

Response of Liquid Organic Fertilizer Application from Sword Fern Weeds and Goat Manure on Growth and Production of Green Beans (*Vigna radiata* L)

Armaniar Armaniar (*), Sulardi Sulardi, Fachrina Wibowo,
Mika Silviana Manik

Agrotechnology, Faculty of Science and Technology,
Pembangunan Panca Budi University
Jl. Gatot Subroto No.5 km, Simpang Tj., Medan Sunggal District, Medan City,
Sumatera Utara 20122, Indonesia

*Corresponding author: armaniar@dosen.pancabudi.ac.id

Submitted September 16th 2023 and Accepted November 04th 2023


Abstract

Research about Response of giving liquid organic fertilizer weeds sword ferns and goat dung to growth and production green beans (*Vigna radiata* L) has done in the month March until July 2023. Research methods use Factorial Randomized Design (FRD) consisting of 2 factors with 16 combinations treatment and 2 replications. The first factor was treatment Fertilizer Organic Liquid weed nail sword plant (M) consists of 4 levels; M0 = 0 cc/ L water/ plot , M1 = 100 cc/ L water/ plot , M2 = 200 cc/ L water/ plot , and M3 = 300 cc/ L water/ plot . Second factor Fertilizer goat dung (S) consists of 4 levels namely S0 = 0 kg/ plot , S1 = 2 kg/ plot , S2 = 4 kg/ plot , and S3 = 6 kg/ plot . Observed parameters tall plants, quantity branch productive, age flowering, production per plot , weight 100 seeds Results showed treatment of Fertilizer Organic Liquid weed plant nail sword give influence against high parameters plants, quantity branch productive, production per plot , and the weight of 100 seeds. However no influence on age flowering parameters. Treatment fertilizer goat dung give influence to tall plants, quantity branch productive, production per plot and weight of 100 seed, however No influence to age flowering parameters. Interaction between P fertilizer applications Organic Liquid weed plant nail sword and fertilizer goat dung showed no impact towards all observation parameters

Keywords: Fertilizer, Green Beans, Manure Goat dung, Sword Fern Weed



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 <https://doi.org/10.36987/jpbn.v9i3.5089>

INTRODUCTION

Peanut green (*Vigna radiata* L.) is one plant food source of vegetable protein. Peanut protein content green by 22% occupy order third after soybeans and beans land. Peanut green is one of the type food plant that has role important as source nutrition. According to (Suhartono et al., 2020) content carbohydrate in 100 g of nuts green a total of 62.9 g which is the value more tall compared to content carbohydrates in soybeans and nuts land (Kaur et al., 2017) . state besides as source carbohydrates, nuts green is source of protein and minerals. Besides that peanut green also plays a role important in increase fertility land (Alfandi, 2015).

Cultivation peanut green can be done in a way organic with use organic fertilizer. Organic fertilizer is very useful in increase fertility land and improve quality land in a way sustainable (Sihotang, 2023). Use fertilizer organic will return material organic into the land so that happen upgrade production plant (Dahlianah, 2014). Fertilizer organic that alone can originate from fertilizer cages, fertilizer green or fertilizer made from remainder plants and others (Nizan, 2021). One of possible organic fertilizer used in cultivation peanut green is goat dung (Matanari, 2023).

Goat dung has texture shaped details hard round broken down in a way physique so it's very influential to decomposition and nutrient processes. Fertilizer C/N ratio value goat dung generally Still above 30. Fertilizer good cage must have C/N ratio <20, so fertilizer goat dung will better its use when composted moreover formerly For fertilization until fertilizer ripe. Characteristic features fertilizer goat dungs who have ripe that is dry and relatively Already no smells. Goat dung own more K content tall compared type fertilizer other . (Marviana & Utami, 2014). Several research results on green bean plants using goat manure showed significant growth results (Kurniawati et al., 2022), optimal production (Risnah et al., 2022) and total fruit increase (Afif et al., 2014). Other research has been done use Liquid organic fertilizer also shows significant on chilli production (Warsito, 2022) .Purpose of this research is for know influence giving dung goats combined with liquid fertilizer from plant nails.

METHOD

This research used method completely random design. Taking sample use method Factorial Randomized Block Design (RAK) , which consists of from 2 (two) factors, 16 treatments, 2 replications . Fertilizer factor organic liquid weed plant nail sword consists of 4 levels, $M_0 = 0$ cc/ L water/ plot , $M_1 = 100$ cc/ L water/ plot , $M_2 = 200$ cc/ L water/ plot , $M_3 = 300$ cc/ L water/ plot . Fertilizer factor goat dung consists of 4 levels, $S_0 = 0$ kg/ plot , $S_1 = 2$ kg/ plot , $S_2 = 4$ kg/ plot , $S_3 = 6$ kg/ plot . Data analysis was carried out with Duncan and Anova tests (Akib, 2014).

RESULTS AND DISCUSSION

Plant Height (cm)

Analysis results fingerprint variety show that response giving fertilizer organic liquid weed plant nail sword and fertilizer goat dungs at 4, 6, and 8 weeks of age after planting (MST) provides very real influence to tall plants , but the interaction between the

two has no significant effect. High average yield plant to fertilizer organic liquid weed plant nail sword and you can get goat manure seen in Table 1.

Table 1. Average Plant Height (cm) Consequences Giving fertilizer organic liquid Weeds Sword Fern Plants (M) and Fertilizer Goat dung (S) at 4, 6, and 8 Weeks of Age After Planting

Treatment	Plant Height (cm)					
	4 WAP		6 WAP		8 WAP	
Weeds Sword Fern (M)						
M0 = 0 cc/liter air/plot	28.10	bB	69.90	bA	80.10	bB
M1 = 100 cc/liter air/plot	29.98	bA	70.58	aA	83.60	aA
M2 = 200 cc/liter air/plot	30.93	bA	74.75	aA	84.20	aA
M3 = 300 cc/liter air/plot	37.13	aA	75.20	aA	84.55	aA
Goat Manure (S)						
S0 = 0 kg/plot	28.03	bB	64.70	bB	80.33	bB
S1 = 2 kg/plot	30.98	aA	72.30	aA	83.80	aA
S2 = 4 kg/plot	31.05	aA	75.55	aA	84.05	aA
S3 = 6 kg/plot	36.08	aA	77.88	aA	84.28	aA

Description : Numbers in the same column followed by letters that are not The same means different significant at the 5% level and very significantly different at the 1% level.

Total of Branches

Analysis results fingerprint variety show that giving fertilizer organic liquid weed plant nail sword and fertilizer goat dung give influence to amount branch productive plant peanut green, but there is no interaction between the two gives influence to amount branch productive. The average result is the number branch peanut green to fertilizer organic liquid weed plant nail sword and fertilizer goat dung can be seen in Table 2.

Table 2. Average Number of Branches (branches) of Green Beans Giving Fertilizer Organic Liquid Weeds Sword Fern Plant (M) and Goat dung (S)

Treatment	Number of Productive Branches	
Weeds Sword Fern (M)		
M0 = 0 cc/liter air/plot	5.28	bA
M1 = 100 cc/liter air/plot	6.40	aA
M2 = 200 cc/liter air/plot	6.40	aA
M3 = 300 cc/liter air/plot	6.60	aA
Goat Manure (S)		
S0 = 0 kg/plot	4.53	bB
S1 = 2 kg/plot	4.80	bB
S2 = 4 kg/plot	7.38	aA
S3 = 6 kg/plot	7.98	aA

Description : Numbers in the same column followed by letters that are not The same means different significant at the 5% level (letter small) and very significantly different at the 1% level (letter big).

Age Flowering (Days)

Analysis results fingerprint variety show that giving fertilizer organic liquid weed plant nail swords and goat dung and the interaction is not give influence to age flowering. Average age results flowering peanut green to fertilizer organic liquid weed plant nail sword and fertilizer goat dung can be seen in Table 3.

Table 3. Average Age Flowering (days) Green Beans Results Giving fertilizer organic liquid Weeds Sword Fern Plant (M) and Goat dung (S) at 5 Weeks of Age After Planting .

Treatment	Age flowering (days)	
Sword Fern Weed (M)		
M0 = 0 cc/liter of water/plot	40.25	a A
M1 = 100 cc/liter of water/plot	45.45	a A
M2 = 200 cc/liter of water/plot	47.58	a A
M3 = 300 cc/liter of water/plot	47.95	a A
Goat dung (S)		
S0 = 0 kg/plot	42.48	a A
S1 = 2 kg/plot	42.95	aA
S2 = 4 kg/plot	47.35	aA
S3 = 6 kg/plot	48.45	aA

Description : Numbers in the same column followed by letters that are not The same means different No significant at the 5% level (letter small) and at the 1% level (letter big)

Production Full (g)

Analysis results fingerprint variety show that giving fertilizer organic liquid weed plant nail sword and fertilizer goat dung give influence to production per plot plant peanut green . , but not give interaction to production per plot peanut green .Average production yield per plot peanut green to fertilizer organic liquid weed plant nail sword and fertilizer goat dung can be seen in Table 4.

Table 4. Average Production Perplot (g) Green Beans Consequences Giving fertilizer organic liquid Weeds Sword Fern Plant (M) and Goat dung (S)

Treatment	Production Perplot (g)	
Sword Fern Weed (M)		
M0 = 0 cc/liter air/plot	880.38	bB
M1 = 100 cc/liter air/plot	1053.25	bB
M2 = 200 cc/liter air/plot	994.38	bB
M3 = 300 cc/liter air/plot	1101.50	aA
Kotoran Kambing (S)		
S0 = 0 kg/plot	939.75	bB
S1 = 2 kg/plot	918.00	bB
S2 = 4 kg/plot	1065.75	abA
S3 = 6 kg/plot	1106.00	a A

Description : Numbers in the same column followed by letters that are not The same means different significant at the 5% level (letter small) and very significantly different at the 1% level (letter big).

Weight of 100 Seeds (g)

Results after analyzed fingerprint variety show that giving fertilizer organic liquid weed plant nail sword and gift fertilizer goat dung give influence to weight of 100 seeds plant peanut green , but No give interaction to weight of 100 seeds peanut green. Average yield weighs 100 seeds peanut green to fertilizer organic liquid weed plant nail sword and fertilizer goat dung can be seen in Table 5.

Table 5. Average Weight of 100 Seeds Green Beans Consequences Giving Fertilizer Organic Liquid Weeds Sword Fern Plant (M) and Goat dung (S)

Treatment	Weight of 100 seeds (g)	
Sword Fern Weed (M)		
M0 = 0 cc/liter of water/plot	9.45	bA
M1 = 100 cc/liter air/plot	9.30	bA
M2 = 200 cc/liter air/plot	10.18	aA
M3 = 300 cc/liter air/plot	10.55	aA
Goat dung (S)		
S0 = 0 kg/plot	9.55	bA
S1 = 2 kg/plot	9.15	bA
S2 = 4 kg/plot	10.15	aA
S3 = 6 kg/plot	10.63	aA

Description : Numbers in the same column followed by letters that are not _ The same means different significant at the 5% level (letter small) and very significantly different at the 1% level (letter big).

Response Giving Fertilizer Organic Liquid Weeds Sword Fern Plant To Growth and Production Green Beans (*Vigna radiata* L).

Results of data analysis statistics show that response giving fertilizer organic liquid weed plant nail sword to growth and production peanut green give influence on growth vegetative that is against high parameters plants and quantities branch productive. This matter because exists content compounds in fertilizer organic liquid weed plant nail sword Enough tall so that give optimal results for growth plant peanut green with dose that delivers influence and results highest , will but at low doses _ will give sufficient influence and results _ low . This matter in accordance with research conducted by (Dayanti & Suyatno, 2012). Plant nail swordtail (*Nephrolepis* sp .) has content compound chemistry including saponins, cardenoline , flavonoids and tannins. Flavonoids are one of them group metabolites secondary in plants known nails _ own activity anti-inflammatory with hinder track cyclo oxygenase (COX). Apart from that , flavonoids also have activity antioxidant , anticancer , and antimicrobial which are these flavonoid compounds works For stimulate growth and development in plants , p This is what leads to giving fertilizer organic liquid weed plant nail sword on high plants and quantities branch productive give influence because compounds contained in nails _ sword respond to growth peanut green (Pranowo et al., 2016).

On giving fertilizer organic liquid weed plant nail sword No give influence on age parameters flowering . This matter caused exists influence characteristic genetic from its parent . Its effect on growth generative that is to production parameters samples , production per plot and weighs 100 seeds . This matter because plant nail own a number of role important , that is deep humus formation , protects land from erosion , guarding humidity land , and as one plant pioneer at the stage beginning succession ecosystem forest and deep pre-research phytochemical tests carried out on plants nail sword (*Nephrolepis sp.*) there is flavonoid compounds and saponin compounds that can hinder growth bacteria matter this is also what gives influence on growth and fruiting that can be increase production peanut green (Nugroho *et. al.*, 2018).

According to (Kurniawan, 2015), mechanism Flavonoid compounds play a role as antifungal . Flavonoids are reported role as antiviral, antibacterial , antifungal , anti-inflammatory and anti-allergic . Flavonoids are metabolites secondary in leaves nail working sword _ denatures cell proteins fungi and nature lipophilic . Mechanism flavonoids work with method protein denaturation , disrupting lipid layer and resulting damage cell wall . characteristic lipophilicity in these flavonoids will tie phospholipids in cell membranes moldy and annoying permeability cell membrane . Whereas according to addition (Kurniawan, 2015). mechanism alkaloid compounds can hinder synthesis sour nuclei and affect ergosterol in *C. albicans* . Plant nail own very important role for ecosystem and life man . In role for ecosystem plant nail role in humus formation and protection land from erosion , guarding humidity soil , mixing litter for formation of soil nutrients , meanwhile in life man plant nail potential as material vegetables and others (Khamalia *et al.*, 2018). Apart from that a number of compound important role _ For growth plant peanut Green , biotic and abiotic factors in the environment also influence growth plants on the land (Warsito, 2023).

Response Giving Fertilizer Goat dung To Growth and Production Green Beans (*Vigna radiata L*)

Results of data analysis statistics show that response giving fertilizer goat dung to growth and production peanut green give influence on growth vegetative that is against high parameters plants and quantities branch productive. This matter in accordance with research conducted by Pranata (2014), that the more tall dose fertilizer given _ the more increase growth plant . This matter can describe that the more tall dose giving fertilizer the the more Lots nutrients supplied _ for growth plant peanut green that can be increase tall plants and quantities branch productive . Whole absorbed elements _ plant each other influence One each other, so fertilizer dirt given goat _ can support growth plant peanut green.

On giving fertilizer goat dung No give influence on age parameters flowering . This matter caused exists influence characteristic genetic from originating parent _ from which varieties _ One varieties bring characteristic from parent so that No Can change characteristic where is the parent ? peanut green Vima 3 variety is varieties peanut green results cross between parent wallet varieties with Elder male MLG 716, p This in accordance with the Research Institute Library Various Nut and Tuber Plants (2014). Its effect on growth generative that is to production parameters samples , production per plot

and weighs 100 seeds . This matter in accordance with research conducted by [Sutejo \(2012\)](#) , that something plant will grow and achieve level production tall if required nutrients plant is at in circumstances Enough available and balanced inside soil and the elements N, P, K which are three element from six absolute macro nutrients required by plants . if one _ element the not enough or No available in land , will influence growth and production plant .

Application fertilizer goat dung can repair aeration land , add ability land withhold nutrients , increase capacity retain water, increase Power prop land , source energy for microorganisms land and as source nutrients for plant . The N element contained in fertilizer goat dung push growth of related organs with photosynthesis that is leaf. Potassium plays a role as activator various essential enzymes _in reactions photosynthesis and respiration as well as For enzymes involved in protein and starch synthesis . In plants, the element P is element important compiler adenosine triphosphate (ATP) which is direct role in the associated energy storage and transfer processes in metabolic processes plant as well as role in enhancement component yield , fertilizer goat dung contain the required N nutrient For support growth vegetative plant . According to ([Napitupulu & Winarto, 2010](#)). that nitrogen is component structural from compound much needed organics For enlargement and division cell , so Optimum nitrogen application will increase growth vegetative plants , p This cause tall plants , quantity branch , production samples and production per plot experience enhancement with increasing N concentration

Interaction Response Giving Fertilizer Organic Liquid Weeds Sword Fern Plants and Fertilizer Goat dung To Growth and Production Green Beans (*Vigna radiata* L)

Based on results analysis in a way statistics is known that interaction between giving fertilizer organic liquid weed plant nail sword and fertilizer goat dung to growth and production peanut green No give influence to all parameters, p This allegedly second treatment No each other support unique can increase production peanut green so that result No happen interaction on both treatment . Treatment fertilizer organic liquid weed plant nail sword own high nutrient elements Where compounds contained namely flavonoids and saponin compounds that can hinder growth bacteria and have activity antioxidant. This is what leads to giving fertilizer organic liquid weed plant nail sword No give influence interaction due to one compound in nail sword own possible functions hinder growth where are the bacteria? bacteria This can help growth and development plants and besides it 's fertilizer pen goat has a high C/N.

Research result ([Susanto et al., 2017](#)) reported that high C/N of the material organic indicated that material Not yet can applied due to the decomposition process Not yet happen perfect. Based on comparative data quality use goat dung with C/N ratio is 13.38% with standard quality SNI 19-7030-2004 , namely results compost from a number of study good quality because fulfil requirements by SNI 90-7030- 2004, with following C/N doses fertilizer goat dung can be used on plants If more from recommended dose of C/N so plant will difficult for absorb nutrients provided . This is what leads to giving treatment fertilizer organic liquid weed plant nail sword and fertilizer goat dungs on growth and production peanut green no experience interaction between second treatment

caused high dose, so make plant incapable carry out a complete decomposition process (Armaniar et al., 2022).

CONCLUSION

Providing weed POC plant nail sword exert influence on plant height parameters, amount branch productive, production per plot, and the weight of 100 seeds, however No give influence to age parameters flowering. The best treatment was found in M3 (= 300 cc/liter of water/plot). Giving Fertilizer goat dung exert influence on the parameters of plant height, number branch productive, production per plot and weight of 100 seeds, however No give influence to age parameters flowering. The best treatment was found in S3 (= 6 kg/plot). Interaction between weed POC applications plant nail sword and fertilizer goat dung No exert influence towards all observation parameters.

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How To Cite This Article, with *APA style* :

Armaniar., Sulardi., Wibowo F., & Manik, M.S. (2023). Response of Liquid Organic Fertilizer Application from Sword Fern Weed and Goat Manure on Growth and Production of Green Beans (*Vigna radiata* L.). *Jurnal Pembelajaran dan Biologi Nukleus*, 9(3), 717-726. <https://doi.org/10.36987/jpbn.v9i3.5089>