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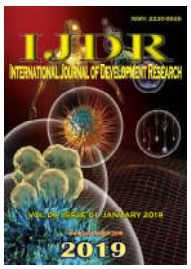

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

THE INFLUENCE OF THE TYPE AND DOSE OF MANURE TOWARD GROWTH AND DEVELOPMENT OF PLANTS PAKCOY MUSTARD (*Brassica chinensis* L.)

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ABSTRACT

Mustard plants including one type of vegetable leaf that has many benefits in people's lives day to day, so the demand for these commodities is enormous. The type of these vegetables are preferred by the rest of the community that low-income to high-income, patcoy mustard plant so that it takes a relatively high amounts of and continuous improvement. Planting mustard plants in the lowlands on the mineral soil was made one of the alternatives for increasing production plant mustard greens. Mineral soils are less fertile cultivated mustard plants if it will need to give material manure. The purpose of this research was: 1). To know the influence of the type and dosage of organic fertilizer towards the growth and development of crop mustard pakcoy on three different soil type 2). To find out the type and dosage of organic fertilizer and their interaction towards the growth and development of crop mustard pakcoy on three different soil types. The methods used in this study was a randomized Design Group (RAK), with three replicates. The treatment arranged in factorial. The treatments tested consists of two factors, namely: 1. the type of manure Factor (J) consists of: post = Cow Manure, POK = Goat Manure, POA = Chicken Manure combined with three kinds of soil minerals. 2. Dose the manure factor (D) is composed of: a D0 = 0 gr/plant, D1 = 100 gr./plant, D2 = 150 Gr./plant, D3 = 200gr/plant combined with three kinds of soil minerals. The experiment consists of 12 units of treatment combinations and each treatment was repeated three times so that the required 36 polybeg/plants experiment. Observations were made to the variable pakcoy mustard plant growth and crop yield components plant mustard greens pakcoy. The collected data were analyzed with the analysis Variant (yout range) according to the experimental design was used. If there is a real interaction influence against the observed variable is then continued with a different test studies on average use the test Duncan Multi Range Test (DMRT) on levels 5% and if only a single factor in a real influence, then proceed with the average difference test with test LSD on level 5%. Based on the results of research that, kind of chicken manure treatment combined with a dose of manure 200 gr./plant code by treatment (POAD3) can enhance the growth and development, pakcoy mustard plants. The real interaction occurs towards the growth and development of plant type of treatment on pakcoy mustard manure with a dose of manure. At the treatment this type of chicken manure with a type of fertilizer is best with maximum results and dose manure 200 gr./plant is the ideal dosage with maximum results. Comoro-NCBA soil type is the type of land suitable for planting crops of mustard greens pakcoy.

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INTRODUCTION

Pakcoy mustard (*Brassica chinensis* L.) is a plant of the family Cruciferae that still are in one genus with chicory/petsai and mustard green/caisim, it's just different variety. Pakcoy mustard is a very sought after vegetable society because many contain protein, fat, carbohydrates, Ca, P, Fe, vitamins A, B, C, E and K are very good for health. Mustard pakcoy many cultivated by the community because it has a high economic value (Zulkarnain, 2010). Mustard plant patcoy is one kind of vegetable leaf that has many benefits in people's lives day to day, so the demand for these commodities is enormous. The type of these vegetables is preferred by the rest of the community that low-income to high-income, patcoy mustard plant so that it takes a relatively high amounts of and continuous improvement. Need vegetables tend to continue to increase in line with the population, an increase in standard of living, the level of education, and public awareness about the importance of nutritional value. The production of mustard greens in Timor-Leste experienced a fluctuation, so it takes a good cultivar to be able to meet the needs of vegetables especially cabbage type pakcoy. The pakcoy production of mustard greens can be caused by a declining soil fertility, so it takes a good cultivation. Soil fertility is often a problem in crop cultivation in East Timor. In addition a less good cultivation techniques will reduce the results of crop production pakcoy mustard. Efforts to tackle these barriers is to improve cultivation techniques of cabbage pakcoy. The use of land for cultivation is continuously lowers soil fertility either physical, chemical and biological. Efforts to resolve the issue can be made through balanced fertilization. The use of organic fertilizer is beneficial because it contains all the necessary elements of plants, besides that can act as gluten particles of soil structure soil aggregation and so be good.

In The Municipio of Dili, Dom Aleixo Sub-district, Village Malinamuk Village, Comoro. East Timor, known as the lowland area with a height of approximately 82.95 m above sea level (ASL) have fertility rates lower and land is the main limiting factor in the production process plant mustard greens pakcoy. The low fertility of the land is not offset by the optimum fertilization then will the occurrence of land degradation. Soil that is scattered in the Municipio of Dili, including mineral soil types of alkalis. Based on the results testing soil samples in the laboratory of agricultural research and Development Institutions of the land, plants, fertilizer and water in Lembang-Bandung West that, soil type Aeroportu, NCBA and Cristo Rei of a third type of soil the soil pH ranged from 7.6-8.7 has the essential nutrient levels are low, especially nutrient elements nitrogen (N), phosphorus (P), and potassium (K). With soil conditions as above, plant growth can be hampered if the nutrient is less available. The use of organic fertilizers not only add nutrient availability to plants, but also create conditions corresponding to the plant by improving aeration, make it easier to root penetration and improve the capacity of holding water. The shortage of water for plant growth phases of lettuce on the stadia cause a decrease in growth can be considerable results. One of the efforts to improve the productivity of the dry climate was dry land through the addition of organic fertilizers.

Fertilizer has a role in providing the nutrients needed by plants. The use of organic fertilizers is one of the efforts to improve soil fertility, because organic fertilizers are acusticus, raising the ability of the soil in the hold (tie) water. The application of organic fertilizer in the system cultivation can increase the content of organic matter/C-organic and N total content in the soil (Zulkarnain *et al*., 2013). Good soil organic C-has been in the range of 3-5% with a c/n ratio of 8/1 to 15/1 with an average of 10/1 to 12/1. Sources of organic materials that are widely used as a fertilizer in agricultural farming is manure. Waste such as livestock manure if not treated properly it will cause environmental pollution. Manure can be beneficial to plants because it contains the elements required complex plants such as N, P, K, Ca, Mg and S. Based on this type of animals there are many different kinds of manure that can be utilized, among others, the manure cows, goats, sheep , horses, and chickens. The fifth such manure has advantages of each of them the content of the elements N, P K which is pretty high. But the manure have a C/N ratio high enough between 30 to 40 >. Based on the provisions of the ratio C/N optimum in organic fertilizer is 10-20% (Suhesy and Adriani, 2011). Therefore the use of organic fertilizers require the decomposition process in advance so that the content of the nutrient elements can be absorbed by plants (Pujisiswanto and Pangaribuan, 2008). Efforts that can be made in increasing the content of nutrients in the soil to improve plant production mustard is to the awarding of the manure. According to the Blessed et al., (2017), stated that the maximum production is done to speed up the granting of nutrients in plants, one of which is the grant of manure.

Manure does not only contain the macro elements such as nitrogen (N), phosphate (P) and potassium (K), but the manure also contains micro elements like calcium (Ca), magnesium (Mg), manganese (Mn) required the plant as well as play a role in maintaining nutrient balance in the soil, because manure was influential for a long period of time and is a storehouse of food for the plant. Manure can be classified into organic fertilizers that have a surplus. Some of the excess manure so highly favored farmers such as, improving soil texture and structure, raise the soil to water absorption, raise the living conditions in the soil and as a source of food for the plant substance. The purpose of this research is to 1) to know the influence of the type and dosage of organic fertilizer towards the growth and development of crop mustard pakcoy on three different soil types. 2) to find out the type and dosage of organic fertilizer and their interaction towards the growth and development of crop mustard pakcoy on three different soil types.

MATERIALS AND METHODS

The experiment was conducted in land Company NCBA-Comoro. Municipality Of Dili, Dom Aleixo Sub-district, Sub-Village Malinamuk, Village Comoro. East Timor, known as the lowland area with a height of approximately 82.95 m above sea level (ASL). The experiment was carried out from Date, 5/Jun/2018-5/Aug/2018. The results of the analysis of the soil before the experiment N of C-organic and low. The design used in this study was a randomized Complete Design Group (RAKL) are arranged in factorial, which consists of two factors and each factor combined with 3 different soil type that is the type of ground Cristo Rei, Comoro-NCBA and Aeroportu. The first factor is the treatment types of organic fertilizer consisting of: post = organic fertilizer beef, POK = organic fertilizer goats and POA = organic fertilizer chicken. The second factor is the dosage of organic fertilizer (manure, cattle manure fertilizer and kangan goat chicken) which consists of: a D0 = 0 g/polybeg, 100gram/polybeg = D1, D2 =

150 gram/polybeg and 200 gram/polybeg = D3. There are 12 treatment combinations and and each repeated three times so that the required thirty-six (36) fruit polybeg experiment. The materials used in the experiment is the seed of mustard greens pakcoy red arrow varieties obtained from the store, the village of Boaventura Bidau Akadiru-Hun, Subdistrict Cristo Rei, District of Dili, cow dung manure by as much as 3600gram is obtained from the cage NCBA company, chicken manure is obtained from corporate grace farma Railaco as much as 5400 grams of goat manure and taken from the cage of goat breeders in Comoro as many as 7200 grams. The tools used include; plow, hoe, sickle, marker, plastic bucket, a flush (gembor), shovels, scales, analytical scales, meter, a ruler, a rope, a plastic pouch of raphia, handcounter, stationery writing, digital camera and polibeg. Observations of the variable variable component growth and results. As for the varibel observed are as follows: high Observation per plant, number of leaves per plant and the diameter of the stem per plant. The variable components of the result are: the growth of plant roots (root length, root fresh weight) and weight of wet (fresh weight of economical, onerous fresh fresh weight of leaves, stems and fresh weight in total). The collected data were analyzed with the analysis Variant (yout range) according to the experimental design was used. If there is a real interaction influence against the observed variable is then continued with a different test with a test average of DMRT level on 5%. When only a single factor influences then continued with test LSD 5% (Sastrosupadji, 2000).

RESULTS AND DISCUSSION

Mustard Plant height (cm): The results of the analysis (Anova) height pakcoy mustard plants showed that fertilization by Manure Type (P) gives a very real influence (P<0.01) At the height of the plant mustard greens 2 and 3 WAP, but the higher plants 4 and 5 give a noticeable influence of WAP (P < 0.05). Treatment doses of manure (D) gives a very real influence (P < 0.01) at high plant mustard greens 2, 3, 4 and 5 WAP. the interaction of different types of manure and manure dose (PxD) exert influence are not real (P≥0.05) in high plant mustard greens 2, 3, 4 and 5WAP. DMRT 5% test results as noted in table 1 as follows:

Table 1. Average high Per plant (cm), due to a combination of different types of Manure (P) and a dose of Manure (D) on a couple of different Age

Treatment	Plant Height (cm)			
	2 WAP	3 WAP	4 WAP	5 WAP
POS D0	11.00a	12.00a	13.67a	15.67a
POS D1	15.67b	18.67b	21.33b	23.67b
POS D2	16.00bc	18.67b	22.33bc	23.67b
POS D3	17.33bcd	19.67bc	26.67d	26.33bc
POK D0	11.33a	12.33a	14.00a	16.00a
POK D1	17.67bcde	23.00cd	25.33cd	26.00bc
POK D2	18.33cde	23.00cd	26.00cd	27.00bc
POK D3	20.33e	24.00d	26.00cd	28.00c
POA D0	11.67a	13.00a	14.67a	16.33a
POA D1	18.33cde	21.67bcd	25.67cd	26.33bc
POA D2	19.00de	24.33d	27.00d	27.67c
POA D3	19.67de	25.67d	28.00d	28.67c

Description: a number that is followed by the same letter in every different column not reality test DMRT 5%.

Growing old is a plant hormone to grow more and more mustard needed for the process of development and expansion of its plant. It is seen that the plant was a pakcoy mustard 2 MST, 3 MST, 4 MST and 5 MST, the average height of higher plants obtained on combination treatment (POAD3) real and distinct treatment tampa fertilization. Based on the results of the research are listed in table 1. on top of that treatment combination of chicken manure (P.O.A.) doses of manure 200 gr (D3) is the best treatment against other treatments. At the end of observation, ranging between mustard pakcoy higher plants 15, 67cm-28, 67cm. It is because the grant was able to add organic fertilizer nutrient elements in soils, so plant growth increased with the availability of nutrient elements. This is supported by the theory of Lakitan (1996), there is a synchronization between the availability of nutrient needs of the plants so that it can help the speed of growing plants. It is also supported by the Sarief (1989), which States that the organic fertilizer which is inserted into the ground will be decomposed by microorganisms and nutrient elements released from the decomposition becomes available and are absorbed by plants, thus rooting growth the plant will increase especially tall plants.

The Number of Leaf Mustard Plant (Strands): The results of the analysis of the multiform prints (Anova) against the number of plant leaf mustard greens pakcoy showed that fertilization by Manure Type (P) gives a very real influence (P<0.01) in the amount of leaf mustard plants aged 3, 4 and 5 WAP, but high plant 2 WAP give the influence of unreal (P> 0.05). Treatment doses of Manure (D) gives a very real influence (P<0.01) on the amount of mustard plant leaves 2, 3, 4 and 5 WAP. The interaction of different types of manure and manure dose (PxD) exert influence are not real (P≥0.05) in the amount of mustard plants leaves are 2, 3, 4 and 5 WAP. DMRT 5% test results as noted in table 2 as follows:

Table 2. Average number of Leaves Per plant (strands), due to a combination of different types of Manure (P) and a dose of Manure (D) on a couple of different Age

Treatment	Number of Leaves (strands)			
	2 WAP	3 WAP	4 WAP	5 WAP
POS D0	4.00a	5.33a	6.67a	8.33a
POS D1	6.33b	8.33b	10.33b	13.33b
POS D2	7.00bc	8.33b	10.67bc	13.33b
POS D3	7.00bc	8.67bc	10.67bc	13.33b
POK D0	4.33a	5.33a	6.67a	8.67a
POK D1	7.00bc	10.00bcd	12.33bcd	15.33bc
POK D2	7.33bc	10.00bcd	12.67cd	15.67bc
POK D3	7.67c	10.67d	12.67cd	16.00bc
POA D0	4.33a	5.67a	7.00a	9.00a
POA D1	7.33bc	10.33cd	12.33bcd	16.00bc
POA D2	7.67c	10.67d	13.00d	16.33bc
POA D3	8.00c	11.00d	14.33d	17.67c

Description: a number that is followed by the same letter in every different column not reality test DMRT 5%.

Based on the results of the research are listed in table 2. on top of that treatment combination of chicken manure (P.O.A.) doses of manure 200 gr (D3) is the best treatment against other treatments. At the end of observation, the amount of leaves of plants mustard pakcoy ranges from 8, 33helai-17, 67helai. This is because plants that have leaves most will catch most rays. Because the organ is the site of leaf photosynthesis and other metabolic processes. The more the number of leaves and the length of the leaf will be getting many carbohydrates are produced. The carbohydrates that will be used by the plant in support of growth and development. It is in accordance with the statement of the Sari (2002) that, the more the number of leaves of a plant owned by the many fotosintat were produced. This was confirmed by Lakitan (1996), the main function that leaves for the plant is as an organ of photosynthesis. When

compared to other plant organs that are green and also carry out the process of photosynthesis, leaf has the ability for this activity. Therefore, a direct role in the leaf provides backup energy that serves to support the growth of the plant mustard greens.

The diameter of the rod Plant mustard greens (mm): The results of the analysis of the (Anova) against the diameter of the rod plant mustard greens pakcoy showed that fertilization by Manure Type (P) gives a very real influence (P<0.01) on the diameter of the rod plant mustard greens 2, 3, 4 and 5 WAP as well treatment against doses of Manure (D) gives a very real influence (P<0.01) on the diameter of the rod plant mustard greens 2, 3, 4 and 5 WAP. The interaction of different types of manure and manure dose (PxD) gives a very real influence (P<0.01) in diameter plant stem mustard aged 3, 4 and 5 WAP, but the type of manure and manure dose (PxD) exert influence are not real (P > 0.05) on the diameter of the rod plant mustard greens 2 WAP. DMRT 5% test results as noted in table 3 as follows:

Table 3. The average Diameter of the stem Per plant (mm) due to the combination of different types of Manure (P) and a dose of Manure (D) on a couple of different Age

Treatment	The Diameter Of The Rod Plant Mustard Greens (mm)			
	2WAP	3 WAP	4 WAP	5 WAP
POS D0	3.04a	4.09ab	5.15ab	5.72a
POS D1	5.22ab	5.10abc	6.29abc	7.90bcd
POS D2	5.34ab	5.23abcd	6.53abcd	7.68bcd
POS D3	5.85bc	5.90abcde	7.02bcd	7.74bcd
POK D0	2.46a	3.60a	4.53a	5.82a
POK D1	6.66bc	6.35bcde	7.84cd	7.06abc
POK D2	7.39bc	7.21cde	7.87cd	8.20cd
POK D3	8.29c	7.81de	7.96cd	8.73cde
POA D0	2.95a	3.69ab	4.75ab	6.25ab
POA D1	7.17bc	5.24abcde	7.53cd	9.07de
POA D2	7.01bc	7.86e	8.64d	10.14e
POA D3	11.70d	12.33f	12.81e	13.21f

Description: a number that is followed by the same letter in every different column not reality test DMRT 5%.

Based on the results of the research are listed in table 3. on top of that treatment combination of chicken manure (POA.) doses of manure 200 gr (D3) is the best treatment against other treatments. At the end of the observation, the diameter of the stem of the plant mustard pakcoy in the range 5, 72 mm -13, 21mm. This is because a vegetative phase is the phase of use carbohydrates in plants. The carbohydrates needed by plants to support the occurrence of important processes in plants, such as cell division, cell renewal, and the first stage of cell differentiation. Plant mustard greens during the vegetative growth phase requires an organic fertilizer such as enclosure with nitrogen (N) content is sufficient, however, to achieve optimum growth must be supported by adequacy of phosphorus (P) and potassium (K). Nitrogen is a nutrient that is very influential in the growth of vegetative plants (Widowati *et al*., 2005). Moko (2004) stated that the metabolism of nitrogen is the main factor of vegetative growth, stem, and leaves.Nitrogen contained in the crop will be formed into networks of proteins and other organic compounds to the growth and development of plants. It further said Sitompul and Bambang (1995) stating the difference large enough at the beginning of the growth will be the potential to generate capital growth differences.

The Growth of Plant Roots: The results of the analysis (Anova) variety fingerprints against the growth of plant roots mustard greens pakcoy showed that fertilization by Manure Type (P) gives a very real influence (P<0.01) on the weight of fresh mustard greens plant roots. but the treatment of different types of manure exert influence are not real (P≥0.05) on the length of the mustard plant roots. Treatment doses of Manure (D) gives a very real influence (P<0.01) on the length of the root fresh weight root crops and mustard greens. The interaction of different types of manure and manure dose (PxD) exert influence are not real (P≥0.05) in the parameter length of root and root fresh weight of mustard plant. DMRT 5% test results as noted in table 4 as follows:

Table 4. The average Root Growth due to a combination of different types of Manure (P) and a dose of Manure (D) on the plant Mustard Pakcoy

Treatment	Root Growth	
	The Length Of The Root(cm)	Fresh Weight Roots(gr)
POS D0	13.67a	3.67a
POS D1	20.33bcd	6.00abcd
POS D2	22.33cd	6.33abcd
POS D3	26.67d	8.00bcde
POK D0	15.00ab	5.33abc
POK D1	23.00cd	7.33bcde
POK D2	24.00cd	8.00bcde
POK D3	24.33cd	9.00cdef
POA D0	13.67ab	5.00ab
POA D1	17.00abc	9.33def
POA D2	20.00abcd	10.00ef
POA D3	25.33d	12.00f

Description: a number that is followed by the same letter in every different column not reality test DMRT 5%.

Observation on growth of plant roots mustard greens are done by measuring the length of the root fresh weight and plant roots was measured when the study ended. Based on the results of research on the table 5.4 that fertilizing crops, mustard greens with a different type of manure combined with different doses of manure gives a different response. Combination of chicken manure (P.O.A.) doses of manure 200 gr (D3) is the best treatment against other treatments. At the end of the observation, the length of the mustard pakcoy plant roots ranging between 13, 67cm-25, 33 cm. So is the combination of chicken manure (P.O.A.) doses of manure 200 gr (D3) is the best treatment against the treatment of the others. On the end of the observation, the weight of the fresh plant roots mustard pakcoy ranging from 3, 67gr-12, 00gr. This is because the growth of the roots is one indication of the success of the planting is done in the process because the roots play an important role for the plant. The function of the roots i.e. absorb water and dissolved minerals, transportation nutrient, strengthen stems and reserve storage of food. Increasingly long roots that form the more ease in carrying out its functions, plant one in the absorption of nutrient elements. A large number of roots will cause the absorption of nutrients and water be optimized so that the process will last well physiology to compensate for the growth and development of plants in the form of the plant is perfect. Aminah *et al*., (2006) States that the more the roots then the more nutrient elements that can be absorbed by plants, so that the plant will be empowered to live high on the field. The rapid growth of the root will stimulate plant growth that fast anyway. The magnitude of the value of the weight of the fresh plant is highly dependent upon the process of photosynthesis. The process of photosynthesis is the process of cooking food in the leaves that requires basic ingredients in the form of materials macro and micro nutrient elements, water and sunlight. The

availability of nutrient elements and the water is very dependent on the ability of the ground to provide such material, both manure each have different capabilities in providing nutrient and water for plant growth. According the opinion of Salisbury and Ross (1995) explains that in addition is determined by genetic factors, root morphology is determined by the State of the environmental media, namely hara. When the nutrient is available in sufficient amount then the plant will form shallow rooting systems. Instead, the media treatment of plants with minimal cropping hara tend to expand rooting to get nutrient.

The weight of the Wet Plant (gr): The results of the analysis of the (Anova) against the weight of the wet brangkasan pakcoy mustard plants showed that fertilization by Manure Type (P) gives a very real influence (P<0.01) on a fresh weight of economical, onerous fresh fresh weight of leaves, stems and the fresh weight of the total plant mustard greens. Treatment doses of Manure (D) gives a very real influence (P<0.01) on a fresh weight of economical, onerous fresh fresh weight of leaves, stems and fresh weight of total plant mustard greens. The interaction of different types of manure and manure dose (PxD) exert influence are not real (P>0.05) on a fresh weight of economical, onerous fresh fresh weight of leaves, stems and fresh weight of total plant mustard greens. as noted in table 5 as follows:

Table 5. The average weight of Brangkasan Wet due to the combination of different types of Manure (P) and a dose of Manure (D) on the plant Mustard Pakcoy

Treatment	The Weight Of The Wet Plant Mustard Pakcoy			
	The Fresh Weight Of The Economically (gr)	Fresh Weight Of Leaves (gr)	The Fresh Weight Of The Rods(gr)	The Fresh Weight Of The Total (gr)
POS D0	47.33a	20.67a	14.33a	99.67a
POS D1	68.00abc	30.67abc	48.00bc	173.00abcd
POS D2	70.00abc	30.67abcd	45.67bc	175.00abcd
POS D3	81.33abcd	37.33abcde	54.00bcd	207.33bcde
POK D0	50.00ab	23.67ab	27.00ab	121.00ab
POK D1	98.33bcd	40.00bcde	59.67cd	228.33de
POK D2	106.33cde	46.33cdef	59.67cd	244.33de
POK D3	122.33de	48.33def	72.67cde	276.67ef
POA D0	62.67abc	25.00ab	25.67ab	132.00abc
POA D1	96.67bcd	39.67bcde	57.00cd	219.67cde
POA D2	123.67de	50.67ef	79.00de	283.33ef
POA D3	156.33e	61.67f	94.33e	349.67f

Description: a number that is followed by the same letter in every different column not reality test DMRT 5%.

Based on the results of research on (table 5) above about the average weight of wet more weight obtained plants on a combination treatment (POAD3) real and distinct treatment not use fertilization. The results of the research on the highest average against the weight of the wet is economical with fresh weight weight weight 156.33 gr, fresh leaves the heaviest 61.67 gr, fresh weight of the heaviest Rod 94.33 gr and fresh weight of the heaviest a total of 349.67 gr. It is suspected that more doses of manure are applied then the nutrient absorption are also getting larger and optimal so the effect on yield and crop production mustard pakcoy. This was confirmed by Sarief (1989) the more organic fertilizer in the media grew, the more nutrient elements available to plants, thus plant growth mustard greens will take place with both surely will increase the weight of the plant mustard greens. Organic matter is able to fix some of the physical properties of the soil so that the absorption of nutrient elements in plants became more optimal because of the soil conditions are more conducive, fertile, and the absorption of water into better (Lingga, 1991). Research results Indrasari and Syukur (2006), indicating also that the granting of micro-nutrient elements increases the concentration of these elements in the tissues of the plant so that it can increase weight wet plants become higher. According to Haq (2009) capability in the manure helps improve weight due to the manure was instrumental in the process of plant growth in particular keep the soil functions, provide nutrients for the plants, improve soil structure, increase the cation exchange processes in addition to add to the macro and micro nutrient elements in in the soil. Manure also proved to be very good in improving the structure of the agricultural land. The increase in the weight of the wet plant thought that the content of the main nutrient elements of N are there in the manure are able to improve growth and crop production optimally so that affect plant biomass. Item N is macro nutrient elements required by plants in large quantities, because this element also plays an active role in the growth and development of plants. Hari *et al*., (2009) the weight of the wet plant is the abundance of nutrients contained plants, thus the weight of plants depending on the rate of respiration and photosynthetic rate and plant nutrient is absorbed.

The relationship between the treatment of different types of Manure with three Different types of Land Against the weight of the Total plant Fresh mustard greens Pakcoy (gr): The graph of the relationship between the treatment of different types of manure with 3 different types of land against the weight of fresh total presented on (Figure 1) the results of the analysis showed that the type of chicken manure treatment with soil type Cristo Rei optimal retrieved on treatment with the treatment code (POA) can produce a total of fresh weight (263.50 gr), the granting of this type of chicken manure on soil type NCBA-Comoro optimal obtained at treatment with the treatment code (POA) can result in severe the total plant fresh mustard greens (271.75 gr), the granting of this type of chicken manure on soil type optimal Aeroportu obtained at treatment with the treatment code (POA) can produce a heavy crop of cabbage total fresh (203.25 gr). This means that the type of chicken manure treatment on three different soil types can increase the weight of fresh total per plant mustard pakcoy.

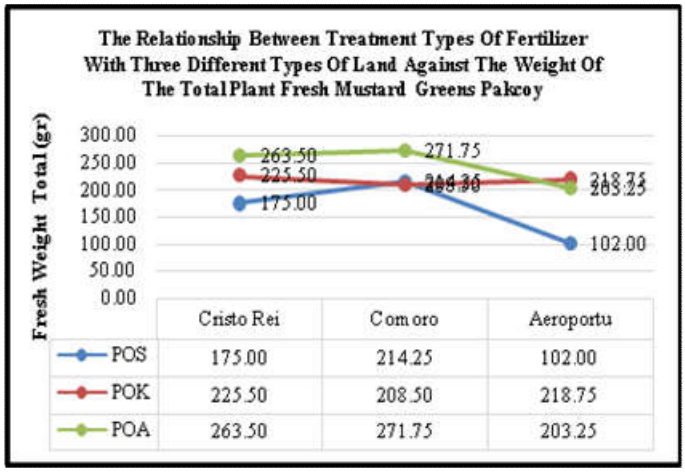

Figure 1. The Relationship Between Treatment Types Of Fertilizer With Three Different Types Of Land Against The Weight Of The Total Plant Fresh Mustard Greens Pakcoy

The granting of this type of manure to land in do to improve material orga nik soil, add a good macro nutrient elements in soils as well as micro, moreover, it can increase the humus,

soil structure and unequivocal inducing life remains miniscule in the soil. The awarding of the organic material in the form of different types of manure will improve the quality of the land that will be absorbed by the plant mustard greens pakcoy.

The relationship between dose of Manure with three Different types of Land Against the weight of the Total plant Fresh mustard greens Pakcoy (gr): The graph of the relationship between dose of manure treatment with 3 different types of land against the weight of fresh total presented on (Figure 2) the results of the analysis showed that treatment doses of manure on soil type Cristo Rei obtained at optimal treatment doses of manure 200 gr with the treatment code (D3) can produce a total of fresh weight (gr 282.67), fertilizers, dose the enclosure at optimal soil Treatment type Comoro obtained at treatment doses of manure 200 gr code (D3) treatment can produce fresh weight total (296.67 gr), treatment doses of manure on soil type optimal Aeroportu obtained at treatment doses of manure 200 gr code (D3) treatment can produce a total of fresh weight (254.33 gr). This means that treatment doses of manure with a dose of 200gr/plants on three different soil types can increase the weight of the total plant fresh mustard greens pakcoy.

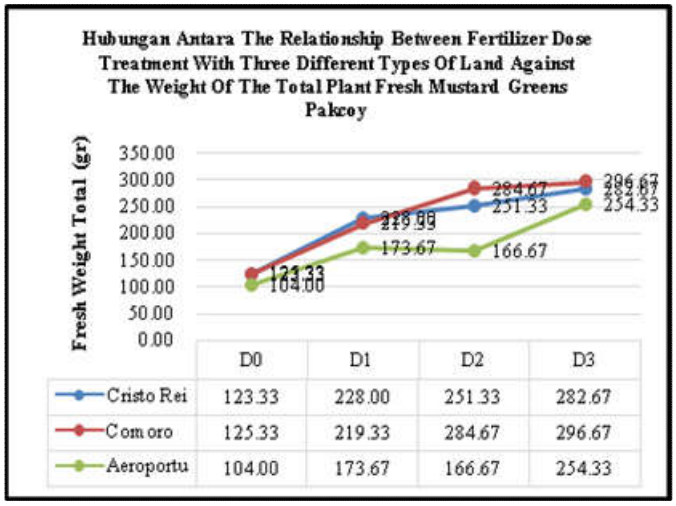

Figure 2. The Relationship Between Fertilizer Dose Treatment With Three Different Types Of Land Against The Weight Of The Total Plant Fresh Mustard Greens Pakcoy

Agustina (2004) stated that, the nutrients and minerals that exists and is available for plants, especially N has the most prominent influence towards the growth and development of plants because it can increase Fitohormon Sitokinin, otherwise Sitokinin acts to increase the uptake of N was available so that it can influence the shape and size of the leaves. Phosphorus and potassium have a vital role in the metabolic processes of plants. Cause phosphorus metabolism goes well and smoothly that results in cell division, enlargement of the cells, cell finding, and running smoothly. So are Potassium acts as a activators of various enzymes that are important in the reactions of photosynthesis and respiration, so that it can set up and maintain the osmotic potential and the taking of water that has a positive influence against the closure and the opening of stomata.

Conclusion

- Type of chicken manure Treatment combined with a dose of manure 200 gr/plant code by treatment (POAD3) can enhance the growth and development, pakcoy mustard plants grown in Sub-Village Malinamuk, Village, Comoro, Post Administrative Dom Aleixo, A Municipality Of Dili.
- The real interaction Occurs towards the growth and development of plant type of treatment on pakcoy sawi manure with a dose of manure.
- In the treatment of this type of chicken manure with a type of fertilizer is best with maximum results and dose manure 200 gr./plant is the ideal dosage with maximum results.
- Comoro-NCBA soil type is the type of land suitable for planting crops of mustard greens pakcoy.

REFERENCES

Agustina, B. 2011. *Green Technology in Organic Agriculture Towards Agriculture continued*. UB Press. Malang. pp 25-59

Aminah, A., B., M. Suartana and R. Kurniaty. 2006. *The criteria for weaning in the sprouts for the procurement of good quality seeds.* Proceedings of the Seminar the results of his research on Technology R & D Perbenihan Hall. Bogor, February 14, 2006. Case 87-91.

Haq, Andrey N. 2009. "The effect of the grant of organic fertilizer and NPK 16:16:16 Against growth and Plants Production of lettuce (*Lactuca sativa* L.)". *Riau Islamic University Agriculture Faculty of Soweto.*

Hari, A. J. Soeseno Hardjoloekito. 2009. The influence of Liming and fertilizing P towards growth and crop yield of soybeans (*Glycine max* L.). *University Soerjo Paths*.

Indrasari, A dan A. Syukur. 2006. The influence of the giving of the manure and Micro Nutrient elements against the growth of Corn at an Ultisol Dikapur. *Journal of The Science of Soil and Environment*, Vol 6 (2), p:116-123.

Lakitan, B. 1996. *Plant Physiology and Development of Plants*. PT. Raja Grafindo Persada. Jakarta.

Lingga, P. 1991.*The Feces of Cattle Use as Soil Enricher*. Jakarta: The Diffuser Is Self-help.

Moko H. 2004. *Reproduction Techniques Of Forest Vegetative Plants*. Technical Information

Pujisiswanto, H. and D. Pangaribuan. 2008. The influence of dose of Cow Manure Compost Against growth and fruit production of tomato. *Proceedings of the National Seminar on Science and technology II*. University of Lampung, 17-18 November 2008. The thing. 11-19.

Salisbury F. B. and C. W. Ross. 1995. Plant Physiology. The first volume. Translator: Dr. Lukman and Sumaryono. *ITB*. Bandung

Sari, R. N. 2002. *Keragaan analysis of Morphology and quality Fruit Pineapples population (Anana comosus (L) Merr) Queen four villages in Bogor regency.* Thesis. Department Of Agricultural Cultivation. IPB. Bogor.

Sarief, S. 1989. *Fertility and cultivation of agricultural land. Library Buana*, Bandung.

Sastropsupadi A. 2000, *Experimental Design of Practical Agriculture.* Canisius Yogiakarta.

Sitompul S. M. and Bambang G. 1995. *Analysis Of Plant Growth*. Gadjah Mada University Press. Yogyakarta

Suhesy, S. and Adriani. 2011. The influence of probiotics and Trichorderma Against Manure Nutrient derived From Feces of cows and goats. *J. Scientific Animal Husbandry Sciences*. 17 (2), 45-53.

Widowati, L.R., S. Widati, R. Jaenudin, and W. Hartatik. 2005. Influence of organic Manure Compost enriched with Mineral Materials for biological & Organic against soil

properties, Nutrient Absorption and Organic vegetable production. Agribusiness Development Program Report, *Land Research Hall*.

Zulkarnain, H. 2010. *Horticulture Basics*. Jakarta: Aksara Earth.

Zulkarnain, M., Prasetya, B., and Soemarno. 2013. The influence of compost, Manure, and Custom-bio against the nature of the soil, the growth and yield of sugar cane (Saccharum officinarum l.) In Entisol In The Garden Ngrakah-Pawon Kediri. *Indonesian Green Technologi Journal*. 2 (1): 45-52.

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