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DESCRIPTIVE RESULTS OF VEGETATIVE GROWTH OF RAWIT CHILI MALITA FM AFTER GIVING LIQUID ORGANIC FERTILIZER RICE WATER

FEBRIYANTI
Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University. Jl. Jend. Sudirman No.6, Dulalowo Tim., Kota Tengah, Kota Gorontalo, Gorontalo, 96128, Indonesia.
Email: febriyanti@ung.ac.id

LARAS PUSPITA TAIB
Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University. Jl. Jend. Sudirman No.6, Dulalowo Tim., Kota Tengah, Kota Gorontalo, Gorontalo, 96128, Indonesia.

DANDI KURNIADI
Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University. Jl. Jend. Sudirman No.6, Dulalowo Tim., Kota Tengah, Kota Gorontalo, Gorontalo, 96128, Indonesia.

ANA AININA
Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University. Jl. Jend. Sudirman No.6, Dulalowo Tim., Kota Tengah, Kota Gorontalo, Gorontalo, 96128, Indonesia.

ABSTRACT:
Malita FM cayenne pepper has been developed as a superior product in Gorontalo since 2008, its cultivation is considered to provide more opportunities for farmers than other types of chillies, for that it requires fertilizer that can be used as an alternative to growth of Malita FM chili. In this study using rice washing wastewater which is used as liquid fertilizer for the growth of Malita FM cayenne pepper because it contains nutrients nitrogen, phosphorus and potassium which are still needed by plants. The purpose of this study was to describe the results of the growth of FM malita chilli plants after being given liquid organic fertilizer of rice washing wastewater with observational parameters: plant height, number of leaves, leaf length and leaf width. The method in this study used an experimental method using RAL (Completely Randomized Design) with 2 treatments that were repeated 5 times so that a total of 10 experiments were obtained. The treatments are: P0 (concentration 0% POC water rice water) and P1 (concentration 100% POC rice water). The results of the research data have been analyzed descriptively showing that the provision of rice water for plant height, number of leaves, leaf length and leaf width in P1 (100% concentration of rice water POC) provides the fastest growth compared to P0 (concentration of 0% water POC for rice water) control treatment.

KEYWORDS: Growth of Malita FM cayenne pepper, Liquid organic fertilizer rice washing water

INTRODUCTION:

Malita FM cayenne pepper is being developed as a superior product in Gorontalo since 2008. The potential for developing cayenne pepper agribusiness is wide open outside Java, especially in Gorontalo Province.

Cultivation of Malita FM cayenne pepper is considered to provide greater opportunities for farmers than other types of chili (BPS Kabupaten Gorontalo Utara, 2000). One alternative that can be given to increase chili production is by applying fertilizers to fulfill plant nutrient content. This research will use liquid fertilizer from washing rice water.

Rice water is liquid waste produced before the cooking or cooking process of rice. Rice water is milky white, contains protein and vitamin B1. The role of vitamin B1 plays a role in metabolism in terms of converting carbohydrates into energy to drive activity in plants, so that plants that experience stress due to open root conditions or from moving plants to new media, immediately carry out metabolic activities to adapt to the environment or media. the new one. In addition, the role of vitamin B1 also functions so that plants do not wither easily, namely maximizing the absorption of nutrients in the soil with the content of vitamin B1 in the rice water. In addition to this, the use of rice water as liquid organic fertilizer contains nutrients needed by plants, around 80% vitamin B1, 70% vitamin B3, 90% vitamin B6, 50% manganese (Mn), 50% phosphorus (P), 60%. iron (Fe), 100% fiber, and essential fatty acids are lost in this process. The latest fact is the result of research conducted by Yayu Siti Nurhasanah, an IPB student. Revealed that rice washing water is an alternative medium for carrying the Pseudomonas bacteria fluorescens. These bacteria are microbes that play a role in controlling petogens that cause rust disease and trigger plant growth (okezone, 19/10/11). Another study by Buchari (2013) found that giving rice washing water with a content of 300L / ha had a significant effect on the height of eggplant plants. The research conducted by Nasution et al (2000) showed that giving rice washing water at a dose of 1.25 L / plant was the best treatment for growth rate, root shoot ratio, plant dry weight, and generative growth of maize plants.

Based on the previous description, then in this study, we will describe the growth results of Malita FM's cayenne pepper after being given liquid organic fertilizer to wash rice water.

METHODOLOGY:

The research was conducted at the Green House, Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University, and was conducted from October 2020 to November 2020.

The tools used in this study were a shovel, tape measure, book, label paper, pens, pencils, sprays, buckets, small plastic hoses, sprouts trays, polybags and cameras. The materials used in this study were water, manure, household waste organic fertilizer (rice washing water), and Malita FM chili seeds.

This research method used the RAK method (Randomized Block Design) with 2 treatments that were repeated 5 times in order to obtain a total of 10 experiments. The treatments were: P0 (concentration 0% POC water rice water) and P1 (POC concentration 100% rice water). The research sample was 10 malita FM cayenne pepper plant seedlings taken by purposive sampling, by selecting the FM malita cayenne pepper with healthy criteria, relatively the same height, and relatively the same number of leaves. Data collection was taken from the first planting in polybags (plant height, number of leaves, leaf length and leaf width) as much as 1 week 2 times. The research data analysis technique, namely descriptive analysis, was used to analyze data on the average plant height, number of leaves, leaf length and leaf width.

RESULTS AND DISCUSSION:

A. Results:

1. Plant Height:

The results of observations of the mean height of untreated and treated plants at various volumes are presented in Figure 1 below.

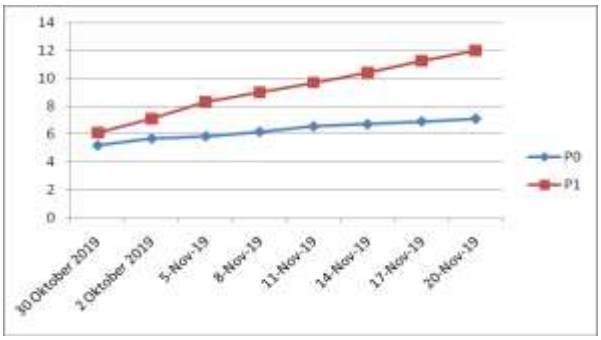

Figure 1. Average Plant Height Based on Treatment of Rice Water

Based on graph 1, it is known that the plant height given the POC rice water concentration is 100% gives the fastest increase in plant height compared to those not given rice water POC. It can be seen in the graph from the observation date of 30 October to 20 November that the height increase has increased to reach 12 cm in contrast to without POC rice water produces an average plant height of only around -6 cm.

2. Number of leaves:

The results of observing the mean number of untreated and treated leaves at various volumes are presented in Figure 2 below. Last name 1 et al. / Jambura Edu Biosfer Journal (xxxx) x (x): pp-pp

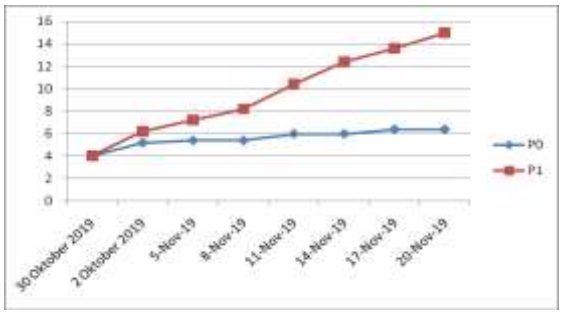

Figure 2. Average Number of Leaves Based on Treatment of Rice Water

Based on Figure 2 shows that the number of leaves of the FM malita cayenne pepper plant given rice water, at a concentration of 100%, the average number of leaves was 16 (Seen in the graph, each observation gave increased results up to the last observation) while the lowest was giving without POC, rice water averaged only 4 pieces (Seen in the graph shows no major changes in the number of leaves at each observation).

3. Leaf Length:

The results of observing the mean number of untreated and treated leaves at various volumes are presented in Figure 3 below.

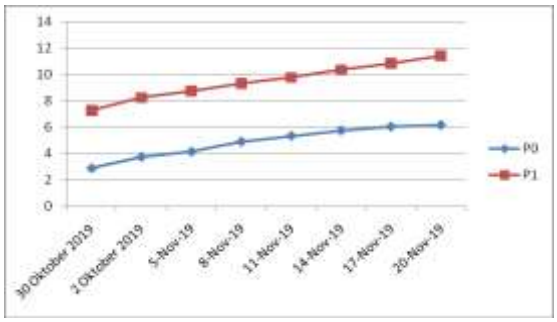

Figure 3. Average Leaf Length Based on Treatment of Rice Water

Based on graph 3 it is known that the length of the leaves given the POC rice water concentration 100% gives the fastest increase in leaf length compared to those not given rice water POC. It can be seen in the graph from the observation date of 30 October to 20 November that the length of the leaves has increased to reach 12 cm in contrast to without POC rice water produces an average plant height of only around 2 -6 cm.

4. Leaf Width:

The results of observations on the average number of untreated and treated leaves at various volumes are presented in Figure 4 below.

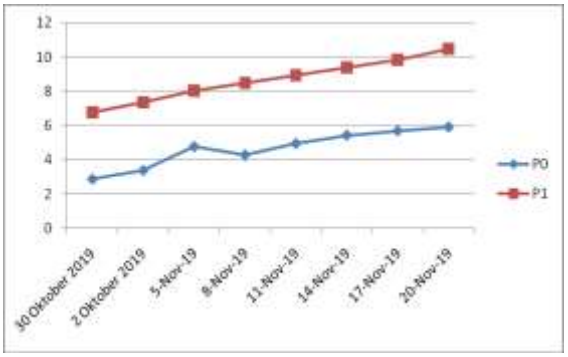

Figure 4. Average Leaf Width Based on Treatment of Rice Water

Based on Figure 4 it is known that the width of the leaves given POC rice water 100% concentration gives the fastest increase in leaf width (Seen in the graph of each observation date there was an increase in leaf width) compared to those not given rice water POC which did not have a major effect on the yield of leaf width increase.

B. Discussion:

Based on the observations, it shows that the provision of POC rice water can increase the growth and yield of malita FM cayenne pepper. Purnami (2014: 23) states, "Plants require optimal amounts of nutrients in order to support plant growth. Provision of sufficient amounts of nutrients will increase the genetic potential of plants such as the shape, size and weight of the resulting organs. According to Buckman and Brady (1982: 15) that the adequacy and availability of nutrients for plants depends on the kinds and amounts of these nutrients in the soil which is in balance according to plant growth. Plants can fulfill their life cycle using nutrients. The function of plant nutrients cannot be replaced by other elements and if there is no plant nutrient, metabolic activities will be disturbed or stop altogether.

Observations were made during the growth of the vegetative phase. In this phase the observations were plant height, number of leaves, leaf length and leaf width. Rice water is liquid waste produced before the cooking or cooking process of rice. Rice water still contains a lot of nitrogen (0.015), phosphorus (16.306), potassium (0.02), calcium (2.944), magnesium (14.252), sulfur (0.027), iron (0.0427), vitamin B1 (0.043). Physiological processes of rice water in plant growth, namely sulfur in plant metabolism, have a role in protein synthesis and part of the amino acids cysteine, biotin and thiamin. Sulfur helps stabilize protein structures, helps oil synthesis and chlorophyll formation, and reduces the occurrence of disease attacks in the plant body. Phosphorus is a constituent of amino acids, coenzymes NAD, NADP and ATP, is active in cell division and stimulates seed growth and flowering. Magnesium is an essential constituent of chlorophyll and acts as a cofactor in most enzymes that activate the phosphorylation process, as a bridge between the pyrophosphate structure of ATP and ADP and the enzyme molecule and stabilizes the particles in the configuration for protein synthesis. Calcium is a constituent of cell walls, which plays a role in maintaining cell integrity and membrane permeability (Wulandari, et al., 2011).

Plant height is the easiest indicator of plant growth to determine the size of a plant as well as a parameter to see the effect of the treatment used on plant growth (Lutfianis, et al., 2012). Based on the average height value of chili plants treated at a concentration of 100%, there was a known increase from the control (watering without rice water) where the two treatments showed significant differences. This plant height increase is due to rice water having a high carbohydrate content, where carbohydrates can be an intermediary for the formation of the hormones auxin and gibberellin. The auxin hormone is then used to stimulate shoot growth and the emergence of new shoots such as an increase in the number of leaves, while gibberellin is useful for stimulating root growth. This is in line with the histogen theory put forward by Hanstein and the tunica

corpus theory put forward by Schamid.

Leaves are the most diverse plant organ. Based on the observation parameters on the number of leaves with the provision of POC rice water with a concentration of 100% also had a significant effect, which was seen in the treatment with an average of 16 strands. Rice water contains nitrogen which functions as shoot formation, stem development, and protein formation.

From the research results, the response of giving POC washing water to rice resulted in the best leaf width of malita FM chili pepper with an average of 12 cm, while the treatment without POC resulted in the lowest plant leaf width. Likewise, the length of the leaves giving POC rice water had a significant effect on the increase in the length of the leaves of the FM malita chili. This shows that the provision of rice washing water has a significant effect on leaf width and leaf length of the FM malita cayenne pepper plant. The supply of nutrient content from rice washing water waste is sufficient for the need to increase plant leaf width. The results of this study are the same as those found by Karlina et al., (2013) which states that rice washing water waste fertilizer can increase plant leaf width. This is thought to be caused by the presence of growth hormones in the rice washing water which can increase the size of the orchid leaves. According to the results of research by Heddy et al., (1989) stated that in the waste water washing rice contains the auxin hormone which plays a role in growth to stimulate the process of cell elongation and the hormone Cytokinin hormones that play a role in cell division (cytokinesis) which play a role in stimulating the formation of roots and stems and the formation of root and stem branches by inhibiting apical dominance and formation of young leaves.

The nutrient content in rice washing water can stimulate the growth of roots, stems and leaves (Wulandari, 2012: 07). In addition, rice washing water is given regularly every 2 (two) days and watered gradually to the planting medium evenly, it is thought that it is absorbed slowly by plant roots, so that the plant's nutritional needs during the vegetative growth period are fulfilled. Another thing that causes plant growth to show very good symptoms is that the washing rice water that is given is thought to be maximally absorbed by the plants, because the research took place in the summer so that the risk of losing nutrients found in rice washing water mixed with rain water does not occur.

This research is in line with Leonardo's research (2009: 12) which shows that the concentration of water washing rice has an effect on the number of leaves and height of eggplant and tomato plants where the concentration of water washing rice 100% gives the largest average and is significantly different from the concentration of water washing rice 0%, 25 %, 50% and 75%. Likewise with the results of Istiqomah's research (2010: 105), showing that the concentration of washing water for brown rice showed a very significant effect on plant height and number of leaves of celery plants, Adrianto (2007) added that fertilization was very influential for plant growth, especially if the planting medium was classified as nutrient poor. Incorrect fertilization, both in terms of type, quantity, method of administration, and timing of application can affect the process of plant growth and development.

CONCLUSION:

Provision of POC rice water with a concentration of 100% on the FM malita cayenne pepper plant for plant height, number of leaves, leaf length and leaf width gave increased results in different observations without POC rice water, there was no major change in plant height growth, leaf number leaf length and leaf width. So it can be concluded that

there is an effect of giving POC rice water on the growth of Malita FM's cayenne pepper as seen from the average plant height, number of leaves, leaf length and leaf width.

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