Growth of *Arengapinnata* Seedlings on Three Different Media

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Growth of *Arengapinnata* Seedlings on Three Different Media

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Abstract. Aren (*Arengapinnata*) trees are the second most important palm trees in Indonesia. However, little information on the effect of media on growth of aren (sugar palm) tree seedlings. The growth of six monts old seedlings on three media, namely soil, soil+Trichocompost, and sawdust+Trichocompost was studied. It was found that the growth of seedlings 45 days after replanting on soil+Trichocompost was higher than that of on sawdust+Trichocompost; However, the growth of the seedlings on soil media was not significantly lower than that of on soil+Trichocompost, nor significantly higher than that of on sawdust+Trichocompost.It was recommended that soil+Trichocompost and sawdust+Trichocompost can be used for aren seedling growing media.

1. Introduction

Aren (*Arengapinnata*) is one of important smallholder industrial palm trees in Indonesia. However, most of the trees donot been planted from seeds. The trees grow naturally on household field, on forests and on other marginal land sites [1].Most farmers replanted seedlings that they found grown naturally on forests or others siteson their backyards or on their own lands [2]. The aren trees are the second most important palm trees in term of the number of plants, distribution areas and economic values. The most economic share for the farmer is brown sugar made from sap of flower stems. Price ofarenbrown sugar is higher than that of coconut brown sugar or cane white sugar and farmers can get 1-2 kg sugar per plant per day. The sap can also be fermented for making ethanol or beverage. Processed endosperms of young fruits of aren are eaten as cocktail, local refreshment, and medicine for curing many diseases. Flour of aren stems is natural edible food, and the leaf sheath is a source of a tough, black fibre [3].

Most farmers did not cultivate the arentrees intensively.The trees grew naturally, without fertilizer and pesticide application[4]. Most farmers did not germinate the aren seeds on nursery beds since germination takes 1- 2 months and 8-10 months for the seedling can be replanted on polybags or even 2-3 years for seedlings ready to be planted in fields [5].

Little information on goodmedia for germinating and raising seedlings of aren. Good growing media should support plant growth, holds water and nutrients, good drainage, and should not easily degraded [6]. Soil was one of media commonly used in nursery, however it heavy. Organic materials commonly were added to lighter and improved the quality of soil media. Some of the organic materials were compost, cocopeat, charcoal, and sawdust [7]. Compost is degraded organic materials that turns into humus-like materials. It is produced in household and industrial sites. It contains

essential macro and micro nutrients needed by plants. In some cases it contains heavy metals and harmful products. However, nutrient content of compost varied [8].SNI number 19-7030-2004 is Indonesian standard of domestic compost. It should contain at least 0.4% Nitrogen, 0.1% P_2O_5, 0.2% K_2O, and C/N ratio in the range of 10-20 [9]. Commercial organic fertilizers based on Ministry of Agriculture decree number 261/KPTS/SR.310/M/4/2019 should contain at least 2% of Nitrogen+P_2O_5+K_2O and C/N ratio 25 [10]. Addition of organic fertilizer increased number of leaves, but it did not increased the height of seedlings of aren [11]

Sawdust was the cheapest organic material, since sawdust is one of industrial sawmill waste that dumped on sawmill sites and it becomes breeding site of *Orictesrenoceros,* the pest of coconut and others palm trees. Some finding on the effect of sawdust based media on germination, growth and yield of crops varied. Growth and yield of shallotgrown on sawdust were lower than that of on rice husk charcoal and on cocopeat [12]. Other study found that vegetative characters of papaya seedlings grown on soil+sawdust (1:1) was the lowest compare to that of on soil+compost (1:1); soil+compost+ husk charcoal (1:1:1); soil+compost+cocopeat (1:1:1); or soil+compost+Albasia sawdust (1:1:1) [7]. High soluble tannin in the sawdusk might retard the growth of plants [5]. Soaking sawdust with water and pouring the water every day for removing the soluble tannin for 7 days resulted in that height of seedlings of pepper grown on sawdust that has been soaked for 7 days was better than that of grown on soil [13].

This research studied the growth of sugar palm seedlings on three different media, namely soil, soil + trichocompost(1:1 v/v), and sawdust + Trichocompost(1:1 v/v). Substitution of soil with trichocompost and sawdust reduced the weight of the media. It will reduce cost for transporting the seedlings.

2. Materials and methods

The experiment was carried out in polybags, atSokaraja Tengah village, Sokaraja, Banyumas. It was carried out from April until June 2021. Six monts old of seedlings on 10 cm diameter polybags were bought from a local farmer from Sunyalangu village, Banyumas, Central Java, Indonesia. The seedlings were replanted on 20 cm diameter polybags filled with media according to the treatments.One seedling in each polybag.

Anonfactorial experiment with sixteenth replications was arranged in Randomized Complete Block Design. The treatment was types of media i.e. soil, soil+Trichocompost (1:1 v/v), and sawdust+Trichocompost (1:1 v/v). The thichocompost contains 1.8% Nitrogen, 1.04 % P_2O5, 1.3 % K_2O and 175 organic C. The trichocompost has C/N ratio of 10-15. Observed variables were plant height and height of new buds. ANOVA was used for analyzing data followed by Least Significantly Different (LSD) if F test was significant

3. Results and discussion

Table 1.plant height of seedlings grown on different media

Media	Plant height (cm)		
	1 st observation	2nd observation	3rd observation
sawdust+trichocompost	36.7a	48.1a	50.6a
Soil	35.7a	45.3a	55.1ab
soil+trichocompost	37.6a	41.5a	62.0b
LSD 0.05	4.83	7.19	8.68

Table 1.showed that the height of seedlings of aren grown of all media in the first and second observation was not significantly different. However in the third observation the height of seedlings of

aren grown on soil+Trichocompost was heigher than that of on sawdust+Trichocompost, but it was not significantly different to the height of aren seedlings grown on soil. This finding supported the finding that addition of organic fertilizer did not improved the growth of seedling of aren [11] The height of aren seedlings grown on sawdust+Trichocompost was not significantly lower than that of on soil+trichocompost. Figure 1.showed that the height of aren seedlings has a linear relationship to the time of observation.

Average height of new bud of seedling on all media on the third observation did not significantly different. The average height of new bud of seedlings grown of sawdust+Trichocompost, soil, and Soil+Trichocompost was 18.03 cm, 18.62 cm. and 15.77 cm respectively. This finding supported the finding that sawdust could be used for media of chilli [12] and shallot [13] but contrary to the finding that papaya seedling grown on sawdust+compost+soil without nutrient solution addition was the lowest [7].

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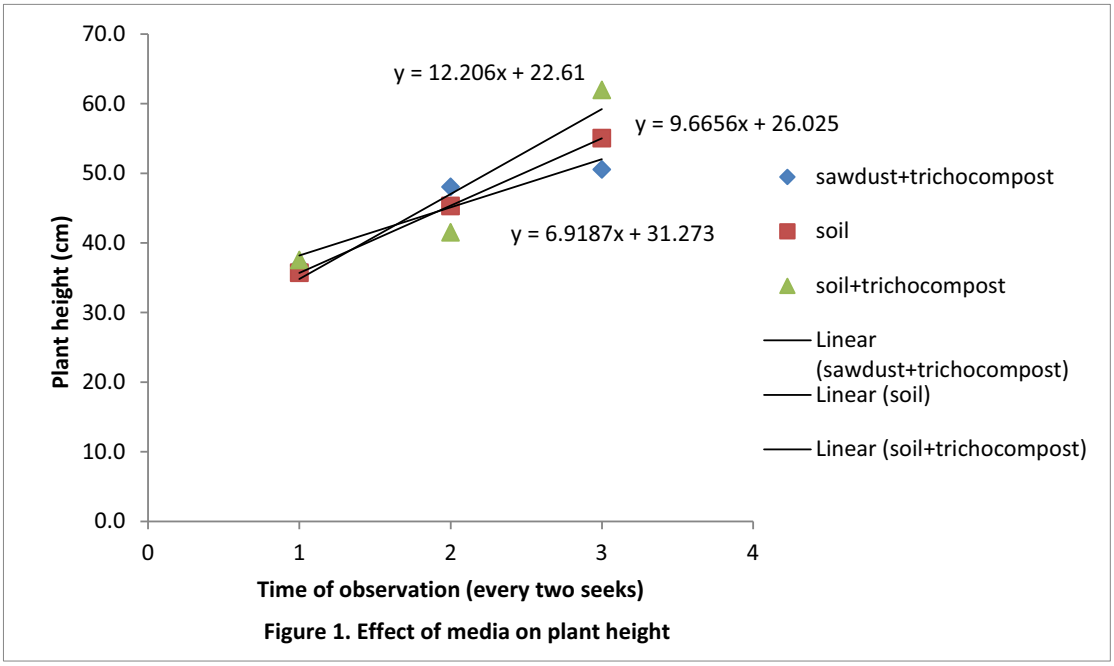

Figure 1. Effect of media on plant height

4. Conclusions

Substitution of 50% of soil with trichocompost improved the growth of seedlings. There is possibility that media consisted of soil+trichocompost is the best media for growing seedling of aren plants, The growth of seedlings on saw dust+trichocompost media waslower than that of in soil+trichocompost, but the growth of seedlings on saw dust+trichocompost media was similar tothat of on soil

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