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619-623Growth Response of Boots Resulting from Grafting of Rambutan Plants (Nephelium Lappaceum L.) on Various Concentrations of Young Coconut Water

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ABSTRACT

This research aimed to determine the response of giving young coconut water to the growth of shoots resulting from grafting of rambutan plants. This research was carried out in Taruncue Hamlet, Alenangka Village, South Sinjai District, Sinjai Regency. This research was carried out using a Randomized Block Design (RAK) consisting of 4 treatments with 3 replications, so there were 12 experimental units. Each unit consists of 6 plants, so the total number of experimental plants is 72 experimental plants. The treatment consisted of: A0: Control, A1: 75 ml of young coconut water/liter of water, A2: 100 ml of young coconut water/liter of water, A3: 125 ml of young coconut water/liter of water. The results of the research showed that in the treatment of various concentrations of young coconut water that had the best influence on the growth of buds resulting from grafting of rambutan plants, there was a concentration of young coconut water of 100 ml of young coconut water/liter of water (A2) and had a very significant effect on the parameters of shoot length (5.67 cm), number of leaves (10.72 pieces) and a significant effect on shoot diameter (1.93 mm).

Keywords: Rambutan, Grafting, Young Coconut Water

I. INTRODUCTION

Rambutan is a horticultural fruit plant in the form of a tree with the Sapindacaeae family. In English, this tropical fruit plant is called Hairy Fruit and comes from Indonesia. Until now, it has spread widely in areas with tropical climates such as the Philippines and Latin American countries and is also found on land that has a sub-tropical climate. Rambutan fruit plants are deliberately cultivated to use their fruit which has nutrients, starch, a type of sugar that is easily dissolved in water, protein and amino acids, fats, essential and non-essential enzymes, vitamins and macro and micro minerals that are healthy for the family. but there are also some people who use it as a protective tree in their yard, as an ornamental plant. A collection of techniques to produce new individuals without mating with human assistance[1].

A vegetative method of reproduction (without mating) which does not occur naturally but is created or deliberately caused by humans. Grafting is often also

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called sticking, the method of propagating plants by grafting has advantages compared to cuttings and grafts. The advantages include that the grafting results have good quality from the parent, it can be said that because the grafting is carried out on plants that have good roots, are resistant to pest and disease attacks combined with plants that have delicious fruit taste, but have poor roots. Growth regulators play a role in plant growth and development for their survival. Regarding this, Went (a German physiologist) has stated that "ohne werchstooff, kein waschstum" means that without growth stimulants there is no growth [2]

Giving substances from outside the individual's system is also called exogenous hormones, namely by providing synthetic chemicals that can function and ac ike endogenous hormones, so that they can cause stimulation and influence on plants like natural phytohormones. On the other hand, growth regulators can function as precursors, namely compounds that can precede the rate of other compounds in the metabolic process and are part of the genetic process of the plant itself. Along with the development of science and technology and the importance of intensification in cultivation in the agricultural sector, ZPT is widely used primarily to increase the quality and quantity of production results [3].

Coconut water is a natural ingredient that contains the hormone cytokinin 5.8 mg/l, auxin 0.07 mg/l [4]. From the research results, it was stated that the natural ingredient type 50% coconut water resulted in faster germination time, shoot length, number of leaves and high root wet weight [5]. Apart from that, coconut water also contains growth regulators in the form of the hormones auxin and gibberellin, so it can stimulate growth [6]. These two sources of growth regulators can replace synthetic root stimulants.

II. METHODS AND MATERIAL

This research was structured using a Randomized Block Design (RAK) consisting of 4 treatments with 3 replications, so there were 12 experimental units. Each unit consists of 6 plants, so the total number of experimental plants is 72 experimental plants. This treatment consists of:

A0 : Control
A1 : 75 ml young coconut water/liter of water
A2 : 100 ml young coconut water/liter of water
A3 : 125 ml young coconut water/liter of water

Research activities include the following stages

1. The grafted rambutan seeds that were treated in this study were grafted seeds that were 6 months old and came from official seed breeders.

2. Ways and Time to apply Growth regulator, (1) Application of growth regulator young coconut water is sprayed at a dose according to the treatment with a number of plants of 6 per bed. (2) Spraying time is carried out in the morning, namely from 08.00 until finished

III. RESULTS AND DISCUSSION

1. Shoot Length

Shoot length and variety are presented in appendix tables 1. Variety tests showed that treatment with various concentrations of young coconut water had a very significant effect.

Table 1. Average shoot length of rambutan plants at various concentrations of young coconut water

Concentration ($^{-1}$ml)	A0	A1	A2	A3
Average	1,77^{c}	2,36^{b}	5,67^{a}	3,56^{b}
Np BNJ 0,05	0,24			

Note: Numbers followed by the same superscript letter (a, b, c) are not significantly different at the BNJ test level = 0.05

Table 1 shows that the average shoot length of the longest rambutan plants was found in the young coconut water concentration treatment of 100 ml/liter of water (A2), namely 5.67 cm, which was significantly different from the other treatments. Meanwhile, the shortest shoot length of rambutan plants was found in the treatment without a concentration of young coconut water (A0) or the control, namely 1.77 cm.

2. Number of Leaves

The number of leaves and their variety are presented in appendix tables 2. Variety tests showed that treatment with various concentrations of young coconut water had a very significant effect.

Table 2. Average number of rambutan plant leaves (strands) in various concentrations of young coconut water

Concentration ($^{-1}$ml)	A0	A1	A2	A3
Average	6,94^{b}	7,94^{b}	10,72^{a}	8,81^{b}
NP BNJ 0,05	0,56			

Note: Numbers followed by the same superscript letter (a, b) are not significantly different at the BNJ test level = 0.05

Table 2 shows that the average number of leaves of rambutan plants was highest in the young coconut water concentration treatment of 100 ml/liter of water (A2), namely 10.72 strands, which was significantly different from the other treatments. Meanwhile, the lowest number of rambutan plant leaves was found in the treatment without a concentration of young coconut water (A0) or the control, namely 6.94 pieces.

3. Shoot Diameter

Shoot diameter and variety are presented in appendix tables 3. Variety tests showed that treatment with various concentrations of young coconut water had a significant effect.

Table 3. Average shoot diameter of rambutan plants (mm) at various concentrations of young coconut water

concentration ($^{-1}$ml)	A0	A1	A2	A3
Average	1,47^{c}	1,68^{a}	1,93^{a}	1,75^{a}
Np BNJ 0,05	0,23			

Note: Numbers followed by the same superscript letter (a, b) are not significantly different at the BNJ test level = 0.05

Table 3 shows that the largest average shoot diameter of rambutan plants was found in the young coconut water concentration treatment of 100 ml/liter of water (A2), namely 1.93 mm, which was not significantly different from the other treatments. Meanwhile, the smallest shoot diameter of rambutan plants was found in the treatment without a concentration of young coconut water (A0) or the control, namely 1.47 mm.

Discussion

Treatment with a concentration of young coconut water of 100 ml/liter of water had the best effect on the number of leaves resulting from grafting of rambutan plants. This is caused by. This is because at this dose there is sufficient cytokinin hormone found in coconut water which plays a role in encouraging cell division and tissue differentiation in stimulating shoot growth. Coconut water contains zeatin which is known to be included in the cytokinin group and apart from cytokinins, the role of auxin contained in coconut water which is absorbed by plant tissue will activate food reserve energy and increase cell division, elongation and cell differentiation. ultimately forms shoots and plays a role in the process of shoot elongation [7].

Treatment with a concentration of young coconut water of 100 ml/liter of water had the best effect on the number of leaves resulting from grafting of rambutan plants. This is because the use of young coconut water as a natural PGR at a dose of 100 ml/liter of water is the right dose and will have a good influence on plant growth, however if the amount is too large it will actually be detrimental to the plant. Number of leaves is closely related to plant height or shoot length, the longer the shoots, the

more leaves can be formed, because leaves are formed from the nodes where the leaves are located on the stem [8]. This is related to the growth and development of the number of leaves which is influenced by genetic and environmental factors. Environmental factors that the rate of leaf formation is relatively constant if plants are grown in constant conditions [9]. The number and size of leaves is influenced by genotypic and environmental factors. The environment is constant, then the primordial leaves appear at the tip of the stem at a constant rate [10].

Treatment with a concentration of young coconut water of 100 ml/liter of water had the best effect on the diameter of shoots resulting from grafting of rambutan plants. This is because the graft growth in diameter is influenced by the hormones contained in young coconut water. Variations in the growth of grafted seedlings in plants are not controlled by the same genes or physiological mechanisms but are influenced by many factors. These include plant anatomical factors, carbohydrate content in plant parts, the effects of phytohormones and others [11]. Growth regulators applied to plants function to stimulate the formation of phytohormones. Hormones can encourage biochemical activity and phytohormones as organic compounds that work actively in small amounts are usually transformed to all parts of the plant so that they can influence plant growth or physiological processes [12].

Concentration treatment with young coconut water gave the best effect on the growth of shoots resulting from grafting of rambutan plants. This is because the dose of 100 ml/liter of water is not too high and is sufficient so that it can stimulate good seedling growth. Excessive use of growth regulators will be toxic, resulting in stunted growth, even resulting in failure of shoot growth. Hormones in sufficient concentration can stimulate seedling growth, but if the concentration is higher it will actually inhibit seedling growth [13].

IV. CONCLUSION

The treatment with various concentrations of young coconut water that gave the best effect was young coconut water with a concentration of 100 ml of young coconut water/liter of water (A2) and had a very significant effect on the parameters of shoot length, number of leaves and had a significant effect on shoot diameter.

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