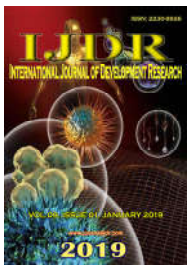
Available online at http://www.journalijdr.com

IJDR

ISSN: 2230-9926

International Journal of Development Research
Vol. 09, Issue, 01, pp.25246-25252, January, 2019



ORIGINAL RESEARCH ARTICLE OPEN ACCESS

EFFECT OF TYPES AND DOSAGE OF LAMTORO LEAF, GAMAL LEAF AND KANDANG AYAM LEAF FERTILIZER ON GROWTH AND RESULTS OF CAISIN GREEN PALM PLANT (*BRASSICAJUNCEA* L)

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ARTICLE INFO

Article History:
Received 10th October, 2018
Received in revised form
20th November, 2018
Accepted 19th December, 2018
Published online 30th January, 2019

Key Words:
Lamtoro leaf green fertilizer,
Gamal leaf, Chicken manure,
Caisin Green Mustard Plant growth.

ABSTRACT

Caisim green mustard plant (Brasiccajuncea L) has been known by the East Timorese people. This plant is a horticultural commodity that is much favored by the community starting from the upper class to the lower classes. because it has the most delicious taste compared to other mustard types. Various dishes that use mustard as a raw material used as a mixture of vegetables such as lodeh, capcay, boiled noodles and as a complement to the food mixture. In every 100 g of mustard, the nutritional value is protein 2.3 g; 0.3 g fat; 4.0 g carbohydrates; Ca 220.0 mg; P 38.0 mg; Fe 2.9 mg; vitamin A 1,940 mg; 0.09 mg vitamin B; and vitamin C 102 mg. Nutritional content in vegetables, especially vitamins and minerals, cannot be substituted through staple foods. (Manurung, 2011). The method used in this study is Randomized Block Design (RBD), with 3 replications. The treatment is arranged factorially. The treatments tested consisted of two factors, namely: Factor 1. Factor doses of green leaf doses of lamtoro, gamal leaves (PHDLG) consisting of PHDLG = 0 gr / plot, PHDLG1 = 1200 gr / plot, PHDLG2 = 2400 gr / plot, PHDLG3 = 3600 gr / plot. 2nd factor. Chicken Cage (PKA) fertilizer dosage consisting of: PKA0 = 0 gram / plot, PKA1 = 240 gram / plot, PKA2 = 340 gram / plot, PKA3 = 460gram / plot. The experiment consisted of 12 combination treatment units and each treatment was repeated three times so that 36 units of research plots were needed. Observations were made on the growth variables of green mustard and plant components and supporting variables. Data collected was analyzed by analysis of variance (variance) in accordance with the experimental design used. If there is a real interaction effect on the observed variables, the study is continued with the average difference test using the Duncan multiple distance test (DMRT) at the level of 5% and if only the influence of the single factor is real, then proceed with the average difference test with the test BNT at a significant level of 5%. Based on the results of research on the influence of the types and doses of green manure lamtoro, gamal and chicken manure on the growth and yield of green mustard plants. The results of the study showed that among the four parameters observed in the growth of Caisin green mustard plants, it was indicated that the effect of lamtoro leaf green manure, gamal leaves on plant height parameters at week 2 and week 4 of MST. Likewise, the influence of chicken manure can affect the growth of tall green mustard greens in the weeks 2,4,6 and 8 WAC. On the other hand, the combination of lamtoro leaf green manure, gamal leaves and chicken manure can also influence the growth of mustard plant height at weeks 2.4 and 6 WAC. From the results of the research on the parameters of leaf number, it indicates that the influence of lamtoro leaf green fertilizer, gamal leaves can affect the parameters of the number of leaves of green mustard plants in the 2nd and 8th weeks of MST. Likewise the influence of chicken manure can affect the growth of the number of leaves of the green mustard greens in the weeks 2,4,6 and 8 MST. In contrast, the combination of lamtoro leaf green manure, gamal leaves and chicken manure can also affect the growth of the number of mustard plant leaves at weeks 2.6, and 8 of MST.

Citation: Paulino da Costa Sarmento, Domingos C.B.B. Gomes and Claudino Ninas Nabais, 2019. "Effect of types and dosage of lamtoro leaf, gamal leaf and kandang ayam leaf fertilizer on growth and results of caisin green palm plant (*Brassicajuncea L*)", *International Journal of Development Research*, 09, (01), 25246-25252.

INTRODUCTION

Caisim green mustard plant (*Brasiccajuncea* L) has been known by the East Timorese people. This plant is a horticultural commodity that is much favored by the community starting from the upper class to the lower classes. Because it has the most delicious taste compared to other mustard types. Various dishes that use mustard as a raw material used as a mixture of vegetables such as lodeh, capcay, boiled noodles and as a complement (mixed meatball food). Mustard is an annual herb that is easy to grow. Apogeal

germination, when young grows weak (easily collapsed), but after the third leaf and so on it will form a half rosette with a stick that is thick enough, but not woody. Elliptical mustard leaves, with usually blunt ends. The color is fresh green, usually not hairy. Towards flowering the nature of the rosette disappears (the growth of leaves does not originate from the root rosette), revealing the stem. Small mustard flowers, composed of various compounds. The crown of mustard flowers is yellow, numbering 4 (typical of *Brassicaceae)*. The mustard stamens number 6, surround one pistil. The fruit resembles pods but has two fruit leaves and is called clique. (Setiadi, 1993). Rukmana (1995) mustard plants are one type of leaf vegetable commonly consumed by the community. Green mustard is very potential as a provider of essential mineral elements needed by the body because of its high nutritional value. Mustard plants are rich in sources of vitamin A, so effective in an effort to overcome the problem of vitamin A deficiency or myopic disease until now a problem among children under five. In the past only known three types of chicory, mustard greens and mustard huma. Nowadays people are more familiar with Caisim aka mustard meatballs, besides that there are still types of curry mustard, mustard huma and mustard monument.

The main nutrients needed by vegetable plants are N, P, and K. Nitrogen is the most dynamic nutrient in nature. According to Prihmantoro. (2003) that, N elements are easily lost from the soil through volatilization or percolation of ground water, are easily deformed, and are easily absorbed by plants. Plants absorb N elements in the form of ammonium (NH4 +) and nitrate (NO3-). The presence of NH4 + is very dynamic because it is easily deformed to NO 3 - due to the nitrification process. Phosphorus is a nutrient that is not easily moved (immobile) in the soil. Hara P in the soil is available in sufficient quantities for plants, but lack of P causes plant growth to be hampered due to disruption of cell and root plant development, carbohydrate metabolism, and energy transfer (Widarawati and Harjoso, 2011). According to Sarief (1989) potassium as an essential nutrient is rather a car like N. Although only a small portion of K is available which can be utilized by plants, nutrient K is easy to move, leachate, and bound by the surface of colloidal soil. Deficiency of K affects the root system, buds, starch formation, and sugar translocation. Plants can absorb nutrients through roots and leaves. C and O elements are taken from plants in the form of CO2 through leaf stomata in photosynthesis. The H element is taken from plants from ground water (H2O) through plant roots. Water is also absorbed by plants through leaves but in small amounts. Other elements are absorbed from plant roots from the soil such as macro nutrients N, P, and K as well as micro nutrients such as Ca, Mg, Cu, Fe, and others (Prihmantoro, 2003). Organic fertilizer itself is a fertilizer that is composed of material living things, such as weathering of the rest of plants, animals, and humans. Organic fertilizers can be either solid or liquid which is used to improve the physical, chemical and biological properties of the soil. Organic fertilizers contain a lot of organic matter rather than the price level. The source of organic material can be compost, green manure, manure, crop residues (straw, stover, corn cobs, sugarcane bagasse, and coconut fiber), livestock waste, industrial waste using agricultural materials, and municipal waste (garbage). (Maryam *et al*., 2015). Elfrida (2016) states that the benefits of lamtoro are that the leaves can be used as green manure which can fertilize plants because lamtoro leaves have a very high nitrogen content compared to other green leaves, besides that, lamtoro leaves also contain 0.2-0 , 4% phosphorus, and 1.3-4.0% potassium. All nutrients contained are essential nutrients that are needed by plants in their growth and development. Besides that, this plant can also be used as a protective plant that can provide nutrients for nitrogen in the surrounding plants.Chicken manure is manure derived from chicken manure mixed with animal feed residue. Chicken manure usually has a nutrient content of 1% N, 0.8% P2O5, and 0.4% K2O. Just like fertilizer, sometimes other chicken manure has a high C / N ratio of above 28, but after decomposition chicken manure has a C / N ratio between 10-20 (Riyawati, 2012). Based on the description above, it is necessary to do research on lettuce conditions in cultivation usually planted in wet climate highlands with fertile and loose soil which shows good results. For this reason, this study seeks to cultivate lettuce on dry land with dry climates using paranet to manipulate microclimate so that green mustard plants can grow well which are carried out in the lowlands on three different types of soil with leaf green manure lamtoro, gamal leaves and chicken manure.

MATERIAL AND METHODS

This experiment was carried out on NCBA nursery land located in Malinamuk Hamlet, Suco Comoro, PostuAdministrativu Dom Aleixo, Municipio Dili. Based on the GeoPointOna Collection Data the location is located at a latitude: S 8o33'53 ". Longitude: E 125o31'50 ". Place height ± 82.95 m above sea level (asl) and accuracy of 4 m. The method used in this study is Randomized Block Design (RBD), with 3 replications. The treatment is arranged factorially. The treatments tested consisted of two factors, namely: Factor 1. Factor doses of leaf doses of green manure lamtoro, gamal leaves (PHDLG) consisting of PHDLG = 0 gr / plot, PHDLG1 = 1200 gr / plot, PHDLG2 = 2400 gr / plot, PHDLG = 3600 gr / plot. 2nd factor. Chicken Cage (PKA) fertilizer dosage consisting of: PKA0 = 0 gram / plot, PKA1 = 2400 gram / plot, PKA2 = 3400 gram / plot, PKA3 = 460gram / plot. The experiment consisted of 12 combination treatment units and each treatment was repeated three times so that 36 units of research plots were needed. The ingredients used in the experiment were curly lettuce seeds of the Grand Rapids variety. the Red Arrow brand was obtained from Boaventura Shop, BidauAkadiru-Hun Village, Cristo Rei District, Dili District, as much as 200 kg of chicken manure were obtained from the NCBA Company Stall and Lamtoro LEAF green fertilizer, Gamal leaves. The tools used include; plows, hoes, sickles, plastic buckets, flushes, shovels, measuring cups, sitting scales, analytical scales, ovens, meters, rulers, raffia ropes, plastic bags, handcounters, writing instruments, soil pH, digital cameras.High growth per green mustard plant, number of leaves per mustard greens, stem diameter of mustard greens, and economical fresh weight of green mustard plants. Data collected was analyzed by analysis of variance (ANOVA) in accordance with the experimental design used. if there is a real interaction effect on the observed variables, the assessment is continued with an average difference test using the dmrt and bnt test at the level of 5% (gomez and gomez, 2007).

RESULTS AND DISCUSSION

Research Results: In this study planting experiments did not experience interference, both pests, mammary diseases and other disorders.

Table 5.1. Recapitulation: Effect of Green Leaves of Lamtoro Fertilizer, GamalGamal Leaf (PHDLG) and Chicken Cage Fertilizer (PKA) and interaction (PHDLG x PKA) on plant growth and yield of Cyanin Mustard at various ages of observations (Appendix 11., 12,13, 14.)

No	VariableObservation	Type of Fertilizer Applied		
		PHDLG	PKA	PHDLG x PKA
1	Plant height:			
	2 Weeks After Cultivate(WAC)	13.97**	16.02**	7.88**
	4 Weeks After Cultivate (WAC)	3.91*	21.30**	2.39*
	6 Weeks After Cultivate (WAC)	0.45^{ns}	6.74**	2.35*
	8 Weeks After Cultivate (WAC)	0.77^{ns}	8.46**	1.34^{ns}
2	Number of Leaves:			
	2 Weeks After Cultivate (WAC)	4.19*	11.09**	2.35*
	4 Weeks After Cultivate (WAC)	0.84^{ns}	14.29**	1.45^{ns}
	6 Weeks After Cultivate (WAC)	1.23^{ns}	13.49**	3.98**
	8 Weeks After Cultivate (WAC)	4.09*	11.54**	6.67**
3	Rod Diameter:			
	8 Weeks After Cultivate (WAC)	0.82^{ns}	2.92^{ns}	0.93^{ns}
	4 Economical Fresh Weight:			
	8 Weeks After Cultivate (WAC)	0.81^{ns}	0.60^{ns}	1.85^{ns}

Note : Ns = Non significant (P≥0,05)
* = Significant (P<0,05)
** = Significantly Different (P<0,01)
WAC = Weeks After Cultivated

The results of the statistical analysis showed that the administration of lamtorogamal (PHDLG) leaf leaves and chicken manure (PKA) had a very significant effect (P <0, 01) on all variables observed for plant height at the age of observation 2 and 4 weeks after planting. (2WAC). While for the 6th week administration of leaf green doses of lamtoro, gamal (6MST) did not give a significant effect, while for observations at the age of 8 weeks after planting (8WAC) there was no interaction between administration of green manure leaves lamtoro, gamal leaves (PHDLG). To observe the number of leaves at the age of 2 weeks after planting the administration of leaf green doses of lamtoro, gamal (PHDLG) had a very significant effect (P <0.01), while for observations on the number of leaves at 4 weeks after planting (4MST) , giving chicken manure dosage had a very significant effect (P <0.01), but for aplicationof leaf green doses of lamtoro, gamal (PHDLG) did not have a significant effect (P≥0.05) besides that there was also no interaction between concentration of green leaf doses of lamtoro, gamal (PHDLG) and concentration of chicken manure doses (PKA). As for the observation of the number of leaves at the age of 6 weeks after planting (6WAC), administration of lamtoro, gamal (PHDLG) leaf green manure did not have a significant effect (P≥0.05), but for giving chicken manure doses (PKA) the effect was very significant (P <0.01), as well as the interaction between the administration of leaf green doses of lamtoro, gamal (PHDLG) and administration of chicken manure doses (PKA) had a very significant effect (P <0.01). To observe the number of leaves at 8 weeks after planting (8MST), concentration of lamtoro, gamal (PHDLG) leaf green fertilizer gave a significant effect (P <0.05), while the administration of chicken manure doses (PKA) had an effect very significant (P <0.01), and also for the interaction between the concentratrionof leaf green doses of lamtoro, gamal (PHDLG) and administration of chicken manure doses (PKA) had a very significant effect (P <0.01).For observations of stem diameter and economical fresh weight at 8 weeks after planting (8MST), administration of green leaf doses of lamtoro, gamal (PHDLG) by administering chicken manure doses (PKA) did not have a significant effect (P≥0.05), as well as the interaction between administration of green leaf doses of lamtoro, gamal (PHDLG) and administration of chicken manure doses (PKA) did not have a significant effect (P≥0.05).

DISCUSSION

Tall Mustard Plant (cm) 5.2.1. Tall Mustard Plant (cm) From the results of analysis of variance (Anova) on mustard plant height (Appendix 1.a.) Showed that the administration of Green Leaves of Lamtoro, Gamal (PHDLG) and concentration of Chicken Cages (PKA) gave a very significant effect (P> 0.01) on the mustard plant age of 2MST, except for plant height at the age of 4MST the concentration of chicken manure doses (PKA) had a very significant effect (P> 0.01), but for concentration of green manure doses of lamtoro, gamal (PHDLG) only had an effect real (P> 0.05), as well as the interaction only gave a significant effect (P> 0.05). For observations on plant height at 6 weeks after planting (MST) the administration of chicken manure doses (PKA) had a very significant effect (P> 0.01), while interactions between administration of green manure doses of lamtoro, gamal (PHDLG) and dosing chicken manure (PKA) only had a significant effect (P> 0.01), while for the dose administration of lamtoro, gamal(PHDLG) leaf fertilizer did not have a significant effect (P <0.05) of plants at 8 weeks after planting (MST), administration of green leaf doses of lamtoro, gamal (PHDLG) and the interaction between administration of green leaf doses of lamtoro, gamal (PHDLG) and administration of chicken manure doses (PKA) did not give a significant effect (P> 0.05), but for fertilizer doses Chicken coops (PKA) have a very significant effect (P> 0.01). From the results of analysis of variance (Anova) on the number of leaves of mustard plants (Appendix 2.a.) showed that, to observe the number of leaves of mustard plants at the age of 2 weeks after planting (MST), administration of green manure leaves lamtoro, gamal (PHDLG), and the interaction between administration of green leaf doses of lamtoro, gamal (PHDLG), and concentration of chicken manure doses (PKA) gave a significant effect (P> 0.05), but for giving doses of chicken manure (PKA) gave a very real (P> 0.01), for observing the number of leaves at the age of 4 weeks after planting (MST), administering green leaf doses of lamtoro, gamal (PHDLG), and interacting between administration of green fertilizer doses oflamtoro, gamal (PHDLG), and the administration of chicken manure doses (PKA) did not have a significant effect (P <0.05), but the administration of chicken manure doses (PKA) had a very significant effect (P> 0.01).

Table 5.2. Average Plant Height (cm) Mustard Due to Combination of Green Leaves of Lamtoro Leaves, Gamal and Chicken Cage Fertilizer (PKA) at Different Ages (Appendix 1.c.)

Treatment	2 WAC	4 WAC	6 WAC	8 WAC
PHDLG0 PKA0	15.00a	22.33ab	32.00ab	30.00a
PHDLG0 PKA1	16.33ab	32.33f	41.67cd	45.00abc
PHDLG0 PKA2	15.33ab	27.67abc	41.00cd	51.00cd
PHDLG0 PKA3	15.00a	28.67cd	42.67e	39.00abc
PHDLG1 PKA0	15.00a	24.00cd	30.33a	35.00abcd
PHDLG1 PKA1	17.67bcd	31.33de	40.67abc	47.33bcd
PHDLG1 PKA2	20.00cd	32.33f	41.00bc	48.00e
PHDLG1 PKA3	20.33abc	32.00de	40.00abc	52.33ab
PHDLG2 PKA0	15.67cd	21.33a	34.33ab	32.00cd
PHDLG2 PKA1	22.00f	28.67cd	41.33cd	51.67f
PHDLG2 PKA2	24.33bcd	29.00cd	40.67cd	52.67cd
PHDLG2 PKA3	18.00a	29.33cd	41.67cd	40.00cd
PHDLG3 PKA0	15.00de	28.00cd	40.67cd	42.00cd
PHDLG3 PKA1	21.33de	28.00cd	36.67ab	43.00cd
PHDLG3 PKA2	20.67abc	29.33cd	41.00cd	46.00de
PHDLG3 PKA3	20.33abc	32.00de	34.33ab	48.67de

Note:The numbers followed by the same letters in each column differ not significantly in the 5% DMRT test.

Tabel. 5.3. Rata-Rata Jumlah Daun (helai) Tanaman Sawi (cm) Akibat Kombinasi Pupuk Hijau Daun Lamtoro, Gamal dan Pupuk Kandang Ayan (PKA) Pada Umur yang Berbeda (Lampiran 7.d.)

Treatment	2 WAC	4 WAC	6 WAC	8 WAC
PHDLG0 PKA0	4.33a	8.33ab	8.33a	13.67a
PHDLG0 PKA1	7.00cde	11.33bcd	10.67cd	20.00ef
PHDLG0 PKA2	7.00cde	11.33bcd	11.33cd	21.67gh
PHDLG0 PKA3	7.33ef	12.33de	12.33e	22.00ab
PHDLG1 PKA0	4.67ab	8.33ab	7.67a	14.67bc
PHDLG1 PKA1	7.33ef	10.67bcd	10.67bc	17.00fg
PHDLG1 PKA2	7.67f	12.00bcd	13.33f	20.33cde
PHDLG1 PKA3	8.33g	12.33de	12.33e	19.00abc
PHDLG2 PKA0	4.33a	7.67a	8.33a	17.33ef
PHDLG2 PKA1	5.67abcd	11.33bcd	12.67cd	18.33abc
PHDLG2 PKA2	6.00cde	10.67bcd	11.67bc	18.67cde
PHDLG2 PKA3	5.67abcd	11.00bcd	11.00cd	19.00fg
PHDLG3 PKA0	6.33cde	10.00bcd	12.00de	23.00h
PHDLG3 PKA1	7.00cde	11.00bcd	10.00cd	17.33ef
PHDLG3 PKA2	5.00abc	9.67abc	13.67f	19.00abc
PHDLG3 PKA3	7.00cd	11.00bcd	11.00cd	20.67g

Note: The numbers followed by the same letters in each column are different not evident in the 5% DMRT test.

And for observations on the number of leaves at 6 weeks after planting (MST), administration of lamtoro, gamal (PHDLG) leaf green manure, did not have a significant effect (P> 0.05), but for administering chicken manure doses and interactions between administration Lamtoro, gamal (PHDLG) leaf green doses, and chicken manure doses (PKA) gave a very significant effect (P> 0.01). As for the observation of the number of leaves at 8 weeks after planting (MST), administration of lamtoro, gamal (PHDLG) leaf green manure, only gave a significant effect (P> 0.05), while for giving chicken manure doses (PKA) and the interaction between administration of green leaf doses of lamtoro, gamal (PHDLG), and concentration of chicken manure doses (PKA) had a very significant effect (P> 0.01).

While the results of analysis of variance (Anova) on stem diameter and economical fresh weight of mustard plants (Appendices 9.a. and 10.a.) indicate that, for observation of stem diameter and economical fresh weight at the age of 8 weeks after planting (MST), administration of lamtoro, gamal (PHDLG) leaf green manure and conentration of chicken manure doses (PKA) and their interactions between the two fertilizer combinations did not have a significant effect (P <0.05). At the age of 2 MST mustard plants are still small so that mustard plants need hormones to grow for relatively small amounts of apical meristem cell division activities. Application of lamtoro, gamal (PHDLG) leaf green manure (PHDLG) combined with chicken manure doses (PKA) gave good results on mustard plant height in all treatments except fertilizer without fertilization.

It is presumed that the treatment without fertilization could not meet the needs of these plants in the process of increasing plant height, because in the treatment without administration of green manure leaves lamtoro, gamal (PHDLG) and chicken manure (PKA), so that the nutrients needed by plants in phase the growth cannot be fulfilled, while the nutrients needed by plants are only supplied from the ground. Providing lamtoro, gamal (PHDLG) leaf green manure and chicken manure (PKA), into the soil for the better, because it can supply the availability of nutrients in the soil, so that nutrient requirements for mustard plants can be fulfilled in the vegetative growth phase. Increasing age, more and more growth hormones are needed for the process of growth and development of plants. It is seen that the mustard plant height at the age of 2 WAC, 4 WAC, 6WAC and 8 MST, the highest average found in the combination treatment (PHDLG1PKA3 and PHDLG2PKA2) showed significant differences. The results showed that administration of green leaf doses of lamtoro, gamal (PHDLG1), 1.20 kg / plot combined with 3.60kg / plot of chicken manure doses gave the highest yield on mustard plants namely 20-24 cm or 7.88%.

Number of Leaves of Green Mustard Plants (strands): Giving organic fertilizer can increase nutrients in the soil, so that plant growth increases with the availability of nutrients. This is supported by Lakitan's theory (1996), there is a synchronization between the availability of nutrients and the needs of plants so that they can help speed the growth of

plants. This is also supported by Sarief (1992), who stated that organic fertilizers incorporated into the soil will be decomposed by microorganisms and nutrients released from decomposition into available and absorbed by plant roots, so that plant growth will increase, especially plant height. The results of analysis of variance (Anova) on the number of leaves of mustard plants (Appendix, 4.2.) Showed that administration of lamtoro, gamal (PHDLG) leaf green manure with chicken cage fertilizer dosage (PKA) had a significant effect (P <0.05) and very significant (P <0.01) on the number of leaves of mustard plants aged 2 MST, and at age 4 MST, administration of lamtoro, gamal (PHDLG) leaf green manure, did not have a significant effect (P <0.05) as well as interactions, while to administer chicken manure doses (PKA) had a very significant effect (P <0.01). at 6 weeks after planting 6 MST fertilizer dosing (PHDLG) did not have a significant effect (P <0.05), but for the provision of doses of chicken manure (PKA) with interactions that had a very significant effect (P <0.01). whereas for the age of 8 weeks after planting (MST) the administration of green leaf doses of lamtoro, gamal (PHDLG) gave a significant effect, but for the administration of chicken manure doses (PKA) and their interactions gave a very significant effect (P <0.01). Stem diameter and economical fresh weight at 8 weeks after planting (MST), administration of lamtoro, gamal (PHDLG) leaf green doses and administration of chicken manure doses (PKA) and their interactions between the two fertilizer combinations did not have a significant effect (P <0.05).

The application of lamtoro, gamal (PHDLG) leaf green manure (PHDLG) combined with chicken manure (PKA) doses gave good results to the number of mustard plant leaves in all treatments except treatment without fertilization. In general, the differences in the types of leaf green doses of lamtorogamal combined with doses of chicken manure significantly affected the vegetative growth of plants. From the average data from the results of the research, it can be seen that there is a tendency to increase plant growth by increasing the dose of organic fertilizer. With the increase in the amount of organic fertilizer given to the soil, the amount of nutrients also increases, so that the availability of nutrients in the soil needed for plants is fulfilled. In other words, plants that are fulfilled by their nutrient requirements can stimulate new leaf growth. Increasing age, more and more growth hormones are needed for the process of growth and development of plants. It is seen that the number of lettuce leaves at the age of 2MST, 4MST, 6MST and 8MST, the average number of leaves of the plant was more in combination treatment (PHDLG3PKA0) and different while the treatment without fertilization (PHDLG0 PKA0) showed no significant difference. The results showed that administration of green leaf doses of lamtoro, gamal (PHDLG3) 3.60gram / plot combined with chicken manure doses (PKA0) 0 gram / plot gave the highest number of leaves of mustard plants, 13 strands or increased by 6.67%. The results showed that the administration of organic fertilizer can increase nutrients in the soil, so that plant growth increases with the availability of nutrients. Plants that are fulfilled by their nutrient requirements will stimulate new leaf growth. The number of leaves is positively correlated with plant height, the higher the plant, the more the number of leaves. Increasing plant height will increase the number of segments and books so that the number of leaves will also increase, this is because the segments and books are where the leaves stick. This is supported by the theory of Sitompul and Guritno (1995) stating that the stem is composed of segments and books where the leaves are attached. Reinforced by Rinsema (1986) states that, the N element plays an important role in leaf formation because with N availability the photosynthesis process will increase and the photosynthate produced can be used by plants for leaf formation.

CLOSING

Conclusion

Based on the results of research on the influence of the types and doses of green manure leaves of lamtoro, gamal and chicken manure on growth and yield of mustard greens caisin (Brassica Juncea L). The results of the study showed that among the four parameters observed in the growth of Caishin green mustard plants, it was indicated that the effect of lamtoro leaf green manure, gamal leaves on plant height parameters at week 2 and week 4 of MST. Likewise, the influence of chicken manure can affect the growth of tall green mustard greens in the weeks 2,4,6 and 8 WAC. On the other hand, the combination of lamtoro leaf green manure, gamal leaves and pp chicken manure can also influence the growth of mustard plant height at weeks 2.4 and 6 WAC. From the results of the research on the parameters of leaf number, it indicates that the influence of lamtoro leaf green fertilizer, gamal leaves can affect the parameters of the number of leaves of green mustard plants in the 2nd and 8th weeks of MST. Likewise the influence of chicken manure can affect the growth of the number of leaves of the green mustard greens in the weeks 2,4,6 and 8 MST. In contrast, the combination of lamtoro leaf green manure, gamal leaves and chicken manure can also affect the growth of the number of mustard plant leaves at weeks 2.6, and 8 of WAC.

While the administration of lamtoro leaf green manure, gamal leaves did not affect the parameters of the green mustard plant at the 6th and 8th week and the combination of green leaf fertilizer from lamtoro, gamal leaves and chicken manure at the 8th week of WAC, while the parameters of the number of leaf plants green mustard leaves of lamtoro green manure, gamal leaves did not affect the growth of the number of leaves of mustard plants at the 4th and 6th weeks, as well as the combination of lamtoro leaf green manure, gamal leaves and chicken manure could not affect the growth of the mustard leaves green at the 4th week. The effect of lamtoro leaf fertilizer, gamal leaves and chicken manure did not have a significant effect on the stem diameter of green mustard plants in the 8th week of MST. Likewise on the economical fresh weight parameters of green mustard plants, the influence of lamtoro leaf green manure, gamal leaves and combination with chicken manure did not affect the economical weight of fresh green mustard plants in the 8th week of WAC.

Suggestions

With the implementation of this study entitled "Effect of green manure dosages of lamtoro, gamal and chicken manure on growth and yield of green mustard caisin (Brassica Juncea L).then researchers can suggest that: 1. From the results of this study, further research is needed to find out in detail the effect of the types and doses of lamtoro leaf green manure, gamal leaves and chicken manure on the growth and maximum yield of green mustard plants in order to guarantee market needs. 2. Further research is needed to review the effect of the types and doses of lamtoro leaf green manure, gamal leaves and chicken

manure on the parameters of fresh root weight, fresh leaf weight, fresh weight of stem and total fresh berate in order to refine this study.

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