

ORIGINAL RESEARCH ARTICLE

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## THE INFLUENCE OF THE COMPOSES OF THE MEDIA COMPOST COFFEE SKIN, THE APPROPRIATE WAY OF DETERMINE THE DIAMETER VANILLA STEM FOR THE GROWTH OF THE VANILLA (*VANILLA PLANIFOLIA ANDREWS*) WITH THREE DIFFERENT SOIL TYPES

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### ABSTRACT

The *Vanillaplanifolia Andrews* plants is a plantation commodity with high economic value and stable market price and is one of the quite valuable export commodities which can increase a farmer's income and the State's finances. This research is aimed at discovering the influence of the composition of the Media Compost Coffee Skin, the appropriate way of determine the Diameter Vanilla Stem for the growth of the Vanilla (*Vanilla planifolia Andrews*) with three Different Soil Types. The vanilla plant, *vanilla planifolia Andrews*, is in the family of Orchidaceae, which is often referred to the orchid of flower's or scented orchid which have long been recognized by society and cultivated, because those plants worth economizing high and fairly well-known in the international market as a Vanilla Java Bean. Therefore, the fruit vanilla dubbed "green gold" in addition to the high cost, it is also utilized as an ingredient of the food industry, beverages, pharmaceuticals and cosmetics. But the obstacles faced by vanillafarmers currently i.e., cultivation techniques that are not yet precise and less available seeds, so the effect on the improvement of the results either in quality or quantity.

The purpose of this research is to: 1) find out the planting medium composted bark, coffee with diameter stem of different panel will provide the growth and vanilla development of the plant seed in planting on three different soil types. 2) to know the dose of compost and the diameter of the stem worthy vanilla towards the growth and development of plant seed penile against three different soil types. 3) Knowing the composition of planting media combining compost coffee skin with a diameter of vanilla stem influence on growth and development of plants vanilla seedson three different soil types. The design used in this study was a randomized Design Group (RAK) arranged in factorial, which consists of two factors. The first factor is the media treatment of the planting is M0 = control (land), M1 = land + compost (1:2:1), M2 = land + compost (2:1:2), M3 = land + compost (2:2:2) combined with the three types of soil and the second Factor is the diameter of the vanilla stem = 0.25 mm is a D0, D1 = 1.25 mm, D2 = D3 = 2.25 mm, 3.25 mm combined with 3 types of soil which repeats. The experiment consists of 16 units of treatment combining and each treatment was repeated three times so that the required 48 poly beg/plants experiment. Observations were made to the vanilla seedling growth variables of component crops. 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 double distance Duncan (DMRT) on levels 5% and if only a single factor in a real influence, then proceed with the average difference test with test BNT on tarap 5%. Based on the results of research that the media Treatment, planting with comparison (1:2:1) combined with the diameter of the vanilla stem treatment code 3.25 (M1D3) can increase the growth of plant vanilla seed. The real interaction happening against the growth of vanilla seedling on media treatment of planting coffee bark compost with a diameter of stem. On the media's treatment of planting soil + sand + compost by comparison (1:2:1) is the best composition with the maximum diameter stem of 3.25 mm vanilla is ideal with maximum results. Manleuana soil type and soil type Comoro is suitable for soil type seedling of vanilla stem.

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### INTRODUCTION

The plant vanilla (*Vanilla planifolia Andrews*) is an annual plant that belongs to the type of Orchid plant from the family Orchidaceae Plant has been vanilla.

Long recognized by society and cultivated, because the plant is worth the high economical and fairly well known in the international market as a Java Bean Vanilla. Therefore, the fruit vanilla dubbed "green gold" in addition to the high cost, it

is also utilized as an ingredient of the food industry, beverages, pharmaceuticals, and cosmetics because the seeds contain compounds vanillin (C<sub>8</sub>H<sub>8</sub>O<sub>3</sub>) organic compound with the molecular formula C<sub>8</sub>H<sub>8</sub>O<sub>3</sub>. Vanillin is a major component of vanilla seed extraction results containing the chemical compound vanillin (4-hydroxy-3-methoxy Benz aldehyde group), which gives the distinctive scent on vanilla. Vanillin can be synthesized by hydrocarbon of eugenol which issued a distinctive scent so desperately needed by the industry in both domestic and foreign. Considering that this commodity has a value of economical is high, stable market price, then the will encourage farmers of Timor-Leste to plant vanilla that has spread widely in almost the whole region with its regional production center in Ermera Municipiu, Same, Lospalos, and Liquisa. This has put vanilla as a high-value export commodities and potentially in receipt of foreign countries and support the development of the plant vanilla in Timor Leste which needed the right strategy and level of productivity of the plant vanilla to increase the income of farmers in good condition and sustainable. The effort could be done by engineering which implemented the agricultural to development of an agricultural product that to be produces high quality vanilla and increase the competitiveness of the vanilla in Timor Leste, to international market. The preclusions faced by farmers currently the techniques i.e. vanilla cultivation that are not yet precise and less available seeds, so the effect on to the improvement of the results either in quality or quantity. Hence, the need to determine the techniques of precise breeding with planting composes media and determine the right of diameters stem, to guarantee the growth of shoots vanilla.

The problems faced in the expansion of vanilla plant in Timor-Leste is the limited availability of the material as the source of the seeds are a factor in restricting the expansion of land. The limitations due to the redundancy of the vanilla plant in General still use long cuttings and farmers generally direct planting cuttings that range from 8-10 book without going through the nursery. It is considered less economical in the use of plant material is mainly for local development with a limited planting materials and planting directly in the field less well due to its growth stunted and the reduced production levels. In addition to the planting directly in the field have the risk of death is high enough conversely planting media usage that does not fit can also affect the growth and seed development of vanilla plant. Lawani (1995) that a good growing medium, should have the ability to retain water, loose structure, aeration and good drainage, pH which corresponds to the type of plant and contains the essential nutrient elements are available in supporting the growth of the plant. Therefore, the determination of the planting medium and long stem cuttings an ideal fit will result in a vanilla plant seeds of good quality. Copy plant Profits in vegetative by using the diameter of the stem have some excess i.e. generating plant seed quality and perfect vanilla with the roots and stems in a short time and highly has the nature of which is similar to its parent, and can also be grown massively because the seeds that resulted from the number of the lot. In addition to the planting medium composted bark of coffee has been commonly used as a medium in the nursery and have proven to be influential both in supporting the growth of the seedling plants, compost coffee skin can also improve the nature of the physical, chemical and biological soil in side as a nutrient for the seed of vanilla plant. The use of planting medium composted bark proper coffee can help plant growth vanilla, especially on cultivating vegetative

by which the media have an enormous role in the success it has, namely as a provider of nutrient for the plant. The purpose of this study is to: 1) find out the planting medium composted bark coffee with diameter vanilla stem of different that will be provided the growth and development plant of the vanilla, seed in planting on three different soil types. 2) To know the composition of compost and the diameter of the stem cuttings worthy vanilla towards the growth and development of plant seed vanilla against three different soil types. 3) Knowing the composition of planting media combinations compost coffee skin with a diameter of stem cuttings vanilla influence on growth and development of plants seeds cuttings vanilla on three different soil types.

## MATERIAL AND METHODS

The research was carried out in the village of Comoro, Dili, Dom Alexo Municipality. Research implementation time 3 months, from May until July 2018. High places 82.95 MDPL (meters above sea level). Materials used Cuttings from a plant stem part diameter vanilla, diameter of the stem that has not flowered and then in pieces in accordance with the treatment. Next the planting medium used; Compost coffee leather, sand, soil, Polybag, gembor, paranet, shelves. While the tools used: scissors, knife cutter, meter, bucket, stationery, caliper, Ribbon meters, and digital scales. The design used in this study was a randomized Design Group (RAK) arranged in factorial, which consists of two factors. The first factor is the media treatment of the planting is M<sub>0</sub> = control (land), M<sub>1</sub> = land + compost (1:2), M<sub>2</sub> = land + compost (2:1), M<sub>3</sub> = land + compost (2:2) combined with the three types of soil and the second Factor is the diameter of the stem cuttings vanilla = 0.25 mm is a D<sub>0</sub>, D<sub>1</sub> = 1.25 mm, D<sub>2</sub> = D<sub>3</sub> = 2.25 mm, 3.25 mm combined with 3 types of soil that was made of Deuteronomy. The experiment consists of 16 units of treatment combinations and each treatment was repeated three times so that the required 48 polybag experiment.

Observation of variable growth seedlings includes: Long shoots performed during the growth of the buds are measured from the base of the growth of shoots up to the ends of the shoots, performed at the age of 3, 6, 9 and 12 weeks after planting. Section diameter made during the growth of shoots were measured from the appearance of a segment, performed at the age of 3, 6, 9 and 12 weeks after planting, the number of roots of the observation is done at the age of 3 months by way of plants deprived of poly bag then counted the number of roots the primary, root Length, performed at the age of 3 months by means of measured from the base of the root up to the tops of the roots, the weight of fresh and dried roots, performed at the age of 3 months by way of the root is taken, then washed and drained, weighed by scales. The number of leaves, the observations made at the time the plant was 3 months end computed by way of research leaves from the base to the tip, long leaf, observations conducted on plants aged 3 months of the end of the research done by the leaves taken part lower, middle, upper measured with tool ruler/m, the weight of the wet seeds, observations made at the time the plant was 3 months done by dismantling the plant roots, leaves, stems all weighed with the scales and weigh the dried seeds, do oven way until it weighs the constant, then conducted analytical scales with weighing. The observations are analyzed using a variety of prints analysis (analysis of Variance) ANOVA. If there is a real difference between the treatments, Multiple Distance Trials followed Duncan (DMRT) at the 5% level.

When only a single influence then continued with test BNT standard of 5%.

## RESULTS AND DISCUSSION

**Shoot length (cm):** The results of the analysis of the multifactorial prints (Anova) against the length of the shoots of seedlings vanilla showed that the treatment skin coffee compost media (M) gives a very real influence ( $P < 0.01$ ) in germ buds long vanilla age 6 and 12 MST, except the length of the shoots of seedlings vanilla age 3 and 9 MST does not provide any real influence ( $P > 0.05$ ). Treatment of the Diameter of the Stem Cuttings vanilla (D) exert influence are not real ( $P > 0.05$ ) on the long shoots of seedlings vanilla 3, 6, 9 and 12 pm MST. The interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) exert influence are not real ( $P \geq 0.05$ ) against the long shoots of seedling cuttings vanilla 3, 6, 9 and 12 pm MST. For more details can be seen in table 1 DMRT 5% test results are as follows:

**Table 1. The average length of the shoot (cm), due to a combination of Composting Coffee Leather Medium (M) and the Diameter of the Stem Cuttings vanilla (D) on a couple of different Age**

Treatment	3 weeks after planting	6 weeks after planting	9 weeks after planting	12 weeks after planting
M0D0	2.17a	18.73abcd	30.63a	39.07a
M0D1	2.50a	17.87abc	31.10a	41.90abc
M0D2	3.53a	17.13ab	29.80a	41.27ab
M0D3	2.60a	15.87a	28.33a	45.40bcde
M1D0	3.27a	21.30abcde	28.67a	43.33abcd
M1D1	3.83a	26.43e	32.83a	50.57e
M1D2	3.40a	21.47bcde	28.63a	46.17bcde
M1D3	3.30a	22.87cde	30.53a	47.30de
M2D0	2.50a	20.00abcd	26.63a	48.10de
M2D1	2.20a	21.73bcde	30.50a	46.77cde
M2D2	3.47a	23.17de	30.47a	48.50de
M2D3	3.07a	21.63bcde	30.80a	47.33de
M3D0	2.43a	22.13bcde	30.57a	47.27de
M3D1	2.70a	23.43de	33.17a	49.60e
M3D2	2.57a	21.73bcde	30.47a	47.70de
M3D3	2.77a	21.23abcde	31.77a	49.13e

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

Observation of long shoots were done on vanilla seedlings aged 3, 6, 9 and 12 weeks after planting. To know the growth of long shoots are presented in table 5.2. Showed the influence of the combination of the media compost coffee skin with a diameter of vanilla stem cuttings are used. At the end of the observation, the length of the shoots range from 39.07 cm — 50.57 cm. Combination treatment of diameter of 1.25 mm and growing media compost + sand + ground (M1D1) aged 3 – 12 MST (Weeks after planting) shows the rate of plant growth is stable in comparison to other combination treatment, due to the characteristics of the plant vanilla store food reserves on the part of the stem of the plant. This section was able to spur the acceleration of the growth of the shoots of the plant so that the larger the diameter stem also grow faster. The results of this research in line with the opinion of Emil (2011) stating that the quality of the seedlings was influenced by the age of the plant and the diameter of the rod. The larger the diameter then it tends to be more resilient rotten disease attacks against the base of the stem. So plants can grow well. Combination treatment of planting medium composted soil + sand + (M1) is the appropriate media for the growth of the seeds of vanilla, because the compost contained various elements of the macro

as well as micro needed for vanilla plant vegetative growth, while sand have a good aeration as a medium for planting so help rooting plants vanilla. This is in line with the opinion of Sofyan and Muslims (2006) stating that the use of this type of media is Reinforced by Gardner et al., (1991) that a good cropping, the media is media that is able to provide water and nutrient elements in quantities sufficient for plant growth. Combination treatment of the diameter of 1.25 mm stem cuttings and planting media land + sand + compost (M1D1) is the best treatment. This is due to the more lengthy materials cuttings used then it will affect the growth of plants, and the composition of the ideal planting media really help the process of absorption of nutrient elements and provisioning so that it helps plant growth. a great thing to note in the treating material cuttings to support an extension of a better seedling shoots.

**Section diameter Seedlings vanilla (mm):** The results of the analysis of the multifactorial prints (Anova) against the diameter of the seed section vanilla indicate that the treatment of the media skin coffee compost (M) gives a very real influence ( $P < 0.01$ ) in germ segment diameter vanilla age 6 and 12 MST, but the diameter of the seed section vanilla 9 MST give real influence ( $P < 0.05$ ), but the diameter of the seed section vanilla 3 MST does not provide any real influence ( $P > 0.05$ ). Treatment of Stem Cuttings vanilla Diameter (D) gives a very real influence ( $P < 0.01$ ) in germ segment diameter vanilla age 9 and 12 MST, section diameter of seedlings, but vanilla 6 MST give real influence ( $P < 0.05$ ), but the diameter of the seed section vanilla 3 MST does not exert influence are not real ( $P > 0.05$ ). The interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) gives a real influence ( $P < 0.05$ ) of diameter sections seeds cuttings vanilla 6 MST. But the interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) exert influence are not real ( $P > 0.05$ ) of diameter sections seeds cuttings vanilla age, 3, 9 and 12 pm MST. For more details can be seen in table 2 results of test DMRT 5% are as follows:

**Table 2. The average Diameter of the Section (mm) due to the combination of Composting Coffee Leather Medium (M) and the Diameter of the Stem Cuttings vanilla (D) on a couple of different Age**

Treatment	3 weeks after planting	6 weeks after planting	9 weeks after planting	12 weeks after planting
M0D0	0.36a	0.82a	1.23a	1.72a
M0D1	0.48a	0.88a	1.38ab	2.00abc
M0D2	0.58a	1.00ab	1.49ab	2.07abcd
M0D3	0.37a	1.06ab	1.91bcde	2.43cdef
M1D0	1.06a	1.73cdef	2.05bcde	2.50defg
M1D1	0.67a	1.28abcde	1.8abcd	2.24bcde
M1D2	0.67a	1.31abcde	1.87abcde	2.48cdefg
M1D3	0.39a	1.21abcd	1.95bcde	2.41cdef
M2D0	0.45a	0.98ab	1.75abcd	2.32bcdef
M2D1	0.41a	0.92ab	1.27ab	1.83ab
M2D2	0.77a	1.80def	2.46de	2.89fg
M2D3	1.04a	1.99f	2.56e	3.01g
M3D0	0.62a	1.10abc	1.55abc	2.18abcde
M3D1	0.59a	1.35abcdef	1.73abcd	2.05abcd
M3D2	0.74a	1.44bcdef	1.92bcde	2.43cdefg
M3D3	0.83a	1.88ef	2.31cde	2.75efg

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

The growth that occurs in the seeds of vanilla caused by the growth of the primary and secondary meristem tissue resulting in diameter gets larger sections. Section diameter observations carried out on seeds of vanilla aged 3, 6, 9 and 12 weeks after planting. To find out the value diameter sections presented in

Table 5.3. Showed the influence of the combination of the media compost coffee skin with a diameter of vanilla stem cuttings are used. At the end of the observation, diameter sections ranging between 1.72 mm — 2.75 mm. Combination treatment of 3.25 mm diameter cuttings and planting medium composted soil + sand + (M3D3) aged 3 – 12 MST (Weeks after planting) shows the rate of increase of diameter a segment that is stable in comparison to other combination treatment. This is because a vegetative phase is the phase of use of 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. Vanilla seedlings during the vegetative growth phase requires organic fertilizers such as compost 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. The seeds of the cuttings is the ideal shaft diameter, so it can be the plant produces vanilla that can grow and develop properly. This is because the greater the material cuttings are used then the more food in the form of carbohydrate reserves to spur the process of growth of shoots and root formation in compare with the smaller cuttings. This is in accordance with the opinion of Lawani (1995) States that on the stems and branches on plants vanilla has a primary function as a replacement for the leaves in the process of assimilation and also the provision of fluids for plant growth. 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 Primary Root**

Growth In Plants The results of the analysis (Anova) variety fingerprints against the growth of primary roots of plants the seeds of vanilla shows that the treatment of the media skin coffee compost (M) give the real influence (P < 0.05) on the number of vanilla seedling root, but the root length, root fresh weight and dry weight of roots seedling vanilla exert influence are not real (P > 0.05). Treatment of Stem Cuttings vanilla Diameter (D) gives a very real influence (P < 0.01) on the number of roots, root fresh weight and dry weight of roots of seedlings vanilla, but the length of the roots of seedlings vanilla exert influence are not real (P > 0.05). The interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) exert influence are not real (P 0.05 >) against the number of roots, root length, root fresh weight and dry weight of roots. For more details can be seen in table 3 DMRT 5% test results are as follows:

Observation on growth of primary roots of plants is done by measuring the length of the root, the number of roots, the weight of the wet roots and plant root dry weight was measured when the study ended. Based on the results of research on the table 5.4 that planting media combinations, composting coffee skin with a diameter of stem cuttings gave a real influence on the number of vanilla seedling roots. At the end of observation, the amount of root ranged from 4.67 fruit — fruit 23.67. Combination treatment of 3.25 mm diameter cuttings and planting medium composted soil + sand +

(M1D3) shows the number of roots of the most compared to other combination treatment. The growth of the roots is one indication of the success of the cuttings are made because the roots play an important role for the plant. The function of the roots i.e. absorb water and dissolved minerals, transportation nutrient elements, reinforcing rods and storing food reserves. Increasingly long roots that form the more ease in carrying out its functions, plant one in the absorption of nutrient elements.

**Table 3. Median the median Number — the roots, Root Length, Root Wet Weight, Root dry weight due to the combination of Composting Coffee Leather Medium (M) and the Diameter of the Stem Cuttings vanilla (D) On Seedling vanilla**

Treatment	The Primary Root Growth In Plants			
	The total of Roots (total)	Root length (cm)	Fresh Root weight (gr)	Root Dry Weight (gr)
M0D0	6.33a	22.77a	1.70a	0.80ab
M0D1	12.67abcde	24.73a	2.60a	0.98ab
M0D2	11.33abcd	15.37a	2.93a	1.15abcd
M0D3	10.33abcd	21.63a	3.47a	1.68abcd
M1D0	9.00abc	28.23a	2.10a	1.13abcd
M1D1	12.33abcde	31.63a	3.47a	2.01abcd
M1D2	20.33cde	18.73a	2.87a	0.98abc
M1D3	23.67e	49.50a	5.27a	3.93e
M2D0	8.00ab	26.83a	2.87a	0.84ab
M2D1	13.67abcde	31.60a	3.07a	1.09abcd
M2D2	19.00bcde	43.43a	4.57a	2.49cde
M2D3	21.00de	39.70a	4.50a	2.21bcd
M3D0	4.67a	16.30a	1.80a	0.35a
M3D1	9.67abcd	22.00a	1.83a	0.64ab
M3D2	14.67abcde	48.00a	4.57a	2.63de
M3D3	15.00abcde	40.43a	5.30a	2.60de

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

The process of the formation of roots in plants results from duplication in different cuttings come from seeding seeds. Roots on cuttings formed in adventif of the liquid and the nodes (the book). Roots on cuttings formed because of scarring, and roots are formed from tissue parenchym (Moko, 2004). 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 cuttings in shaping the perfect plant. Aminah et al., (2006) stating that the more roots then the more nutrient elements that can be absorbed by plants, thus seedlings will be empowered to live high on the field. The rapid growth of the roots will be stimulating the growth of seedling of fast anyway. The combination of growing media compost coffee skin with a diameter of vanilla stem cuttings root length and weight against the gives no real influence. This is allegedly due to use of poly bag vanilla plant nursery system could hinder root development, so that its development is not optimal. According to Santoso et al., (2008), that low rate of growth of the plant in the pot due to the limitations of space contact roots with soil so stunted root growth and development that is causing the growth rate being lower than the plant growing in field. The function of the roots i.e. absorb water and dissolved minerals, transportation nutrient elements, reinforcing rods and storing food reserves. Increasingly long roots that form the more ease in carrying out its functions, plant one in the absorption of nutrient elements. The larger the diameter of the cuttings root length trend is getting longer. According to Harjadi (1989) stated a plant makes cells – new cell, cell renewal, thickening tissue actually develop the stem, leaf and routing system. The faster the rate of cell division of the extension and thickening of the tissues of the stem growth, leaf and root faster. The combination of growing media compost coffee skin with a diameter of stem cuttings gave a

real influence on the weight of the dried root of seedling vanilla. At the end of observation, root dry weight ranges between 0.35 grams — 3.93 Gr. Treatment combinations of diameter stem of 3.25 mm and planting medium composted soil + sand + (M1D3) show the heaviest roots dry weight compared to the treatment of other combinations. The magnitude of the value of the dry weight of the plant depends on very much of the process of photosynthesis. The process of photosynthesis is the process of the nutrition 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 land to provide both these materials, every composition of planting media has 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 nutrient. 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 nutrient end to expand rooting to get nutrient. The fresh weight of the Seed and Seedling dry weight Stem Cuttings vanilla (gr). The results of the analysis of the multifactor prints (Anova) of the weight of fresh and dry weight of seedlings vanilla showed that the treatment skin coffee compost media (M) gives a real influence ( $P < 0.05$ ) on vanilla seedling dry weight, but heavy fresh seeds of vanilla gives the influence of unreal ( $P > 0.05$ ). Treatment of Stem Cuttings vanilla Diameter (D) gives a very real influence ( $P < 0.01$ ) on a Fresh weight and dry weight of seedlings. Interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) exert influence are not real ( $P > 0.05$ ) of the weight of fresh and dry weight of seedling vanilla. For more details can be seen in table 4 DMRT 5% test results are as follows:

**Table 4. The average Fresh Weight and Dry weight of Seedling Cuttings Vanilla due to a combination of Composting Coffee Leather Medium (M) and the Diameter of the Stem Cuttings vanilla (D) On Seedling vanilla**

Treatment	Fresh Seed weight (gr)	Seedling dry weight (gr)
M0D0	35.93a	16.07a
M0D1	40.77ab	16.00a
M0D2	36.50a	20.50abc
M0D3	38.90ab	16.70ab
M1D0	32.30a	15.60a
M1D1	45.33abc	27.43abcde
M1D2	58.33bcd	29.83abcde
M1D3	78.33de	42.30e
M2D0	27.93a	14.30a
M2D1	44.40abc	24.27abcde
M2D2	73.83de	35.00bcde
M2D3	80.83e	41.13de
M3D0	30.83a	11.17a
M3D1	46.83abc	20.73abcd
M3D2	59.50bcde	35.50bcde
M3D3	65.17cde	37.57cde

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 study are showed in table 4. That combination treatment diameter stem 3.25 mm and media for planting soil + sand + compost (M2D3) is the best treatment against compared with other treatments. At the end of observation, fresh weight of seedling stem vanilla range between 27.93-80.83gr. This is due to the larger diameter material stem used then it will affect the growth of plants, and the ideal planting of the media composition really help the

process of absorption and provision of nutrient elements so as to help plant growth. The process of formation and development of plant organs are greatly influenced by the availability of water and compost Contained in the soil. The formation and development of the organs of the plant (leaves, roots, and stems) associated with the process plant cells to enlarge. Plant cells will be increased along with the thick and cell wall formation of cellulose in plants. Other influences related to the availability of transport water, nutrient for crop, in the form of soil for plants. Nutrition is in soil being transported through water that is absorbed by plants through the process of diffusion, osmosis occurs. The better the nutrient is absorbed by plants, then the availability of the material basis for the process of photosynthesis will be getting better anyway. The process of photosynthesis which takes place properly, will spur hoarding carbohydrates and proteins in the body organs of the plant vanilla. Stockpiling of carbohydrates and protein as a result of accumulation of photosynthetic processes will affect the weight of the wet plant.

Harjadi (1989) States that the factors – factors that affect the growth of internal factors and external factors, internal factors comprising the rate of photosynthesis, respiration, differentiation and the influence of genes, while the external factors include light, temperature, water, organic matter and nutrient availability. So with these factors – factors satisfy the process of photosynthesis can take place properly and produces Photostat which will be used to process the next growth especially heavy added base. Treatment combinations of diameter of 3.25 mm and media cuttings for planting soil + sand + compost (M1D3) is the best treatment against other treatments. At the end of the dry weight of seedlings, cuttings vanilla ranges from 11.17 gr — 42.30 gr. Dry weight is the weight of the plant after plant is dried in the oven, so that the water levels have gone and left only the chemical compounds contained in the plant. This condition is closely related with the size of the diameter of cuttings and nutrient elements on the media as well as absorption by the roots which ultimately have an effect on biomass. According to Dwijoseputro (1990), biomass plants indicates multiplicity of chemical compounds contained in the plant, the higher the biomass then the chemical compounds contained in it more so increase the dry weight of the plant. The magnitude of the value of the dry weight of the plant depends on very much of 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 land to provide both the material composition of the growing medium, each has different capabilities in providing nutrient and water for plant growth. According to Dartius (1990) if the photosynthesis takes place properly, then the plants will grow well followed by the dry weight of the plants that reflect the status of plant nutrients, because the plant dry weight depending on the activity of the cells, the size of the cells and plant cell quality.

#### **The number of leaves and the length of the Leaf Stem Cuttings vanilla Seedlings (strands)**

The results of the analysis of the multifactor prints (Anova) against the number of leaves and the length of the leaves of seedling vanilla showed that the treatment skin coffee compost

media (M) provide no real influence ( $P > 0.05$ ) on the number of leaves and the length of the seed leaf vanilla the influence Unreal ( $P > 0.05$ ). Treatment of Stem Cuttings vanilla Diameter (D) gives a very real influence ( $P < 0.01$ ) on the length of the leaves of seedling cuttings vanilla, but treatment of the Diameter of the Stem Cuttings vanilla (D) exert influence are not real ( $P \geq 0.05$ ) on the number of leaves of seedling cuttings vanilla. The interaction between the media compost coffee skin with a diameter of stem cuttings vanilla (M x D) exert influence are not real ( $P \geq 0.05$ ) against the number of leaves and the length of the leaves of seedling cuttings vanilla. For more details can be seen in table 5 DMRT 5% test results are as following:

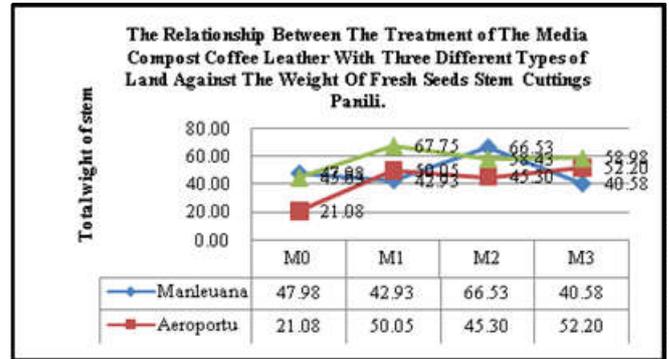
**Table 5. Average number of leaves and the length of the leaves of vanilla Seedling due to a combining of Compost Coffee Leather Medium (M) and the Diameter of vanilla Stem (D) On Seedling vanilla**

Treatment	The Total of leaves (strands)	Leaf length (cm)
M0D0	4.17a	5.50a
M0D1	5.83a	6.22ab
M0D2	4.83a	6.75abc
M0D3	6.00a	8.46abc
M1D0	5.00a	6.03ab
M1D1	6.67a	8.23abc
M1D2	8.67a	8.43abc
M1D3	7.00a	12.42d
M2D0	6.00a	7.13abc
M2D1	6.67a	8.22abc
M2D2	4.67a	9.00bcd
M2D3	3.33a	8.43abc
M3D0	4.33a	6.65abc
M3D1	5.00a	7.51abc
M3D2	6.00a	7.70abc
M3D3	3.33a	10.32cd

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

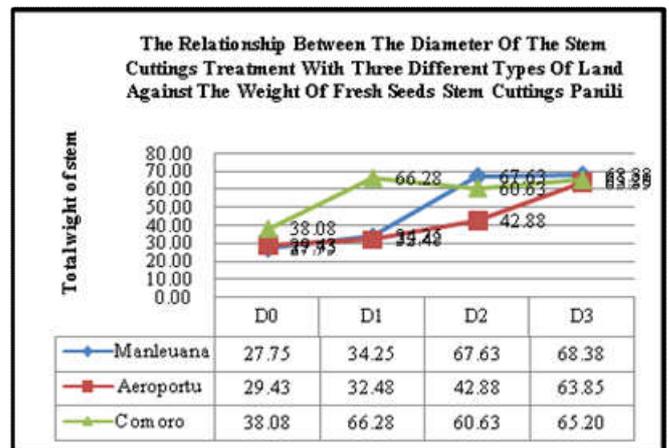
Based on the results of the study are listed in table 5. That combination treatment diameter 3.25 mm and media for planting soil + sand + compost (M1D3) is the best treatment against other treatments. At the end of the observation, the length of the leaves of seedling stem vanilla ranged from 5.50 cm – 12.42 Gr. plants that have leaves most and the longest leaves will catch most rays. Because in site the organ of leaf is have photosynthesis and other metabolic processes. The more number of leaves and the length of the leaf will be getting many carbs 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 Photostats 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 a greater capability for this activity. Therefore, a direct role in the leaf provides backup energy that serves to support the growth of the plant vanilla The combining between the treatment of the Composes Media Compost Coffee Leather with three Different types of Land Against the weight of Fresh shoots of Seedling Cuttings of the stem vanilla (gr). The graph of the combining between the treatment of the media compost coffee leather with 3 different types of land against the weight of fresh shoots of seedling vanilla stem presented on (Figure 1) the results of the analysis showed that the granting Media skin coffee compost on soil type Aeroportu obtained at optimal soil compost + comparison + sand (2:2:2) with the treatment code (M3) can produce fresh shoots of weight (52.20 gr), the

awarding of the media skin coffee compost on soil type Manleuana obtained at optimal ground compost + comparison + sand (2:1:2) with the treatment code (M2) can produce fresh shoots of weight (66.53 gr), the awarding of the media skin coffee compost on soil type Comoro obtained at optimal soil compost + comparison + sand (1:2:1) with the treatment code (M1) can produce fresh shoots of weight (67.75 gr). This means that media treatment of skin 1-2 compost on three different soil types can increase the weight of fresh shoots of vanilla seedlings.



**Figure 1. The Relationship between the Treatments of the Media Compost Coffee Leather with Three Different Types of Land against the Weight of Fresh Seeds vanilla Stem**

The awarding of the media skin coffee compost to land indo to improve material organic soil nutrient elements, add either the macro or the micro in the soil, it can increase the humus, the soil structure of the unequivocal good and push the life remains miniscule in the soil. The awarding of the organic material in the form of compost of coffee skin will improve the quality of soil that will be occurred. Absorbed by the seeds of vanilla.



**Figure 2. The Relationship between the Diameters of the Stem Cuttings Treatment with Three Different Types of Land against the Weight of Fresh Seeds Stem Cuttings vanilla**

**The relationship between the Diameters of the Stem vanilla with three Different types of Land Against the weight of Fresh Seeds vanilla Stem (gr)**

The graph of the combining between the diameter of the vanilla stem with 3 treatment different types of soil that's against the weight of fresh shoots of stem vanilla seedling presented on (Figure 2) the results of the analysis showed that the diameter stem of treatment on soil type optimum from

Aeroportu was gained by using on treatment of the diameter of 3, 25 mm stem with the treatment code (D3) can produce fresh shoots of weight (63.85 gr), diameter of stem treatment on soil type Manleuana obtained at the optimum treatment of the diameter of 3, 25 mm stem with the treatment code (D3) can produce fresh shoots of weight (68.38 gr), diameter of stem treatment on soil type optimal Comoro obtained at treatment of the diameter to the size of 3, 25 mm with the treatment code (D3) can result in severe fresh shoots of (65.20 gr). This means that treatment with a diameter of 3, 25 mm stem on three different soil types can increase the weight of fresh shoots of vanilla seedlings. The results of the analysis of the skin in the lab of coffee compost soil Faculty of Agriculture University of Muhammadiyah of Yogyakarta (2016), indicates that the levels of C-organic coffee bean skin was 12.49% 2.09% N, 21.54% organic ingredients, 5.96 c/n and moisture 18.74% levels, so compost the waste coffee bark can be used as a source of organic matter.

The successful utilization of the skin of the coffee beans as an ingredient of compost will give you an advantage. In addition to the compost can be obtained which can restore soil fertility, can also reduce the environmental pollution caused the abundance of leather coffee waste. 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. Phosphorus metabolic causes goes well and smoothly that results in cell division, enlargement of the cells, cell differentiation, and running smoothly. So are Potassium acts as a aktifator 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

1. Planting media Treatment by comparison (1:2:1) combined with the diameter of the stem cuttings treatment code 3.25 (M1D3) can increase the growth of seedlings of crops vanilla grown in the village Malinamuk, Suco Comoro, Administrative Postu Dom Aleixo, Municipio Dili.
2. The real interaction happening against the growth of seedling vanilla on media treatment of planting coffee bark compost with a diameter of stem cuttings.
3. On the media treatment of planting soil + sand + compost by comparison (1:2:1) is the best composition with the maximum diameter and stem diameter of 3.25 mm vanilla is ideal with maximum results.
4. Soil type and soil type Manleuana Comoro is soil type that is suitable for nursery vanilla stem.

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