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The Effect of Time Application from Nasa Liquid Organic Fertilizer on The Generative Phase of Sponge Plants (*Luffa acutangula* L.)

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Abstract

The study was to determine the effect of the time of application from NASA liquid organic fertilizer on the generative phase of sponge plants (gambas). In cultivating plants, there are several obstacles faced such as less fertile soil and fertilization that is not on target, causing production results to be not optimal. One way that can be done to increase crop production is using NASA's POC. The aim of this research is to look at the effect of different time giving Nasa POC on the generative phase of sponge plants. The research method used was a study using a one-factor Randomized Group Design (RGD) with 4 treatments and 5 tests so that 20 experimental units with a NASA LOF concentration of 2 ml.l-1 water were obtained. The treatment to be applied is: P0 = without giving NASA LOF, P1 = giving NASA LOF (application at 2 WAP), P2 = giving NASA LOF (application at age 2 and 4 WAP), P3 = giving NASA LOF (application at age 2, 4 and 6 WAP). The results showed that the timing of NASA's LOF It has no effect on the parameters of fruit length, fruit diameter, fruit weight and number of fruits of sponge plants, but has a noticeable effect on the parameters of the number of male flowers and the number of female flowers of sponge plants. NASA's POC application with a time interval of 3 times (P3) showed the best results in the parameters of the number of male flowers as many as (9.32) flower florets and (3.28) florets the number of female flowers. The different time giving Nasa POC has an effect on the generative growth of sponge plants.

Keywords: cultivating, fertilizer, generative, organic, phase,

Introduce

Luffa acutangula L. (Gambas) is a vegetable that grows by climbing. Gambas is included in the *Cucurbitaceae* family which originates from India. Gambas is cultivated to harvest its young fruit as a vegetable. Gambas plants are believed to be able to stabilize blood sugar, lower cholesterol and blood pressure [1]. In traditional markets, gambas vegetables are widely distributed. This shows that gambas is a popular vegetable and has many consumers [2].

Increasing gambas plant production can be done by fertilization. Fertilization is the addition of new nutrients to replace lost nutrients. According to [3], the effectiveness and efficiency of fertilization are guided by the 5T principle. Fertilization which is usually done through the soil has disadvantages such as the possibility of soil leaching. Therefore, fertilization in this study was carried out by spraying through the leaves of the plant [4].

The fertilizer used in this study was POC NASA. The advantages of liquid fertilizer are that it contains various nutrients, contains macro and micro nutrients, and is absorbed more quickly by plants [5]. The use of NASA POC can encourage plant growth and development [6]. According to research by [7], the difference in compost application time has a significant effect on stem height, leaf length, number of leaves, and leaf width of ground water spinach. Therefore, it is necessary to conduct research on the effect of NASA POC application time on the reproductive phase of loofah plants [8]. The purpose of the study was to determine the effect of NASA liquid organic fertilizer on

the generative phase of loofah plants and to obtain the best NASA liquid organic fertilizer application time parameters for the generative phase of loofah plants.

METHODE

The materials used in this study were gambas plant seeds of the graceful f1 variety, POC NASA, ultisol soil, water, and goat manure. The tools used in this study were scales, stationery, cameras, polybags, raffia ropes, stakes, soil sieves, watering cans, and hoes.

The method used was a 1-factor Randomized Block Design (RAK) with 4 treatments and 5 repetitions with a concentration of 2 $ml.L^{-1}$ water. The treatments to be applied were: p0 = without fertilizer, p1 = 1 application at the age of 2 weeks after planting, p2 = 2 applications at the ages of 2 and 4 weeks after planting, p3 = 3 applications at the ages of 2, 4, and 6 weeks after planting.

Table 1. Treatment Tabel

No	Code	Treatment
1	p0	without fertilizer
2	p1	1 application at the age of 2 weeks after planting
3	p2	2 applications at the ages of 2 and 4 weeks after planting
4	p3	3 applications at the ages of 2, 4, and 6 weeks after planting

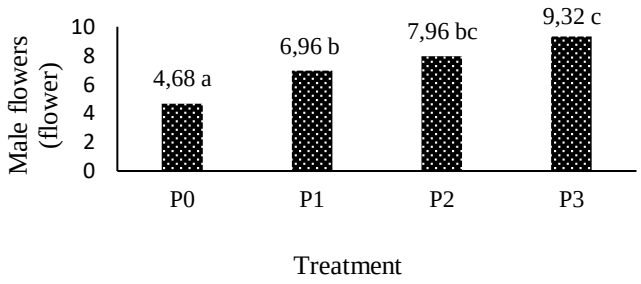
The stages of research activities include: **Seed Preparation**, seed quality determines success in cultivating gambas plants, good seeds have normal and uniform sizes, are clean from dirt, contain seeds, and have bright seed colors. **Preparation of Planting Media**, preparation of planting media is carried out in a 40 x 40 cm polybag as much as 10 Kg of $soil.polybag^{-1}$. The soil used is ultisol soil. Furthermore, the ultisol soil is sieved to homogenize the soil. Then 500 grams of goat manure is added per polybag which functions as a base fertilizer. **Planting**, loofah seeds are sown first in small polybags, one polybag one seed. A week after planting, healthy seedlings are selected to be maintained. Seedlings that will be selected for maintenance must have leaves with a fresh green color and have a straight stem. **Fertilization**, treatment fertilizer is given two weeks after planting. The fertilizer applied to loofah plants is NASA liquid organic fertilizer with a concentration of 2 $ml.L^{-1}$ water. P0 = without giving NASA POC, P1 = giving NASA POC (application at age 2 MST), p3 = giving NASA POC (application at age 2 and 4 MST), P4 = giving NASA POC (application at age 2, 4, and 6 MST). **Maintenance**, watering is done regularly 2 times a day every morning and evening. Weeding is done by removing weeds that grow on the planting medium. Control of fruit fly pests in this study was carried out by wrapping the luffa fruit using transparent plastic.

The data obtained were then analyzed for homogeneity using Bartlett's variance. Homogeneous data is then subjected to analysis of variance (ANOVA) using Microsoft Excel. If the data analyzed has a significant effect ($P \leq 0.05$), then further testing is carried out using the DMRT test at the α level of 5%.

RESULT AND DISCUSSION

Number of male flowers

The results of data analysis using Barlet's variance test showed that the data obtained were homogeneous. Continued ANOVA analysis showed that the administration of NASA POC had a significant effect on the number of male flowers. Data from the analysis results can be seen in Figure 1.



Description: P0: Control, P1: POC NASA concentration of 2 ml.l^{-1} water applied 1 time, P2: POC NASA concentration of 2 ml.l^{-1} water applied 2 times, P3: POC NASA concentration of 2 ml.l^{-1} water applied 3 times.

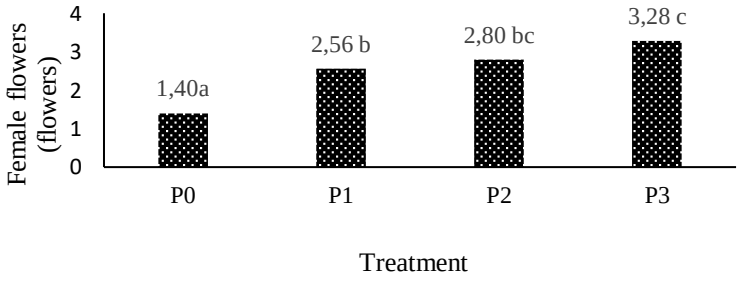
Figure 1. Male Flowers

The results of observations on the number of male flowers show that the interaction of POC NASA administration affects the number of male flowers of the luffa plant. In the P3 treatment, there were 10 flowers and P0 4 flowers. Flowering is a transition phase from vegetative to generative which is marked by the emergence of flower buds [8][9]. The results of data analysis from the research that has been conducted show that the application of POC NASA affects the number of male flowers. The availability of P and K elements contained in POC NASA plays a very important role, because P and K nutrients play a role in the flowering process of plants.

In addition to fertilizer nutrition factors, other factors also affect the number of male luffa flowers. According to [10] the transition from the growth phase to the reproductive phase is not only influenced by the concentration and administration of fertilizer, but also by genetic factors and external factors such as temperature, water, nutrients and light. Light intensity can have different effects on male and female flowers. High light intensity stimulates the formation of female flowers more, while low light intensity is likely caused by shade which stimulates the formation of male flowers more [11][12].

Number of female flowers

The results of data analysis with Barlet's variance test showed that the data obtained were homogeneous. Continued ANOVA analysis showed that the administration of NASA POC had a significant effect on the number of female flowers. Data from the analysis results can be seen in Figure 2.



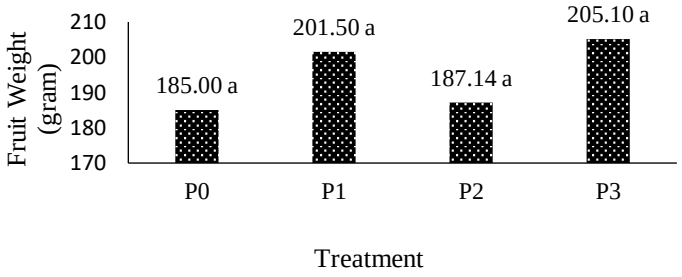
Description: P0: Control, P1: POC NASA concentration of 2 ml.l^{-1} water applied 1 time, P2: POC NASA concentration of 2 ml.l^{-1} water applied 2 times, P3: POC NASA concentration of 2 ml.l^{-1} water applied 3 times.

Figure 2. Female Flowers

Shows that the interaction of POC NASA administration affects the number of female flowers of the loofah plant. In the P3 treatment, there were 5 flowers and P0 only 1 flower. The results of data analysis from the research that has been conducted show that the application of POC NASA affects the number of female flowers. If the nutrients absorbed by the plant are sufficient, the plant will produce maximum growth and production. According to [13], P nutrients encourage the growth of flowers, pods and seeds and increase the percentage of flowers that develop into pods and seeds. Optimal vegetative growth accelerates the growth of generative plants in loofah plants, it turns out that the number of male flowers is greater than the number of female flowers.

Fruit weight

The results of data analysis with Barlet's variance test showed that the data obtained were homogeneous. Continued ANNOVA analysis showed that the administration of NASA POC had no effect on fruit weight. Data from the analysis results can be seen in Figure 3.



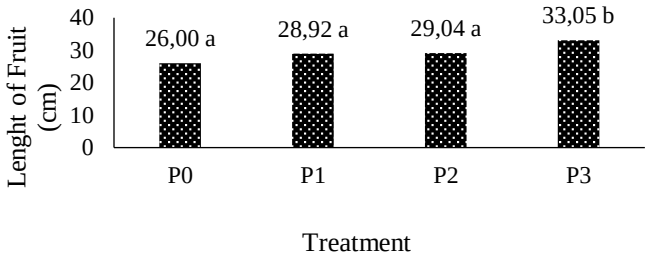
Description: P0: Control, P1: POC NASA concentration of 2 ml l^{-1} water applied 1 time, P2: POC NASA concentration of 2 $ml.l^{-1}$ water applied 2 times, P: POC NASA concentration of 2 $ml.l^{-1}$ water applied 3 times.

Figure 3. Fruit Weight

Shows that the interaction of POC NASA administration affects the number of female flowers of the luffa plant. In the P3 treatment, the heaviest fruit was 238 grams and P0 the smallest was 158 grams. The results of data analysis from the research that has been conducted show that the application of POC NASA does not affect the weight of the fruit. The weight of the fruit produced by the plant is thought to be due to poor environmental conditions. The size and shape of the fruit are influenced by the availability of growing space and nutrients that support fruit development. At the time of the study, the leaves of the luffa plant turned slightly yellow which affected the growth of chlorophyll so that the photosynthesis process was less than optimal [14][15]. Research by [16] showed that the more fruit, the greater the competition between fruits for assimilation, so that the less fruit was produced.

Length of Fruit

The results of data analysis with Barlet's variance test showed that the data obtained were homogeneous. Continued ANOVA analysis showed that the administration of NASA POC had a significant effect on fruit length. Data from the analysis results can be seen in Figure 4.



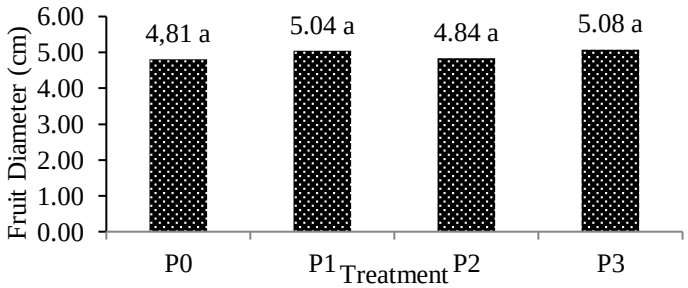
Description: P0: Control, P1: POC NASA concentration of 2 ml l^{-1} water applied 1 time, P2: POC NASA concentration of 2 $ml.l^{-1}$ water applied 2 times, P: POC NASA concentration of 2 $ml.l^{-1}$ water applied 3 times.

Figure 4. Length of Fruit

The results of data analysis from the research that has been conducted show that the application of NASA POC has a significant effect on fruit length. It is known that P3 plants have the highest fruit length value of 34.5 cm while the lowest fruit length in P0 is 24 cm. This is likely because the specified concentration does not meet the needs of the plant so that the fruit is not optimal. In addition, organic fertilizers have the disadvantage of being slow in providing nutrients for plants because organic fertilizers are slow release. According to [17], to obtain optimal plants, a sufficient dose of fertilizer is needed for plant needs. If the fertilizer dose is too high it will be toxic to plants.

Fruit diameter

The results of data analysis with Barlet's variance test showed that the data obtained were homogeneous. Continued ANOVA analysis showed that the administration of NASA POC had no effect on fruit diameter. Data from the analysis results can be seen in Figure 5.



Description: P0: Control, P1: POC NASA concentration of 2 ml l^{-1} water applied 1 time, P2: POC NASA concentration of 2 $ml.l^{-1}$ water applied 2 times, P: POC NASA concentration of 2 $ml.l^{-1}$ water applied 3 times.

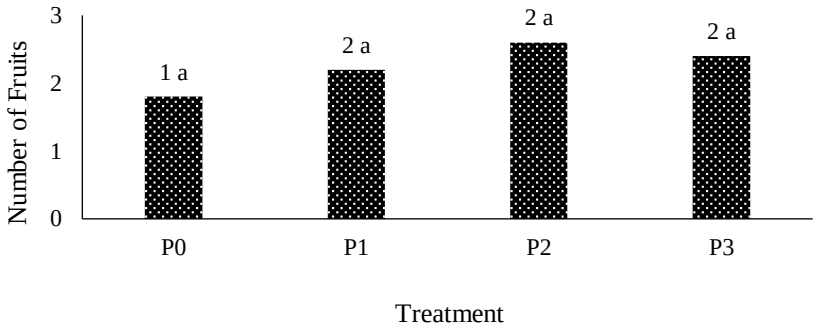
Figure 5. Fruit Diameter

The results of data analysis from the research that has been conducted show that the application of NASA POC has no effect on fruit diameter. It is known that P3 plants have the highest fruit diameter of 5.08 cm while the lowest fruit length is in P0 at 4.81 cm. This is due to the availability of nutrients that affect fruit filling. The addition of organic matter to the planting medium can increase the activity of soil microorganisms and increase the amount of plant hormones. Lack of nutrients in the soil makes the fruit produced usually small. Physiologically, it is impossible for a

plant to grow all large and ripe fruits unless the plant is able to provide sufficient nutrients for fruit growth [18][19][20].

Number of Fruits

The results of data analysis with Barlet's variance test showed that the data obtained were homogeneous. Continued ANOVA analysis showed that the administration of NASA POC had no effect on fruit diameter. Data from the analysis results can be seen in Figure 6.



Description: P0: Control, P1: POC NASA concentration of 2 ml l^{-1} water applied 1 time, P2: POC NASA concentration of 2 ml.l^{-1} water applied 2 times, P: POC NASA concentration of 2 ml.l^{-1} water applied 3 times.

Figure 6. Fruit Diameter

Not all flowers that have formed can be fertilized, and not all fruits that are formed can continue to grow into ripe fruit. Each plant has a certain capacity to produce several fruits which are greatly influenced by internal plant factors and environmental factors [21][22]. In addition to the time of application, climate and pests also affect the number of luffa fruit. In this study, one of the pests that attacked was the fruit fly. Fruit flies attack the fruit from the beginning, as a result of this attack the pumpkin fruit shrinks, bends, small fruit, causes rot, then the fruit falls off, affects the length of the fruit, the diameter of the fruit. and fruit weight [8][19].

Conclusion

The application with a time comparison of NASA POC has an effect on the parameters of the number of male flowers and the number of female flowers. The application of NASA POC with a time interval of 3 times (P3) showed the best results in the parameters of the number of male flowers as many as (9.32) flowers and (3.28) flowers of the number of female flowers.

Refrence

[1] Sunarjono, H. H. (2007). Bertanam 30 Jenis Sayuran. Penebar Swadaya, Jakarta. 184
[2] Sobir. (2009). Sukses Bertanam Pepaya Unggul Kualitas Supermarket. Jakarta. Agromedia Pustapka. 162.
[3] Adhikari, S. (2004). *Fertilization, soil and water quality management in small scale ponds.* Fertilization requirements and soil, 3.
[4] Manullang, G. S., A. Rahmi., P. Astuti. (2014). Pengaruh Jenis dan Konsentrasi Pupuk Organik Cair terhadap Pertumbuhan dan Hasil Tanaman Sawi (*Brassica juncea* L.) Varietas Tosakan. *Jurnal Agrifor*.13(1).: 33-40.
[5] Hadisuwito, S. (2007). Membuat Pupuk Kompos Cair. PT. Agromedia Pustaka. Jakarta.

[6] Azisah, Idrus, M.I. and Arbiannah (2017). Pengaruh pemberian pupuk organik cair unire sapi terhadap pertumbuhan dan produksi tanaman terong (*Solanum melongena* L.). *Jurnal Agrotan*. 3(2): 80–91.
[7] Azri. (2018). Respon Pupuk Organik dan Pupuk Anorganik terhadap Pertumbuhan dan Produktivitas Buah Naga. *Jurnal Pertanian Agros*. 20(1): 1-9.
[8] Prihmantoro. (2007). *Memupuk Tanaman Sayur*. Penebar Swadaya. Jakarta.
[9] Raksun, A., Zulkifli, L. dan Mahrus. (2020). Pengaruh Dosis dan Waktu pemberian Kompos terhadap Pertumbuhan Kangkung Darat. *Pijar MIPA*. 15(2): 171 – 176.
[10] Pflanz, M., Gebbers, R. & Zude, M. (2016). Influence of tree-adapted flower thinning on apple yield and fruit quality considering cultivars with different predisposition in fructification. *Acta Hortic*. 1130, 605- 612.
[11] Supriandi, D., Anggorowati, D., Sasli, I.(2022). Pengaruh Varietas dan Jarak Tanam Terhadap Pertumbuhan dan Hasil Gambas di Tanah Gambut, https://jurnal.untan.ac.id/index.php/jspp/article/viewFile/57655/75676594388
[12] Lidya, Emiliana., Jannah, Noor., Rahmi, Abdul. (2018). Pengaruh Pupuk Kompos dan Pupuk Organik Cair NASA Terhadap Pertumbuhan dan Hasil Tanaman Mentimun (*Cucumis sativus* L.) Varietas Misano F1. *Jurnal Agrifor* :17(1), 2018.
[13] Indrakusuma, (2000). *Proposal Pupuk Organik Cair Supra Alam Lestari*. PT. Supra Pratama Alam. Yogyakarta.
[14] Prayoda, R., Juhriah, Z. Hasyim & S. Suhadiyah. (2015). Pertumbuhan dan Produksi Tanaman Melon (*Cucumis melo* L). Var. Action dengan Aplikasi Vermikompos Padat. [Skripsi] Jurusan Biologi Fakultas MIPA. Universitas Hassanudin Makasar. Makasar
[15] Pescie, M.A & B.C. Strik. (2004). Thinning Before Bloom Affect Fruit Size and Yield of Hardy Kiwifruit. *Hortscience*. 39(6):1243-1245.
[16] Hayati, E. T. (2012). Pengaruh Jenis Pupuk Organik dan Varietas terhadap Pertumbuhan dan Hasil Tanaman Cabai (*Capsicum Annum* L.). *Jurnal Floratek*. 7.
[17] Kusmanto, A. Azies, & T. Soemarah. (2010). Pengaruh dosis Pupuk Nitrogen dan Pupuk Kandang Kambing Terhadap Pertumbuhan dan Hasil Jagung Hibrida (*Zea mays* L.) Varietas Pioneer 21. *J. Agrineca*. 10(2):135-150.
[18] Pracaya. (2003). *Bertanam lombok*. Kanisius. Yogyakarta.
[19] Rosmakam., & Yuwono. (2002). *Ilmu Kesuburan Tanah*. Kanisius. Yogyakarta.
[20] Gumelar, R.M.R., Sutjahjo, S.H., Marwiyah, S., & Nindita, A. (2014). Karakterisasi dan Respon Pemangkasan Tunas Air Terhadap Produksi Serta Kualitas Buah Genotype Tomat Lokal. *Jurnal Hortikultura Indonesia*. 5(2): 7883.
[21] Handika, D., Helilusiatiningsih,N., Mustopa, M. (2023). Analisis Produksi Tanaman Gambas (*Luffa Acutangula* L.) Varietas Anggun F1 dengan Aplikasi Petroganik dan POC Nasa, *Jurnal Agrotek*. 7(1): 61-66. doi 10.33096, https://jurnal.fp.umi.ac.id/index.php/agrotek/indeks
[22] Puspadewi, S., Sutari, W., & Kusumiyati, K. (2016). Pengaruh Konsentrasi Pupuk Organik Cair (POC) dan Dosis Pupuk N, P, K Terhadap Pertumbuhan dan Hasil Tanaman Jagung Manis (*Zea mays* L. var Rugosa Bonaf) kultivar talenta. *Kultivasi*, 15(3). https://doi.org/10.24198/kultivasi.v15i3.11764
[23] Irawati, T. (2016). Respon Pupuk Kandang dan Jarak Tanam Terhadap Pertumbuhan dan Hasil Tanaman Gambas (*Luffa acutangula*) Varietas Prima. *Jurnal Hijau Cendikiawa*. 59(1):2477–5096.