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ROLE OF TEA DREGS LIQUID ORGANIC FERTILIZER AND PLANT MEDIA COMPOSITION IN INCREASING TOMATO RESULTS (*Lycopersicon esculentum* Mill.)

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ABSTRACT

The aim of this study was to determine the composition of the tea waste liquid organic fertilizer and the composition of the growing media in increasing the yield of tomato plants. The research was conducted from June to November 2022 at the Wedomartani Experimental Garden, Faculty of Agriculture UPN "Veteran" Yogyakarta Kapanewon Ngemplak, Sleman Regency, Yogyakarta. Research method with polybags using factorial (3 × 3 + 1) arranged in a completely randomized design. The first factor was tea waste liquid organic fertilizer with 3 levels: 200 ml/l, 300 ml/l, and 400 ml/l. The second factor was the composition of the planting medium in the form of a mixture of soil and goat manure consisting of 3 levels: (1:1), (1:2), and (2:1). For each treatment of tea waste liquid organic fertilizer, 3 grams of NPK 16:16:16 fertilizer was added. The control treatment used soil and 3 grams of NPK fertilizer for each application of fertilization which was given 3 times. The results showed that the combination of treatments was better than the control on tomato fruit diameter per harvest, tomato fresh fruit weight per third and fourth harvest. There was no interaction between the concentration of tea waste liquid organic fertilizer and the composition of the planting medium. Concentration of 400 ml/l tea waste liquid organic fertilizer gave higher yields on tomato fruit diameter per harvest, tomato fresh fruit weight per harvest and total tomato fresh fruit weight. The composition of the growing media with a composition of 1:1 gave the highest yield on tomato fruit diameter per harvest and a composition of 2:1 for total fresh fruit weight of tomatoes.

Keywords: *tomatoes, tea dregs, growing media.*

INTRODUCTION

Tomato is one type of fruit-producing vegetable plant that belongs to the horticultural group which is very beneficial for the human body. The fruit can be used as a food flavoring, a basic ingredient for making juice, acne medicine, making sauces, making juice, making pasta, and making dry flour. Tomatoes are also a source of vitamins A and C which are useful for eye health and endurance, while other benefits are substances that are important for building human body tissues and can increase energy to move, think, and so on. The content of vitamins A and C in every 100 grams respectively are as follows: tomato juice 600 mg and 10 mg; young fruit 320 mg and 30 mg; and ripe fruit 1500 mg and 40 mg (Cahyono, 1998). The content of other substances, in the form of the main pigments in the form of

lycopene and carotene. Lycopene is important as an antioxidant and prevents free radicals that damage cells. As an antioxidant, it can prevent prostate cancer in men and can prevent breast cancer, cervical cancer and ovarian cancer, as well as suppress the occurrence of osteoporosis in women (Husas, 2009).

Based on BPS 2021, from 2017 to 2020 tomato crop production will always increase. Even in 2021 the production of tomato plants will continue to increase to 1,053,249 tons. In addition, the consumption of tomato plants for the community has also increased by 1,035,457 tons, so that the production of tomato plants is sufficient to meet the needs of public consumption, while consumption for industry is not sufficient, so there was a shortage of tomatoes. For that, it is necessary to take certain steps to be able to increase production as a whole. Actions that can be taken include intensification, including the use of liquid organic fertilizers and the selection of appropriate planting media. The use of inorganic fertilizers is reduced and the application of organic matter needs to be increased to improve and improve soil quality, so as to significantly increase the growth and yield as well as the quality of various plants. Liquid organic fertilizer given through the leaves reaches the plants faster than through the roots of the plants.

Tea contains beneficial compounds such as polyphenols, teofilin, flavonoids, tannins, vitamin C and vitamin E as well as a number of minerals Zn, Se, Mo, Ge and Mg. The content of tea in the form of minerals is an essential needed by plants (Pujianto, 2007). According to the classification of plant nutrients, it appears that the element Zn is the main essential micro element, the Mg element is the secondary essential macro element, the Mo element is the secondary essential micro element (Purba, et al., 2021). In stale tea water is beneficial to improve soil fertility, stimulate the growth of roots, stems and leaves. The water content of stale tea is polyphenols, B complex vitamins, organic carbon, 20% copper (Cu), 10% magnesium (Mg), and 13% calcium (Ca) (Pujianto, 2007). Usually stale tea water can also be referred to as tea dregs or leftover tea brewing. The tea dregs are usually thrown away and not reused. In fact, tea dregs can be used as liquid organic fertilizer which is beneficial for plants, including improving soil fertility, stimulating the growth of roots, stems and leaves. Research conducted by Baon (2017) showed that the use of tea waste liquid organic fertilizer had a significant effect on the number of leaves and wet weight.

In general, the planting medium must be able to maintain humidity in the area around the roots, provide enough air and be able to withstand the availability of nutrients (Cahyo, 2016). One that can be used as a mixture of planting media is goat manure. The nutritional content in goat manure is organic-carbon (C) 30.17%, nitrogen (N) 1.73%, phosphorus (P) 2.57%, potassium (K) 1.56% and sulfur (S) 0 .34%. Goat manure can increase the nutrient content needed by plants, thus increasing shoot fresh weight, fresh root weight and root volume (Febrianto, et al., 2018). The role of the element nitrogen can stimulate the growth of leaves and stems and help roots, the element phosphorus stimulates the growth of roots, fruit and seeds. Potassium element increases plant resistance to pests and diseases. The element zinc plays a role in the formation of the hormone auxin which is useful for stimulating the elongation of stem cells and root cells. The element calcium plays a

role in helping the growth of root tips and the formation of root hairs (Adikasari, 2012).

LITERATURE REVIEW

Tea waste contains crude fiber, cellulose and lignin which can be used by plants for their growth. Tea pulp contains antioxidants which are very potent in fighting free radical damage to plant cells. Tea waste has many benefits, especially for plants, such as increasing the intake of nitrogen, phosphorus and potassium (NPK) needed by plants, so that it can fertilize the soil (Adikasari, 2012). Tea dregs also contain minerals, carbohydrates and help release nitrogen as plant nutrition. The use of tea waste liquid organic fertilizer of 20% per liter has a significant effect on the number of leaves and the wet weight of tomatoes (Baon, 2017). According to Aman, et al., (2018) states that the use of liquid organic fertilizer has several advantages, namely it is easy to apply compared to solid organic fertilizer, nutrients in liquid fertilizer are easily absorbed by plants, and contain microorganisms which are rarely found in solid organic fertilizer. . Liquid organic fertilizer from tea powder waste serves as a very effective source of plant nutrients for the provision of nutrients that are quickly absorbed by plants, both through roots and leaves.

Based on research by Muningsih and Ciptadi (2017), liquid tea waste organic fertilizer has a total N of 0.24%, a total of 0.06% P2O5, a total of 0.69% K2O. The role of N as a builder of nucleic acids, proteins, bioenzymes and chlorophyll as well as a constituent of amino acids, nicotine, alkaloids. The role of P as the construction of nucleic acids, phospholipids, bioenzymes, proteins, metabolic compounds and is part of ATP which is important in energy transfer. Inorganic phosphate constituent which is part of the plant buffer system, nucleoprotein, part of the enzyme, plays a role in the synthesis of carbohydrate and fat hydrates. The role of K is to play a role in the synthesis of carbohydrate carbohydrates and protein constituents, regulate the activity of enzymes and other processes and regulate the balance of ions in cells, which functions in regulating various metabolic mechanisms such as photosynthesis, carbohydrate metabolism and its translocation, protein synthesis plays a role in the process of respiration and increases resistance to pests and diseases (Subhan and N. Nurtika, 2004).

The manufacture of tea waste liquid organic fertilizer begins with preparing tools (plastic buckets and filters) and materials in the form of 5 kg of tea dregs, 10 liters of water, 1 kg of brown sugar, and 100 ml of EM-4. Then EM-4 is mixed with water and brown sugar, then deposited overnight. All ingredients are mixed together in a drum/barrel, the ingredients are stirred until evenly distributed. Furthermore, stirring is carried out every day for approximately 60 days and the preparation is considered successful if the fermentation emits a distinctive fragrant odor (Marpaung, et al., 2014).

Regosol soil types generally have not experienced horizon differentiation, except in old Regosol soils the horizon has begun to form weak gray in color, containing material that has not or has recently been weathered. The texture of the soil is usually coarse, the structure is coarse or crumbly, the consistency is loose and loose and the pH is 6.0-7.0. The older the soil, the denser the structure and

consistency, and often forming pads with blocked drainage and porosity, generally enough to contain elements of P and K which are still fresh and not ready to be absorbed by plants, lack of elements of N (Darmawijaya, 1992).

Planting media is a place where plants grow or where cultivated plants function as a supply of nutrients for plants as well as a place for plant roots to attach and develop. Growing media has an important role that determines the growth and development of plants. A good planting medium is having the ability to bind water and supply the nutrients needed, able to control excess water or good drainage, has good air circulation and availability (aeration), can retain moisture around the plants, and is not easily weathered and brittle (Wildasari, 2019). The more pores in the soil, the higher the porosity of the soil. Soil pores are spaces in the soil that are not filled with solid material, but are filled with water or air. The composition of the soil in good soil volume is 45% solids (minerals), 5% organic matter, 25% water and 25% air.

Applying goat manure to the planting medium is one way to add soil organic matter, so that it can affect the physical, chemical and biological properties of the soil. The addition of organic matter can add nutrients and improve soil structure due to an increase in soil porosity, so that the soil's ability to bind water is higher. A stable soil pore space will make it easier for water to flow down and be absorbed by the soil matrix, so that the soil's ability to hold water can increase (Tyas, 2018).

The texture of goat manure is unique, because it is in the form of granules which are quite difficult to break down physically, so it greatly influences the decomposition process and nutrient supply. The value of the C/N ratio of goat manure is generally still above 30. A good manure must have a C/N ratio of <20, so goat manure will be better used if it is composted first. Manure that is used directly will provide better benefits in the second planting season (Surya and Suryono, 2013). The moisture content of goat manure is relatively lower than cow manure and slightly higher than chicken manure. The nutrient content of goat manure contains potassium (K) which is relatively higher than other manures. While the levels of N and P nutrients are almost the same as other manure. The average nutrient content of goat manure is 0.7% N; 0.4% P2O5; 0.25% K2O and 0.4% (Thariqussalam, 2018).

The Ministry of Agriculture in 2006 has determined the description of the Fortuna variety tomato plants, as follows: hybrid tomatoes come from PT. Fertile Core Seeds Intani, Indonesia. Plant class: single cross hybrid. Category : vegetable tomatoes. Growth type: determinate. Early harvest age ranges from 58 days after planting, final harvest age 85-90 days after planting. Harvest frequency is around 10 times. Plant height is around 22 cm, stem diameter is around 1.4 cm. Green leaf color, oval leaf shape. The size of the long leaves ranges from 35 cm, width ranges from 32 cm. Flat leaf type, blunt leaf tip, smooth surface. The length of the petiole is around 7.6 cm. The position of the leaves slightly down. Flowering age ranges from 23 days after planting. The color of the flower crown is yellow. Number of flowers per bunch 5-6 flowers. Number of flowers per plant 61 bunches. The color of the young fruit is green, the color of the old flower is bright red. The shape of the fruit is round, the size of the fruit is about 5.0 cm high, and the diameter is about 5.2 cm. The thickness

of the fruit flesh is around 0.6 cm. The texture of the fibrous fruit flesh is rather soft. Sugar content 4.5 brix. Number of fruit cavities 3 cavities. Fruit hardness is hard. Rice per fruit is around 41 grams. The number of fruits per bunch is 4-6 pieces. The number of fruits per plant is 58-102 fruits. Fruit weight per plant is around 2.2 kg. The number of seeds per fruit is around 128 seeds. The weight of 1000 seeds is around 3.3 grams. The yield of fresh fruit is around 45.7 t/ha. Description: well suited in low to medium altitudes with an altitude of 50-650 m above sea level.

MATERIALS AND METHODS

The research was carried out in July-November 2022. This research was carried out at the Wedomartani Experimental Garden, Faculty of Agriculture, UPN, Kapanewon Ngemplak, Sleman Regency, Special Region of Yogyakarta. Regosol soil type with an altitude of 154 m above sea level. The tools used include nursery tubs, covered tubs/drums, measuring cups and sprayers, stationery, rulers, analytical scales, calipers and polybags measuring 40×40 cm. The materials used were tomato seeds of the Fortuna variety, goat manure, tea waste, brown sugar, EM-4, and pearl NPK (16:16:16).

The experiment used polybags with a factorial experimental design (3x3+1) arranged in a Completely Randomized Design (CRD) consisting of 2 factors and 1 control which was repeated 3 times. The first factor was the concentration of tea waste liquid organic fertilizer which consisted of 3 levels: K1 = 200 ml/l, K2 = 300 ml/l and K3 = 400 ml/l. The second factor was the composition of the planting medium (a mixture of soil and goat manure) consisting of 3 levels: M1 = (1:1), M2 = (1:2), M3 = (2:1). In each treatment, the use of tea waste liquid organic fertilizer was added with 3 grams of NPK fertilizer. Control plants used soil media and 9 grams of NPK fertilizer given 3 times in the vegetative phase. Data were analyzed by orthogonal contrast and analysis of variance. If there is a significant difference, continue with Duncan's Multiple Range Test test level $\alpha = 5\%$.

Research on tomatoes begins with preparing a nursery planting medium by making a mixture of soil and manure with a ratio of 1:1. Making planting media with a mixture of soil and goat manure in a ratio of 1:1, 1:2, and 2:1 is put into a 40x40 cm polybag. Planting is carried out at the age of tomato seedlings which have 3-4 or 25 days. Fertilization with tea dregs liquid organic fertilizer and NPK was carried out at 14 hst, 21 hst and 28 hst. Fertilization was carried out in three concentrations, namely 200 ml/l, 300 ml/l and 400 ml/l and each concentration of liquid organic fertilizer was added 3 grams of NPK. Control treatment using NPK as much as 9 grams was given 3 times at the age of 14 HST, 21 HST and 28 HST in the vegetative phase.

Maintenance which includes installing stakes which is done when the plants are still small or 5 DAP by tying raffia ropes but not too hard, so as not to damage the plants. Stitching is done at the age of 7 hst. Next is watering done in the morning and evening. Pruning water shoots is an effort to remove the required plant parts from plants called side shoots or water shoots. Preventive control of pests and plant diseases. To control fungi that can cause wilt disease in tomato plants, Trichoderma sp. The application is done by dissolving 100 grams of trichoderma powder with 14

liters of water. Then 200 ml of the solution was leaked into the planting medium and applied 4-7 days before transplanting. Harvesting was carried out 7 times with an intensity of 2-3 days. The criteria for tomatoes that are ready to harvest are no longer green but orange or red in color with the texture of the fruit not being too hard anymore.

RESULTS AND DISCUSSION

After analyzing the data on the yield of tomato plants, the results of tomato fruit were obtained as shown in the following Table:

Table: 1. Average diameter of tomatoes per harvest (cm)

Treatment	Diameter of tomatoes per harvest (cm)						
	harvest 1	harvest 2	harvest 3	harvest 4	harvest 5	harvest 6	harvest 7
Cons. poc tea dregs							
200 ml/l	5,23 a	5,19 a	4,98 a	4,85 b	4,77 b	4,77 a	4,35 b
300 ml/l	5,16 a	5,03 c	5,03 a	4,87 b	4,80 b	4,64 a	4,52 a
400 ml/l	5,32 a	5,10 b	5,02 a	4,94 a	4,92 a	4,65 a	4,48 a
Media composition							
1:1	5,28 p	5,13 q	5,05 p	4,89 q	4,73 q	4,70 p	4,50 p
1:2	5,12 q	4,97 r	4,92 q	4,84 q	4,98 p	4,61 q	4,43 q
2:1	5,31 p	5,22 p	5,03 p	4,94 p	4,77 q	4,66 p	4,41 q
Average	5,24 (x)	5,11 (x)	5,06 (x)	4,89 (x)	4,83 (x)	4,65 (x)	4,45 (x)
Control	5,26 (x)	5,21 (x)	4,96 (y)	4,85 (x)	4,81 (x)	4,82 (x)	4,64 (x)
Interaction	(-)	(-)	(-)	(-)	(-)	(-)	(-)

Note: Numbers followed by the same letter in the column are not significantly different. Letters (x,x) indicate no significant difference between the treatment combination and the control.

Table 1 shows that the diameter of tomato fruit per harvest in the combination of tea waste liquid organic fertilizer treatment and the composition of the planting media at the time of the third harvest showed a significant difference where the treatment combination was higher than the control treatment, while the other treatment combinations did not show a significant difference with control treatment. The interaction between tea waste liquid organic fertilizer and the composition of the growing media on tomato fruit diameter also did not show any significant difference.

The application of 400 ml/l tea bag liquid organic fertilizer on the diameter of tomatoes per harvest showed 4.48 cm was larger than 200 ml/l of 4.35 cm, although the 400 ml/l tea bag liquid organic fertilizer was not significantly different from 300 ml/l of 4.52 cm. This is understandable because the high concentration of tea waste liquid organic fertilizer will also give high yields. The role of the three main essential elements is clearly seen in the role of N as a builder of nucleic acids, proteins, bioenzymes and chlorophyll as well as a constituent of amino acids, nicotine and alkaloids. The role of P as the construction of nucleic acids, phospholipids, bioenzymes, proteins, metabolic compounds and is part of ATP which is important in energy transfer. Inorganic phosphate constituent which is part of the plant buffer system, nucleoprotein, part of the enzyme, plays a role in the synthesis of carbohydrate and fat hydrates. The role of K is to play a role in the synthesis of

carbohydrate carbohydrates and protein constituents, regulate the activity of enzymes and other processes and regulate the balance of ions in cells, which functions in regulating various metabolic mechanisms such as photosynthesis, carbohydrate metabolism and its translocation, protein synthesis plays a role in the process of respiration and increases resistance to pests and diseases (Subhan and N. Nurtika, 2004). The diameter of the tomatoes in the treatment of the 1:1 media composition was 4.50 cm which was the largest diameter of the tomatoes achieved in the composition of soil and goat manure with a ratio of 1:1 compared to the composition of the 1:2 planting medium which was only 4.43 cm and 2:1 composition of 4.41 cm.

Based on harvest time, it appears that when the third tomato harvest was the highest tomato harvest, then it gradually decreased from fourth to seventh in both the tea waste liquid organic fertilizer and the composition of the planting medium.

Table: 2. Average fresh fruit weight of tomatoes per harvest (kg)

Treatment	Fresh fruit weight of tomatoes per harvest (kg)						
	harvest 1	harvest 2	harvest 3	harvest 4	harvest 5	harvest 6	harvest 7
Cons. poc tea dregs							
200 ml/l	0,13 ab	0,17 b	0,22 a	0,25 a	0,26 a	0,22 a	0,18 b
300 ml/l	0,12 b	0,15 b	0,21 a	0,24 a	0,24 b	0,22 a	0,19 b
400 ml/l	0,13 a	0,19 a	0,21 a	0,25 a	0,24 b	0,22 a	0,22 a
Media composition							
1:1	0,12 q	0,17 q	0,20 q	0,24 p	0,26 p	0,22 q	0,19 p
1:2	0,12 q	0,16 q	0,21 q	0,25 p	0,24 q	0,21 q	0,21 p
2:1	0,14 p	0,19 p	0,23 p	0,25 p	0,24 q	0,23 p	0,20 p
Average	0,14 (x)	0,17 (x)	0,21 (x)	0,25 (x)	0,25 (x)	0,22 (x)	0,20 (x)
Control	0,14 (x)	0,21 (x)	0,17 (y)	0,20 (y)	0,25 (x)	0,29 (y)	0,23 (x)
Interaction	(-)	(-)	(-)	(-)	(-)	(-)	(-)

Note: Numbers followed by the same letter in the column are not significantly different. Letters (x,x) indicate no significant difference between the treatment combination and the control.

Table 2 shows that the fresh fruit weight of tomatoes per harvest at the fifth harvest was the highest tomato fruit weight compared to the sixth and seventh harvests. One of the factors in the weight of tomatoes is the diameter of the tomatoes. Although the highest diameter of tomatoes per harvest was achieved at the third harvest, while the fresh fruit weight of tomatoes per harvest showed the fifth harvest. This situation was due to the fact that the fruit diameters in the fifth to seventh harvests were relatively small in diameter, but in larger quantities, causing the fresh fruit weight of tomatoes to increase and making the fifth harvest the highest fresh fruit weight of tomatoes.

The application of 400 ml/l tea waste liquid organic fertilizer at the seventh harvest showed that the highest fresh tomato fruit weight per harvest was 0.22 kg compared to 300 ml/l (0.19 kg) and 200 ml/l (200 ml/l) tea dregs fertilizer. 0.18 kg). This is caused by the application of tea waste liquid fertilizer with high concentrations which will cause the weight of fresh tomato fruit to also be high as

well. Tea waste liquid organic fertilizer contains the nutrient K. Element K functions to strengthen plant body parts such as leaves, flowers and fruit which do not fall easily, increase plant resistance to disease and improve seed quality. The P element functions to increase yields and plant dry weight, fruit weight and accelerate fruit ripening (Khosiatun, et al., 2020). The use of growing media with compositions of 1:1, 1:2 and 2:1 was not significantly different or the same on fresh fruit weight of tomatoes per harvest.

The fresh fruit weight of tomatoes per harvest in the treatment combination with the control at the third, fourth and sixth harvests showed a difference, where at the third and fourth harvests the treatment combinations showed higher yields compared to the control. On the other hand, during the harvest of the six control treatments, the fresh fruit weight of tomatoes per harvest was higher than the combined treatment. The interaction between the application of organic tea waste fertilizer and the composition of the planting media on the parameter of tomato fresh fruit weight per harvest showed no significant difference.

Table: 3. Average fresh fruit weight of tomatoes per plant and total fresh fruit weight of tomatoes (kg)

Treatment	Fresh fruit weight per plant (kg)	Total fresh fruit weight of tomatoes (kg)
Cons. poc tea dregs		
200 ml/l	1,44 a	9,69 b
300 ml/l	1,39 a	9,32 b
400 ml/l	1,48 a	10,26 a
Media composition		
1:1	1,43 p	9,48 q
1:2	1,41 p	9,59 q
2:1	1,48 p	10,19 p
Average	1,44 (x)	9,75 (x)
Control	1,49 (x)	10,05 (x)
Interaction	(-)	(-)

Note: Numbers followed by the same letter in the column are not significantly different. Letters (x,x) indicate no significant difference between the treatment combination and the control.

Table 3 shows that the yield of tomato fruit weight per plant is lower than the description of tomatoes. In the treatment of liquid organic fertilizer dregs concentration of 400 ml/l it produced a tomato fruit weight per plant of 1.48 kg and in the treatment of the composition of the planting media all produced 1.41-1.48 kg, while in the description of tomatoes it could produce a tomato fruit weight per plant around 2.2 kg. This is because tomato planting is carried out in polybags so that the roots are not as flexible as when planting in the field. In addition, it seems that the concentration of liquid tea waste organic fertilizer also needs to be increased and the composition of the planting medium needs to be added with rice husk charcoal. Table 3 also shows that the weight of tomato fruit per plant with the application of liquid organic tea grounds fertilizer 400 ml/l, 300 ml/l and 200 ml/l did not show significant results. Likewise, on the weight of tomato fruit per plant, the composition of the growing media was not significantly different. However, if the total fruit weight of tomatoes (whole plants) showed that the application of 400 ml/l tea waste liquid organic fertilizer resulted in a total tomato fruit weight of 10.26 kg and that

was higher than the tea waste fertilizer 300 ml/l and 200 ml/l . This is because the tea waste liquid organic fertilizer contains the nutrients nitrogen, phosphorus, and potassium, where the three nutrients are essential nutrients which are the main elements for the formation of tomato fruit. Apart from that, organic tea waste liquid fertilizer also has the element magnesium which participates in the formation of leaf green matter and distributes phosphorus throughout the plant.

The use of a 2:1 composition of the planting medium gave a yield of 10.19 kg higher than the 1:1 composition of 9.47 kg and the 1:2 composition of 9.59 kg. This is due to the composition of soil and manure with a ratio of 2:1 for the weight of tomato fruit throughout the plant is a typical form of planting media composition. With the addition of organic matter will improve soil structure due to an increase in soil porosity, so that the soil's ability to bind water is higher. A stable soil pore space will make it easier for water to flow down and be absorbed by the soil matrix, so that the soil's ability to hold water can increase (Tyas, 2018). Organic fertilizers play an important role in improving soil conditions, namely by reducing soil density so that roots develop properly and have a good impact on plant growth. Goat manure can increase the nutrient content needed by plants, thus increasing shoot fresh weight, root fresh weight and root volume (Febrianto, et al., 2018) and total fresh fruit weight of tomatoes.

There was no significant difference in the fresh fruit weight of tomatoes per plant and the total fresh fruit weight of tomatoes in the treatment and control combinations. From the three tables above it can be seen that the effect between the treatment of tea waste liquid organic fertilizer and the composition of the planting medium did not show a significant interaction. Interaction is the tendency of a factor to have a different effect on various levels of other factors (Sutjihno, 1992).

CONCLUSION

1. The combination of treatments was better than the control on tomato fruit diameter per harvest, tomato fresh fruit weight per third and fourth harvest.
2. There was no interaction between the concentration of tea waste liquid organic fertilizer and the composition of the planting medium.
3. Concentration of 400 ml/l tea waste liquid organic fertilizer gave higher yields on tomato fruit diameter per harvest, tomato fresh fruit weight per harvest and total tomato fresh fruit weight.
4. The composition of the growing media with a composition of 1:1 gave the highest yield on tomato fruit diameter per harvest and a composition of 2:1 for total fresh fruit weight of tomatoes.

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