cm), (184.12 cm), number of fruit per plant The highest number is found in N3G3 (10.00 pieces), the highest number of fruit per plot is found in N3G3 (39.00 pieces), the heaviest fruit weight per plant is found in N3G3 (2.73 kg), the heaviest fruit weight per plot is found in N3G3 (14.76 kg). The parameters observed in this research included: Plant Height (cm) at 30, 45 HST, Number of Branches, Number of Pods per Plant (fruit), Pod Weight per Plant (g) and Pod Weight per Plot (g).

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1. INTRODUCTION

Cucumber (Cucumis sativus L.) is a fruit vegetable that is widely consumed fresh by Indonesian people. The nutritional value of cucumber is quite good because this fruit vegetable is a source of minerals and vitamins. One raw cucumber weighing 300 grams (g) that is not peeled contains nutrients such as calories, carbohydrates, protein, vitamins C and K, and potassium. In general, cucumbers are served in fresh processed form, such as pickles, pickles, kimchi, salads, salads and fresh vegetables. Cucumbers can also be consumed as a fresh drink in the form of juice. Cucumber juice that is drunk regularly every 2 days is efficacious for smoothing the skin,

preventing skin damage from sunburn, and can reduce heat, help lose weight, is good for bone health, and lowers blood sugar (Husna, 2021).

Cucumber is a type of vegetable that is quite popular in almost all countries. Cucumbers originate from the Himalayan highlands and currently their cultivation has spread throughout tropical regions. In Indonesia, cucumbers are widely grown in Java and Sumatra. Advances in the field of beauty technology reveal that cucumbers can be used as cosmetic ingredients for beauty treatments by processing them using modern technology. From an economic point of view, cucumbers have quite good prospects because they are in demand in many countries (Zulyana, U. 2019).

Based on data from the Indonesian Central Statistics Agency (2022), the amount of cucumber production in Indonesia in 2020 increased by 30,655 tons from 2019. The amount of cucumber production in 2020 was 441,286 tons and the amount of cucumber production in 2021 was 471,941 tons. The low production of cucumber plants in Indonesia can be caused by several factors including climate factors, farming techniques such as soil processing, fertilization, irrigation, as well as pest and disease attacks (Kurniawati et al., 2019). In the rainy season, cucumber production is lower than in the dry season, because too much rainfall can cause the flowers of cucumber plants to fall. Cucumber production can be increased by proper fertilization. Fertilization needs to be done because the nutrient content in the soil is always reduced due to being absorbed by plants. In general, there are two types of fertilizer, namely organic fertilizer and inorganic fertilizer. According to research results (Puspitasari, 2019), factors in cucumber productivity can be estimated using eight variables, namely seeds, manure, lime, chemical fertilizers, leaf and fruit fertilizers, solid pesticides, liquid pesticides and labor.

NPK Fertilizer 17+17+17 Kuda Sakti is an NPK fertilizer that contains a balanced ratio of N, P2O5 and K2O, namely 17%. This means that the Nitrogen, Phosphorus and Potassium content in this fertilizer is 17% each. NPK 17+17+17 Kuda Sakti fertilizer has many good uses for all types of plants. NPK 17+17+17 fertilizer can be used for all types of soil and plants. This fertilizer is more efficient to use for podzolic soils with poor Phosphorus and Potassium reserves. This fertilizer can be used as the main fertilizer for vegetables, corn, peas, and so on.

GDM (Gajah Dipelupuk Mata) is the trademark name of fertilizer produced by PT. Graha Alam Perfect. This fertilizer contains complete macro and micro nutrients and is environmentally friendly. The elements contained in GDM are N, P, K, Na, Ca, Mg, Fe, Cu, Zn, Mn, B, Co, and Mo. Apart from containing liquid nitrogen nutrients, it also contains microelements which function as catalysts in the synthesis and formation of chlorophyll. Research by Rambe et al, (2019) shows that administering GDM liquid organic fertilizer at a dose of 4 cc/l of water can increase plant growth and production. Based on the description above, the author is interested in conducting research "The Effect of Giving NPK 17+17+17 Fertilizer and GDM Liquid Organic Fertilizer (POC) on the Growth and Production of Cucumber Plants (Cucumis sativus L.)".

2. METHOD

2.1 Place and time

Study This carried out in October - December 2023. Research This carried out in Pematangsiantar , Pisang Kipas Village , District Siantar Sitalasari . Pematangsiantar city with height 400-600 m above sea level as well as average minimum temperature 210C and temp maximum 310 C. Average bulk rain is 229mm-341mm per month .

2.2 Tools and materials

Tools used in research This that is hoe, machete, measuring tape, stake, label board, hand sprayer, bamboo, plastic rope, gembor, tools write, and other tools needed at the time study. Materials used in the implementation study This is Seed cucumber varieties Metavy F1, NPK fertilizer 17+17+17 Kuda Sakti, fertilizer organic liquid (POC) GDM, Dolomite Lime, Insecticide Petrogenol 800L, Losmine 50 EC, Pegasus 500 SC, Fungicide Benlox 50 WP, and water for water.

2.3 Research methods

Study this is by design with Factorial Randomized Block Design (RAK) consisting of of 2 treatment factors, namely: First factor is giving NPK 17+17+17 fertilizer consists on 4 levels, namely: N0= Without Treatment; N1= NPK 17+17+17 dose 150 kg/ha (60 g/plot); N2= NPK 17+17+17 dose 300 kg/ha (120 g/plot); N3= NPK 17+17+17 dose 450 kg/ha (180 g/plot). The

second factor is the concentration of liquid organic fertilizer (POC) GDM consisting of 4 levels, namely: G_0 = No Treatment; G_1 = 6.7 ml POC GDM/1 liter of water; G_2 = 13.4 ml POC GDM/1 liter of water ; G_3 = 20 ml POC GDM/1 liter of water. To determine the effect of treatment on the observed plant parameters, calculations were carried out using a systematic model and analysis of variance. If from the analysis of variance there is a significant effect then proceed with the least significant difference test (BNT) at the 5% level

2.4 Research Implementation

2.4.1 Soil Cultivation

Soil processing is carried out twice. The first processing is carried out by hoeing the soil to a depth of ± 20 cm, then leaving it for a week. The second land preparation is carried out by hoeing and smoothing the lumpy soil. Then make 48 plots with an area of 200 cm x 200 cm per plot, then sprinkle dolomite lime before planting at 1 kg/plot.

2.4.2 Planting

This planting was carried out according to the recommended distance of 40 cm x 40 cm (plant population of 48 plots) in each experimental plot. Planting is done in single steps, by making a planting hole, then inserting 1 seed per planting hole with a planting hole depth of ± 2 cm below the surface of the soil.

2.5 Maintenance

2.5.1 Sprinkling

Watering is done 2 (two) times a day between morning and evening, but if it rains no watering is done. Where watering is done using gembor.

2.5.2 Stitching

Embroidery is carried out no later than one (1) week. The plants that are embroidered are those that die and those that are attacked by disease. Embroidery is done by planting the seeds again individually.

2.5.3 Weeding

Weeding is done after the plants are 2 weeks old by pulling out the weeds around the plants. Subsequent weeding depends on the condition of the weeds in the field.

2.5.4 Installation of poles or stakes

Stakes or stakes are bamboo and wood that function to prop up plants, make it easier to maintain and support cucumber plants. Pengajiran is carried out 2 weeks after planting, the height of the bamboo and wood is 200 cm.

2.5.5 NPK 17+17+17 Fertilizer Application

Twice applications of NPK 17+17+17 Kuda Sakti fertilizer were carried out when the plants were 14 and 28 HST, ½ dose each. 4 levels were carried out N0 = No Treatment, N1 = 60 grams/plot, N2 = 120 grams/plot, N3 = 180 grams/plot. Fertilization is done by sprinkling it evenly around the plant, with a predetermined dose.

2.5.6 POC GDM application

The application was carried out 3 times on plants aged 10 HST, 20 HST and 30 HST by spraying evenly onto the leaves and stems. POC GDM application was carried out with 4 levels G0 = No Treatment, G1 = 6.7 ml POC GDM/1 liter of water, G2 = 13.4 ml POC GDM/1 liter of water, G3 = 20 ml POC GDM/1 liter of water. How to apply by spraying POC GDM using a handsprayer, application is done in the morning.

2.6 Pest and Disease Control

Pests that damage cucumber plants in the research area are fruit flies and aphids (aphids). Pest control is carried out at 7 HST by spraying the insecticide Petrogenol 800L (active ingredient methyl eugenol 800 g/l) concentration 1 ml/trap to kill fruit flies, insecticide Losmine 50 EC (active ingredient lufenuron 50 g/l) concentration 1 cc/liter and insecticide Pegasus 500 SC (active ingredient diafentiuron 500 g/l) concentration of 1 cc/liter. The disease attack found on cucumber plants was fusarium wilt and was controlled by spraying the fungicide Benlox 50 WP 250 gr (active ingredient benomyl) at a dose of 1.5 gr/liter and carried out at 7 HST.

2.7 Harvesting

The first harvest is done at the age of 35, the 2nd harvest is at the age of 37, the 3rd harvest is at the age of 39, the 4th harvest is at the age of 41, the 5th harvest is done at the age of 43. Harvesting is done by picking (cutting) the fruit by hand and leaving the fruit stalk on the plant. Cucumber fruit that are ready to be harvested look for the stems on the stem to be brown, the skin of the fruit is yellow.

2.8 Observed Parameters

2.8.1 Stem Length (cm)

The length of the primary stem was measured 3 times namely, at the age of 14 HST, 28 HST, and 42 HST after plant with method measure start from base stem until point grow highest with use tape measure with centimeter scale.

2.8.2 Amount Fruit Per Plant (fruit)

Amount fruit calculated every harvest on each plant samples / plants.

2.8.3 Amount Fruit Per Plot (fruit)

Amount fruit per plot is calculated at the time harvest with method count amount fruit in each plot.

2.8.4 Fruit Weight Per Plant (kg)

Fruit weight per sample calculated at the time harvest with method weigh fruit that is in each plant sample.

2.8.5 Fruit Weight Per Plot (kg)

Fruit weight per plot was calculated with method weigh fruit results harvest plant cucumbers on each plot.

3. RESULTS AND DISCUSSION

3.1 Primary Stem Length

Long average data Primary stems aged 14 DAP, 28 DAP and 42 DAP can be obtained seen in attachments 1, 4, 7. Analysis results fingerprint variety long primary stems in appendices 3, 6, and 9 show that treatment NPK fertilizer 17+17+17 and Fertilizer Organic Liquid (POC) GDM and interactions between second treatment influential real to long primary stem.

By statistics giving NPK 17+17+17 fertilizer can increase long primary stem in plants cucumber. This is because internal nutrient content land like the elements N, P2O5 and K2O are sufficient available for growth vegetative like tall plant. This matter Because useful element N For growth plants and formation green leaf, function phosphorus (P) divide plant useful for stimulate growth roots, potassium also plays a role in strengthen body plants, increasingly increase dose fertilizer so tall plants too increased (Purnomo et al., 2017). Alpani et al., (2021) stated element K is element important for the process of photosynthesis takes place Where influence availability ray sun, water, CO2 and the next opening of the stomata influence growth with show tall low plant. For know difference between treatment done testing with different tests real smallest (BNT) at the 5% level which can be seen in table 1.

Table 1. Test Results for Average Differences in Primary Stem Length at 14, 28, and 42 DAP with Giving NPK 17+17+17 Fertilizer and Fertilizer Organic Liquid (POC) GDM

Treatment	Average Primary Stem Length (cm)		
	14 HST	28 HST	42 HST
N0	11.80 d	80.98 d	143.71 d
N1	12.68 c	89.84 c	167.25 c
N2	13.04 b	93.77 b	172.50 b
N3	13.38 a	103.21 a	178.66 a
BNT 5%	0.29	2.42	5.07
G0	12,10 c	82.20 d	157.05 c
G1	12.53 b	90.52 c	163.04 b
G2	13.22 a	95.80 b	169.27 a
G3	13.05 a	99.26 a	172.76 a
BNT 5%	0.29	2.42	5.07
N0G0	12.09 e	79.02 f	153.80 e
N0G1	11.64 f	77.53 f	131.90 h
N0G2	11.97 e	83.60 e	140.20 f
N0G3	11.47 g	83.75 e	148.93 e
N1G0	12,14 e	81.81 e	149.17 e
N1G1	12.72 d	89.43 d	165.68 c
N1G2	13,11 c	93.42 d	176.24 a
N1G3	12.76 d	94.68 c	177.93 a
N2G0	12.39 d	82.37 e	157.94 d
N2G1	13,13 c	95.95 c	173.35 a
N2G2	13.81 b	98.21 c	178.63 a
N2G3	12.82 d	98.53 c	180.07 a
N3G0	11.78 f	85.60 e	167.28 b

N3G1	12.64 d	99.16 c	181.22 a
N3G2	13.97 b	107.98 b	182.01 a
N3G3	15,14 a	120.08 a	184.12 a
BNT 5%	0.58	4.85	10.15

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

Table 1 shows that the NPK (N 3) fertilizer treatment showed the longest primary stem which was significantly different from the other treatments. Table 2 shows that the GDM (G3) liquid organic fertilizer (POC) treatment showed the longest primary stem which was not significantly different from other treatments at 14 and 42 DAP, but was significantly different from other treatments at 28 DAT. This is because the higher concentration of liquid organic fertilizer will increase the supply of nutrients to plants, where liquid organic fertilizer can stimulate microbial activity in the soil which produces macro elements such as Nitrogen (N), Phosphorus (P), and Potassium (K).). According to Prasetya et al., (2019) the nitrogen element is useful for plant vegetative growth, namely the formation of new cells such as leaves, branches, and replacing damaged cells. POC GDM has microorganisms, namely Bacillus pumillus bacteria, which are useful for producing hormones to increase plant growth, increase the height & size of plant stems, increase the number & area of leaves.

3.2 Number of Fruits Per Plant (fruit)

Data on the average number of fruit per plant is in appendix 10 and the results of variance analysis in appendix 12 show that the NPK 17+17+17 fertilizer treatment, GDM liquid organic fertilizer (POC) and the interaction between the two treatments have a significant effect on the number of fruit per plant. To determine the differences between treatments, testing was carried out with the least significant difference test (BNT) at the 5% level which can be seen in table 2.

Table 2 shows that the number of fruit per plant has a significant effect due to the NPK fertilizer treatment, the highest average number of fruit per plant is found in the N3 treatment, which is not significantly different from the N2 treatment, but is significantly different from the other treatments.

Table 2. Test Results for Differences in Average Number of Fruits Per Plant with Application of NPK 17+17+17 Fertilizer and GDM Liquid Organic Fertilizer (POC)

Treatment	Average Number of Fruits Per Plant (fruit)
N0	7.00 c
N1	8.00 b
N2	9.00 a
N3	9.00 a
BNT 5%	0.20
G0	7.00 c
G1	8.00 b
G2	9.00 a
G3	9.00 a
BNT 5%	0.20
N0G0	7.00 d
N0G1	6.00 e
N0G2	6.00 e
N0G3	7.00 d
N1G0	7.00 d
N1G1	8.00 c
N1G2	8.00 c
N1G3	9.00 b
N2G0	7.00 d
N2G1	9.00 b
N2G2	9.00 b
N2G3	10.00 a
N3G0	7.00 d
N3G1	9.00 b
N3G2	10.00 a
N3G3	10.00 a
BNT 5%	0.50

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

This is because the application of NPK 17+17+17 fertilizer is able to provide sufficient and balanced nutrients for plant needs. NPK 17+17+17 fertilizer provides large amounts of nutrients, especially the nutrient N, this element plays a very important role in the number of fruit produced Dewi, (2019). Table 3 shows that the number of fruits per plant has a significant effect due to GDM liquid organic fertilizer (POC) treatment. The highest average number of fruits per plant was in treatment G3, which was not significantly different from treatment G2, but was significantly different from other treatments. POC GDM has microorganisms, namely Pseudomonas mallei bacteria, which are useful for increasing P elements in the soil & crop yields, preventing cut-neck disease. Saptorini, (2018) stated that the P element in Pseudomonas mallei bacteria functions as a protein constituent, which is needed for the formation of flowers, fruit and seeds. To get the right amount of fruit, sufficient nutrient availability is needed so that the fruit produced is of good quality.

3.3 Number of Fruits Per Plot (fruits)

Data on the average number of fruit per plot are in Appendix 13 and the results of variance analysis in Appendix 15 show that the NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC) have a significant effect on the number of fruit per plot, but there is an interaction between the two treatments. no real effect.

This is because the NPK 17+17+17 fertilizer treatment is able to meet the nutrient needs of cucumber plants. By fulfilling the plant's nutrients, the plants are able to increase the success of pollination in spurring the formation of tall cucumber fruit. Fruit formation that is high enough will have a big influence on the number of fruit the plant produces. If fruit formation is high, the number of fruit on the plant will also be high Yani, (2021). Fertilizer is able to bind nutrients and provide nutrients according to their needs, so that the presence of NPK 17+17+17 fertilizer provides fertilization effectiveness and efficiency. The development of plant tissue is largely determined by the availability of nutrients, especially N, which both of them possess. This is in accordance with the opinion (Ayu et al., 2019)that sufficient nitrogen availability in plants will increase the quantity and quality of plant results. Nitrogen availability plays an important role in plant production so that it influences the quantity and quality of a plant.

To determine the differences between treatments, testing was carried out with the least significant difference test (BNT) at the 5% level which can be seen in table 3.

Table 3. Test Results for Differences in Average Number of Fruits Per Plot with Application of NPK 17+17+17 Fertilizer and GDM Liquid Organic Fertilizer (POC)

Treatment	Average Number of Fruits Per Plot (fruit)
N0	30.00 c
N1	33.00 b
N2	34.00 a
N3	35.00 a
BNT 5%	1.61
G0	30.00 d
G1	32.00 c
G2	34.00 b
G3	36.00 a
BNT 5%	1.61
N0G0	28.00
N0G1	31.00
N0G2	30.00
N0G3	32.00
N1G0	30.00
N1G1	32.00
N1G2	35.00
N1G3	34.00
N2G0	30.00
N2G1	33.00
N2G2	36.00
N2G3	37.00
N3G0	30.00
N3G1	33.00
N3G2	37.00
N3G3	39.00

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

Table 3 shows that the number of fruit per plot has a significant effect due to the NPK 17+17+17 fertilizer treatment, the highest average number of fruit per plot is in the N_3 which is not significantly different from the $N_{2\ treatment}$, but is significantly different from the other treatments. Table 4 shows that the number of fruit per plot has a significant effect due to the GDM liquid organic fertilizer (POC) treatment. The highest average number of fruit per plot was found in the G3 treatment which was significantly different from the other treatments.

In accordance with the opinion of Fajjriyah, (2019), increasing the number of fruit is also influenced by the provision of appropriate fertilizer and additional fertilizer so that it helps the process of moving the food cycle for the growth of plant fruit, on the other hand, excessive application can suppress the growth of plant fruit. POC GDM has microorganisms, namely Klebsiella oxytoca bacteria, which are useful for providing phosphorus which can be absorbed by plants, capturing nitrogen nutrient content so that it can be absorbed by plants effectively, increasing the composting process in the soil.

3.4 Fruit Weight Per Plant (kg)

Data on the average fruit weight per sample is in appendix 16 and the results of variance analysis in appendix 18 show that the NPK 17+17+17 fertilizer treatment, GDM liquid organic fertilizer (POC) and the interaction between the two treatments have a significant effect on fruit weight per plant.

To determine the differences between treatments, testing was carried out with the least significant difference test (BNT) at the 5% level which can be seen in table 4. Table 4 shows that the fruit weight per plant had a significant effect due to the NPK 17+17+17 fertilizer treatment, the average fruit weight per plant was heaviest in the N3 which was significantly different from the other treatments.

Table 4. Test Results for Differences in Average Fruit Weight Per Plant with Application of NPK 17+17+17 Fertilizer and GDM Liquid Organic Fertilizer (POC)

Treatment	Average Fruit Weight Per Plant (kg)
N0	1.83 d
N1	2.08 c
N2	2.14 b
N3	2.34 a
BNT 5%	0.07
G0	1.85 d
G1	1.99 c
G2	2.20 b
G3	2.34 a
BNT 5%	0.07
N0G0	1.78 i
N0G1	1.79 i
N0G2	1.82 h
N0G3	1.92 f
N1G0	1.80 h
N1G1	1.92 f
N1G2	2.24 c
N1G3	2.34 c
N2G0	1.87 h
N2G1	2.06 e
N2G2	2.24 c
N2G3	2.39 b
N3G0	1.95 f
N3G1	2.18 d
N3G2	2.50 b
N3G3	2.73 a
BNT 5%	0.16

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

This may be due to the role of macro nutrients contained in NPK 17+17+17 fertilizer. Where these elements have their respective functions in plant metabolic processes, resulting in differences in fruit weight per plant, possibly caused by differences in the P nutrients received.

This is because the application of NPK 17+17+17 fertilizer is able to provide sufficient and balanced nutrients for plant needs. NPK 17+17+17 fertilizer provides large amounts of nutrients, especially the nutrient N, this element plays a very important role in fruit formation (Handayani et

al., 2023). Table 4 shows that fruit weight per sample/plant has a significant effect due to GDM liquid organic fertilizer (POC) treatment. The heaviest average fruit weight per plant was found in the G3 treatment which was significantly different from the other treatments.

This shows that the higher the POC GDM concentration, the heavier the fruit per sample/plant. Factors that support growth such as microorganisms contained in POC GDM such as Bacillus mycoides bacteria are useful for increasing soil fertility, increasing nutrient absorption for plants. According to Suridikarta, (2019) stated that the application of liquid organic fertilizer must pay attention to the dosage in application to plants so that it can provide good results. Table 5 shows that fruit weight per sample has a significant effect due to the interaction of NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC), the heaviest average fruit weight per plant in the N3G3 treatment is significantly different from the other treatments.

This shows that the higher the POC GDM concentration, the heavier the fruit produced per sample. POC GDM has microorganisms such as Pseudomonas Mallei bacteria which are useful for increasing yields in harvest weight. This is caused by the provision of POC with this concentration which can contribute to the availability of nutrients which are broken down by microbes, especially N which plays a role in accelerating the vegetative period, P plays a role in improving the quality of fruit weight and K plays a role in accelerating photosynthesis and translocation rate reactions in increasing fruit weight. According to Ramli, N. (2022), nutrients affect the weight, especially of fruit, because the nutrients absorbed by the plant will be used to form proteins, carbohydrates and fats which will later be stored in the seeds, thereby increasing the weight of the fruit.

3.5 Fruit Weight Per Plot (kg)

Data on the average fruit weight per plot are in appendix 19 and the results of variance analysis in appendix 21 show that the NPK 17+17+17 fertilizer treatment, GDM liquid organic fertilizer (POC) and the interaction between the treatments have a significant effect on fruit weight per plot.

This is because the effect of the NPK 17+17+17 fertilizer treatment has been able to provide energy which is then used by the plant to produce fruit optimally. Apart from that, this treatment has been able to supply nutrients in a sustainable manner and in accordance with the plant's needs for nutrients and is able to improve the physical, chemical and biological properties of the soil optimally so that photosynthesis runs well (Daniel et al., 2019). Good photosynthesis will have an effect on providing a good amount of carbohydrates. The fulfillment of nutrient needs and the availability of carbohydrates according to the needs of cucumber plants will influence the plants to achieve maximum fruit weight and increase the potential for plant production.

To determine the differences between treatments, testing was carried out with the least significant difference test (BNT) at the 5% level which can be seen in table 5. Table 5 shows that the fruit weight per plot had a significant effect due to the NPK 17+17+17 fertilizer treatment, the heaviest average fruit weight per plot was in the N_3 which was significantly different from the other treatments.

Table 5. Test Results for Differences in Average Fruit Weight Per Plot with Application of NPK 17+17+17 Fertilizer and GDM Liquid Organic Fertilizer (POC)

Treatment	Average Fruit Weight Per Plot (kg)	Conversion (Tons/Ha)
N0	9.82 c	24.55
N1	10.96 b	27.40
N2	10.72 b	26.80
N3	12.37 a	30.92
BNT 5%	0.58	
G0	9.33 c	23.32
G1	10.63 b	26.57
G2	11.75 a	29.37
G3	12.17 a	30.42
BNT 5%	0.58	
N0G0	9.00 e	22.50
N0G1	9.93 d	24.82
N0G2	9.77 d	24.42
N0G3	10.59 c	26.47
N1G0	9.36 e	23.40
N1G1	10.43 c	26.07
N1G2	12.01 b	30.02
N1G3	12.02 b	30.05
N2G0	9.49 e	23.72

N2G1	10.78	c	26.95
N2G2	11.32	b	28.30
N2G3	11.31	b	28,27
N3G0	9.45	e	23.62
N3G1	11.38	b	28.45
N3G2	13.89	a	34.72
N3G3	14.76	a	36.90
BNT 5%	1.20		

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

Table 5 shows that fruit weight per plot has a significant effect due to GDM liquid organic fertilizer (POC) treatment. The heaviest average weight of fruit per plot was in treatment G_3 which was not significantly different from treatment G_2 , but was significantly different from other treatments.

This shows that the higher the POC GDM concentration, the heavier the fruit produced per plot . POC GDM has microorganisms such as *bacteria Pseudomonas alcaligenes* which is useful for increasing the absorption of the elements N, P and K. Dewi, (2019) state that in the generative period plant need lots of nutrients For produce energy for plants, that is phosphorus and potassium. The energy needed by plants is used to form flowers and other growth processes. Phosphorus and potassium are important elements that play a large role in the flowering and ripening of fruit and seeds. Table 5 shows that fruit weight per plot has a significant effect due to the interaction of NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC). The average weight of the heaviest fruit per plot in the N3G3 treatment was not significantly different from the N3G2 treatment, but was significantly different from the other treatments.

This was due to the interaction between the NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC) which was able to have a good influence on fruit weight per plot. Availability of sufficient nutrients and genetic ability to grow and develop. This is in line with Utami et al., (2019) who stated that sufficient nutrient availability is related to the ability to produce production under certain circumstances. POC GDM contains microorganisms, namely Micrococcus roseus bacteria, which are useful for loosening the soil, supporting plant root growth, being able to process micro elements, so they do not harm plants, and provide immunity to plant diseases.

4. CONCLUSION

NPK 17+17+17 fertilizer treatment had a significant effect on primary stem length at 14, 28, and 42 DAP, number of fruit per plant, number of fruit per plot, fruit weight per plant, and fruit weight per plot. Giving NPK 17+17+17 with the highest average for each parameter, namely primary stem length 14, 28, and 42 HST respectively highest N 3 (13.38 cm), (103.21 cm), (178.66 cm) , the highest number of fruit per plant was found at N 3 (9.00 pieces), the highest number of fruit per plot was at N 3 (35.00 pieces), the heaviest fruit weight per plant was found at N 3 (2.34 kg), heavy the heaviest fruit per plot was found at N 3 (12.37 kg). The best dose for administering NPK 17+17+17 is 450 kg/ha (180 g/plot). GDM liquid organic fertilizer (POC) treatment had a significant effect on primary stem length at 14, 28, and 42 DAP, number of fruit per plant, number of fruit per plot, fruit weight per plant, and fruit weight per plot. GDM liquid organic fertilizer (POC) was given with the highest average for each parameter, namely primary stem length 14, 28, and 42 HST respectively, the highest was G 3 (13.05 cm), (99.26 cm), (172.76 cm).), the highest number of fruit per plant is in G 3 (9.00 pieces), the highest number of fruit per plot is in G 3 (36.00 pieces), the heaviest fruit weight per plant is in G 3 (2.34 kg), The heaviest fruit weight per plot was found in G 3 (12.17 kg). The best dose for administering POC GDM is 20 ml POC GDM/1 liter of water. Interaction of NPK 17+17+17 fertilizer treatment and GDM liquid organic fertilizer (POC) had a significant effect on primary stem length at 14, 28, and 42 DAP, number of fruit per plant, fruit weight per plant, and fruit weight per plot, but had no effect real impact on the number of fruits per plot. The interaction between the two treatments with the highest mean for each parameter was primary stem length at 14, 28, and 42 HST respectively, the highest N 3 G 3 (15.14 cm), (120.08 cm), (184.12 cm), total The highest number of fruit per plant was found in N 3 G 3 (10.00 pieces), the highest number of fruit per plot was in N3G3 (39.00 pieces), the heaviest fruit weight per plant was found in N 3 G 3 (2.73 kg), The heaviest fruit weight per plot was N 3 G 3 (14.76 kg). The best treatment combination for applying NPK 17+17+17 fertilizer is 450 hg/ha and the use of POC GDM

should be at a concentration of 20 ml POC GDM/1 liter of water. It is recommended to use NPK 17+17+17 fertilizer at a dose of 450 kg/ha and POC GDM should be used at a concentration of 20 ml/1 liter of water to increase the growth and production of cucumber plants.

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