THE EFFECT OF FOLIAR SPRAY APPLICATION ON YOUNG SAGO PALM GROWTH AT PT. NATIONAL TIMBER AND FOREST PRODUCT, SELAT PANJANG, RIAU

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ABSTRACT

Sago palm is one of plant which is produce carbohydrate from the trunk. Sago palm in peat land showed symptoms of mineral deficiency. Because of that, sago palms need fertilizers to support its growth. The objective of the experiment was to know the effect of various foliar spray applications on young sago palm growth. The experiment was conducted at PT. National Timber and Forest Product, from February 2009 – August 2009. Foliar spray was applied on young sago palm. Complete Block Randomized Design with three repetitions and four treatments was used. The treatments were T1 (Biogronic D, 5 cc/l), T2 (Gandasil D, 2 g/l), T3 (JMT, 2 cc/l), and T4 No fertilizer (as control). The results indicated that all foliar spray treatment did not have any effect on young sago palm growth. It is possible that the effects of water level, weed control, and sucker pruning were more dominant than fertilizer treatment.

Keywords: young sago palm, foliar spray, effect, growth

INTRODUCTION

Sago palm is one of plant which is produce carbohydrate from the trunk. Sago palm produces a higher yield of starch than any other crops. It can be 200-400 kg/trunk. Sago starch can be used as staple food, snack raw material (empek-empek, bakso, onde-onde, dodol, and cendol). Sago starch is also used as raw material for various food industries, fish, and animal feed, handy craft, and as industry raw material (Bintoro, 2000). Sago starch can be raw material for bio ethanol and biodegradable plastic.

Sago palm can grow at marginal area that the other crops can not grow. Naturally, sago palm can grow at river bank, swampy areas, humid soil and peat land. Sago palm at peat land differs than sago palm grown on mineral soil especially on the growth and starch production. Sago palm in peat land indicates mineral deficiency. Peat land is extremely poor in nutrient content. Although the sago palm can grow in peat land, but the starch production may be lower per unit time and area (Flach *in* Jong, 2000). Sago palm may take 17 years to reach maturity. The trunk production in deep peat estimated at 15-20 tons per hectare per year as compared to that of 25-40 tons on mineral soils (Jong, 2000). Because of that, sago palm in peat land need fertilizer to supports its growth.

Fertilizer based on the application is classified to be root fertilizer and foliar spray. Root fertilizer is applied to pass soil, while foliar spray is applied to pass leaf. Foliar spray has several benefit, one of them is foliar spray absorption quicker than the absorption of the root fertilizer. Foliar spray included inorganic fertilizer which consists of macro and micro nutrient. It is expected, the added of foliar spray on young sago palm can increase the sago palm growth so the trunk production can be accelerated.

According to the past studies, fertilizer application on sago palm did not significantly affect sago palm growth (Kakuda, *et al*, 2005 and NTFP, 2008). This fertilizer is applied to pass soil (root fertilizer). Because the root fertilizer did not influence the sago palm growth, it is necessary to study new fertilizing experiment using foliar spray.

The objective of the experiment is to know the effect of various foliar spray applications on young sago palm growth.

MATERIALS AND METHODS

The experiment was conducted at PT. National Timber and Forest Product, from February-August

2009. Foliar spray applied on young sago palm leaf. Completely Randomized Block Design with three replications is used. The treatments were T1 (Biogronic D, 5 cc/l), T2 (Gandasil D, 2 g/l), T3 (JMT, 2 cc/l), and T4 No fertilizer (as control).

RESULTS AND DISCUSSION

The result indicated that all foliar spray treatments did not affect young sago palm growth. It is possible that the concentration of foliar spray is too low, application period which too long (once a month), weather condition, and environment condition around the plants affect young sago palm growth. According to the monthly observations the young sago palm growth has increase on leaf number, petiol length, and sucker high variable (**Figures 1, 2, and 3**).

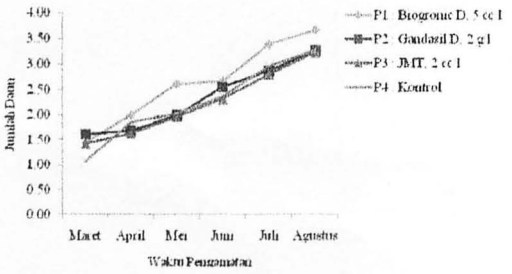

Fig 1. Leaf Number of Young Sago Palm Growth

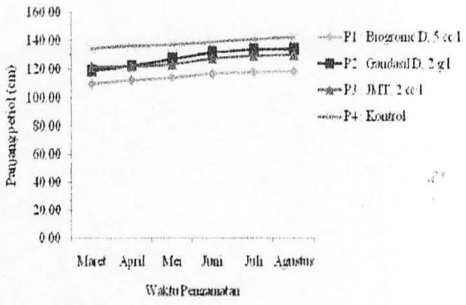

Fig 2. Petiol Length of Young Sago Palm Growth

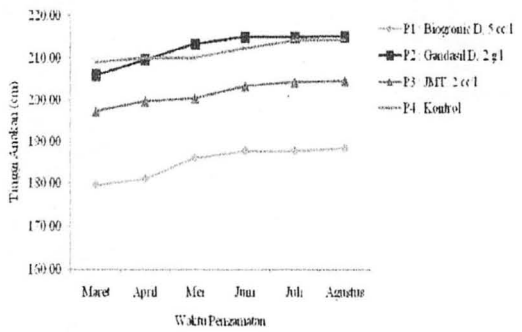

Fig 3. High Sucker of Young Sago Palm Growth

The foliar spray treatments did not affect the rate growth of young sago palm too. But, according to the monthly observations, the young sago palm growth has increase on leaf number, petiol length, and sucker high variable (**Figures 4, 5,** and **6**).

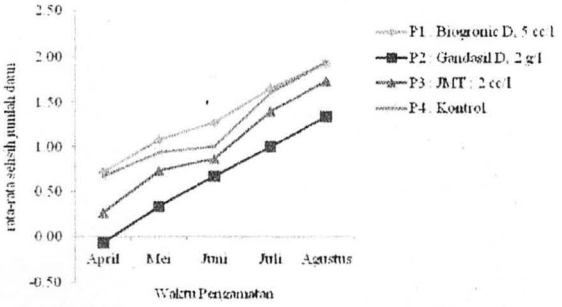

Fig 4. Leaf Number Rate Growth of Young Sago Palm

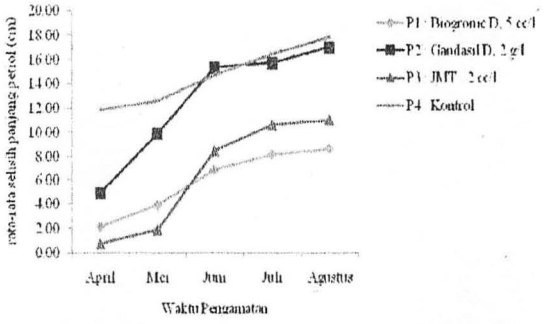

Fig 5. Petiol Length Rate Growth of Young Sago Palm

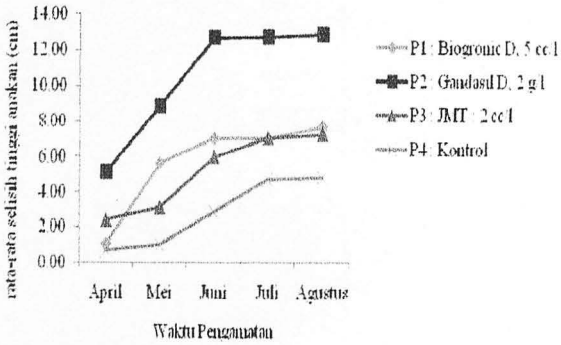

Fig 6. Sucker High Rate Growth of Young Sago Palm

Theoretically, the fertilizer foliar spray is more effective than the root fertilizer. Proper application period and foliar spray concentration can increase the effectiveness of plant nutrient absorption. Foliar spray is usually applied more often than root application. But, in sago palm proper application period and foliar spray concentration is not yet known so it still necessary to conduct further experiment. It is possible that the concentration of foliar spray is too low so that nutrient which can be adsorbed by plant is very small. Beside that, foliar spray is given in once a month so it is not effect the young sago palm growth.

Sago palm growth is affected by several factors such as weeds, insect and disease. It can reduce potential production of sago palm. The other factors are nutrient, plant spacing, leaf direction, and variety. Plants management is aimed to get maximum production (Harjadi, 1996). The dominant limiting factor in sago palm plantation at PT. National Timber and Forest Product are weeds and high number of suckers. Data on water and nutrients are unavailable. Imbalance factors cause sago palm growth not optimal. The young sago palms which were applied with foliar spray were still attached on their mother plants so that the growth of young sago palm still influence by mother plants. Peat land has high cation exchanges capacity (CEC : 46.59-74.22 me/100 g) but low percentage of alkali saturation (5.75-7.69 %) so that causes the soil pH is very low (pH3.1-4.0). The low pH in soil can retard availability of nutrient. This causes sago palm at PT. National Timber and Forest Product to have nutrient deficiency. Therefore, although young sago palms still get supply energy from their mother plants, the growth is still limited. Thus, young sago palm still need additional nutrient.

High air temperature also influenced foliar spray effectiveness. By the end of the experiment, weather condition began to change. The rainfall was few and the temperature was very hot. The average temperature at experiment at location was around 26.0-27.4°C. The temperature during daytime is more than 30°C (very hot). The condition causes the nutrient treatments that were applied on sago palm leaves has evaporated, so that fertilizer treatment can not increase the sago palm growth rate.

Environment factors such as uncontrolled weeds, too much sucker, low water level (>50 cm under soil surface) were more dominant in influencing the sago palm growth than fertilizer treatment.

CONCLUSION

The application of foliar spray did not influence the young sago palm growth. It is possible that the effects of water level, weed control, and sucker thinning were more dominant than fertilizer treatment.

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REFERENCES

1. Bintoro, H. M. H. 1999. Pemberdayaan Tanaman Sagu sebagai Penghasil Bahan Pangan Alternatif dan Bahan Baku Agroindustri yang Potensial dalam Rangka Ketahan-an Pangan Nasional. Institut Pertanian Bogor. Bogor. 70 hal.
2. Bintoro, H. M. H. 2000. Country reports of Indonesia : Sago situation in Indonesia. Proceeding of The International Sago Seminar. UPT Pelatihan Bahasa IPB. Bogor. 26-29 p.
3. Harjadi, S. S. 1996. Pengantar Agronomi. PT. Gramedia Pustaka Utama. Jakarta. 197 hal.

4. Kakuda, K, A. Watanabe, H. Ando, F. S. Jong. 2005. Effects of fertilizer appli-cation on the root and aboveground biomass of sago palm (*metroxylon* spp.) cultivated in peat soil. Jpn. J. Trop. Agr. 49(4) : 264-269.
5. Jong, F. S. 2000. Revolutionizing sago palm cultivation : a mission of PT. N. T sago plantation. Proceeding of The International Sago Seminar. UPT Pelatihan Bahasa IPB. Bogor. 94-102 p.