

THE EFFECT OF GIVING COMPOSE OF WEEDS ON THE GROWTH OF PALM OIL SEEDS

(*Elaeis guineensis*. Jacq) in Pre-Nursery

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ABSTRACT

The study aims to determine the impact of a compost dose on palm seed growth and to determine the ideal dosage for palm seed growth. The research was conducted in the experimental garden of Graha Karya College of Agriculture, Muara Bulian Batanghari Jambi province, the research was conducted for three months starting, from October 1, 2019 to December 31, 2019. The research was conducted using Randomized Block Design (RBD) with 6 treatments 4 replications. The treatment is compost consisting of. K1 = Dose of 100 Gram per polybag, K2 = Dose of 200 Gram per polybag, K3 = Dose of 300 Gram per polybag, K4 = Dose of 400 Gram per polybag, K5 = Dose of 500 Gram per polybag, K6 = Dose of 600 Gram per polybag. In this study there were 6 treatments in the study area, each treatment was repeated 4 times, so that obtained 24 plots or plot plots.

Variables observed were sprout growth, number of leaves, leaf length, leaf width and plant height, then the observation data were statistically analyzed using analysis of variance and followed by DNMRT (Duncan New Multiple Range Test) test α 5%. The results showed that the dose of compost from weeds significantly affected the growth of sprouts, leaf length, leaf width and plant height but did not significantly affect the number of leaves of oil palm seedlings in pre-nursery. Compost doses of 100 g weeds provide the best growth for oil palm seedlings in pre-nursery.

Keywords: Compost, Weeds, Organic Fertilizer

INTRODUCTION

Oil palm is one of the vegetable oil crops that are currently being developed in Indonesia. The government continues to encourage the growth of the national palm oil industry because palm oil is one of the leading commodities in Indonesia and is the largest non-oil and gas foreign exchange contributor. (Rhephi. 2007)

Jambi Province is one of the oil palm producing provinces in Indonesia. Data from the Jambi Province plantation office recorded and reported that the area of oil palm plantations in Jambi Province in 2017 reached 689,966 ha, spread across a number of districts with the number of production reaching 1.6 million tons / year, the area of production and productivity of oil palm has increased every year. (Jambi Provincial Plantation Office. 2017).

Batanghari is one of the central areas for palm oil plantation in Jambi Province which has a plantation area that always increases every year. The following is a table of the area of production and productivity of oil palm plantations in Batanghari district.

Table 1: The area of production and productivity of CPO for oil palm plantations in Batanghari Regency in 2017.

Districts	The Land Area			Production (ton)	Productivity (ton/ha/year)
	TBM	TM	Total		
Batin XXIV	2,544,72	15,543,42	21,517,14	50,526	3,251
Bajubang	1,114	18,088,99	19,281,99	69,020	3,816
Muaro Sebo Ulu	7,409,39	9,345,06	16,771,45	29,252	3,130
Mersam	2,409,22	12,412,44	15,630,66	40,419	3,256
Muaro Sebo Ilir	1,307	9,365,47	10,697,47	36,013	3,845
Pemayung	1,694,99	2,532,66	4,246,65	8,739	3,451
Muara Tembesi	1,035,28	2,961	4,014,28	8,909	3,009
Muara Bulian	1,554,74	2,419,92	3,993,66	8,785	3,630
Sum	19,089,34	72,668,96	96,153,30	251,663	3,463

Source : BPS (Central Bureau of Statistics Republic of Indonesia) *Batanghari District 2017*.

Based on BPS (Central Bureau of Statistics Republic of Indonesia) Batanghari data in 2017, we can see that the areas that have good plantation areas and oil palm production are in the sub-districts of Muaro ebo ilir, Muara bulian, Bajubang, Batin XXIV, Mersam, Pemayung, Muara Tembesi. From the large amount of oil palm production and productivity in Batanghari Regency, Batanghari Regency is therefore one of the largest producers of palm oil in Jambi Province. What can be done to meet the nutrient needs of plants that grow on marginal land requires a large amount of fertilizer to be used to increase growth and productivity. Balanced fertilization is the key of the successful land and crop management. The activity is by providing fertilizer in accordance with the dosage or dosage and type of fertilizer with soil characteristics and plant needs.

Organic fertilizer is a good and natural soil repairer, although in general organic fertilizers contain low macro nutrients N, P, K but it contains more complete micro nutrients because plant growth is needed. Another function of organic fertilizers is as a soil repairer, preventing erosion, movement of the soil surface (crusting) and soil cracks, maintaining soil moisture. Organic fertilizers contain nutrients in varying amounts, it's depending on the basic ingredients and processing processes. Placement of organic fertilizers into the soil can be done like inorganic fertilizers (Supartha, 2012).

One type of organic fertilizer that is commonly used is compost. Compost is a fertilizer derived from organic matter residue that can improve soil physical properties, (increase water retention capacity), soil chemistry and soil biology. Sources of compost material include organic waste such as plant debris (straw, stalks, branches), household waste, livestock manure (cows, goats, chickens, ducks), husk charcoal, kitchen ash and others. (Rukmana. 2007). The purpose of this study was to determine some of the effects of compost from weeds on the growth of oil palm seedlings and to obtain the best weed compost dose to support the growth of oil palm seedlings.

THEORETICAL FRAMEWORK

Oil Palm Seeds

Nursery is an activity to grow and care for sprouts until they become seeds that are ready to be transplanted into the field. The aim of nurseries is to ensure carefully that the seeds planted in the field are seeds that comply with standards. Mentioning that the aim of oil

palm nurseries is to produce high quality seedlings which must be available when the planting land preparation has been completed, the nursery consists of 2 stages, the first stage is the pre-nursery stage and the second stage is the main nursery (Main Nursery) . (Fairhust, et al. 2009). Oil palm nurseries can be done in two systems, namely one stage (Single Stage) and a two-stage nursery (Double Stage). What is usually done at this time is two stages or double stage, namely a nursery system that uses the pre-nursery and the main nursery.

The first stage of nursery (Pre Nursery) in this nursery system is to plant oil palm sprouts in baby polybags. The advantage of this early nursery is that it is easier to control because it focuses on a small, centralized area for three months. The second stage of the nursery (Main Nursery) is the second stage of a double stage nursery which lasts 6-9 months. Main nursery is an activity of transplanting or transferring seeds from pre-nursery to main nursery. (Pahan. 2006)

Weed Compost

The use of organic matter from weed biomass has been widely practiced by farmers, namely by putting it back into the soil when cultivating the soil. Organic matter will increase soil fertility so that it can be reduced the use of inorganic fertilizers for plants. Utilization of organic material derived from green manure and crop residues directly as a complement to inorganic fertilizers has become popular since land and environmental damage occurred. (Sugito, et al. 1999). Organic material from weeds is a potential source of nutrients, the magnitude of which depends on the weed species used and on the condition of its growth. Broadleaf weeds usually contribute more nutrients than weeds in the danteki grass group. (Yahya, et al. 1996).

Weeds are a type of plant that grows a lot in rice fields which are still considered as bug plants, on the other hand some types of weeds are plants that contain nutrients and can be used. (Achmanu, et al. 1997). Therefore eradicating weeds that are not environmentally friendly can be disrupted in ecosystem damage, thus weeds need to be explored for use. There are 4 types of weeds that are often encountered and grow in plantations, with details of the types of grasses, riddles, and broadleaf weeds. (Sastroutomo. 1990). From the various types of weeds, the differences in individual weeds will also affect their physical properties and chemical composition. Exploration for selecting weed species is necessary.

Table 2. Nutritional Content of Various Weed Species that will be used in composting.

Types of weeds	Basic Dry Material			Dry Material	
	(%)	N (%)	P (%)	K (%)	Ca (%)
Cyperus halpan (Pendulum grass)	24,68	0,96	0,26	6,01	0,08
Lindernia crustaceae (Chrysanthemum grass)	17,73	1,06	0,26	6,64	0,04
Limnocharis flava (Genjer)	15,79	1,32	0,58	8,28	0,04
Monochoria vaginalis (Water hyacinth)	19,18	1,14	0,36	7,12	0,13
Total	77,47	4,21	1,49	24,05	0,29

Source: Results of Analysis of the Laboratory of Soil Science, Faculty of Agriculture, Bengkulu University (2009).

The amount of NPK macro nutrient content in organic materials from various types of weeds is a very potential natural resource, this organic material can be processed into

alternative fertilizers in the form of organic fertilizers so that it provides benefits for efforts to improve soil fertility, increase production, and preserve natural resources.

METHODS

The research has been carried out in the experimental garden of the Graha Karya College of Agricultural Sciences Muara Bulian Batanghari, with a height of 12 meters above sea level and a red and yellow podzolic soil type (PMK). by 31 December 2019.

The materials used in this study were: DxP simalungun oil palm seedlings, paranet, 14x22 polybags (1 kg), weeds obtained from cleaning research areas and local community plantations, chicken manure, EM4 microbes, plastic granulated sugar, Tarps, sacks, fertilizer manufacturing methods can be seen in Appendix 4. And the tools used in the research were scales, hoes, machetes, gembor, buckets, experimental baleho, nameplate, stationery and other aids.

The research was carried out BY using a randomized block design (RAK) with 6 treatments and 4 replications, the treatment was a compost dose consisting of, K1: dose of 100 grams / polybag, K2: dose of 200 grams / polybag, K3: dose of 300 grams / polybag, K4: Dose of 400 Gram / polybag, K5: Dose of 500 Gram / polybag, K6: Dose of 600 Gram / polybag. In this study, there were 6 treatments in the study area, each treatment was repeated 4 times, so 24 experimental plots were obtained. The distance between treatments was 50 cm, the distance between the replicates was 60 cm, the number of plants in one experimental plot was 12 plants. As a sample, 2 plants were taken in each experimental plot, so that 288 seeds needed for the study were added with 12 reserve plants with each treatment. There is a total of 360 oil palm seedlings.

DISCUSSION

The Sprouts Growth

The results of the analysis of variance showed that the administration of various doses of compost from weeds on the growth of sprouts at 7 days after planting and continued with DNMRT at α 5% level is shown in Table 3.

Table 3. The Sprouts growth according to the application of several compost measures from weeds.

Dosage of Weed Compost (gram)	Average the height of Sprouts (cm)
100	3.25 a
200	2.75 b
300	2.44 bc
500	2.38 bc
400	2.19 c
600	2.16 c

Note: Numbers which are accompanied by the same lowercase letter are not significantly different at the 5% DNMRT level.

Table 3 above can be seen that giving several doses of compost from weeds at doses of 100, 200 and 300 grams are different, 300, 500 grams are not significantly different, 400 and 600 grams are not significantly different to the height of sprouts in oil palm seedlings.

Number of Leaves

The results of the analysis of variance showed that giving several compost measures from weeds to the number of leaves at the age of 90 days after planting and continued with DNMRT level of α 5% was seen at

Table 4. Number of leaves according to the application of several compost doses from weeds.

Dosage of Weed Compost (gram)	The avarages of Leaves' numbers (strand)	
100	4.63	a
300	4.50	a
500	4.50	a
200	4.25	a
600	4.25	a
400	4.13	a

Note: Figures which are accompanied by the same lowercase letter are not significantly different at the α 5% DNMRT level.

In Table 4 above, it can be seen giving several doses of compost from weeds at a dose of 100 - 600 gr is not significantly different from the number of leaves on oil palm seedlings.

The Length of Leaf

The results of the analysis of variance showed that the application of several compost measures from weeds to the length of the leaves at the age of 90 days after planting and continued with DNMRT at α 5% level is shown in Table 5

Table 5. Leaf's length according to the application of several compost measures from weeds.

Doage of Compost weeds (gram)	Avarage of the lenght of the leaf (cm)	
100	18.94	a
200	18.44	ab
300	17.00	ab
400	16.19	bc
600	15.56	c
500	15.13	c

Note: Figures which are accompanied by the same lowercase letter are not significantly different at the 5% DNMRT level.

In Table 5 above, it can be seen that the distribution of several doses of compost from weeds at doses of 100, 200, 300, 400 grams differed significantly, while 200, 300 and 600, 500 grams were not significantly different from leaf lengths in oil palm seedlings.

The Width of the Leaf

The results showed giving several compost measures from weeds to leaf width at the age of 90 days after planting and continued with DNMRT at α 5% level is shown in Table 6.

Table 6. Leaf width according to the application of several compost measures from weeds.

The Dosage of Weed Compost (gram)	Avarage of Leaf's Width (cm)	
100	4.94	a
600	4.19	ab
400	4.13	b
300	4.06	b

200	4.00	b
500	4.00	b

Note: Figures accompanied by the same lowercase letter are not significantly different at the α 5% DNMR level.

In Table 6 above, it can be seen that the application of several compost doses from 100, 600 and 400 doses of weeds is significantly different, while 400 - 500 grams does not significantly differ on leaf width in oil palm seedlings.

The Height of The Plants

The results of the analysis of variance showed that by giving several compost measures from weeds to plant height at the age of 90 days after planting and continued with DNMR at α 5% level is shown in Table 7.

Table 7. Plant's height according to the application of several compost measures from weeds.

Dosage of the Weed Compost (gram)	The Avarage of Plants High (cm)	
100	22.38	a
200	21.44	ab
300	20.13	abc
500	19.69	bc
400	18.94	bc
600	18.36	c

Note: The numbers that accompanied by the same lowercase are not significantly different at the α 5% DNMR level.

In Table 7 above, it can be seen that the application of several doses of compost from weeds at doses of 100 - 300 and 400, 600 grams is significantly different, while 500 and 400 are not significantly different from plant height in oil palm seedlings.

DISCUSSION

Based on the results of identification, the effect of compost from weeds on the growth of oil palm seedlings (*Elaeis guineensis*. Jacq) in the Pre-Nursery had an effect on germination, number of leaves, leaf length, leaf width and plant height. In each observation variable, it can be seen that the plants that show good growth are given a compost dose of 100 g / polybag. This is due to the nitrogen contained in the compost from weeds given to plants in the vegetative phase, which is suitable to help plant growth, so that even though the results are increased, the results are not significantly different.

Sutedjo, (2010). Nitrogen nutrients in sufficient condition during growth will accelerate the development of plant cells. Lingga, (1994). Compost contains macro and micro nutrients needed by every plant to spur vegetative and generative growth, especially in the growth phase.

CONCLUSIONS

Conclusion

Based on the results and discussion, the following conclusions can be drawn :

1. Based on the effect of compost from weeds on the growth of oil palm seedlings (*Elaeis guineensis*. Jacq) in the pre-nursery at a dose of 100 g / polybag, it affects the growth of sprouts, number of leaves, leaf length, leaf width and plant height.

2. Based on the DNMR of test tarap 5%, the effect of giving compost from weeds at a dose of 100 g / polybag is appropriate to be able to provide effective effect, because the nutrients in sufficient conditions at the time of growth will be able to accelerate the development of cells and growth in plants.

Suggestion

From the results of this study The Effect of Giving Compost Fertilizer From Weeds on the Growth of Oil Palm Seeds (*Elaeis guineensis*. Jacq) in Pre-Nursery at a dose of 100g / polybag showed good results, but further research is needed to make the results more accurate.

REFERENCES

- Abidin, Z. (2016). Mengenal Sistem Perakaran Kelapa Sawit. <http://id.wikipedia.Org/2016/03/mengenalstistemperakaransawit.html>. Diakses 30-08-2019.
- Annonim (2006). Perkecambahan, Benih, Biji. [http:// publicut. ac.id /html/ suplmen /lunt4344 /kecambah](http://publicut.ac.id/html/suplmen/lunt4344/kecambah). Di akses 20-01- 2020.
- Azman, A., Ambiyar, Simatupang, W., Karudin, A., Dakhi, O. (2020). Link And Match Policy In Vocational Education To Address The Problem Of Unemployment. *International Journal Of Multi Science*, 1(6), 76-85.
- Badan Pusat Statistik (2016). Data luas perkebunan kelapa sawit di Indonesia Tahun 2014-2016. <http://bps.co.id>. Diakses 15-02-2020.
- Badan Pusat Statistik Batanghari (2017). Statistic Table Luas Perkebunan Menurut Jenis Tanaman Per Kecamatan di Kabupaten Batanghari Tahun 2017. [http// batangharikab .bps,go.id](http://batangharikab.bps.go.id). Diakses 08-11-2018.
- Dakhi, O., Jama, J., Irfan, D., Ambiyar, Ishak. (2020). Blended Learning: A 21st Century Learning Model At College. *International Journal Of Multi Science*, 1(8), 50-65.
- Dinas Perkebunan (2017). Luas Lahan Perkebunan Sawit Jambi. [http://jambiantarnews .com /luaslahan_perkebunan_sawit_jambi](http://jambiantarnews.com/luaslahan_perkebunan_sawit_jambi). Diakses 08-11-2018.
- Effendi (2011). Botani Tanaman Kelapa Sawit, Jurnal Agroteknologi, Budidaya Tanaman Kelapa Sawit. Vol. 06 IPB.
- Hikmatullah, et al. (2008). Perkembangan Pertumbuhan Kelapa Sawit Pada Tanah marjimal. <http://ilmugeografi.com>. Diakses 25-12-2018.
- Kedidiri, H. (2015). Pupuk Organik dan Reaksi Tinggi Makalah Seminar Hasil Penelitian, Balai Penelitian Lahan Rawa, Banjarbaru.
- Fairest dan Rankine (2009). Tujuan Pembibitan Tanaman Kelapa Sawit. [http:// steemit. Com /Budidaya/Tanaman/Kelapa/Sawit](http://steemit.Com/Budidaya/Tanaman/Kelapa/Sawit). Diakses 15-01-2019.
- Fajra, M., Suparno, Sukardi, Ambiyar, Novalinda, R. (2020). Project-Based Learning Innovation To Improve The Suitability Of Productive Competencies In Vocational School With The Needs Of The World Of Work. *International Journal Of Multi Science*, 1(8), 1-11.
- Fajra, M., Jalinus, N., Jama, J., & Dakhi, O. (2020). Model Pengembangan Kurikulum Sekolah Inklusi Berdasarkan Kebutuhan Perseorangan Anak Didik. *Jurnal Pendidikan*, 21 (1), 51-63. <https://doi.org/10.33830/jp.v21i1.746.2020>
- Febtriko, A., Ambiyar, Jama, J., Irfan, D., Dakhi, O. (2020). Effectiveness Of Occupational Therapy Using Robot Manipulator For Elderly. *International Journal Of Multi Science*, 1(9), 1-9.
- Fauzi Y. Yustina E. Widiyastuti. Iman Satyawibawa. Rudi H. Paeru (2012). Panduan Lengkap Kelapa Sawit, Penebar Swadaya.

- Luthfyrahman, H. (2013). Optimalisasi dosis pupuk Anorganik dan pupuk kompos.
- Novalinda, R., Giatman, M., Syahril, Ambiyar, Fajra, M. (2020). Problem-Based Learning: 21st Century Vocational Education. *International Journal Of Multi Science*, 1(8),
- Pahan, I. (2006). *Panduan Lengkap Kelapa Sawit*. Penerbit Penebar Swadaya. Jakarta.
- Rina Novalinda, Oskah Dakhi, Melda Fajra, Azmil Azman, Mardhiah Masril, Ambiyar, Unung Verawadina (2020). Learning Model Team Assisted Individualization Assisted Module to Improve Social Interaction and Student Learning Achievement. *Universal Journal of Educational Research*, 8(12A), 7974-7980. DOI: 10.13189/ujer.2020.082585
- Rukman (2007). *Bahan-Bahan Organic Yang Terdapat Dalam Pupuk Kompos*. 11 Maret University Press. Surakarta.
- Rhepy (2007). Pengolahan kelapa sawit di Indonesia. <http://oilPlamIndonesia.com>. Diakses 25-02-2020
- Sastroutomo (1990). *Ekologi Gulma*. Cetakan Pertama. PT. Gramedia Pustaka Utama. Jakarta.
- Sutanto (2002). *Pertanian Organik Menuju Pertanian Alternative Dan Berkelanjutan*. Jakarta: Kanisius. <http://id.wikipedia.org>. Diakses 05-02-2019.
- Sutriyono, et al. (2009). Nilai Nutrisi Gulma Pertanian Fakultas Pertanian Universitas Bengkulu. <http://ejournal.unib.ac.id/index.php.jspi/article/view/111>. Diakses 30-08-2019.
- Shupatha (2012). Kandungan dan Peroses Pengolahan Pupuk Organik, <http://Alamtani.com>. Diakses 10-12-2019.
- Sugito, et al. (1999). Pemamfaatan Bahan Organic Dari Biomasa Gulma. <http://kompasiana.com>. Diakses 10-02-2019.
- Universitas Bengkulu (2009). Kandungan Nutrisi Berbagai Spesies Gulma dan Hasil Analisi Laboratorium Ilmu Tanah, Fakultas Pertanian.
- Yahya, et al. (1996). *Kandungan Bahan Organik yang Terdapat Dalam Gulma Ekologi Gulma*. Cetakan Pertama. PT. Gramedia Pustaka Utama. Jakarta.