

THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

The Effect Giving Local Microorganisms against the Formation of Tomato Flowers and Fruits (*Lycopersicum esculentum* Mill)

Patang

Lecturer, Makassar State University, Makassar, Indonesia

Andi Heryanti Rukka

Lecturer, Tadulako University, Indonesia

Nurjannah Bando

Lecturer, Pangkep State Agricultural Polytechnic, Indonesia

Megawati

Lecturer, Pangkep State Agricultural Polytechnic, Indonesia

Abstract:

The research aims to know comparison of the number of flowers and tomatoes produced through the application of fertilizer compost and Local Microorganisms and soil quality. This research was conducted in April-July 2017. The tools used in the research includes a set of tools ho, bucket, gembor, polybag 25 x 35 cm, and weigher. Materials used include soil, sand, compost, Local Microorganisms, tomato seeds and water. This research uses Completely Randomized Design with two treatments and three replications namely soil, sand of local microorganisms, and soil, and treatment of soil, sand and compost. The number of flowers and tomatoes calculated per week per treatment. Data were analyzed with descriptive analysis.

The amount of tomatoes produced from the application of compost and Local Microorganisms fertilizer through the application of compost and Local Microorganisms fertilizer the highest obtained in the application of compost fertilizer, but based on the percentage of the large number of flowers which turns into a tomato fruit, the soil which the Local Microorganisms fertilizer have a percentage interest which turns into a tomato fruit, so soil given Local Microorganisms fertilized have a percentage of interest to be a larger fruit namely 40.35%. while the soil is given compost fertilizer only amounted to 28.32%.

Keywords: Compost, Local Microorganisms, Flowers, and Tomato

1. Introduction

Tomato plants (*Lycopersicum esculentum* Mill.) Are crops of agricultural commodities which has a unique flavor, but until now the development of this plant is widely experienced problems including the application of cultivation technology, as well as pest and disease control. Therefore, the efforts undertaken to increase the productivity of agricultural land namely by doing the provision of fertilizer. Fertilizer can be given namely organic or inorganic fertilizers (Maryanto and Rahmi, 2015).

Organic materials are added to the soil serves to improve physical properties, soil of chemical and biological. Soil organisms utilize organic matter as a source of energy, then through his humic acid, organisms can maintain soil structure, so that the physical properties of soil such as infiltration and drainage to be good for plant growth. According Purwati (2007) lack of giving of organic material and the remains of plants Her causing a decrease in activity of soil organisms. Furthermore, According Sutanto (2006) the use of chemical fertilizers continuously causing the biological ecosystem of the soil to be unbalanced, so the purpose of fertilization to satisfy the nutrients in the soil not achieved.

Compost fertilizer and liquid organic fertilizer has a pretty good economic value where the existence of the current fertilizer is in great demand by lovers of organic products. Along with the increasing trend of healthy lifestyle, then compost fertilizer and liquid organic fertilizer too will be in great demand to support such a healthy lifestyle (Nurdiyanti, *et al.*, 2017). Compost is a fertilizer derived from weathering process materials in the form of leaves, straw, reeds, grass, animal waste, organic waste and others (Dewi and Tresnowati, 2012).

Compost fertilizer has advantages which h can improve the physical properties of the soil, soil chemical properties and soil biological properties. This is because of the characteristics it has among others containing nutrients in varied types and amounts depending on the material origin, provide nutrients slow release and in limited quantities, and has the main

function improve fertility and soil health (Dewi and Tresnowati, 2012). While local microorganisms can be used as organic liquid fertilizer, as a decomposer or cause composting and as a natural pesticide (Latifah, *et al.*, 2012).

In nature, self-pollination in tomato plants occurs very low (7-12%) and generally occurs in varieties with stigmas with long pistils stalk and open pistil (Fontaine *et al.*, 2005)

1.1. Purpose

The research aims to know comparison of the amount of interest and fruit of tomato plants produced through the giving of compost fertilizer and fertilizer Local Microorganisms and soil quality.

1.2. Method

This research was conducted on April-June 2017 on experimental field of Agricultural Studies Program Faculty of Engineering Makassar State University. Tools used in research includes hoe bucket, yells, polybag 25 x 35 cm, and weights. Materials used include land, pasir, kompos, local microorganism, tomato seeds and water. This research uses Completely Randomized Design with two treatments and three replications, sand soil giving local microorganisms as well as land plus sand and compost fertilizer. The number of flowers and tomatoes. Calculated per week per treatment. Data were analyzed with descriptive analysis.

2. Results and Discussion

2.1. Total Interest Tomatoes

The results showed that the total of interest generated through the provision of compost fertilizer still more than the provision of fertilizer Local Microorganisms with an average value of 17.3 flowers tomatoes for tomato plants that are given compost fertilizer and the average value of 5.7 tomato flowers for tomato plants that are fed with local microorganisms (Figure 1).

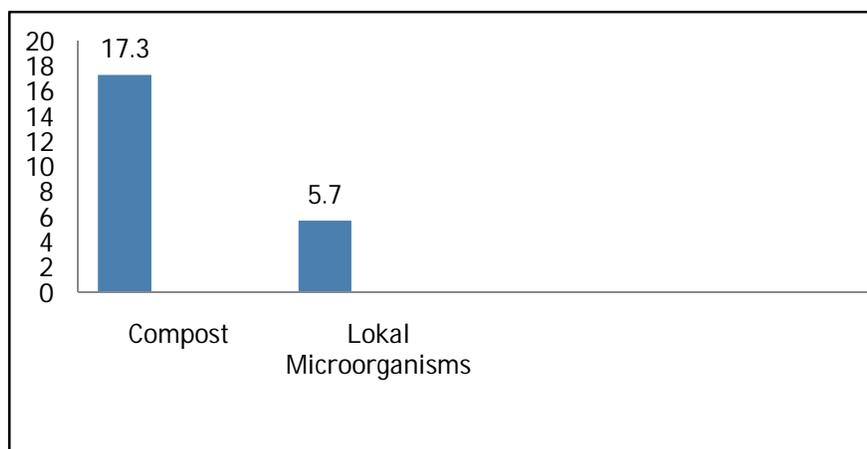


Figure 1: Total of Tomato Plant Flowers through Provision of Compost Fertilizer and local microorganisms

Figure 1 shows the total of flowers of tomato plants through the provision of compost fertilizer bigger than giving of local microorganism fertilizer. Flowering process is closely related to the content of gibberellins. High sugar content in shoots is required as an initial energy source for the process of interest induction as well as the meristem process of regional development and flower parts (Hempel *et al.*, 2000).

According to Hartati (2000), tomato plants start flowering when entering the age of 18-25 days after planting. Age of flowering in every varieties of tomato plants is different. Pollination or pollination occurs 1-2 days after flower bloom. Furthermore, Wijayanti and Susila (2013) stated nutrients absorbed by plants more used to vegetative growth such as branches and leaves.

2.2. Total of Tomatoes

The results showed total of tomatoes produced through the provision of compost fertilizer and local microorganisms. The highest obtained at giving compost with an average value of 4.9 tomatoes for plants given the treatment of compost fertilizer and an average value of 2.3 tomatoes for treatment given the fertilizer of local microorganisms (Figure 2), but when viewed from the percentage of the total of flowers that turn into tomato, then the soil given the treatment of local microorganism fertilizer has a percentage of interest to be tomato fruit greater is 40.35%, while the soil is given the treatment of compost fertilizer only amounted to 28.32%.

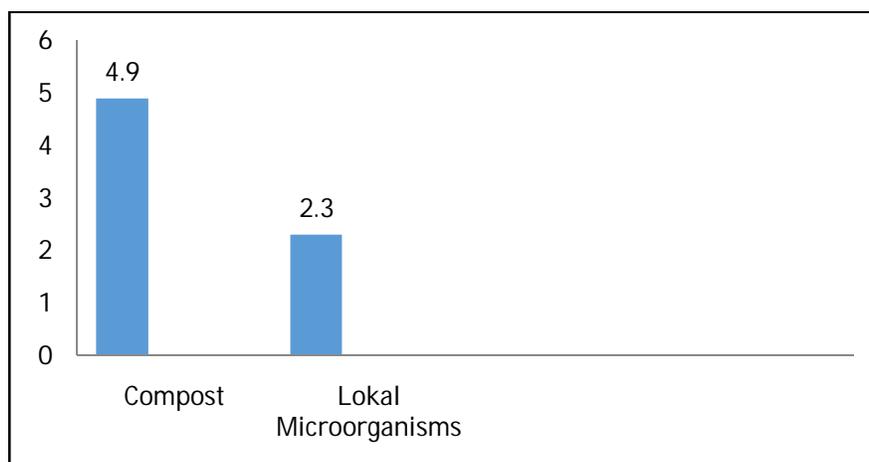


Figure 2: Amount of Tomato Fruits through Provision of Compost Fertilizer and local microorganisms

Kusumayati *et al.*, (2015) stated the percentage of fruit formation in tomato plants is influenced by plant growing environment. One of the factors that influence percentage of fruit formation is the amount of interest into fruit. If the amount of flowers that bloom high but the number of flowers that became low fruit, then the percentage of the formation of the fruit is also low.

2.3. Soil Quality pH

The results showed the highest soil pH values were obtained in tomato plants tomato plants are given the compost fertilizer application of on treatment of local microorganisms.

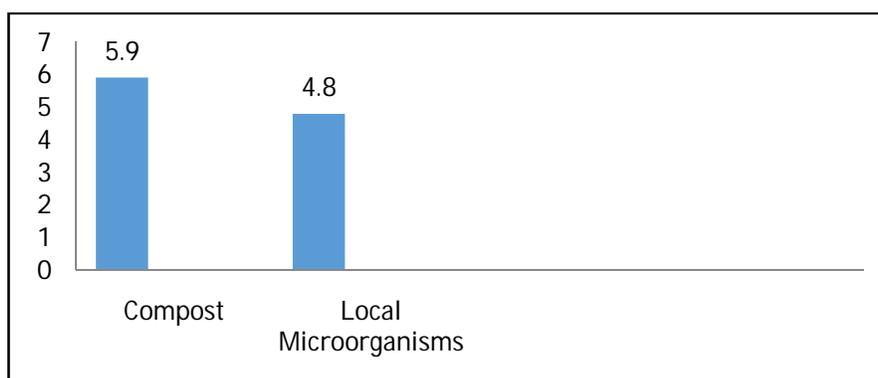


Figure 3: Soil pH Value on Media Planting Tomatoes

In Figure 3 shows pH value of planting medium through the application of compost fertilizer higher than that of the local microorganisms. The results of this research are in step with Suntoro (2003) stated giving organic matter can increase soil pH although the increase is still in the sour category.

P_2O_5

The results showed P_2O_5 value of soil of which given local microorganisms fertilizer higher than those given compost (Figure 3).

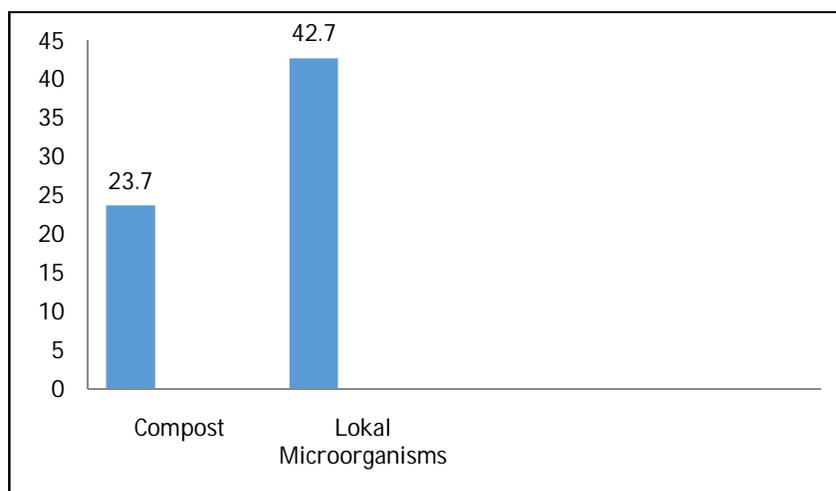


Figure 4: Soil P2O5 value on Media Planting Tomatoes

In Figure 3 shows P2O5 values of planting medium on local microorganisms are higher compared with the application of compost fertilizer, where the value of P2O5 on local microorganisms is 42.7, while the application of compost fertilizer is only 23.7

Soil Texture

Soil analysis results to the soil texture of composted fertilizer Local microorganism fertilizer are a sandy texture

3. Conclusion

The amount of tomatoes flower produced from the provision of compost and local microorganisms highest obtained in the application of compost fertilizer, but based on the percentage of the amount of interest which turns into a tomato fruit then the soil given the local microorganism fertilizer has a percentage of interest to be a larger fruit namely 40.35%, while the soil by composting only amounted to 28.32%. The range of soil pH values in both treatments still showed acid values although compost is still higher.

4. References

- i. Dewi, Y. S., and Tresnowati. 2012. Waste Processing Household Scale Using Composting Method. Scientific Journal of LIMIT'S Faculty of Engineering Vol.8 No.2 diversity of Plant-Pollinator Interaction Webs Enhances the Persistence of Plant Community. Journal Plos Biologi \$ (1): 10-25
- ii. Hartati, S. 2000. Appearance of Tomato Plant Genotype Artificial Mutation Result on Water Stress Condition and Optimal Condition. Journal Agrosains. 2(2): 35-42.
- iii. Hempel, F.D., D.R. Welch dan L. J. Feldman. 2000. Florial Induction and Determination: Where is Flowering Controlled. Journal Trends Plant Science 5:17-21
- iv. Latifah,R.,N.,Winarsih,And R.Y.Sri. 2012. Organic Waste Utilization as Liquid Fertilizer for Red Spinach Plant Growth (*Alternanthera ficoides*). LenteraBioVol.1 No.3September 2012:139-144
- v. Kusumayati, N., E. E. Nurlaelih And L. Setyobudi. 2015. Level of success The Formation of Three Tomato Plant Varieties (*Lycopersicon esculentum* Mill.) on a Different Environment. Journal of Crop Production, Vol. 3 No. 8 December 2015.
- vi. Maryanto and A. Rahmi. 2015. Effect of Type and Dosage of Organic Fertilizer against Growth and Results of Tomato Plant (*Lycopersicum esculentum* Mill.) Permata varieties. Journal of AGRIFOR Vol. XIV No. 1, March 2015.
- vii. Nurdianti, D., A. S.Utami, N.Bastian., and Johan. 2017. Utilization of Market Organic Waste As Compost Fertilizer For Greening in Cirebon City Community Environment. HE5THURECOLPROCEEDING. UAD,Yogyakarta.
- viii. Purwati. 2007. Production of cassava in Indonesia can increase with organic fertilizer. Www. read on. or.id. Retrieved on 12 June 2007.
- ix. Sajiwo, W.,R.Prihandarinii. , and T.Suharjanto. 2016. Study of Microorganism Utilization and Organic Fertilizer on the Growth and Production of Curly Lettuce. (*Lactucasativa,L.*). Journal of Agricultural Sciences "AGRIKA", Volume 10, Number 2, November 2016.
- x. Suntoro,2003. The Role of Organic Materials Against Soil Fertility and Management Efforts. Faculty of Agriculture, Sebelas Maret University. Sebelas Maret University Press. Jakarta
- xi. Sutanto,R. 2006. Application of Organic Agriculture (Correctional and Development). Publisher Kanisi us. Yogyakarta
- xii. Wijayanti, E., and M.A. D. Susila. 2013. Growth and Production of Two Tomato varieties (*Lycopersicon esculentum* Mill.) By Hydroponics by Several Compositions of Planting Media. Journal Buagron Agronorti 1 (1):104-112.