CHAPTER I

INTRODUCTION

1.1. Background

Melon (Cucumis melo L.) is an annual fruit plant originating from the hot valleys of Persia or the Mediterranean area that is the border between West Asia and Europe and Africa.

According to Soedarya (2010), melon is a type of pumpkin plant that is still in the same family as watermelon and cantaloupe. Melon plants are very similar to watermelons, which have many branches, but the stem hairs are smoother. The aroma of the fruit, when it is ripe, is almost as fragrant as cantaloupe. Melon fruit size is averagely smaller and more perfectly round than cantaloupe. Although in the same species, melons, watermelons and cantaloupe, there are still many differences.

In Indonesia, in 2014, melon production reached 150,347 tons with productivity of 18.40 tons/ha. In Indonesia, the melon harvest area reached 8,185 ha. While, in the province of West Sumatra, in 2014, that melon production reached 93 tons with productivity of 15.42 tons/ha, melon harvest area reached 6 ha. The year 2015 showed increasing results, the melon production reached 19,207 tons, with productivity of 16.63 tons/ha, harvest area of 155 ha (Directorate General of Horticulture, 2015).

Domestic demand for melons tends to increase every year, in line with population growth. According to the Central Statistics Agency (2017), melon production in 2013, 2014 and 2015 were 125,207; 150,365 and 137,887 tons, respectively, and only met the national needs of around 40%, the rest of the needs were met by imports.

Melon is one of the alternative ingredients for fruit consumption that is popular with the wider community. Melon has a sweet and distinctive taste. Melon also contains high enough nutrition and a complete composition. Every 100 g of melon contains 23 calories of energy, 0.6 g of protein, 17 mg calcium, 2,400 IU vitamin A, 30 mg vitamin C, 0.045 mg thiamin, 0.0065 mg riboflavin, 1.0 mg niacin, 6.0 g carbohydrates, 0.4 mg iron, 0.5 mg nicotinamide, 93 ml of water and 0.4 g of fiber (Samadi, 2015).

Melon farming is attractive to farmers because it is quite profitable and has a short harvest life, namely, from 55 - 65 days (Rukmana, 1994). In general, the price of melons is relatively higher than horticultural commodities (Tjahjadi, 2000). However, melon requires intensive handling in its cultivation.

According to Setiadi and Parimin (2001), melon plants can grow at altitudes ranging from 0 to 2,000 m above sea level. However, each melon variety requires a certain height to grow optimally. Most melons grow at an optimal altitude of 200-1,000 m above sea level. In Indonesia, melon cultivation is present in Cisarua-Bogor and Kalianda-Lampung, but it has

spread to East Java (Ngawi, Malang, Pacitan, Madiun) and Central Java (Sukoharjo, Surakarta, Karang Anyar, Klaten). Agromedia (2009) said that melons in the lowlands, which are less than 300 m above sea level, have small fruit and slightly dry flesh (less juicy). However, Setiadi and Parimin (2001) classified melon varieties based on altitude and temperature.

Plantation waste that produces the highest by-product in the form of biomass waste is sugar cane plantations. Sugarcane plantations in Indonesia are the 10th largest in the world. According to the Central Bureau of Statistics for Indonesian plantations, in 2015, the areas of sugarcane commodities in the last five years were: in 2011: 451,788 ha, in 2012: 451,225 ha, in 2013: 469,227 ha, in 2014: 478,108 ha, and in 2015: 478,171 ha. Increasing the area and production of sugarcane would certainly have an impact on increasing the amount of waste produced. The high amount of waste produced at the time was only limited to the utilization of bagasse, the accumulation of these materials in large quantities would be a source of environmental pollution. Bagasse contains organic colloid material is dispersed in sugarcane juice and mixed with organic and inorganic anions (Nurwan and Yati Haryati, 2008).

According to Agustina (2008), bagasse is the first waste produced from the industrial processing of sugarcane. The volume reaches 30%-34% of milled sugar cane. Bagasse consists of water, fiber and dissolved solids in relatively small amounts.

An effort to increase melon production can be made in 2 ways, namely, through agricultural extensification and intensification. Agricultural extensification is a way of increasing yields by expanding the research area, while agricultural intensification is a way to increase agricultural yields by making the best use of land, such as using technology appropriately. The organic materials can be usable by giving liquid organic fertilizer. Purbowo (2012) in Maria Sari (2013) stated that household waste that can be used as liquid organic fertilizer is banana peel waste. Kepok banana peel waste contains macro elements N, P, and K functioning for fruit growth and development. Kepok banana peels also contain macro elements Ca, Mg, Na, Zn functioning for immunity and growth in plants so that they can grow optimally (Maria, et al., 2013).

Based on the description above, the writer is interested in knowing the response of melon plant growth and production to the application of bagasse compost and liquid organic fertilizer of banana peel.

1.2. Question

Based on the above background, the making of question in this study: do bagasse compost and liquid organic fertilizer or (POC) of banana peels respond to the growth and production of melon (*Cucumis melo* L.)?

1.3. Objective

This study objective is to determine the response of the growth and production of melon (*Cucumis melo* L.) to the application of bagasse compost and liquid organic fertilizer (POC) of banana peel.

1.4. Benefit

1) As one of the reference materials in paper writing, to fulfill the requirements to obtain a Bachelor's degree in the Agrotechnology Study Program, Faculty of Agriculture, University of Medan Area.
2) As information material for farmers in making an effort to increase melon growth and production

1.5. Hypotheses

1) The application of bagasse waste compost significantly increased the growth and production of melon (*Cucumis melo L*.) plants.
2) The application of liquid organic fertilizer for banana peels significantly increased the growth and production of melons (*Cucumis melo* L.).
3) The application of bagasse waste compost followed by the application of liquid organic fertilizer of banana peels significantly increased the growth and production of melon (*Cucumis melo* L.).

CHAPTER II

STUDY OF LITERATURE

2.1. Melon Plant (*Cucumis melo*. L.)

2.1.1. Melon Plant Classification

According to Soedarya (2010), melon plants are included in the class of seed plants in two pieces. Melon plants are classifiable into:

Kingdom : Plantae

Subkingdom : Tracheobionta

Superdivisio : Spermatophyta

Divisio : Magnoliophyta/Spermatophyta

Subdivisio : Angiospermae

Class : Magnoliopsida/Dicotyledoneae

Subclass : Dilleniidae

Ordo : Violales

Family : Cucurbitaceae

Genus : Cucumis

Species : *Cucumis melo* L.(Soedarya, 2010).

Figure 1. Melon Plant

2.1.2. Melon Plant Morphology

1) Root

The roots of the melon plant are widespread but shallow. The roots of the branches and the root hairs are abundant on the surface of the soil, the deeper into the roots the less. Melon plants form root tips that penetrate into the soil to a depth of 45 - 90 cm. Horizontal roots grow rapidly in the soil, spreading to a depth of 20 - 30 cm.

2) Leaf

Melon (*Cucumis melo* L.) leaves are almost round, single and spread at five angles, have 3-7 indentations. Melon leaves are green, wide-open or grooved, slightly short fingers. The surface of the leaves is rough, there is a type of melon whose leaf edges are wavy and not scalloped. The length of the base ranges from 5-10 cm and width of 3-8 cm (Soedarya, 2010).

3) Stem

The stems of melon plants are twisted, grooved, leathery, green or bluish green. The stems are pentagon-shaped blunt, growing creeping, hairy, soft, branched and can reach three meters in length. Melon stems have a holding device called a gyre. The stems function as a place to climb plants (Soedarya, 2010).

4) Flowers

Melon plant flowers are bell-shaped, yellow and mostly unisexual-monoecious. Therefore, pollination needs the help of other organisms. The

most common pollination is cross-pollination and self-pollination is rare. The male flowers of melon plants form in groups of 3-5 pieces, found in all leaf axils, except for the leaf axils occupied by female flowers. The number of male flowers is relatively more than the number of female flowers. Male flowers have thin and long stalks; fall out within 1-2 days after blooming (Soedarya, 2010).

5) Fruit

Melon fruit varies in shape, size, taste, aroma, and appearance. Generally, melons are round, but some are oval. Melon fruit can be harvested at the age of 75 – 120 days, depending on the type. The signs of old or ripe melon are when it is hit it makes a loud sound (Soedarya, 2010).

2.2. Terms of Growing Melon Plants

2.2.1. Altitude

Melon is easy to grow in the middle plains with an altitude of 300-1,000 meters above sea level, in the lowlands with altitude of fewer than 300 meters above sea level, the melon fruit is smaller and the flesh is slightly dry (less juicy).

2.2.2. Soil

Good soil for melon cultivation is Andosol soil or sandy clay that contains a lot of organic matter to facilitate plant roots to develop. Melons need a lot of water. However, it is better if the water comes from irrigation, not from rainwater, melons will grow well in soil with a pH of 5.8 – 7.2. This

plant is intolerant of acidic soil (low pH). In addition, melons are more sensitive to stagnant groundwater or poor soil aeration conditions.

2.2.3. Temperature

The growth temperature for melon is between 25 – 30 ^{o}C (Team Bina Karya Tani, 2010). The average temperature for melon plants is 26 ^{o}C, but melon plants are plants that can adapt so that even though they do not meet the requirements for growing melons, they can still grow and produce (Setiadi, 1999).

2.2.4. Wind and Air Humidity

Air humidity suitable for melon plants is estimated at 70-80% or at least 60%. Humidity that is too high (> 80%) can affect plant growth, fruit quality, and plant conditions to become susceptible to disease.

2.3. Melon Plant Cultivation

1) Seedling

Healthy melon plants and optimal production come from seeds that are healthy, strong and well cared for at first. The seeds were soaked in a solution of Furadam and Atonic for 2 (two) hours. Good seeds are at the bottom of the water, and bad seeds will float on the surface of the water. Therefore, the seedling is the key to the success of a melon agribusiness.

2) Seed Sowing

Melon seeds to sow are firstly soaked in water for 2–4 hours. Then the seeds are sown, soil and manure mixed in a ratio of 5: 1. Seeds are sown in upright position where with the tip of the root candidate facing

down. The seeds are covered with a mixture of husk ash and soil with a ratio of 2: 1 that has been prepared, so that the plants can grow well, not easily collapse. To stimulate seed germination by creating warm atmosphere then cover the surface of the seeds with a wet burlap sack. When the sprouts have appeared on the surface of the seeding media (on the 3rd or 4th day) then the burlap sack can be opened.

3) Soil Cultivation

In general, tillage is the process of processing the soil for the cultivation of melons in question is to loosen the soil up to a depth of 20 cm. Give basic fertilizer to the soil to increase fertility in plants. The basic fertilizer given can be in the form of organic fertilizer, such as manure or straw compost as much as 200 kg given during soil loosening. In order for the organic fertilizer to evenly distribute and mix with the soil to use, a ratio between organic fertilizer and soil is 1: 1.

4) Planting

Melon plant planting is done by transplanting, namely removing the seeds from the seedling and planting directly in the planting hole, firstly selecting good seeds, then the seeds are transferred to the planting hole. Each planting hole contains only 1 plant with a spacing of 50 x 60 cm. The less space the plants are, the fewer chances of a struggle for nutrients between plants have.

5) Watering

The first thing that must be considered in care is watering. Watering depends on the season. If the rainy season comes and the rainfall is excessive, then water reduction must be done. However, if it's the other way around, i.e. if there's not enough water due to the arrival of the dry season, then additional water must be added to make it enough for melon plants. Watering is done once a day in the morning and early afternoon from planting to harvest.

6) Pest and Disease Control

Manual pest and disease control are carried out by killing pests directly and removing diseased plants and using vegetable pesticides or chemical pesticides.

7) Fertilizing

Before planting, melon plants have been given fertilizer (urea, manure or compost).

8) Harvest

Usually, melon plants have a harvest period of about 3 months after planting. Melon fruit harvesting can only be done when the melons have shown the characteristics of being ready to harvest.

2.4. Melon Plant Pests and Diseases

2.4.1. Melon Plant Pests

1) Aphids Flea (*Aphis gossypii Glover*)

This pest has a liquid sap that contains honey and is shiny from a distance. This pest attacks melon plants in the planting area. Young

aphids that attack melons are yellow, while adults have wings and are slightly black in color. **Symptoms**: plant leaves curl and plant shoots become dry due to leaf liquid sucked by pests. **Control**: 1. weeds must always be cleaned so as not to become a pest host; 2. Severely affected plants must be sprayed simultaneously using Perfekthion 400 EC (Dimethoate) insecticide in concentration of 1.0–2.0 ml/liter; 3. Plants that have been infected with the virus must be removed and burned (destroyed).

2) Thrips (*Thrips parvispinus Karny*)

This pest attacks during the seedling phase until the plants mature. *Thrips nymphs* are yellowish in color and adult thrips are blackish brown. Thrips reproduce very rapidly parthenogenetically (capable of giving birth to offspring even though they do not mate). The attack begins in the summer. **Symptoms**: young leaves or new shoots become curly, and the spots are yellowish; curly and stunted plants and cannot form fruit normally. If these symptoms arise, you must be careful because you have contracted the virus carried by the thrips pest. **Control**: spraying with contact poison every 3-4 days.

3) Aphids

The area that is attacked is the leaf, as a result, the leaves are deformed or curled. Green, brown, or black soft-bodied insects live on the underside of the leaf. Sticky melon or black soot mold is sometimes present. The control technique is by spraying soapy water or insecticide.

2.4.2. Melon Plant Disease

Some of the diseases that attack melon plants are as follows:

1) Rotten Fruit

Rotten fruit is caused by *Phytophthora nicotianae B. De haan var parastica (Dast)*. Attacks on stems are characterized by elongated wet brown spots. Serious attacks can cause plants to wither to death. Affected leaves are like scalded. Fruit attack is characterized by wet spots becoming blackish-brown and soft. The longer the spots shrink and settle. The rotten fruit is covered with white fungus. Control is done by pruning excessive leaves or branches to reduce humidity around the soil, rotating plants with plants that are not in the same family as melons, and pulling and burning affected plants.

2) Anthracnose

Anthracnose caused by *Colletotrichum lagenarium* (pass) Ell.Et Halst gray to blackish brown. The spots gradually bend and coalesce. The plant tissue under the spots rots. Disease control was carried out by adjusting the proper spacing (45 x 60 cm, 50 x 60 cm, or 60 x 70 cm), soaking the seeds with a fungicide using the active ingredient Azoxithrobin 250 g/l or Propineb 70% and cleaning the dead plant parts.

3) Downy mildew

Downy mildew is caused by *Psuedoperonospora cubensis barkeley et Curtis*. Symptoms of the attack begin with the presence of light yellow spots bordered by leaf veins so that they seem to be angular spots. As

time goes on, the spots turn brown. If the leaves are turned over, you will see a mass of gray mold. Control by choosing a distant planting location with plants that are in the same family as melons. Prune and burn affected leaves. Alternatively, spray a fungicide with the active ingredient Simoksanil or Mancozeb.

4) Bacterial Wilt

It is caused by the bacterium *Erwina tracheiphila E.F.Sm*. This disease can be spread by the oteng-oteng leaf beetle (*Aulacophora femoralis Motschulsky*). **Symptoms**: leaves and branches wither and shrinkage of the leaves occurs, the color of the leaves turns yellow, dries up and eventually dies; the plant leaves wilt one by one, although the color remains green, then the plant wilts as a whole. If the stems of the plant are cut transversely, they will secrete thick and sticky white mucus that can even be pulled like a thread. **Control**: (1) before planting, the land is sterilized with Basamid G at a dose of 40 g/m2; (2) seeds soaked in bactericide Agrimyciin (oxytetracycline and streptomycin sulfate) or Agrept (streptomycin sulfate) in concentration of 1.2 grams/liter; (3) spraying this bactericide at the age of 20 DAP.

2.5. Nutritional Content of Melon

Vitamins and minerals contained in melons are very good for the health of the human body. The nutritional content of melons per 100 g of edible material can be seen in Table 1 below:

Table 1. Nutritional Content of Melon Fruit Per 100 g of Edible Ingredients

Type of Nutrient	Amount
Energy	22.00 Kal
Protein	0.60 gr
Calcium	12.00 mg
Vitamin A	2.140.00SI
Vitamin C	35.00 mg
Thiamin	0.045 mg
Riboflavin	0.065mg
Niacin	0.1 mg
Carbohydrate	6.0 mg
Ferro	0.4 mg
Nicotinamide	0.5 mg
Water	93.0 mg
Fiber	0.4 mg

Source: Wirakusumah (2009).

2.6. Organic fertilizer

Organic fertilizers are fertilizers where raw materials come from living things in the form of plants and animals. Usually used raw material is plant waste such as dry leaves, straw, vegetable waste, litter, and other plants. Compost can also be made using basic ingredients of animal manure, such as goat, chicken, and other livestock manure.

Organic fertilizers have advantages and disadvantages. Some of the advantages of organic fertilizers include: increasing the content of organic matter in the soil, improving soil structure, increasing the ability of the soil to store water (water holding capacity), increasing soil biological activity, increasing soil cation exchange capacity, reducing phosphate fixation by Al and Fe in acid soil and increasing the availability of nutrients in the soil. Disadvantages or weaknesses of organic fertilizers are: low

nutrient content, relatively difficult to obtain in large quantities, inapplicable directly to the soil but must go through a decomposition process, expensive transportation and application because of the large amount. Organic fertilizers consist of manure, green manure and compost (Hasibuan, 2006).

2.6.1. Sugarcane Waste

Waste is a remnant present in a certain time or place not desired by the environment because it has no economic value. Waste containing pollutant materials that have toxic and dangerous properties is known as B3 waste, which is stated as material that is in relatively small quantities but has the potential to damage the environment and resources (Ginting, 2007).

One example of waste is bagasse waste, which is solid waste that comes from the juice of sugarcane stalks to take the juice. This waste contains a lot of fiber and cork. This bagasse has a fresh aroma and is easy to dry so it does not cause a bad smell. Bagasse is a waste material that is disposed of in open dumping without further processing, so it will cause environmental disturbances.

According to Agustina (2008), bagasse is the first waste produced from the industrial processing of sugar cane; the volume reaches 30-34% of milled sugar cane. Bagasse consists of water, fiber, and dissolved solids in relatively small amounts. Bagasse fiber is insoluble in water and mostly consists of cellulose, pentosan, lignin and also has an organic

matter content of about 90%, N content 0.3%, P2O5 0.02%, K2O 0.14%, Ca 0.06%, and Mg 0.04% (Toharisman , 1991). Bagasse cannot be directly applicable to the plantation area because of the high C/N ratio of bagasse. If applied directly, there will be immobilization of nutrients in the soil. The high C/N ratio in bagasse causes the material to take a long time to decompose so it may still be useful to maintain the BOT content if it returns to the soil properly. The results showed that the application of 4-6 tons/ha of bagasse compost could reduce the use of NPK fertilizer up to 50%.

To make liquid compost, you need a container called a composter, which is something made of a plastic trash can or a modified iron box and placed in a room. This composter aims to change the type of household organic waste into useful one (Linggadan Marsono, 2003).

Bagasse is a solid waste product from a sugar mill station, produced in the amount of 32% of milled sugarcane. Bagasse can also be regarded as a complementary product, because most of the bagasse is used directly by sugar factories as boiler fuel to produce energy for processing purposes, which is around 10.2 million tons per year (97.4% of bagasse production). The rest (about 0.3 million tons per year) lies on the factory land so that it can cause air pollution, unpleasant views and odors around the sugar factory. Sugarcane bagasse contains water, sugar, fiber and microbes, so that when stacked it will undergo a severe fermentation,

generate heat. If the stack temperature reaches 94 ^{o}C, a spontaneous fire will occur (Sutrisno and A. Toharisman, 2009); Santoso, 2009).

2.6.2. Liquid Organic Fertilizer (POC) of Banana Peel

Organic fertilizers are fertilizers derived from organic materials such as vegetables, fruits and animals. In addition to solid form, organic fertilizers also have other forms, namely liquid organic fertilizers (Lingga and Marsono, 2003).

Liquid organic fertilizer is a solution resulting from the decomposition of organic materials derived from plant residues, animal and human wastes containing more than one nutrient element. The advantage of organic liquid fertilizer is that it can precisely overcome nutrient deficiencies and is able to provide nutrients appropriately. Organic liquid fertilizers generally do not damage the soil and plants and are used as often as possible. Liquid fertilizer is a plant fertilizing agent derived from organic materials and in liquid form, besides functioning as fertilizer, liquid fertilizer can also be used as an activator to make compost (Lingga and Marsono, 2003).

Liquid fertilizer has many benefits and advantages; for example these are to fertilize plants, to maintain the stability of nutrients in the soil, to reduce the impact of organic waste in the surrounding environment, easy to obtain, cheap and has no side effects. A very good liquid fertilizer raw material is a wet organic matter or organic material having a high water content such as fruit residue and vegetable residue (carrots,

pumpkins, mustard greens, lettuce, orange peels, banana peels, and others). The greater the cellulose content of organic matter (C/N ratio), the longer the bacterial decomposition process will take. In addition to easy decomposition, this material is rich in nutrients that plants need (Lingga and Marsono, 2003).

Based on study by Hadi Mustofa (2017), giving POC banana peel uses concentrations of 20%, 30%, and 40% respectively into 1 liter of water for plant height growth, fruit weight and flowering age of melon plants (*Cucumis melo* L.).

The use of liquid organic fertilizer Banana peel is expectable to facilitate the application and absorption of nutrients contained in organic liquid fertilizer by plants (Siboro, et al, 2013). This liquid organic fertilizer is also expected to encourage and increase the formation of chlorophyll and fruit in melon plants, and stimulate branch growth (Suryati, 2014). A similar opinion was also expressed by (Wardiah, 2016) stating that the application of 50% banana peel liquid organic fertilizer affected fruit formation and vegetative growth of melons.

CHAPTER III

MATERIAL AND METHOD

3.1. Location and Time

This study was carried out on Jalan PBSI NO.1 Experimental Garden, Faculty of Agriculture, Percut Sei Tuan Sub-District, Deli Serdang District, Medan Estate, North Sumatra Province in altitude of 22 meters above sea level. The study was carried out from March to July 2019.

3.2. Material and Tool

The materials used in this study were melon seeds of Sky Rocket variety, manure, bagasse compost, liquid organic fertilizer (POC) of banana peel, EM4, brown sugar, fungicide benlate.

The tools used in this study were hoe, machete, tripe, tape measure, ruler, plot label board, *gembor*, stationery, raffia rope and silver black plastic mulch.

3.3. Method

This study was designed by a factorial randomized block design (RBD) consisting of 2 levels of treatment, namely:

1) The factor of giving compost from bagasse waste (K), consists of 4 levels, namely:

   K_0 = without organic fertilizer bagasse waste (control)

   K_1 = organic fertilizer from sugarcane waste 5 tons/ha (2 kg/plot)

   K_2 = organic fertilizer from bagasse waste 10 tons/ha (4 kg/plot)

   K_3 = organic fertilizer from bagasse waste 20 tons/ha (6 kg/plot)

2) The factor of giving liquid organic fertilizer (POC) of banana peel waste (P), consists of 5 levels, namely:

P_0 = without liquid organic fertilizer of banana peel (control)

P_1 = 1% liquid organic fertilizer of banana peel (10 ml/liter)

P_2 = liquid organic fertilizer of banana peel 2%(20 ml/liter)

P_3 = 3% liquid organic fertilizer of banana peel (30 ml/liter)

P_4 = liquid organic fertilizer of banana peel 4% (40 ml/liter)

Thus, a combination of treatments as many as 4 x 5 = 20 treatments is obtainable, namely:

K_0P_0 K_1P_0 K_2P_0 K_3P_0

K_0P_1 K_1P_1 K_2P_1 K_3P_1

K_0P_2 K_1P_2 K_2P_2 K_3P_2

K_0P_3 K_1P_3 K_2P_3 K_3P_3

K_0P_4 K_1P_4 K_2P_4 K_3P_2

Study unit:

Number of repetitions : 2 replications

Number of experimental plots : 40 plots

Experimental plot size : 200 cm x 120 cm

Melon planting distance : 50 cm x 60 cm

Number of plants per plot : 12 plants

Number of sample plants per plot : 4 plants

Total number of plants : 480 plants

Distance between plots : 50 cm

Distance between tests : 100 cm

3.4. Analysis Method

The data analysis methods used for this factorial randomized block design (RAK) are:

$$Y_{ijk} = \mu + \rho_i + \alpha_j + \beta_k + (\alpha\beta)_{jk} + \Sigma_{ijk}$$

Where:

Y_{ijk} = Observation results on the i-level replication receiving various doses of bagasse compost at the jth level and liquid organic fertilizer of banana peel at the k-level.

μ = Mean value of treatment

ρ_I = The effect of the i-level test

α_j = Effect of dose of bagasse compost fertilizer j

β_k = Effect of dose of liquid organic fertilizer of banana peel k

$(\alpha\beta)_{jk}$ = Effect of combination between treatment dose of bagasse compost fertilizer jth level and dose of liquid organic fertilizer of banana peels k-level

Σ_{ijk} = Effect of experimental error due to the jth grade of sugarcane bagasse compost and k-level liquid organic fertilizer placed in the i-level group.

If the results of the analysis of the variance of treatments showed a significant effect, then the test continued using the Duncan's Test (Montgomery, 2009).

3.5. Study Implementation

3.5.1. Manufacture of Compost Fertilizer of Sugarcane Bagasse

How to make sugarcane bagasse compost: The bagasse is placed on a tarp, then added cow dung, stirred until well mixed. Reduction of the water content of cow dung can be added bran. After that, pour the EM4 solution and brown sugar evenly, then cover the tarpaulin so that the fermentation process goes well. Once a week the tarpaulin is opened and stirred again so that the fermentation runs perfectly. After 1 month, the compost is ready for use (Purwendro and Nurhidayat, 2007). Then the analysis of Sugarcane Bagasse Dregs Compost Fertilizer is carried out.

3.5.2. Making Liquid Organic Fertilizer (POC) of Banana Peel

How to make Liquid Organic Fertilizer (POC) 10 kg of ripe banana peels obtained from sellers of fried bananas that are daily waste, 10 liters of rice water, 250 ml of EM 4 to decompose organic matter, and 300 grams of brown sugar as food ingredients of microorganisms. The tools used are a container made of plastic, a stirrer, a measuring cup, a scale, and a knife.

Kepok banana peels as much as 10 kg obtained from fried banana traders were chopped into smaller pieces, then put into a plastic barrel. Then add 10 liters of rice water, 250 ml of brown sugar 300 grams of EM4 bioactivator, stir until evenly distributed. After all the ingredients are well mixed, cover the barrel and then let stand or ferment for 2 weeks (Satuhu

and Supriyadi, 2004). Then the analysis of POC Banana peel is carried out.

3.5.3. Land Preparation

Before carrying out soil processing, the land is first cleared of plant remains, rocks and disturbing plants (weeds) then the land is processed with a hoe, then experimental plots are made in such a way according to the treatment. The rest of the plant and the dirt was thrown out of the planting area. Land clearing aims to avoid pests, diseases and suppress competition with weeds for nutrient absorption.

3.5.4. Land Cultivation

Land cultivation is done by hoeing the land to a depth of 25-30 cm, which is useful for loosening the soil and cleaning the roots of weeds in the soil. Tillage is done twice, the first treatment is hoe roughly in the form of lumps of soil and reversal of lumps of soil and then left for a week for good aeration and the release of gases that are toxic to plants. The second soil treatment is in the form of soil smoothing done by crushing or smoothing lumps so that loose soil is obtained.

3.5.5. Plot Making

The plot was made after tillage. The plot size has a length of 200 cm and a width of 120 cm and a plot height of 30 cm. The distance between plots was 50 cm and between replicates was 100 cm.

3.5.6. Application of Sugarcane Bagasse Compost

The application of bagasse compost is carried out before the melon planting process, according to the level of treatment. In the application of bagasse compost, there is only K_0 or control (without bagasse compost) while K_1 has a dose of 10 tons/ha = 2 kg/plot K2 with a dose of 20 tons /ha = 4 kg/plot and K_3 has a dose of 30 tons/ha = 6kg/plot. The application of bagasse compost was carried out one week before melon planting and simultaneously with the application of basic fertilizer.

3.5.7. Application of Basic Fertilizer

Basic fertilizer is given one week before the melon plant planting process simultaneously on the application of bagasse compost by mixing and spreading it on the beds and in the planting hole until evenly distributed then let stand 3-4 days so that the fertilizer can be mixed with the soil and undergo a decomposition process. The basic fertilizer used is cow manure. The dose of cow manure base used is half the recommended dose of 13.5 tons/ha or 9 kg/plot

3.5.8. Seed Sowing

After germination, the seeds are sown directly into the seed sowing bag one by one, with a hole depth of 2 cm. Media used in the form of topsoil. For laying the seeds, namely in a sleeping position with the prospective root tip facing downwards, after that the seeds are covered with fine soil then watered in the morning and evening using *gembor*.

3.5.9. Mulch Installation

The installation of mulch is done after the addition of sugarcane dregs compost and cow manure base is complete, so that no fertilizer evaporates, then the beds are trimmed and watered sufficiently until the soil becomes moist. Mulch is installed when the weather is sunny and the air is hot. Before the mulch is installed, a bamboo clamp is prepared that is cut to a size of 200 cm x 120 cm. The bamboo pieces are shaped in the letter "U", which is used as a mulch clamp on the ground. Mulch is pulled at the ends to cover the beds with both ends clamped with bamboo. After the mulch installation is complete, the beds are left covered with mulch for 3 days before planting holes are made. The goal is that the basic fertilizer given can be quickly available so that it can be absorbed by plants.

3.5.10. *Ajir/Turus* Installation

Installation of turus is done one week before planting, the installation of turus is 30-35 cm from the edge of the bed and around the planting hole. The turus is made of bamboo. The turus is 200 cm long, 3-4 cm wide and 1-1.5 cm thick. Next to the installation of the girder, the girder serves as a liaison between the sides of one row with other rows that are in line or as reinforcement at the confluence point of two opposite rows. The size of the girder is longer than the turus, but slimmer. The length of the girder is adjusted to the length of the bed (200 cm). The width of the girder is 2.5-3.0 cm and the thickness is 1 cm. Raffia rope is tied to the girder connected to the fruit stalk, so that the girder functions as a support for the melon.

3.6. Planting

Planting is done in the afternoon. The spacing used is 50 x 60 cm. Before planting, the soil on the surface of the baby bag is watered and compacted. Then, the baby bag is torn off slowly and carefully removed then the seeds are inserted into the planting hole in an upright position. The soil around the hole is compacted towards the seedling so that the soil is not hollow, then the seeds are watered.

3.7. Application of Liquid Organic Fertilizer Banana Peel

The application of POC banana peel waste is carried out after planting melon plants in the field. The method of application is by pouring onto the melon plants, according to the treatment regimen with watering intervals once a week.

3.8. Melon Seed Maintenance

3.8.1. Watering

Watering is carried out around the root area every morning at 07.30 and in the afternoon at 16.30 that is adjusted to the weather in the field. If it rains then watering is no longer carried out. Watering is done by using *gembor* carefully so that the soil does not erode and the plants do not break or fall.

3.8.2. Insertion

Insertion is done after the seeds are planted 3 days, at that age the seedlings have started to adapt and it is confirmed that there are unhealthy or dead seeds. It can be caused by pests and diseases or

physical disturbances. Plant material used for insertion was taken from the reserve plot.

3.8.3. Plant Binding

Plant binding is intended to propagate plants on the already installed turus. Plant stems begin to be tied to turus using raffia at the age of 3 WAT. Binding is done every 2 days by following the length of the plant.

3.8.4. Pruning

Pruning is done to remove harmful potential branches, especially shoots that appear in the axils of the leaves. Branch pruning is carried out starting from the 1st to the 6th segment while the 7th to 10th branches are maintained as a place for fruit to raise. This pruning is done using scissors carefully so as not to injure other branches.

3.8.5. Fruit Selection and Fruit Stem Binding

In 1-2 weeks after pollination, prospective fruit will usually appear. This fruit candidate needs to be re-selected to get quality fruit, then the other fruit candidates are removed using scissors and only keep one fruit on each plant.

The binding of the fruit stalk is done when the fruit is the size of a mature's fist, the part that is tied is the branch where the fruit grows in a horizontal position. The tying is done by raffia rope carefully, so as not to injure the branches of the plant. Then the other end of the rope is tied to a turus where position is horizontal.

3.8.6. Pest and Disease Control

Pest control is carried out chemically and manually. Pests that attack plants are leaf-eating beetles. Then leaf-eating beetles, these pests attack the flesh of the leaves and cause the leaves to become hollow. The way to control it is by spraying insecticide marshal 25 EC at a dose 1.5 ml/liter of water, which is sprayed on the leaves of the plant evenly. This spraying is done in the afternoon.

Disease control is done by chemical means. Diseases that attack plants are stem rot, fusarium wilt and leaf spot. This disease attacks the stems and leaves of plants, so the leaves turn pale and the leaves gradually wither, then the plant will die over time. The method of control is by spraying the fungicide Dhithane EM-45 at a dose of 3 g/liter of water and then spraying it evenly on the stems and leaves. This spraying is carried out in the afternoon.

3.8.7. Harvest

Harvesting is carried out in the morning and evening, this harvesting is carried out in stages, by prioritizing fruit that is really ready to be harvested, namely at the first harvest age of 70 days after planting and at the second harvest 77 days after planting, by cutting the fruit stalks by forming the letter "T". The aim is that the fruit does not rot easily and stays fresh. Melon fruit is harvested when it meets the harvest criteria, namely there are cracks in the fruit stalk, the net is fully formed, the skin color changes to dark green and the fruit smells good.

3.9. Observation Parameters

3.9.1. Plant Height (cm)

The average plant height of each plot was measured using raffia rope. It was done by measuring from the base to the highest growing point on the stems of the plant and measuring the raffia rope again using a roller meter/cloth meter when it started at 2 WAP to 12 WAP in an interval of observation time being carried out once a week.

3.9.2. Flowering Age (days)

Flowering age begins to be calculated when 50% of the plants from each plot have flowered.

3.9.3. Leaf Area (cm^2)

Leaves measured in length and width are the 9th and 10th leaves, then the area is calculated using the formula: LD = P x L x c; where LD = leaf area, P = leaf length, L = leaf width, and c = melon leaf constant (1.09).

3.9.4. Rod Diameter (cm)

The average stem diameter of each plot was measured using a caliper from the bottom of the plant ± 1cm above the soil surface at the age of 2 WAP to 12 WAP. The observation time interval was once a week.

3.9.5. Fruit Weight per Sample Plant (kg)

The weight of the sample plant fruit was weighed using a digital scale at harvest. Harvesting is done 2 times, then the results are averaged.

3.9.6. Fruit Weight per Plot (kg)

All the fruits produced from each plot were weighed using a digital scale at harvest. Harvesting is done 2 times, then the results are added up.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

From the results of this study, the following conclusions can be made:

1. The addition of bagasse compost had a significant effect on plant height and production per plot, but had no significant effect on flowering age, leaf area, stem diameter and production per sample plant.
2. The application of POC banana peels had no significant effect on plant height, flowering age, leaf area, stem diameter, production per sample plant and production per plot.
3. The combination of the two treatment factors had no significant effect on plant height, flowering age, leaf area, stem diameter, production per sample plant and production per plot.

5.2. Recommendation

1. The use of bagasse compost at a dose of 6 kg/plot can increase melon production by 75.6 tons/ha.
2. The use of agricultural waste materials as compost or liquid organic fertilizer should pay attention at the quality of these materials.
3. It is recommended that this study can be continued to obtain suitable POC types for melon cultivation.

5.3.

PROOFREADING

1.	melon	:	The melon
2.	altitude	:	altitudes
3.	In order to	:	to
4.	monoesius	:	monoecious
5.	number	:	The number of
6.	Less	:	fewer
7.	mixture	:	A mixture
8.	with the aim of increasing	:	to increase
9.	spaced	:	space
10.	season	:	The season
11.	is	:	are
12.	rooten	:	rotten
13.	*Phytoptora*	:	*Phytophthora*
14.	blackish brown	:	Blackish- brown
15.	fertilizersare	:	fertilizers are
16.	wet	:	A wet
17.	had an effect on	:	affected
18.	Top soil	:	topsoil
19.	an mature's	:	a mature's
20.	is	:	Which is
21.	response	:	The response
22.	complement	:	compliment
23.	ith the aim of improving	:	to improve
24.	micro nutrients	:	micronutrients
25.	shoes	:	shows