VIKRAMA RESEARCH INSTITUTE
LOKA Journal of Environmental Sciences
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

Effect of Liquid Organic Applications of Ananas Comosus (L.) Merr. and Citrullus Colocynthys (L.) Schrad. on Soil Fertility in Latosol Soils and Growth and Yield of Vigna Unguiculata Ssp. Sesquipedalis Plants

Erwin Junaidi LUBIS[1]

[1]Department of Agricultural Sciences, Meranti Institute of Technology and Science, Kepulauan Meranti, Riau, Indonesia

Article Info:

Article History:
Received: 2025-02-0
Revised: 2025-03-24
Accepted: 2025-04-07

Keyword:
Citrullus Colocynthys, Ananas Comosus, Kalium, Asam Sitrat, Asam Malat, Asam Oksalat

Corresponding Author:
Erwin Junaidi Lubis
Email:
lubiserwinjunaidi@gmail.com

Paper Type:
Research Paper

Abstract:

Purpose:
The need for fruit, especially Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. Fruit is increasing in the world demand. Ananas comosus (L.) Merr. fruit and Citrullus colocynthys (L.) Schrad. Fruits are very suitable for the health of the human body as a health vitamin enhancer, such as Vitamin C, A, Fibre and Potassium, and their role is very important. However, for health, it is very good for health and soil fertility, because Ananas comosus (L.) Merr. fruit contains 78-87% citric acid, which is found in organic acids other than malic acid and oxalic acid, and the content of Citrullus colocynthys (L.) Schrad. fruit. has a relatively high level of acidity compared to Ananas comosus (L.) Merr. fruit so that it can limit the level of acidity in the effect of citric acid Ananas comosus (L.) Merr. fruit and also good for the growth and yield of Vigna unguiculata ssp. Sesquipedalis.

Methodology:
This Study used a Factorial Randomized Group Design (RGD). This research was conducted on land located in Pinang Sebatang Timur Village, Tualang District, Siak Regency.

Findings:
In this study, it was found that the application of mixed formulation of Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. fruit as much as 300 ml.polybag-1 mixed with nutrient fertilizer 12.12.17.2 as much as 10 g.polybag-1. Able to increase the growth of Vigna unguiculata ssp. Sesquipedalis plants are well and fertile and have better production results.

Implication:
In this study, it is indicated to apply it to different soil types as well in order to see the reaction of soil fertility.

INTRODUCTION

The study of the content of Ananas comosus (L.) Merr. fruit and the content of Citrullus colocynthys (L.) Schrad. fruit is closely related to soil fertility, which points out that it can provide benefits. Ananas comosus (L.) Merr. fruit contains vitamins, minerals and fiber that can improve soil quality, while the content of Citrullus colocynthys (L.) Schrad. fruit contains a lot of water and nutrients, and many microorganisms will also increase soil fertility.

Ananas comosus (L.) Merr. fruit contains various nutrients which are very important for growth, such as the presence of Vitamin C, manganese and Vitamin B6, and the content of Ananas comosus (L.) Merr. fruit can help improve soil conditions, increase the ability of soil to store water, and increase the availability of essential nutrients for plants, such as nitrogen (N) and phosphorus (P), through the decomposition process (Suwanti et al., 2017).

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

In the content of Citrullus colocynthys (L.) Schrad. fruit, the fruit contains a large amount of water so that it can help the soil in maintaining soil moisture, and also contains various vitamins and kinral which can be a source of soil nutrients and Citrullus colocynthys (L.) Schrad. fruit supports the growth of microorganisms which help in forming a symbiotic mutualism relationship with plant roots and absorbing nutrients from the soil.

Citrullus colocynthys (L.) Schrad. fruit greatly contributes to maintaining soil fertility, especially in the content of nutrients nitrogen (N) and phosphorus (P) (Zubair et al., 2021). Organic fertilizer is a fertilizer that is very instrumental in increasing the biological, chemical and physical activities of the soil, which makes the soil fertile and good for plant growth (Christina, 2021).

Liquid organic does not damage the soil and plants, even though it is used frequently. Besides that, the use of liquid organic can be used as an activator for making compost (Lingga and Marsono, 2003; Zubair et al., 2021).

The study of water content in Ananas comosus (L.) Merr. fruit contains a very high water content of about 85% - 90%. Water in Ananas comosus (L.) Merr. fruit is very important for soil fertility and health because it can increase the value of soil acidity (pH), especially in soils that have acidic properties, and improve soil structure. It is done so that the soil becomes looser and able to hold water and provide essential nutrients such as nitrogen (N), phosphorus (P), and potassium (K) needed by plants in vegetative and generative growth.

It is the same as the study of the content in the fruit of Citrullus colocynthys (L.) Schrad. which contains nutrients nitrogen (N), phosphorus (P), and potassium (K), where the use of essential nutrients in the fruit of Citrullus colocynthys (L.) Schrad. is that N levels are important for plant growth, P is very important for root growth, flower and fruit formation, and K is very important for plant strength and resistance to disease and fruit quality. In addition, it can increase the ability to store water and nutrients (Al Musyafa et al., 2016).

METHODS

This research was conducted for 4 months, from December 2023 to April 2024. The research was conducted in a garden or private land located in Pinang Sebatang Timur Village, Tualang District, Siak Regency, Riau Province. The research used a Non-Factorial Randomised Group Design (RGD) of 4 treatments with 3 replications, and there were 2 plants in the experimental polybag, so the total number of plants was 24 polybag plants.

Long bean plants (Vigna unguiculata ssp. Sesquipedalis) with the Ijo Belt variety planted in polybags with an age of 1 month in mini polybags. Topsoil with Latosol soil type was taken from the oil palm plantation of PT Surya Intisari Raya (PT SIR) Perawang, Riau. The inorganic fertilizer used in the study is N.P.K.Mg 12.12.17.2. Fertilizer with the following treatment factors: Factor 1 is Liquid Organic Ananas comosus (L.) Merr. + Nutrient Fertilizer 12.12.17.2 with 2 treatment levels namely A1 = 150 ml.polybag-1 + 5 g.polybag-1, A2 = 300 ml.polybag-1 + 10 g.polybag-1, Factor 2 namely Liquid Organic Citrullus colocynthys (L.) Schrad. + Nutrient Fertilizer 12.12.17.2 with 2 treatment levels namely C1 = 150 ml.polybag-1 + 5 g.polybag-1, C2 = 300 ml.polybag-1 + 10 g. polybag-1, Factor 3 is a Liquid Organic Formulation of Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. + Nutrient Fertilizer 12.12.17.2 with 2 treatment levels namely AC1 = 150 ml.polybag-1 + 5 g.polybag-1, AC2 = 300 ml.polybag-1 + 10 g.polybag-1, Factor 4 is Nutrient Fertilizer 12.12.17.2 treatment with 2 treatment levels namely P1 = 5 g.polybag-1, P2 = 10 g.polybag-1.

Research observations consist of parameters and indicators: initial soil testing includes Soil Texture (%), C-Organic (%), N-Total (%), P2O5-avl (P-Bray I) (ppm), Potential K2O Ex. HCl 25% (me.100 g-1), CEC (me.100 g-1), MnO (%), Soil H2O pH, exchangeable cation parameter, Al-dd (me.100 g-1), Ca-dd (me.100 g-1), K-dd (me.100 g-1), Mg-dd (me.100 g-1) and final soil including is a N-Total (%), P2O5-avl (P-Bray I) (ppm), Potential K2O Ex. HCl 25% (me.100 g-1), CEC (me.100 g-1), Soil H2O pH, Plant Length (cm), Number of Leaves (Blade), Number of String Beans (Fruit).

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

RESULTS AND DISCUSSION

Initial Soil Analysis - Latosol Growing Media Characteristics. In this research, the soil media used is Topsoil with Latosol Soil type. Thus, the results of laboratory analysis on the initial analysis of Latosol Soil can be seen in Table 1 as follows:

Table 1. Preliminary Analysis of Soil as a Planting Media

Texture	Method of Analysis	Units	Results	Description
Sand			40,10	
Dust	Hydrometer	%	32,28	Clayey Loam
Clay			28,15	
C-Organik	Spectrophotometry	%	2,10	m
N-Total	Kjedhal	%	0,29	l
P_2O_5-avl (P-Bray I)	Spectrofotometry	ppm P	7,10	l
K_2O Potential Ex. HCl 25%	AAS	me.100 g^{-1}	0,50	l
MnO	Spectrophotometry	%	0,08	l
CEC	Volumetry	me.100 g^{-1}	24,55	m
pH H_2O	Elektrometry	------	5,7	m (*Slightly Sour*)
Al-dd	Titrimetry		0,0	nm
Ca-dd			10,12	m
K-dd	AAS	me.100 g^{-1}	0,38	l
Mg-dd			1,14	m

Description: Criteria for Planting Media, h = High, l = Low, m = Medium, sl = Slightly Low, vl = Very Low, vh = Very High, nm = Not Measurable

Soil Laboratory analysis results, that the initial analysis of Latosol soil shows low nutrient levels. In the Latosol soil texture, the analysis of Sand is 40.10%, Dust is 32.28%, and Clay is 28.15%. The results of the Latosol Soil Texture analysis can be categorized from the results of Clayey Loam soil.

The results of the analysis of macronutrients N, P, and K in Latosol soil can be concluded that the soil is experiencing nutrient deficiencies, where the N-Total level is 0.29% with low criteria, P2O5-avl (P-Bray I) level is 7.10 ppm P with low criteria and K2O Ex. HCl 25% is 0.50 me.100 g-1 with low criteria. Likewise, the levels of soil organic carbon (C-Organic) determine the presence or absence of organic matter in the Latosol soil. Latosol soil has a C-Organic result of 2.10% with moderate criteria.

Testing soil acidity (pH) determines whether the soil is healthy or not and the presence of nutrients that cause high or low soil acidity in the soil, so the soil needs to be tested for soil acidity (Josephine et al., 2022). The level of soil acidity in the potential of Hydrogen (pH) in Latosol Soil is 5.7 with slightly acidic criteria.

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

While testing the cation exchange capacity (CEC) in Latosol soil is 24.55 me.100 g-1. It determines whether or not there is a change in the exchangeable cations in the soil so that the soil becomes a better fertility value or not; the CEC determines the level of soil fertility (Lubis et al., 2023).

In the observation of the analysis of exchangeable ion levels in Aluminium (Al-dd) is not measurable, Calcium analysis (Ca-dd) is 10.12 me.100 g-1 with moderate criteria, Potassium analysis (K-dd) is 0.38 me.100 g-1 with low criteria, and Magnesium analysis (Mg-dd) is 1.14 me.100 g-1 with moderate criteria. It is stated that the level of fertility of Latosol soil is determined by the presence of exchangeable ions in the soil, but aluminum ions and iron or zinc ions are so dangerous that plants cannot grow on the soil surface properly (Wahyuni, 2018 in Lubis, et al., 2023).

Final Soil Analysis - Latosol Growing Media Characteristics.

a. Soil N-Total Level – Latosol Soil. The final soil analysis of soil total nitrogen (N-Total) testing of Latosol soil can be seen in Table 2 as follows:

Table 2. Final Analysis Results of Soil as a Planting Media

Treatment		Analysis
Liquid Organic	Nutrient Fertilizer	
***Ananas comosus* (L.) Merr.**	**12.12.17.2**	**N-Total**
ml.polybag^{-1}	**g.polybag^{-1}**	**%**
150	5	0,51 h
300	10	0,51 h
***Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**N-Total**
ml.polybag^{-1}	**g.polybag^{-1}**	**%**
150	5	0,52 h
300	10	0,53 h
Liquid Organic Mixture		**N-Total**
***Ananas comosus* (L.) Merr. + *Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	
ml.polybag^{-1}	**g.polybag^{-1}**	**%**
150	5	0,55 h
300	10	0,56 h
Nutrient Fertilizer 12.12.17.2		**N-Total**
g.polybag^{-1}		**%**
5		0,45 m
10		0,47 m

Description: Criteria for Planting Media, h = High, l = Low, m = Medium, sl = Slightly Low, vl = Very Low, vh = Very High, nm = Not Measurable

In the results of the analysis of total soil nitrogen (N-Total) in Latosol soil, it can be seen that the application of a liquid organic mixture of Ananas comosus (L.) Merr. fruit. + Citrullus colocynthys (L.) Schrad. with the addition of nutrient fertilizer 12.12.17.2 makes the N-Total content of Latosol soil increase, where the initial

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

analysis was 0.29% with low criteria now becomes 0.56% with high criteria. It is also different with the application of nutrient fertilizer 12.12.17.2, which makes the highest soil total nitrogen 0.47% with medium criteria.

In the application of liquid organic Ananas comosus (L.) Merr. + Nutrient fertilizer 12.12.17.2 was not significantly different at the time of application of the higher dose given, which was 0.51% with high criteria. While the application of liquid organic Citrullus colocynthys (L.) Schrad. + nutrient fertilizer 12.12.17.2 was also not significantly different, only increased by 1% from the different applications.

The application of 12.12.17.2 Nutrient Fertilizer at a dose of 5 g.polybag-1 produces 0.45% soil N-Total content, while a dose of 10 g.polybag-1 produces 0.47% soil N-Total content. It is because of the fruits of Ananas comosus (L.) Merr. and Citullus colocynthys (L.) Schrad. is able to increase the nitrogen content in Latosol soil and the additional nitrogen content from inorganic fertilizer 12.12.17.2, which increases by 12% nitrogen in Latosol soil content. It shows that the application of liquid organic fertilizer Ananas comosus (L.) Merr. + nutrient fertilizer 12.12.17.2 was able to increase the soil N-Total level to 0.51%, the same thing with the application of liquid organic fertilizer Citrullus colocynthys (L.) Schrad. + nutrient fertilizer 12.12.17.2 which was also able to increase the soil N-Total to 0.53%.

b. Soil P2O5-avl (P-Bray I) Level – Latosol Soil. The final analysis of soil Phosphor testing (P2O5-avl), P-Bray I on Latosol soil can be seen in Table 3 as follows:

Table 3. Final Analysis Results of Soil as a Planting Media

Treatment		Analysis
Liquid Organic	Nutrient Fertilizer	
***Ananas comosus* (L.) Merr.**	**12.12.17.2**	**P_2O_5-avl (P-Bray I)**
ml.polybag^{-1}	**g.polybag^{-1}**	**ppm P**
150	5	10,97 m
300	10	10,99 m
***Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**P_2O_5-avl (P-Bray I)**
ml.polybag^{-1}	**g.polybag^{-1}**	**ppm P**
150	5	11,12 h
300	10	11,17 h
Mix Liquid Organic		**P_2O_5-avl (P-Bray I)**
***Ananas comosus* (L.) Merr. + *Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	
ml.polybag^{-1}	**g.polybag^{-1}**	**ppm P**
150	5	14,55 h
300	10	14,67 h
Nutrient Fertilizer 12.12.17.2		**P_2O_5-avl (P-Bray I)**
g.polybag^{-1}		**ppm P**
5		8,99 m
10		9,87 m

Description: Criteria for Planting Media, h = High, l = Low, m = Medium, sl = Slightly Low, vl = Very Low, vh = Very High, nm = Not Measurable

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

In the results of soil phosphorus analysis with P-Bray I testing (P2O5-avl (P-Bray-I)), it is known that the application of liquid organic Ananas comosus (L.) Merr. 150 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 5 g.polybag-1 soil phosphorus results are 10.97 ppm P with moderate criteria, as well as the dose of liquid organic 300 ml.polybag-1 + nutrient fertilizer dose of 10 g.polybag-1 with the analysis of 10.99 ppm P results.

While in liquid organic Citrullus colocynthys (L.) Schrad. Fruit with a dose of 150 ml.polybag-1 + nutrient fertilizer 12.12.17.2 with a dose of 5 g.polybag-1 the results of the analysis of 11.12 ppm P in the soil, and a dose of liquid organic 300 ml.polybag-1 + a dose of nutrient fertilizer 10 g.polybag-1 with the results of the analysis of 11.17 ppm P.

The results of the analysis on the Liquid Organic Mixture of Ananas comosus (L.) Merr. + Citrullus colocynthys (L.) Schrad. with a dose of 150 ml.polybag-1 + Nutrient Fertilizer 12.12.17.2 with a dose of 5 g.polybag-1 resulted in a phosphor analysis of 14.55 ppm P with high criteria, while the dose of liquid organic 300 ml.polybag-1 + 10 g.polybag-1 nutrient fertilizer resulted in an analysis of 14.67 ppm P with high criteria.

Whereas the application of nutrient fertilizer 12.12.17.2 at a dose of 5 g.polybag-1 produced 8.99 ppm P with moderate criteria, a dose of 10 g.polybag-1 produced 9.87 ppm P.

It indicates that the addition of organic matter into the soil can cause soil fertility to increase, fertile and healthy, where initially nutrient deficiencies have now increased due to the role of liquid organic matter from Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. as well as the addition of inorganic fertilizers to the soil so that P levels in the soil increase and are needed by plants in their growth.

c. Soil K2O-Potential Ex. HCl 25% Level – Latosol Soil. In the final analysis of the testing soil, Potassium (K2O) Ex. HCl 25% on Latosol Soil can be seen in Table 4 as follows:

Table 4. Final Analysis Results of Soil as a Planting Media

Treatment		**Analysis**
Liquid Organic	**Nutrient Fertilizer**	
***Ananas comosus* (L.) Merr.**	**12.12.17.2**	**K_2O-Potential Ex. HCl 25%**
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**
150	5	0,69 m
300	10	0,72 m
***Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**K_2O-Potential Ex. HCl 25%**
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**
150	5	0,73 m
300	10	0,75 m
Mix Liquid Organic		**K_2O-Potential Ex. HCl 25%**
***Ananas comosus* (L.) Merr. + *Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**
150	5	1,27 h
300	10	1,27 h

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

Nutrient Fertilizer 12.12.17.2	K_2O-Potential Ex. HCl 25%
g.polybag^{-1}	me.100 g^{-1}
5	0,54 m
10	0,55 m

Description: Criteria for Planting Media, h = High, l = Low, m = Medium, sl = Slightly Low, vl = Very Low, vh = Very High, nm = Not Measurable

In Table 4, the resulting Latosol soil analysis in the Potassium test (K2O-Potential Ex. HCl 25%), where the application of Liquid Organic Ananas comosus (L.) Merr. with a dose of 150 ml.polybag-1 + Nutrient Fertilizer 12.12.17.2 with a dose of 5 g.polybag-1 makes the potassium yield of 0.69 me.100 g-1 with moderate criteria, while the dose of liquid organic 300 ml.polybag-1 + nutrient fertilizer 12.12.17.2 10 g.polybag-1 produces 0.72 me.100 g-1 with moderate criteria.

The application of liquid organic Citrullus colocynthys (L.) Schrad. At a dose of 150 ml.polybag-1 + nutrient fertilizer at a dose of 5 g.polybag-1 made the potassium yield 0.73 me.100 g-1 with moderate criteria, while liquid organic at a dose of 300 ml.polybag-1 + nutrient fertilizer at a dose of 10 g.polybag-1 made the potassium yield 0.75 me.100 g-1 with moderate criteria.

In the application of a liquid organic mixture of Ananas comosus (L.) Merr. + Citrullus colocynthys (L.) Schrad. at a dose of 150 ml.polybag-1 + 12.12.17.2 nutrient fertilizer at a dose of 5 g.polybag-1 with an analysis result of 1.27 me.100 g-1 with high criteria, while liquid organic at a dose of 300 ml.polybag-1 + nutrient fertilizer at a dose of 10 g.polybag-1 with an analysis result of 1.27 me.100 g-1 with high criteria, the two doses were not significantly different in application but could increase soil fertility.

Whereas in nutrient fertilizer 12.12.17.2 with a nutrient dose of 5 g.polybag-1 the result was 0.54 me.100 g-1 with moderate criteria, but not significantly different from the application of higher doses of nutrient fertilizer with a result of 0.55 me.100 g-1 with moderate criteria.

It states that the potassium content contained in the fruit of Citrullus colocynthys (L.) Schrad. is able to increase potassium levels in the soil and increase plant growth, as well as the content in the fruit of Ananas comosus (L.) Merr. It can increase soil fertility due to the large amount of water content in the fruit that can activate the enzyme amylase and potassium nutrients to be sufficiently filled in the soil and plants.

d. Cation Exchange Capacity (CEC) & Soil Acidity (pH) Levels – Latosol Soil. In the final analysis of soil testing, Cation Exchange Capacity (CEC) and Soil Acidity (pH) in Latosol Soils can be seen in Table 5 as follows:

Table 5. Final Analysis Results of Soil as a Planting Media

Treatment		Analysis	
Liquid Organic	Nutrient Fertilizer		
***Ananas comosus* (L.) Merr.**	**12.12.17.2**	**CEC**	**pH H_2O**
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**	**-----**
150	5	26,70 h	5,8
300	10	26,89 h	5,9
***Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**CEC**	**pH H_2O**
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**	**-----**
150	5	26,88 h	6,0

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

300	10	26,92 h	6,7
Mix Liquid Organic			
***Ananas comosus* (L.) Merr. + *Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**CEC**	**pH H_2O**
ml.polybag^{-1}	**g.polybag^{-1}**	**me.100 g^{-1}**	-----
150	5	27,34 h	6,9
300	10	28,00 h	7,2
Nutrient Fertilizer 12.12.17.2		**CEC**	**pH H_2O**
g.polybag^{-1}		**me.100 g^{-1}**	**-----**
5		25,44 h	5,9
10		25,64 h	6,2

Description: Criteria for Planting Media, h = High, l = Low, m = Medium, sl = Slightly Low, vl = Very Low, vh = Very High, nm = Not Measurable

In Table 5, the results of soil analysis on the analysis of Cation Exchange Capacity (CEC) and Soil Acidity (pH) H2O. In the analysis of Cation Exchange Capacity (CEC), the liquid organic Ananas comosus (L.) Merr. dose of 150 ml.polybag-1 + nutrient fertilizer 12.12.17.2 with a dose of 5 g.polybag-1 analysis is 26.70 me.100 g-1 with high criteria, while in the liquid organic dose of 300 ml.polybag-1 + nutrient fertilizer 10 g.polybag-1 is 26.89 me.100 g-1 with high criteria. In liquid organic Citrullus colocynthys (L.) Schrad., the dose of 150 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 5 g.polybag-1 was 26.88 me.100 g-1 with high criteria, while the liquid organic dose of 300 ml.polybag-1 + nutrient fertilizer 12.1.2.17.2 dose of 10 g.polybag-1 was 26.92 me.100 g-1 with high criteria. It states that a single treatment of liquid organic Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. fruit can make ions in soil cations increase so that Latosl soil fertility occurs.

In the analysis of a liquid organic mixture of Ananas comosus (L.) Merr. + Citrullus colocynthys (L.) Schrad. A dose of 150 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 5 g.polybag-1 resulted in a Cation Exchange Capacity (CEC) of 27.34 me.100 g-1 with high criteria, and at a liquid organic dose of 300 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 10 g.polybag-1 was 28.00 me.100 g-1 with high criteria. It is said that the application of liquid organics alone or a mixture of both types of organics is not significantly different, and the results are not different.

In the measurement of soil acidity (pH), the highest application of liquid organic is the liquid organic mixture of Ananas comosus (L.) Merr. + Citrullus colocynthys (L.) Schrad. dose of 300 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 10 g.polybag-1 is with pH 7.2.

The Cation Exchange Capacity level determines the level of ions that can be exchanged with other ions, and if ion exchange occurs in the soil, the level of soil fertility takes place so that the level of organic carbon in the soil occurs.

The level of soil acidity (pH) in Latosol soils determines whether the soil is fertile or not for plant growth, so plants can grow in conditions where the acidity in the soil is slightly acidic to neutral.

Plant Growth.

Vegetative and Generative Plant. To see the results of the Liquid Organic and Inorganic Fertilizer Application on Plant Growth of Vigna unguiculata ssp. Sesquipedalis, it can be seen in Table 6 as follows:

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

Table 6. Plant Growth Measurement Results of Vigna unguiculata ssp. Sesquipedalis

Treatment		Parameters		
Liquid Organic	Nutrient Fertilizer			
***Ananas comosus* (L.) Merr.**	**12.12.17.2**	**Plant Length**	**Number of Leaves**	**Number of String Beans**
ml.polybag^{-1}	**g.polybag^{-1}**	**cm**	**Blade**	**Fruit**
150	5	218 c	25 a	12 a
300	10	225 d	27 a	12 a
***Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**Plant Length**	**Number of Leaves**	**Number of String Beans**
ml.polybag^{-1}	**g.polybag^{-1}**	**cm**	**Blade**	**Fruit**
150	5	219 c	24 a	12 a
300	10	222 d	26 a	12 a
Mix Liquid Organic				
***Ananas comosus* (L.) Merr. + *Citrullus colocynthys* (L.) Schrad.**	**12.12.17.2**	**Plant Length**	**Number of Leaves**	**Number of String Beans**
ml.polybag^{-1}	**g.polybag^{-1}**	**cm**	**Blade**	**Fruit**
150	5	289 e	35 b	14 a
300	10	315 f	37 b	15 a
Nutrient Fertilizer 12.12.17.2		**Plant Length**	**Number of Leaves**	**Number of String Beans**
g.polybag^{-1}		**cm**	**Blade**	**Fruit**
5		188 a	22 a	9 a
10		205 b	23 a	9 a

Description: The number followed by the same index in the same row or column showed no significant difference according to the DMRT test (Duncan's Multiple Range Test) 95% confidence level (a = 0,05)

In the analysis of the measurement of vegetative growth and yield in Vigna unguiculata ssp. Sesquipedalis plants against the application of liquid organic Ananas comosus (L.) Merr. fruit and Citrullus colocynthys (L.) Schrad. Fruit applied with a mixture of Nutrient Fertilizer 12.12.17.2 produces significant growth, where the highest growth is found in the application of a mixture of liquid organic dose of 300 ml.polybag-1 + nutrient fertilizer 12.12.17.2 dose of 10 g.polybag-1, which is 315 cm, while the number of leaves is 37 leaves or strands, the number of long beans 15 pieces.

It can be concluded that supporting the growth of plant length in Vigna unguiculata ssp. Sesquipedalis is the presence of macronutrients in the soil such as N, P, K, Ca, and Mg, which support the growth of plant length and the role of nitrogen nutrients available both from the soil and photosynthesis that occurs so that the development of the number of leaves increases.

VIKRAMA RESEARCH INSTITUTE
LOKA
P-ISSN - 2985-6531 (PRINT)
E-ISSN - 2986-3023 (ONLINE)
LOKA: JOURNAL OF ENVIRONMENTAL SCIENCES
Indexed By : GARUDA Google ROAD ISJD EBSCO

In the generative development of Vigna unguiculata ssp. Sesquipedalis plants where fruit development occurs in long beans, the multiplication of the number of long bean fruits of Vigna unguiculata ssp. Sesquipedalis plants are due to the role of Potassium nutrients applied in liquid organic and nutrient fertilizer applications.

CONCLUSION

In conclusion, the application of liquid organic from Ananas comosus (L.) Merr. and Citrullus colocynthys (L.) Schrad. Fruit is very good both on Latosol Soil in Soil Fertility, and Plants in Growth and Development.

The best application dose of liquid organic was mixed liquid organic at a dose of 300 ml.polybag-1 + nutrient fertilizer 12.12.17.2 at a dose of 10 g.polybag-1.

This study implies that the dose can be lowered on inorganic fertilizers but not increased. Doses of Liquid Organic can be increased, but on the suitability of the soil.

Acknowledgements. I am very grateful to Mr. Armen Lubis for allowing me to conduct research on his farm as my research site for 5 months. I thank you. Good health to you and your family.

REFERENCE

Al Musyafa, M.N., Afandi, & Novriansyah, H. (2016). Kajian Sifat Fisik Tanah pada Lahan Pertanaman Nanas (Ananas comosus L.) Produksi Tinggi dan Rendah di PT. Great Pineapple Lampung Tengah. *J. Agrotek Tropika, 4(*1): 66-69. https://doi.org/10.23960/jat.v4i1.1903

Christina, C., Sitinjak, R. R., & Pratomo, B. (2021). Pengaruh Tingkat Kematangan POC Kulit Semangka (Citrullus vulgaris Schard.) di Pembibitan Kelapa Sawit Pre Nursery. *Jurnal Indonesia Sosial Teknologi,* (2): 1123-1131. https://doi.org/10.36418/jist.v2i7.197

Lingga, P & Marsono. (2003). *Petunjuk Penggunaan Pupuk*. Jakarta. Penebar Swadaya.

Lubis, E. J., Rauf, A., & Sarifuddin. (2023). Effectiveness of Fertilization Techniques on Growth Two Varieties of Palm Oil Seeds (Elaeis guineensis Jacq.) in Main Nursery. *Journal of Social Research, 2*(8): 2759-2772. https://doi.org/10.55324/josr.v2i8.1333

Suwanti, Susilo, J., Baskara, M., & Wicaksono, K. P. (2017). Response of Flowering and Yield of Pineapple (Ananas comosus (L.) Merr.) cv. Smooth Cayenne for Fertilizer Reduction and Ethylene Applications. *Jurnal Produksi Tanaman, 5*(8): 1346-1355.

Wahyuni, M. (2018). Efektifitas Aplikasi Pupuk Sistem Tabur dan Sachet terhadap Pertumbuhan Bibit Kelapa Sawit (Elaeis guineensis Jacq.). *Jurnal Agro Estate, 2*(1): 32-41.

Yosephine, I. O., Wijaya, H., & Lubis, E. J. (2022). Effect of Market Waste Compost and Compound Fertilizer Application on The Vegetative Growth of Oil Palm Seedling (Elaeis guineensis Jacq.) in Ultisol Growing Media. *Journal of Agricultural Engineering Lampung, 11*(3): 438-450. https://doi.org/10.23960/jtep-l.v11i3.438-450

Zubair M., Rizkiana, N., Khaironi, S., Cahyaningrum, R. A., Pratiwi, R. D., & Alawi, M. Y. (2021). Upaya Pemanfaatan Limbah Buah Semangka sebagai Alternatif Pupuk Organik untuk Mengurangi Pencemaran Lingkungan di Desa Pringgabya. *Jurnal Pengabdian Magister Pendidikan IPA, 4*(3): 38-42. https://doi.org/10.29303/jpmpi.v4i3.891