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THE EFFECTIVENESS OF GIVING COFFEE DREGS COMPOST AND POC HORSE URINE ON RADISH PRODUCTION (Raphanus Sativus L.)

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Abstract

This study aims to determine the effectiveness of using coffee grounds and horse urine POC administration on the production of radish (Raphanus sativus L.). This research method used a factorial randomized block design (RBD) consisting of 2 factors. The factors studied were coffee grounds compost (K) treatment factors consisting of 4 levels K0 = 0 kg/Plot, K1 = 1 kg/Plot, K2 = 2 kg/Plot, K3 = 3 kg/Plot and the second factor was the provision of POC Horse urine (U) consists of 4 levels, namely U0 = 0 ml/liter of water/plot, U1 = 300 ml/liter of water/plot, U2 = 600 ml/liter of water/plot, U3 = 900 ml/liter of water/plot. Parameters observed were tuber length (cm), tuber production per sample (g) and tuber production per plot (g). The results showed that the application of coffee grounds compost and horse urine POC to radish production had a very significant effect on the parameters of tuber length, tuber production weight per sample and tuber production weight per plot. Where the best treatment for coffee grounds compost was in the K3 treatment (3 kg), the best treatment for horse urine POC was in the U3 treatment (900 ml/liter of water/plot).
Keywords: *Coffee grounds compost, POC, horse urine, radish*

1. INTRODUCTION

Radish (Raphanus sativus L.) is a type of root vegetable plant that belongs to the cabbage family (Brassicaceae) with short stems, so that all the leaves appear full above the ground. Enthusiasts to buy radishes are not as many as enthusiasts of other vegetables, because some people do not know the benefits and how to process radishes (Parman, 2010).

The development of research and information about health has made radishes the center of attention for treating various diseases herbally. Diseases that can be treated with radishes include curing fever, cleansing the blood, helping to treat diabetes, reducing the risk of cancer, lowering bad cholesterol levels and many other diseases. Therefore, radish is increasingly in demand and cultivated in several regions in Indonesia (Barus, 2020).

Increasing radish production is by using superior varieties and by increasing soil fertility. Organic use of solid or liquid fertilizers can be done to improve fertility in the soil. Solid and liquid organic fertilizers contain nutrients needed by plants, so that when applied to soil or planting media, they can maintain and increase the organic matter contained in the soil (Nurhayati, 2011).

Coffee is a very popular drink both in Indonesia and abroad. The increasing consumption of coffee drinks has led to an innovation to make organic compost from coffee grounds so that it is not wasted. Composting is important so

that the coffee grounds are properly decomposed. This is done so that the elements contained in the coffee grounds compost are easily absorbed by the soil and plant roots to support the growth and development of these plants so they can grow optimally.

Giving organic fertilizer from coffee grounds is the most effective alternative in plant cultivation because it contains the nutrients needed by plants. The advantage of coffee grounds compost is that it has balanced macro nutrients such as nitrogen (N), phosphorus (P), potassium (K). In addition, coffee grounds also contain other elements such as magnesium (Mg), copper (Cu), sulfur (S), and calcium (Ca). So that it has a positive impact in supporting plant growth and development (Pande, 2019).

Horse urine is widely available but so far it has been thrown away without being used, even though horse urine is very useful as liquid organic fertilizer for plant growth. The use of

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liquid organic fertilizer does not pose a risk of damage to the soil or the environment because it comes from natural sources and is easily absorbed by plants compared to solid fertilizers. The advantages of horse urine contain nutrients such as nitrogen (N), phosphate (P), potassium (K), and calcium (Ca), so it is good when applied to plants. The application of horse urine liquid organic fertilizer is very effective on plant growth. This happens because horse urine POC can work fast and contains the hormone auxin which can stimulate plant growth and development (Parnata, 2010).

Horse urine is the basic ingredient of liquid organic fertilizer which is widely available considering the number of horse breeders today. Fermented urine can be used as available nutrients for plants. The application of horse urine organic liquid fertilizer can meet nutritional needs and increase crop production because it has sufficient macro nutrients for plants. Plants that are given POC will have high production yields because POC is easily absorbed by plants (Herlinawati, 2019).

The macro-nutrient content in horse urine is 1.40% nitrogen, 0.02% phosphorus, 1.60% potassium, 1.1% carbon, 90% water. Where these nutrients act as a stimulant of cell division, enlarging cell tissue and assisting in the process of photosynthesis. Based on the nutrients contained in horse urine, it can meet the nutrient needs of plants if applied correctly. Horse urine liquid fertilizer is very good if it is applied when the vegetative phase of the cells is still active split (Refnizuida, 2018).

2. METHODS

This research was carried out in the research area atJl. Beringin/Kampung Wisata Hamlet 1 Bandar Baru, Sibolangit District, Deli Serdang Regency, North Sumatra from May to July 2021. The materials used are radish seeds of the Green bow variety, coffee grounds, horse urine, EM4, rice husks, bran, water , garlic, The tools used in this study were hoes, tape measure, analytical scales, plastic straps, gembor, cameras, buckets, stirrers, tarpaulins, spray bottles, and stationery.

This study used a factorial randomized block design (RBD) which had 2 blocks. The first factor was the dosage of coffee grounds compost, namely 0, 1, 2 and 3 kg/plot and the second factor, horse urine POC, namely 0, 300, 600 and 900 ml/l.water per plot.

Parameters observed were tuber length (cm), tuber production per sample (g) and tuber production per plot (g).

3. RESULTS AND DISCUSSION

3.1. Tuber Length (cm)

The results of statistical analysis of variance showed that the effectiveness of coffee grounds compost and horse urine POC had a very significant effect on the radish tuber length, while the interaction between the two had no significant effect on the radish (Raphanus sativus L.) tuber length.

The longest tubers were found in K3 coffee grounds compost (3 kg/plot) which was 37.49 cm and the shortest K0 (0 kg/plot) which was 23.01 cm. The longest tubers were given POC horse urine U3 (900 ml/liter water/plot) which was 32.21 cm, and the shortest was U0 (0 ml/liter water/plot) which was 28.19 cm.

The very real effect of giving coffee grounds is because the nutritional content in coffee grounds can be an alternative in fulfilling the nutrients needed by plants. Coffee compost is compost that makes coffee grounds as the main raw material in fulfilling plant nutrition as fertilizer. The length of the tuber determines the effectiveness in carrying out its function, namely determining the surface area of the tuber which will affect the weight of the tuber so that if the length of the tuber increases, the weight of the tuber will increase (Disri, 2017).

In coffee grounds for nutrients N, P and K. This is also supported by Harahapet al (2015) who stated that potassium plays a role in increasing stem diameter, especially in the translocation of K nutrients, so that with the availability of K nutrients, the formation of carbohydrates will run well. Furthermore, Akhtar et al (2002) also reported that potassium functions to maintain plant water status and cell turgor pressure, regulate stomata and regulate the accumulation and translocation of newly formed carbohydrates.

In administering POC horse urine POC horse urine can increase the growth and development of plants because it contains elements that are needed by plants such as 1.40% nitrogen, 0.02% phosphorus, 1.60% potassium, 0.32% calcium and carbon 1. 1%. Where these

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nutrients act as a stimulant of cell division, enlarging cell tissue and assisting in the process of photosynthesis. Based on the nutrients contained in horse urine, it can meet the nutrient needs of plants if applied correctly. Horse urine is very easily absorbed by plants because it is liquid. Horse urine has active compounds that cause soil bacteria to develop properly (Herlinawati, 2019).

3.2. Tubers Production per Sample (g)

The results of statistical analysis of variance showed that the effectiveness of applying coffee grounds compost and horse urine POC had a very significant effect on tuber production per sample of radish plants, while the interaction between the two had no significant effect on tuber production per sample of radish plants (Raphanus sativus L.).

The highest tuber production per sample was found in K3 coffee grounds compost (3 kg/plot), namely 792.81 g and the smallest K0 (0 kg/plot), namely 497.27 g. The highest tuber production per sample was in the administration of horse urine POC U3 (900 ml/liter water/plot) namely 683.20 g, and the smallest U0 (0 ml/liter water/plot) namely 606.56 g.

Coffee grounds are organic and can be easily absorbed by the soil, however, coffee grounds need to undergo a composting process such as proper fermentation so that the resulting compost is of high quality and can be used effectively. According to (Roidah, 2013) to produce good quality coffee grounds compost, it is necessary to use a bioactivator to help speed up the composting process. Bioactivators are bioactives that can break down organic matter

for example like EM4 (Effective Microorganism 4) which is an example of a simple bioactivator used to produce better and more effective compost).

The successful utilization of coffee grounds is a double advantage because apart from being able to use fertilizers, it can also reduce environmental pollution due to the large amount of coffee grounds being thrown away like coffee waste produced from coffee shops (Irham, 2016).

This is due to the nutrients contained in horse urine can support and meet the nutrient needs of plants. The 1.60% K and 0.32% Ca nutrients contained in horse urine function as a stimulus for cell division, enlarge cell tissue and increase respiration and photosynthesis activities which stimulate the absorption of nutrients thereby increasing plant growth and production to the maximum. The application of horse urine POC should be done during the vegetative period of the plant because at that time the plants are still actively dividing (Refnizuida, 2018).

3.3. Tuber Production per Plot (g)

The results of statistical analysis of variance showed that the application of coffee grounds compost and POC horse urine had a very significant effect on tuber production per radish plant plot, while the interaction between the two had no significant effect on tuber production per rapeseed plant plot (Raphanus sativus L.).

The highest tuber production per plot was in the application of K3 coffee grounds compost (3 kg/plot), namely 13892.7 g and the smallest K0 (0 kg/plot) namely 8206.88 g. The highest tuber production per plot was in the administration of U3 horse urine POC (900 ml/liter water/plot) namely 11398 g, and the smallest U0 (0 ml/liter water/plot) namely 10369.3 g

The effect is very real on coffee grounds where coffee grounds used as compost can increase the intake of Nitrogen, Phosphorus and Potassium needed by plants so that they can fertilize the soil and support the growth of plants to be cultivated (Adikasari, 2012). The advantages of compost are improving soil properties, soil structure, ability to hold water and bind soil cations. The use of compost can maintain soil balance because it does not use chemical fertilizers that can damage the soil. Compost also does not have a detrimental effect on the environment so it is safe for long-term use in cultivation. Using compost in cultivation means that it can utilize organic waste or organic waste that can be utilized (Roidah, 2013).

The effect is very real from horse urine where urine is the residual liquid excreted by the kidneys which will then be excreted from the body through the process of urination. Animal urine is one of the basic ingredients of liquid organic fertilizer which is widely available and is waste if not processed. So far, animal urine is thrown away without being used because it smells bad, even though animal urine has the benefit of being used as liquid organic fertilizer for plants which is very easily absorbed by plants (Parnata, 2010).

4. CONCLUSION

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The conclusion of this study is that the effectiveness of applying coffee grounds compost and horse urine POC to radish production has a very significant effect on the parameters of tuber length, tuber production weight per sample and tuber production weight per plot. Where the best treatment for coffee grounds compost was in the K3 treatment (3 kg), the best treatment for horse urine POC was in the U3 treatment (900 ml/liter of water/plot).

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