e-ISSN 2795-4362
p-ISSN 2795-4340

10.5281/zenodo.10069212 Vol. 06 Issue 10 Oct - 2023 Manuscript ID: #01080

THE EFFECT OF CHICKEN MANURE AND PLANT ORGANIC NUTRITION (NOT) LAU KAWAR ON THE GROWTH AND YIELD OF RED CHILI PLANTS (*Capsicum annuum L.*)BAJA F1 VARIETY

Marisi Napitupulu, Puji Astuti, Hery Sutejo, Abdul Fatah, and, Syarah Muliana
Faculty of Agriculture, University of 17 Agustus 1945 Samarinda

Corresponding Author*: Puji Astuti*

ABSTRACT

Red chili is one of the vegetable commodities that is widely cultivated by farmers in Indonesia because it has a high selling price so it has good prospects for cultivation. The research objectives were: (1) to determine the effect of chicken manure and NOT Lau Kawar and their interaction on the growth of red chili plants, and (2) to obtain the correct dose of chicken manure and NOT Lau Kawar concentration on the growth and yield of red chili plants of the Baja F1 variety. The research was carried out from November 2021 to April 2022 on the grounds of the Samarinda Agricultural Development Vocational School, JL. Thoyyib Hadiwijaya, North Samarinda District, East Kalimantan, Indonesia. The research used a Completely Randomized Design (CRD) with 4x4 factorial analysis which was repeated 4 times. The first factor is the dose of chicken manure (A) consisting of 4 levels, namely: a0 = without giving chicken manure; a1 = 37 g polybag^{-1}; a2 = 52 g polybag^{-1}; and a3 = 75 g polybag^{-1}. The second factor is the concentration of NOT fertilizer (N) consisting of 4 levels, namely: n0 = without NOT fertilizer; n1 = 18 ml l^{-1} water; n2 = 28 ml l^{-1} water, and n3 = 38 ml l^{-1} water. Research activities include (1) preparation of the research site; (2) preparation of planting media; (3) nursery; (4) giving chicken manure; (5) planting; (6) giving NOT Lau Kawar; (7) plant maintenance includes watering, replanting, weeding, installing stakes, pest control; (8) harvesting. The results of the research showed that: (1) chicken manure treatment was affected significantly to very significantly on the plant height at 10, 20, 30, and 40 days after planting, plant age at harvest, number of fruit per plant, and fruit weight per plant. but has no significant on the plant age at flowering; (2) NOT Lau Kawar treatment was affected significantly on the plant height at 10, 20, 30, and 40 days after planting, number of fruit per plant, and fruit weight per plant, but no significant on the plant age at flowering and age plants at harvest; (3) the interaction between chicken manure treatment and NOT Lau Kawar was affected very significantly on the plant height at 10, 20, 30 and 40 days after planting, and fruit weight per plant, but no significant on the plant age at flowering. age of plants at harvest and the number of fruits per plant; and (4) The highest fruit weight per plant was produced in a combination of 75 g polybag-1 chicken manure and 28 ml l^{-1} NOT Lau Kawar (a3n2) water, namely 445.75 g plant^{-1}, while the lowest was produced in the treatment combination without chicken manure and NOT Lau Kawar (a0n0) namely 155.00 g plant^{-1}.

KEYWORDS: **Chicken Manure, Organic Nutrition for Lau Kawar Plants, Red Chili.**

INTRODUCTION

Red chili *(Capsicum annuum* L.) is a vegetable commodity that is important both from an economic perspective and from its nutritional content. As Indonesia's population increases, consumption of chilies also continues to increase. Until now, chilies cannot be substituted for other horticultural commodities. The more varied the types of food that use chilies, the daily need for chilies will continue to increase. Therefore, the development of red chili cultivation is still wide open. [1] states that as chili consumption continues to increase, chili is a product that provides huge profits for farmers and traders selling this agricultural product.

In terms of productivity, large red chilies in East Kalimantan are only 3,503 tons ha^{-1}, where this yield is still low compared to the South Kalimantan area, which is 11,392 tons ha^{-1} [2]. The low productivity is influenced by the cultivation technology used. In carrying out farming, the technology that must be applied is the use of superior seeds, tillage, timing and spacing of planting, controlling pests and diseases, and using fertilizer according to needs.

Fertilization is an effort to manage soil fertility by adding nutrients. Fertilization aims to ensure optimum nutrient availability to support plant growth so that optimal harvest results are obtained. Providing chemical fertilizers without adding organic material can reduce soil fertility and cause damage to the soil structure even though it can increase soil productivity in a short time. According to [3] continuous use of inorganic fertilizers can damage the physical, chemical, and biological properties of the soil so that the level of soil fertility decreases.

Solutions to increase the value of agricultural production can be done by preserving agricultural resources, appropriate strategies, and efforts such as using organic fertilizer. [4] Stated that the benefits of applying solid organic fertilizer such as manure can increase plant fertility, improve the chemical, biological, and physical properties of the soil, and not pollute the environment. Furthermore, [5] stated that organic fertilizer has many benefits for soil fertility, namely it can improve soil structure, improve living conditions in the soil to increase sources of food for plants, and make it easier to absorb water into the soil. Apart from the macro elements nitrogen (N), phosphate (P), and potassium (K).

Chicken manure contains macro and microelements, namely 29% organic matter; 1.5% N; 1.3 % P_2O_5; 0.8 % K_20; 4.0% CaO, C/N: 9 - 11, and 57% water content. Manure has an effect for a long period and acts as nutrition for plants. Chicken manure contains more nutrients than other types of livestock; this is because the solid manure of livestock is mixed with liquid manure [6].

In addition to providing chicken manure, plant organic nutrition (NOT) can also be provided. Lau Kawar's Plant Organic Nutrition (NOT) is a form of liquid nutritional material produced by local farmers from East Kalimantan. Based on the results of analysis in the soil laboratory of the Faculty of Agriculture, Unmul Samarinda in 2019, the NOT Lau Kawar content is as follows: 2.6% C- organic; 0.15 % N total; C/N = 17.30; 462.96 ppm P-available, 733.79 ppm K-available; 60.24 mg l^{-1} Ca^{++}; 16.78 mg l^{-1} Mg++; pH = 3.64 [7]. The use of liquid organic fertilizer is starting to become popular with the public; therefore research needs to be carried out to find recommendations for the right concentration for plants when using liquid organic fertilizer.

The research objectives were: (1) to determine the effect of chicken manure and NOT Lau Kawar and their interaction on the growth of red chili plants, and (2) to obtain the correct dose of chicken manure and NOT Lau Kawar concentration on the growth and yield of red chili plants of the Baja F1 variety.

RESEARCH METHODS

A. Time and Place

The research was carried out from November 2021 to April 2022 on the land of the Samarinda Agricultural Development Vocational School, JL. Thoyyib Hadiwijaya, North Samarinda District, Province of East Kalimantan, Indonesia.

B. Materials and Tools

The materials used are large red chili seeds of the Baja F1 variety, polybags measuring 40 cm x 50 cm, polybags 15 cm x 23 cm, chicken manure fertilizers, NOT Lau Kawar fertilizer, matador insecticide, and pool water. The tools used are hoes, machetes, embers, rulers, labels for marking plants, stationery, markers, analytical scales, raffia rope, bamboo stakes, and plastic fertilizer containers.

C. Experimental Design

The experiment was carried out using a Completely Randomized Design (CRD) with 4x4 factorial analysis which was repeated 4 times. The first factor is the dose of chicken manure fertilizer (A) consisting of 4 levels, namely: a0 = without giving chicken manure; a1 = 37 g polybag"^{1}; a2 = 52 g polybag"^{1}; and a3 = 75 g polybag"^{1}. The second factor is the concentration of NOT Lau Kawar fertilizer (N) consisting of 4 levels, namely: n0 = without NOT Lau Kawar fertilizer; n1 = 18 ml l"^{1} water; n2 = 28 ml l"^{1} water, and n3 = 38 ml l$^{"1}$ water.

D. Stages of Research Activities

Research activities include (1) preparation of the research site; (2) preparation of planting media; (3) nursery; (4) giving chicken manure according to treatment; (5) planting; (6) giving NOT Lau Kawar according to treatment; (7) plant maintenance includes watering, replanting, weeding, installing stakes, pest control; (8) harvesting.

E. Data Collection

The data observed were as follows: (1) plant height 10, 20, 30, and 40 days after planting; (2) age of the plant at flowering; (3) age of the plant at harvest; (4) number of fruits per plant; and (5) fruit weight per plant.

F. Data Analysis

Data analysis uses variance, if the variance results are significant (F count > F table 5%) or very significant (F count > F table 1%), then to compare the two treatment averages a followup test is carried out with the Least Significant Difference test (LSD) level is 5%.

RESULTS AND DISCUSSION

The results showed that the application of chicken manure and NOT Lau Kawar and their interactions affected significantly to very significantly on the plant height at 10, 20, 30, and 40 days after planting, the number of fruits per plant, and fruit weight per plant, but no significant on the age of the plant at flowering; and age of the plant at harvest. The research results are presented in Table 1 and Table 2.

Table 1. Plant Height Aged 10, 20, 30, and 40 Days After Planting at Various Doses of Chicken Manure and NOT Lau Kawar Concentration and Interactions (cm)

Treatments		Plant Height (cm)		
	10 DAP	20 DAP	30 DAP	40 DAP
Chicken Manure (A)	**	**	**	**
No chicken manure application (a0)	8,43 b	14,50 c	23,50 c	28,87 c
37 g polybag^{-1} (a1)	9,12 b	15,50 b	23,42 c	30,06 b
52 g polybag^{-1} (a2)	9,67 b	14,56 c	25,12 b	29,18 c
75 g polybag^{-1} (a1)	11,60a	16,62 a	26,12 a	35,81 a
NOT Lau Kawar (N)	**	*	**	**
No NOT Lau Kawar application (n0)	8,37 b	14,06 d	22,24 c	28,81 d
18 ml l^{-1}water (n1)	9,11 b	14,43 c	24,31 b	29,37 c
28 ml l^{-1} water(n2)	9,18 b	15,18 b	24,43 b	32,62 b
38 ml l^{-1} water(n3)	12,16 a	17,50 a	27,18 a	33,12 a
Interaction (AxN)	**	**	**	**
a0n0	8,50 bc	14,00e	24,00 cd	25,50 h
a0n1	7,75 bc	16,00bc	19,24 f	28,00 f
a0n2	8,75 bc	12,75 f	21,25 e	26,50 d
a0n3	8,50 bc	13,50 e	24,50cd	35,25 b
a1n0	6,75 c	13,00f	23,00d	29,75 e
a1n1	10,00 b	14,50 d	24,50cd	29,75 e
a1n2	9,50 bc	15,50 c	26,75 b	26,50 g
a1n3	10,20 b	14,75 d	23,00d	31,50 d
a2n0	8,75 bc	15,50 c	23,50d	30,50 e
a2n1	8,25 bc	15,75 c	23,75 cd	31,50 d
a2n2	9,75 bc	13,50 e	25,75 bc	33,25 c
a2n3	10,00 ab	16,00 bc	24,75 c	35,25 b
a3n0	9,75 bc	15,50c	23,50d	29,75 e
a3n1	10,50b	15,75c	26,25 b	31,00 d
a3n2	10,70 b	16,50 b	26,75 b	30,50 e
a3n3	17,70 a	22,25 a	32,25 a	41,25 a

Note: The average number for each column followed by the same letter is not significantly different based on the Least Significant Difference test at the 5% level; tn = not significantly; * = affected significantly; ** = affected very significantly; and DAP = days after planting

Table 2. Age of Plant at Flowering, Age of Plant at Harvest, Number of Fruit and Weight of Fruit per Plant at Various Doses of Chicken Manure and NOT Lau Kawar Concentration and Their Interactions.

Treatments	Age at Flowering (DAP)	Age at Harvest (DAP)	Number of Fruit per Plant (fruit)	Weight of Fruit per Plant (g plant^{-1})
Chicken Manure (A)	**tn**	*	**	**
No chicken manure application (a0)	41,62	94,12 d	33,75 d	185,00 d
37 g polybag^{-1} (a1)	40,56	93,62 c	52,37 c	261,00 c
52 g polybag^{-1} (a2)	40,31	92,68 b	58,43 b	275,00 b
75 g polybag^{-1} (a1)	37,50	90,56 a	78,43 a	388,00 a
NOT Lau Kawar (N)	**tn**	**tn**	**	**
No NOT Lau Kawar application (n0)	40,25	94,87	48,00 d	199,00 d
18 ml l^{-1} water (n1)	41,75	92,81	49,68 c	276,00 c
28 ml l^{-1} water (n2)	39,00	92,25	62,43 b	296,00 b
38 ml l^{-1} water(n3)	38,75	91,06	63,87 a	308,00 a
Interaction (AxN)	**tn**	**tn**	**tn**	**
a0n0	40,00	95,50	26,75	155,00 o
a0n1	40,75	95,50	48,75	235,25 j
a0n2	41,00	94,00	45,50	193,75 k
a0n3	39,25	94,50	71,00	350,75 d
a1n0	41,75	94,50	34,50	183,75 n
a1n1	42,50	93,50	45,50	278,25 i
a1n2	41,00	93,50	51,75	280,75 h
a1n3	41,75	89,75	67,00	362,00 c
a2n0	41,75	93,50	33,75	213,00 k
a2n1	39,50	93,00	59,00	242,25 j
a2n2	40,75	93,50	60,00	286,50 g
a2n3	34,50	89,00	93,00	445,75 a
a3n0	43,00	93,00	40,00	192,00 m
a3n1	39,50	92,50	56,25	289,00 f
a3n2	38,50	89,75	76,50	339,25 e
a3n3	34,50	89,00	82,75	415,25 b

Note: The average number for each column followed by the same letter is not significantly different based on the Least Significant Difference test at the 5% level; tn = not significantly; * = affected significantly; ** = affected very significantly; and DAP = days after planting

A. Effect of Chicken Manure

The research results presented in Table 1 show those treatments of various doses of chicken manure fertilizers produced taller large red chili plants compared to treatments without chicken manure. The higher the dose of fertilizer given, the higher the plants produced. This is because the provision of chicken manure can encourage the vegetative growth of plants. After all, the chicken manure given can increase the availability of nutrients in the soil, including the element N which plays a role in increasing the vegetative growth of plants. As stated by [8], the nutrient N can accelerate plant vegetative growth.

The treatment without chicken manure (a0) produced shorter plants compared to the treatment with various doses of chicken manure. This is because the content of soil N elements that plants need

is only 0.10%, which is in the low category. As stated by [9], plants that lack the element N vegetative growth becomes slow and the plants become stunted.

The results of variance analysis showed that chicken manure treatment was not significant on the plant age at flowering, but had a significant effect on plant age at harvest. The research results presented in Table 2 show that treatments of various doses of chicken manure resulted in plant age at flowering (37.50 - 40.56 days after planting) and plant age at harvest (90.56 - 93.62 days after planting). The age of the plants at flowering and harvest was faster than the treatment without chicken manure (a0), namely 41.62 and 94.12 days respectively after planting. This is because the P nutrient content in the soil is not sufficient for plant needs, namely only 36.10 ppm (classified as moderate), so by applying chicken manure you can increase the availability of P nutrients in the soil, the P nutrient plays an important role in spurring the process. flowering and fruit ripening. As stated by [10], the nutrient P for plants is useful for stimulating root growth, especially seeds and young plants as well as accelerating flowering and fruit/seed ripening.

The results of variance analysis showed that the treatment of giving chicken manure was affected very significantly on the number of fruit per plant and the weight of fruit per plant. The research results presented in Table 2 show that the application of various chicken manures resulted in fruit numbers ranging from 52.37 - 78.43 per plant^{-1} and fruit weight ranging from 261.00 - 388.00 g per plant^{-1}. The number and weight of fruit per plant were greater and higher compared to the treatment without chicken manure (a0), namely only 33.75 fruit and 185.00 g plant^{-1}. The results of this research are those reported by [11] that the application of chicken manure combined with NPK fertilizer resulted in a greater number of fruit per plant and higher fruit weight per plant compared to the control and NPK fertilizer treatment alone. This is because the provision of chicken manure can increase the availability and uptake of nutrients by plants, thereby increasing plant yields/production. As stated by [4], the benefits of applying solid organic fertilizer such as manure can increase plant fertility, improve the chemical, biological, and physical properties of the soil, and not pollute the environment

B. Effect of NOT Lau Kawar

The results of variance analysis showed that the NOT Lau Kawar treatment was affected significantly the height of red chili plants at the ages of 10, 20, 30, and 40 days after planting. The research results presented in Table 1 show that treatments with various concentrations of NOT Lau Kawar (18, 28, and 38 ml l^{-1} water) produced taller large red chili plants compared to treatments without NOT Lau Kawar. This is because the application of NOT Lau Kawar can increase the N content of the soil so that it can stimulate plant vegetative growth. Based on the results of laboratory analysis, it shows that NOT Lau Kawar fertilizer contains 0.15% total N. As stated by [12], the element N is a constituent of proteins, nucleic acids, chlorophyll, and other organic compounds. The N element has an effect on plants, namely making plants green and increasing the growth of leaves and stems.

The results of variance analysis showed that the NOT Lau Kawar treatment was not significant on the age at flowering and age at harvest. The research results presented in Table 2 show that the treatment with various concentrations of NOT Lau Kawar (18, 28, and 38 ml l^{-1} water) resulted in plant age at flowering ranging from 38.75 - 41.75 days after planting and plant age at harvest between 91.06 - 92.81 days after planting, while in the treatment without NOT Lau Kawar it was 40.25 and 94.87 days after planting, respectively. There was no real effect on the NOT Lau Kawar fertilizer

treatment, it is suspected that the application of NOT Lau Kawar fertilizer could only add relatively small amounts of P elements, so the effect was not significant.

The results of variance analysis showed that the NOT Lau Kawar fertilizer treatment was affected very significantly by the number of fruit per plant and the weight of fruit per plant. The research results presented in Table 2 show that the application of various concentrations of NOT Lau Kawar fertilizer (18, 28, and 38 ml l^{-1} water) produced fruit numbers ranging from 49.68 - 63.87 per plant and fruit weight ranging from 276 .00 - 308.00 g $plant^{-1}$. The number and weight of fruit per plant were greater and higher compared to the treatment without NOT Lau Kawar fertilizer (n0), namely only 48.00 fruit and 199.00 g $plant^{-1}$. This is because NOT Lau Kawar contains several nutrients such as N, P. K, Ca. and Mg, these nutrients are needed to increase plant growth and yield. The research results reported by [13] that paria plants were given various concentrations of NOT Lau Kawar 15 ml l^{-1} water (p1), 30 ml l^{-1} water (p2), and 45 ml l^{-1} water (p3) tended to produce a higher fruit weight per pariah plant (392.88 - 405.80 g $plant^{-1}$) compared to the treatment without NOT Lau Kawar (p0) with an average of 395.26 g $plant^{-1}$; Then [14] reported that giving NOT Law Kawar with a concentration of 15 - 35 ml l^{-1} water tended to produce higher fruit weight on okra plants (i.e. 126.11 - 136.90 g $plant^{-1}$) compared to treatment without NOT Lau Kawar with the yield was only 122.41 g $plant^{-1}$. Furthermore, it was reported by [15] that giving NOT Lau Kawar with a concentration of 5 - 15 ml l^{-1} water resulted in a greater number of fruit per plant (16 - 19 fruit $plant^{-1}$) and higher fruit weight (112.33 - 130.83 g $plant^{-1}$) compared to the treatment without NOT Lau Kawar, namely the number of fruit per plant was only 14 fruit and the fruit weight was 102.23 g $plant^{-1}$.

C. Effect of Interaction Between Chicken Manure and NOT Lau Kawar

The results of variance analysis showed that the interaction between chicken manure and NOT Lau Kawar fertilizer was affected very significantly on plant height at 10, 20, 30, and 40 days after planting, and fruit weight per plant, but had no significant on the plant age plant at flowering, age plants at harvest and number of fruits per plant. This shows that the chicken manure treatment and the NOT Lau Kawar fertilizer treatment can jointly or individually influence the growth and yield of large red chili plants. As stated by [16], if the effect of different interactions is not significant, then it can be concluded that the treatment factors act independently or their influence is independent. Furthermore, [17] stated that two treatment factors are said to interact if the influence of one treatment factor changes when the level of another treatment factor changes. This situation was explained by [18] that during plant growth and development there are various growth processes whose intensity varies, in other words, according to the activities of various physiological processes, plants need sufficient nutrients.

In general, the research results presented in Table 1 and Table 2 show that the combination treatment of various doses of chicken manure with various concentrations of NOT Lau Kawar fertilizer resulted in taller red chili plants, faster flowering age, faster harvest time, and number of fruit. more per plant, and higher fruit weight per plant compared to the combination without chicken manure and without NOT Lau Kawar fertilizer (a0n0). The highest fruit weight per plant was produced in a combination of 75 g $polybag^{-1}$ chicken manure and 28 ml l^{-1} NOT Lau Kawar water (a3n2), namely 445.75 g $plant^{-1}$, while the lowest was produced in the treatment without chicken manure and without NOT Lau Kawar (a0n0) which is 155.00 g $plant^{-1}$. This is because the application of chicken manure combined with NOT Lau Kawar fertilizer can increase the availability and uptake of nutrients so that large red chili plants can grow well and produce high fruit yields. As stated by [19], plants will grow well and provide good results if the nutrients they need are available in sufficient and balanced quantities.

CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

Based on the results of the research and discussion, conclusions can be drawn as follows:

1. Chicken manure fertilizer treatment was affected significantly to very significantly on the plant height at 10, 20, 30, and 40 days after planting, age of plant at harvest, number of fruit per plant, and fruit weight per plant, but had no significant on age of plant at flowering.
2. The NOT Lau Kawar treatment affected very significantly on the plant height at 10, 20, 30, and 40days after planting, the number of fruit per plant, and fruit weight per plant, but had no significant on the age of plant at flowering and age of plant at harvest.
3. The interaction between chicken manure treatment and NOT Lau Kawar has affected verysignificantly on the plant height at 10, 20, 30, and 40 days after planting, and fruit weight per plant, but has no significant on the age plant at flowering, age plants at harvest and number of fruits per plant.
4. The highest fruit weight per plant was produced in a combination of 75 g polybag^{-1} chicken manureand 28 ml l^{-1} NOT Lau Kawar (a3n2) water, namely 445.75 g plant^{-1}, while the lowest was produced in the combination treatment without chicken manure and without fertilizer NOT Lau Kawar (a0n0) namely 155.00 g plant^{-1}.

B. Suggestions

Based on the research results, several suggestions can be put forward, namely as follows:

1. For cultivating large red chili plants in polybags, it is recommended to provide a combination ofchicken manure (75 g polybag^{-1}) and NOT Lau Kawar of 28 ml l^{-1} water.
2. Further research needs to be carried out using chicken manure and NOT Lau Kawar on differentland and plant conditions.

Further research needs to be carried out, complete with an analysis of the chemical properties of thesoil after the research.

BIBLIOGRAPHY

[1] Warsino. 2010. Business Opportunities and Chili Cultivation. Gramedia, Jakarta.

[2] Central Statistics Agency and Directorate General of Horticulture. 2019. https://www.pertanian.go.id. Accessed September 15, 2020.

[3] Iwuagwu, M., Chukwuka, K. S., Uka, U. N., & Amandianeze, M. C. 2016. Effects of Biofertilizers on the Growth of *Zea mays* L. Asian Journal of Microbiology, Biotechnology and Environmental Sciences, 15(2), 235-240.

[4] Musnawar, E.I. 2013. Manufacture and Application of Solid Organic Fertilizer. Penebar Swadaya, Jakarta

[5] Koto, D. A., Mansyur, Mustafa, H. K., & Rifianda, N. F. D. 2022. PengaruhPemberian Berbagai Jenis Pupuk Organik Dan Pupuk Anorganik TerhadapPertumbuhan Chicory *(Chicorium intybus* L.). Jurnal Nutrisi Ternak Tropis. 5(2): 106-114.

[6] Dermiyati, 2005. Sustainable Organic Farming System. Plantaxia Publisher, Yogyakarta.

[7] Radja, Melyana Djo. 2019. Response of Pakcoy Plants to Giving NOT Lau Kawar and POC Bio Sugih. Student Thesis, Faculty of Agriculture, University of 17 August 1945 Samarinda.

[8] Hardjowigeno, S. 1995. Soil Classification and Pedogenesis. Academic Pressindo, Jakarta.

[9] Winarso, S. 2005. Soil Fertility, Basics of Soil Health and Quality. Gaya Media, Yogyakarta.

[10] Prihmantoro, H. 2003. Fertilizing Vegetable Plants. Penebar Swadaya, Jakarta.

[11] Sunarningtyas, S., and Sudiarso. 2020. Effect of Dosing Chicken Manure and NPK Inorganic Fertilizer on the Growth and Yield of Red Chili Plants *(Capsicum annuum* L.). Journal of Crop Production 10 (11): 646-652 http://dx.doi.org/10.21776/ub.protan.2022.010.11.07.

[12] Poerwowidodo. 2002. Soil Fertility Study. Angkasa, Bandung.

[13] Arif, S. 2020. The Effect of NOT Lau Kawar and POC Bio Sugih on the Growth and Yield ofParia Plants. Faculty of Agriculture, University of 17 Agustus 1945 Samarinda.

[14] Zulfikri, H.E. 2020. Effect of Planting Media and Plant Organic Nutrition (NOT) Lau Kawar onthe Growth and Yield of Green Okra Plants of the Menara F1 Variety. Faculty of Agriculture, University of 17 Agustus 1945 Samarinda.

[15] Masan, A. 2021. The Effect of Lau Kawar Plant Organic Nutrition (NOT) and Ratu Biogen ZPTon the Growth and Yield of Red Chili Plants of the Baja MC F1 Variety. Faculty of Agriculture, University of 17 Agustus 1945 Samarinda.

[16] Steel, R.G..D and J. H. Torrie. 1991. Principles and Procedures of Statistics, a Biometric Approach, Gramedia Pustaka Utama, Jakarta.

[17] Gomez, K.A and A.A. Gomez. 1995. Statistical Procedures for Agricultural Research (Translated by A. Sjamsuddin and J.S Baharsyah). Second Edition. UI Press, Jakarta.

[18] Mulyani Sutejo, M and A.G. Kartasapoetra. 2003. Fertilizers and Fertilizing Methods. Rineka Cipta, Jakarta.

[19] Dwijoseputro, D. 1998. Introduction to Plant Physiology. Gramedia, Jakarta.