



The Effect Various of Kinds Organic Fertilizer On Gaharu Seedling (*Aquilaria malaccensis* LAMK) In The Field

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ABSTACK

This research aims to determine the effect of various types of organic fertilizer on the growth of agarwood seedlings (*aquilaria malaccensis lamk*). This research was conducted in August to November 2022. This study was conducted at Arboretum of the Faculty of Forestry. Tadulako University Palu. This research uses a complete random design (RAL) consisting of 3 treatments namely K1 (Control) K2 (DOAMI Organic Fertilizer) K3 (Gresik Organic Fertilizer). The results showed that the administration of various types of organic fertilizer had a significant effect on high increase and seedling diameter, but did not significantly affect the increase in the number of leaves. K2 treatment gives better results than other treatment. Average of seed height K1 = 4.5, K2 = 7.75 k3 = 6.75, the average increase in the diameter of the seedlings is K1 = 0.37 K2 = 0.72 k3 = 0.45. The average increase in the number of leaves of K1 = 6, K2 = 10.25, K3 = 7.75.

Keywords: Gaharu (*aquilaria malaccensis lamk*), hbbk, organic fertilizer.

1. INTRODUCTIONS

Gaharu is one of the forest plants that produces non -wood forest products (HBBK) (Fitriana, et al. 2017). Gaharu is one of the groups of high commercial aromatic -producing plants in the form of agarwood, high market demand and high selling prices make this plant feared its use will exceed the carrying capacity of the experience, this is due While the growth rate for each type of agarwood is not widely known (Wiriadinata et al 2010).

The high economic potential and value of the agarwood trees has triggered the community to seek to find in all areas of natural forest that are still available. This effort if it continues to be carried out will certainly threaten the existence of agarwood trees in nature, so it needs cultivation as a first step to preserve and a hope to earn income (Kamaluddin, 2018).

To support its sustainability, planting needs to be done. During this time planting agarwood is usually done under or between plantation plants such as rubber and coffee. (Muin and Fahrizal, 2015). One of the causes of agarwood cannot be planted on open land due to semi -semi - agarwood nature. To plant in an open land, it is necessary to increase the adaptability of seedling to





the new environment One of the ways that can be done to increase the adaptation is intensive fertilization. The use of organic fertilizer can increase the growth response of plants that have been proven empirically and laboratory.

Eertilization is the addition of one or several nutrients to the soil/plant to maintain soil fertility aimed at achieving high yields/production (Sari et al., 2020). There are 2 types of fertilizers, namely inorganic fertilizer (artificial fertilizer) and organic fertilizer Organic fertilizer is fertilizer derived from nature, in the form of residual organisms both plants and animals, organic fertilizers contain nutrients both macro and micro needed by plants, so that they can grow fertile (Handayani, et al 2011).

At present organic fertilizer is widely available in the market and circulating widely in the community, especially in Central Sulawesi including Gresik Organic Fertilizer and DOAMI Organic Fertilizer . The fertilizer is widely used by farmers in cocoa, rice and annual crops. Gresik Organic Fertilizer produced by PT Petrokimia Gresik, in general Gresik organic fertilizer can increase the yield of all types of plants (Soim and Farmers, 2008 in Parmila et al 2019).

Based on the description above, the author is interested in conducting research with the title " the effect of various organic fertilizer on gaharu seeds (*Aquilaria malaccensis* lamk) in the field

2. RESEARCH METHODS

This research was conducted in August to October 2022 located in the Arboretum Faculty of Forestry, Tadulako University. This study uses a complete random design (RAL) consisting of 3 treatments and 4 ulangan, namely: P0 = without fertilizer, P1 = Doami Organic Fertilizer (2 Kg), P2 = Gresik Organic Fertilizer (2 Kg) , Of the three treatments, it was repeated 4 times each so that the total total of 12 experimental units. Data was analyzed using an analysis of the Fulfricular test F with a 5 % level was carried out to find out whether or not the effect of treatment. The treatment that has a significant effect will be carried out further tests using the BNT test at a 5% level to determine different treatment.

3. RESULTS AND DISCUSSIONS

Height Addition

To determine the effect of the treatment given to the height addition of the agarwood seedlings, an analysis of variance was carried out which is presented in Table 1.





Table 1. Analysis of Variety of Height addition (cm) of Common Gaharu Seedlings 3 Months After Planting

Source Of Diversity	Degrees of Freedom	Number Of Kuads	Middle square	Count factor	Table factor
					5%
Treatment	2	477.13	238.56	57.25*	4.1
Error	9	37.5	4.166		
Total	11	514.63			

Description *=Significant

In Table 1 it shows that the treatment of two types of organic fertilizer on the growth of gaharu seedlings on height addition, then a further test was carried out with the Honest Significant Difference Test (BNJ) at 5% level in Table 2.

Table 2. Results of the Honest Significant Difference Test (BNJ) on Height addition (cm) of Gaharu Seedlings 3 Months After Planting

Treatment	Average	BNJ
K2	7.75 a	4.79
K3	6.75 b	
K1	4.5 b	

Description: Numbers followed by unequal Letter Notations are Significantly Different on the 5% BNJ Test



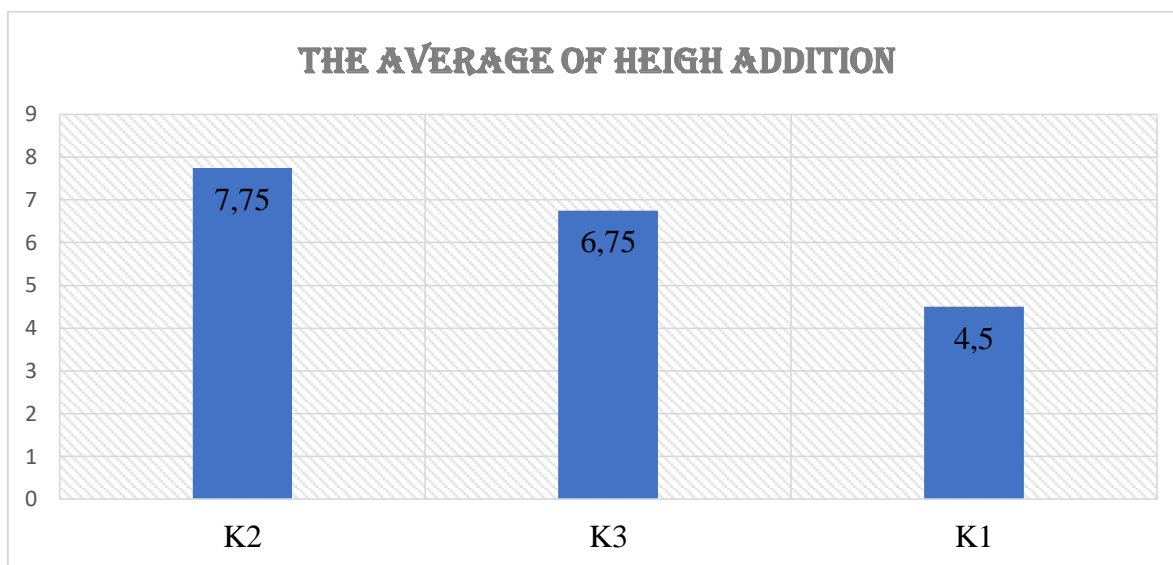


Figure 1. Diagram of the average high addition of gaharu seedlings for each treatment

Diameter Addition

To determine the effect of the treatment given to the increase in the diameter of the gaharu seedlings, an analysis of variance was carried out which is presented in Table 3.

Table 3. Results of the Analysis of Variation of the addition in Diameter of Gaharu Seedlings 3 Months After Planting

Source Of Diversity	Degrees of Freedom	Number Of Kuads	Middle square	Count factor	Table factor 5%
Treatment	2	3.208	1.6046	18.870	4.1
Error	9	0.765	0.085		
Total	11	3.973			

Description *=Significant

In Table 3 it shows that the treatment of two types of organic fertilizer on the growth of the agarwood seedlings on the height increase, then a further test was carried out with the Honest Significant Difference Test (BNJ) at the 5% level in Table 4.

Table 4. Results of the Honest Significant Difference Test (BNJ) on the Average Diamete addition (mm) of Gaharu Seedlings 3 Months After Planting

Treatment	Average	BNJ
K2	0.725 a	0.68
K3	0.45 b	
K1	0.375 b	

Description: Numbers followed by unequal Letter Notations are Significantly Different on the 5% BNJ Test



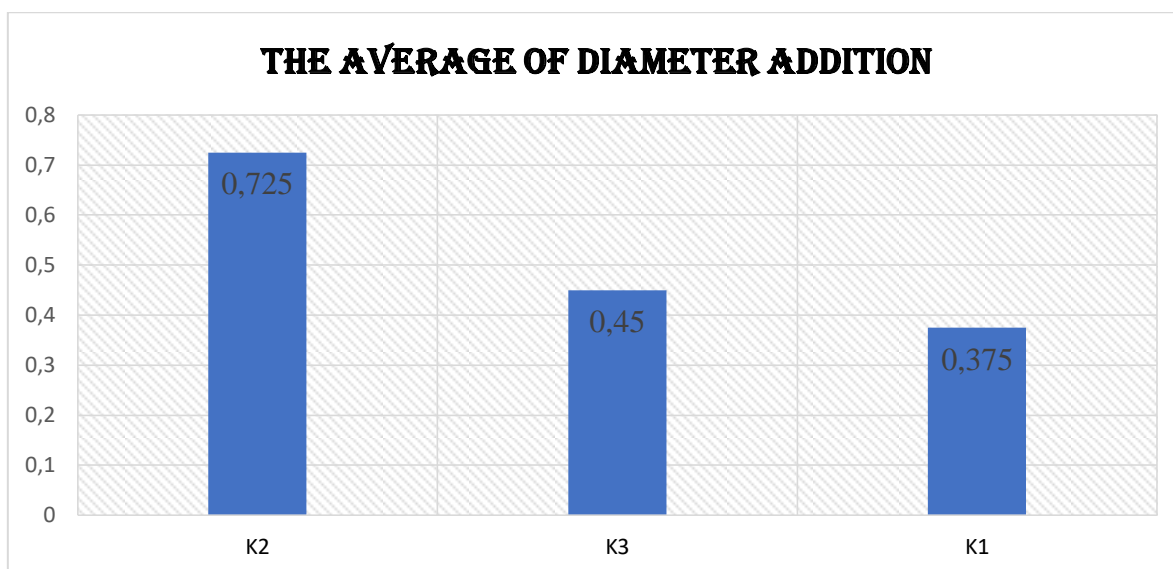


Figure 2. Diagram of the average diameter addition gaharu seedlings for each treatment

Number Of Leaves Addition

Table 5. Results of Analysis of Variety of addition in Diameter of Gaharu Seedlings 3 Months After Planting

Source Of Diversity	Degrees of Freedom	Number Of Kuads	Middle square	Count factor	Table factor
					5%
Treatment	2	48.5	24.25	0.3153 ^{ns}	4.1
Error	9	692	76.8889		
Total	11	64			
Description ns =Not Significant					

Table 5 shows that the treatment of the two types of organic fertilizers did not have a significant effect on the increase in the number of leaves, so further tests were not carried out. The average increase in the number of leaves can be seen in Table 6.

Table 6. The Average addition Number of Leaves of Gaharu Seedlings 3 Months After Planting

Treatment	Average
K2	10.25
K3	7.75
K1	6



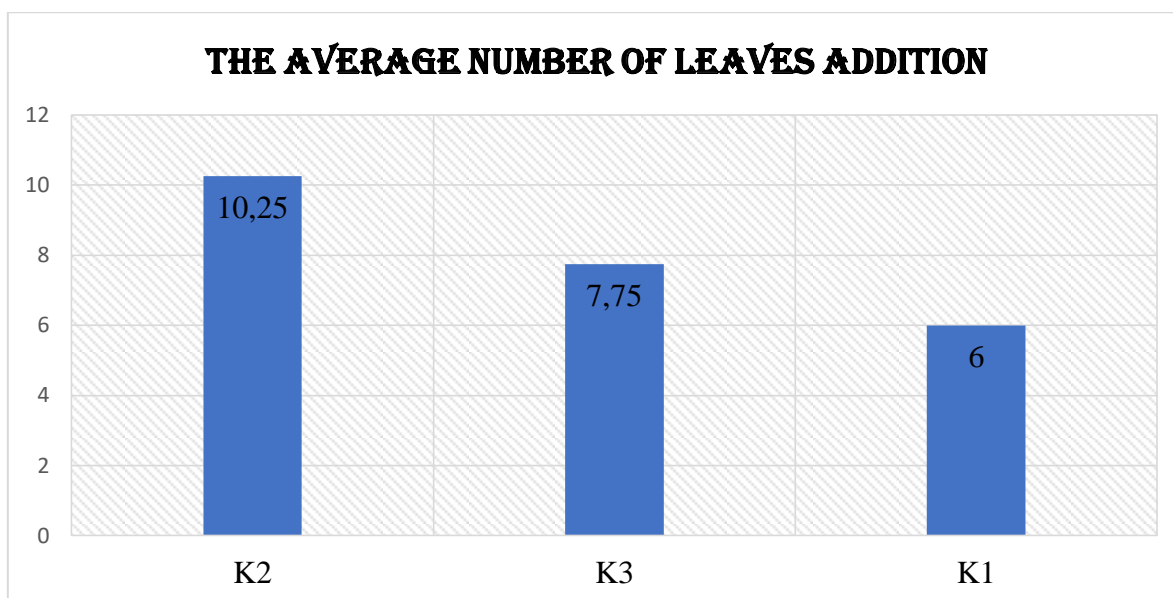


Figure 3. Diagram of the average addition in the number of gaharuseedlings for each treatment

The results showed that the application of various types of organic fertilizer had a significant effect on the growth of height and diameter of the seedlings, compared to no treatment, but had no significant effect on the increase in the number of leaves. The results showed that the average increase in seedling height was K1 (Control) of 4.5 cm, K2 (Doami Organic Fertilizer) of 7.75 cm and K3 (Gresik Organic Fertilizer) of 6.75 cm. The average increase in seedling diameter was 0.725 K1, 0.725 K2, 0.45 mm K3. While the average increase in the number of leaves is K1 of 6, K2 of 10.25 and K3 of 7.75.

Treatment of various types of organic fertilizers in the K2 treatment (Doami) gave a better effect on the increase in height, diameter and number of leaves compared to Gresik organic fertilizer and no treatment. It is presumed that DOAMI Fertilizer is made from fermented fresh manure and quality natural ingredients and is enriched with natural microorganisms which are propagated by organic media. Doami organic fertilizer contains high nutrients for plant growth. Doami Fertilizer contains 22.81% C-organic so it is easily absorbed by plants, resulting in faster growth. Fertilizer Compared to the C-organic content in petrogenic fertilizers of 15%. This is suspected to be the cause of the difference in growth. Doami organic fertilizer is also produced using cow dung. According to (Zuraida and Nuraini 2021) the application of cow manure compost has a significant effect on the chemical properties of the soil, increasing height, diameter and number of leaves. Plant height, diameter and number of leaves are measurements that are often





observed both as growth indicators and as parameters used to measure environmental influences or treatments applied. This is based on the fact that the height, diameter and number of plant leaves are the most easily observed growth measurements (Riawati, et al 2022).

Addition the number of leaves requires nutrients, especially nitrogen as a form of leaf tissue, chlorophyll which can improve the quality of plants to produce many leaves. The existence of leaves on plants in addition to photosynthesis is also to stimulate roots and strengthen the effect of fertilizer application. The presence of leaves also affects the viability of the seedlings, because the seedlings lose water more quickly due to the transpiration process, so the plants wilt and dry quickly. In addition, fully developed leaves provide materials for growth through the process of photosynthesis (Hartatik, et al 2020).

4. CONCLUSSION

Application of various types of organic fertilizers on the growth of gaharu seedlings in the field has a significant effect on the increase in height and diameter, but has no significant effect on the increase in the number of leaves. The K2 treatment (Pupuk Doami 2 Kg) gave a better effect with an average increase in height of 7.75, an average increase in diameter of 0.72 and an average increase in the number of leaves of 10.25

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