Benzyl Amino Purine (BAP) Growth Regulator Application and Shoot Origin Stem Lai (*Durio kutejensis*) Against Growth Durian (*Durio zibethinus* Murr) Grafting Seedlings

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ABSTRACT
This study aims to determine the concentration of Benzyl Amino Purine (BAP) and the exact origin of scion shoots to optimize the growth of durian (*Durio zibethinus* Murr) grafting seedlings. This study was arranged in a completely randomized design (CRD) consisting of two factors with four replications. The first factor is the concentration of BAP, consisting of four levels, namely: 0 ppm, 125 ppm, 250 ppm and 375 ppm. The second factor is the origin of shoots, consisting of 3 levels, namely 10 cm from the shoot, 20 cm from the shoot and 30 cm from the shoot. The data obtained were analysed using variance and continued with the Least Significant Difference (LSD) test at the 5% level. The results showed that there was an interaction between the concentration of BAP treatment and the origin of Lai (*Durio kutejensis*) shoots on the growth of durian seedlings. The interaction of 125 ppm BAP concentration and 30 cm shoot origin from the shoot were the best treatments in optimizing the growth of durian seedlings. Giving BAP concentration affects the growth of durian seedlings. The concentration of BAP 125 ppm is the best treatment concentration in optimizing the growth of durian grafting seedlings. The use of stem shoots from lai (*Durio kutejensis*) has an effect on the growth of durian seedlings. The origin of scion shoots 30 cm from the shoot is the best treatment of shoot origin in optimizing the growth of durian grafting seedlings.

Keywords: *Durian (Durio zibethinus), Lai (Durio kutejensis), Benzyl Amino Purine, Origin of shoots, Grafting.*

1. INTRODUCTION

Durian (*Durio zibethinus* Murr) is a type of fruit native to thr archipelago with avery large genetic diversity. This makes Indonesia a country with the best durian potential in the World. Until now, it is known about 30 types of wilde durian, especially on the Island of Borneo. Lai *(durio kutejensis)* is one of them that have been widely introduced. The richness of endemic fruit plant species such as local durian in West Kutai Regency is an essential genetic source or germplasm in the context of perfecting the types that have been cultivated and as a basic material for the Development of new species or varieties. In addition to the Exploration of forest Resources, forest destruction and lack of knowledge of the Economic potential of these plants have caused the endemic fruit plant Resources to be threatened with extinction.

Seeds are an important element in the cultivation of superior durian plants. One way to obtain these seeds is done by vegetative propagation, namely grafting. Grafting is a vegetative propagation technique by attaching the scion (entres or scion) which consists of

only one bud to the rootstock. Propagation through grafting is mostly done for woody plants as well as expensive and exclusive plants because it is more efficient in providing plant material for scions [2].

The Holai Sentawar durian variety is a durian produced by grafting by combining the rootstock of an ordinary local durian (*Durio zibethinus* Murr) and the scion of another durian (*Durio kutejensis*). The Holai Sentawar durian variety has been declared a national superior variety fruit seed by the center for Plant Variety Protection and Agricultural Licensing of the Ministry of Agriculture. The Holai Sentawar durian variety was submitted by the West Kutai Regent in October 2014 [3].

Vegetative propagation of durian plants, especially grafting, can be accelerated by the adding growth regulators. Growth regulators commonly used are cytokinin. cytokinin's are growth regulators used in plant nurseries because they play an important role in cell division in tissues, stimulate lateral shoot growth, encourage leaf expansion and encourage chloroplast development [4].

The growth regulators for the scion buds influenced by the origin of the shoots which showed the level of stem aging in one twig. End Entres have the fastest growth rate because of the high content of growth hormones (cytokinin and auxins) so that they can stimulate faster cell division. The higher the hormone up to a certain limit, the shoot growth rate increases, but at higher concentrations the shoot growth rate slows down. This is related to hormonal imbalances, especially in the cambium cells because the rootstock is getting harder, the cambium cells less active, so shoot growth also slows down [5].

2. MATERIALS AND METHODS

2.1. Materials

This research was carried out for 4 months (four) months, from February to May 2020. The research site is at the Anum Lio Foundation in Bigung Baru Village, Linggang Bigung District, West Kutai Regency.

The tools used in this study were grafting knife, PE (Polyethylene) plastic/grafting tape, 20 cm x 20 cm polybag, 250 ml volumetric flask, cotton, sprayer, calliper, stationery and paperboard for labels.

The materials used in this study were durian rootstock seeds (*Durio zibethinus* Murr) aged 8-12 months, scion shoots (entrees) durian lai (*Durio kutejensis*), ZPT BAP, aquadest, alcohol, planting media consisting of soil, husks and manure, NPK fertilizer (15-15-15), and pesticides (Fungicide Decis 2.5 EC and Insecticide Dithane M-45).

2.2. Statistical Analysis

This study is a factorial experiment, arranged in a Completely Randomized Design (CRD) and each treatment was carried out with 4 groups as replicates. The treatment combinations were as follows: The first factor was BAP concentration (k), consisting of 4 levels, namely k0 = 0 ppm, k1 = 125 ppm, k2 = 250 ppm and k3 = 375 ppm. The second factor of shoot origin (t), consists of 3 levels, namely t0 = 10 cm from the shoot, t1 = 20 cm from the shoot and t2 = 30 cm from the shoot. The research data were analyzed using variance followed by the Least Significant Difference (LSD) test at the 5% level.

2.3. Research Procedure

The seeds needed for this study were ±96 plant seeds (including seed reserves). Rootstock seeds used for grafting are local durians that grow from swept (ilegitim) seeds from lembo or traditional fruit gardens of the Dayak people in West Kutai Regency. Seedlings have been selected according to the rootstock requirements, which are protected from pests and diseases, not stunted or bent, stems and leaves are not dry, rootstock bark is easy to peel, 0.8-1 cm in diameter and 8-12 months old.

The origin of the scion shoots (entrees) used comes from the durian lai (*Durio kutejensis*) plant. Entres taken were woody stems by comparing the original growth yield of 10 cm from the shoot, 20 cm from the shoot and 30 cm from the shoot. Entres come from healthy parent tree branches with a height of 3-5 meters from the ground. Entres are taken not during the hot sun so that the Entres do not dry out quickly.

Two weeks before grafting, polybags were replaced and planting media was added. The planting medium is a mixture of soil, husk and chicken manure with a ratio of 1:1:1. The distance between polybags is 10 cm x 10 cm.

This study used Forkert grafting which was carried out by slicing the rootstock transversely from left to right with a width of ± 1 cm then from the end of the transverse incision made longitudinal slices along the length of 3 cm. Peel the bark on the plane of the slices and cut some of the bark peeling until the remaining ± 0.5 cm. The distance between the grafting window and the soil surface in polybags is 15 cm. The shoots that have been taken are immediately attached to the grafting window on the rootstock. The shape of the bark containing the buds is adjusted to the shape of the grafting window.

The growth regulator used was Benzyl amino purine (BAP) type cytokinin with concentrations of 0 ppm, 125 ppm, 250 ppm and 375 ppm. It is given on 0 Days After Graduation (DAG) or at the time of grafting by spraying

BAP solution onto the surface of the skin of the buds that contain cambium, then the buds are attached to the grafting window according to the treatment. The results of the attachment buds that had been applied to BAP were tied with grafting tape with a width of 3 cm. The bond opening is done after 21 days of grafting, if the patched eye still looks fresh green and has been attached to the rootstock, it indicates successful grafting, but if the patched eye is brownish green or black, it indicates failed grafting. Then the rootstock is cut one week after the opening of the grafting plastic and the grafting has been confirmed to be alive, the top of the rootstock is cut at a distance of 1-1.5 cm from the grafting window.

Watering of plant seeds is done once a day, namely in the morning or evening and adjusts to the climatic conditions in the nursery. Plant fertilization was given when the plant was 4 weeks old after grafting using NPK pearl 16 N, 16 P2O5, 16 K2O fertilizer at a dose of 5 grams/plant and ZA fertilizer at a dose of 5 grams/plant. Pest and disease control was carried out by spraying every two weeks using the insecticide Decis 25 EC to control pests and the fungicide Dithane M-45 to control the fungus, each with a dose of 3 mL.L-1 of water.

Observations were made including the percentage of grafting success, the time of bud break, the appearance of the first leaf, the length of the grafting shoot, the diameter of the grafting bud, and the number of leaves.

3. RESULTS AND DISCUSSION

3.1. Percentage of successful grafting age 90 days after grafting (DAG)

Observation of the percentage of successful grafting using 8 groups as replicates. The results of the analysis of variance showed that the effect of BAP concentration and shoot origin was not significantly different while the interaction effect between the two was significantly different on the percentage of successful grafting of durian seedlings aged 90 DAG. The average time of rupture of the entrees eye can be seen in Table 1.

The results showed interaction between treatment of BAP concentration and shoot origin of lai (Durio kutejensis). The interaction of BAP concentration and shoot origin treatment resulted in the highest percentage of grafting success, namely 100%, found at 0 ppm BAP concentration and 20 cm shoot origin, 125 ppm BAP concentration and 30 cm shoot origin, and 250 ppm BAP concentration and 30 cm shoot origin. shoots.

Table 1. Percentage of successful grafting with BAP concentrations treatment and different shoot origins (%) 90 DAG age

Origin of shoots (cm)	Concentrations of BAP (ppm)				Average
	$k_0 = 0$	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	50 Aa	88 Bb	63 Aa	63 Aa	66
t1 = 20	100 Bb	63 Aa	63 Aa	63 Aa	72
t2 = 30	63 Aa	100 Bb	100 Bb	50 Aa	78
Average	71	83	75	58	

Notes: Numbers followed by the same letter in the same row and column show no significant difference in the LSD test at the 5% level (LSD kt = 0.11), the data analyzed is the result of the transformation $\sqrt{x} + 0.5$

The use of growth regulators can increase the percentage of finished seedlings because it can activate cambium activity, produce strong callus and increase linkage [6]. The success of grafting with 0 ppm BAP concentration or without BAP can occur because the endogenous cytokinin hormone content in plants is available according to plant needs. Natural cytokinin's are produced in actively growing tissues, especially in plant roots [7]. The growth rate of buds is determined by the activity of the cambium which is influenced by hormonal balance at the site of bud attachment so that the buds can burst and grow. The highest percentage of occupancy growth was found in the base and middle entrees. The root Entres have a higher carbohydrate content than the end Entres so that it can stimulate the growth of Entres [5]. The use of shoots of 10 cm, 20 cm and 30 cm from the shoots did not have a significant effect on each treatment because the food reserves in the three treatments of shoot origin were in a balanced state so that cell division, enlargement and differentiation also ran in a balanced manner [8].

Table 2. Average time of bud breakage with different concentrations of BAP and shoot origin (days)

Origin of shoots (cm)	Concentrations BAP (ppm)				Average
	k0 = 0	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	69.00	64.75	63.75	66.00	65.88
t1 = 20	69.75	63.75	61.75	65.00	65.06
t2 = 30	69.50	6.75	54.25	64.00	62.88
Average	69.42 c	64.08 b	59.92 a	65.00 b	

Notes: Numbers followed by the same letter in the same row show no significant difference in the LSD test at the 5% level (LSD k = 1.61)

3.2. When the eye bursts entrees (days)

The results of the analysis of variance showed that the effect of BAP concentration was significantly different, while the effect of shoot origin and the interaction between the two was not significantly different to the time of bud break of grafting durian seedlings. The average time of rupture of the entrees eye can be seen in Table 2.

The results of further analysis using LSD 5% the effect of BAP concentration on the time of rupture of the entrees eye showed that the concentrations of BAP 125 and 375 ppm were not significantly different, but the two treatments were significantly different with BAP concentrations of 0 and 250 ppm. The concentration of BAP which resulted in the fastest rupture of the entrees eye was found at a concentration of 250 ppm of BAP, which was 59.92 days, while the control produced the slowest time of rupture of the entrees eye, which was 69.42 days.

Observations at bud break in durian grafted seedlings showed that there was no interaction between the administration of BAP concentrations of 0 ppm, 125 ppm, 250 ppm and 375 ppm with the use of shoots of 10 cm, 20 cm and 30 cm from the shoot. This can happen because the concentration of BAP and the use of shoot origin that are applied are not appropriate or not in accordance with plant growth conditions. The effectiveness of growth regulators is not only determined by the concentration but also by the application according to the plant growth phase [9].

The effect of BAP concentration treatment on the time of rupture of the entres eye was very significantly different. Giving BAP concentration of 250 ppm tends to give the fastest entrees eye rupture compared to the treatment levels of 0 ppm (control), 125 ppm and 375 ppm. Giving BAP with a certain concentration was able to give effect to the time of rupture of the entrees eye. The rate of rupture of the entrees eye is thought to be due to the addition of cytokinin hormone (BAP) in sufficient quantities which can affect the process of cell division and help the formation of callus into new shoots [11]. cytokinin's can stimulate the activity of the cambium and the formation of phloem in the stem, so that it is possible to have a faster bud break time [10].

The effect of treatment from shoots on bud breakage was not significantly different. The origin of shoots 10 cm and 20 cm from the shoot did not affect the time of bud break, presumably because the diameter of the buds is smaller than the diameter of the rootstock, so that when attaching and binding the buds will stretch and break, this can trigger wilting or rot in the entrees eye after grafting or attachment. Large and uniform stem diameters have better growth so that they are able to provide and transfer nutrients and minerals for growth and accelerate grafting linkage [11]. The size of the scion and rootstock that are not the same causes the cambium to be positioned incorrectly. This causes connection failure [12].

3.3. The appearance of the first leaf (days)

The variance analysis showed that the effect of BAP concentration was significantly different while the effect of shoot origin and the interaction between the two was not significantly different to the appearance of the first leaf of durian seed grafting. The average appearance of the first leaf can be seen in Table 3.

The results of further analysis using LSD 5% the effect of BAP concentration on the appearance of the first leaves showed that the concentrations of BAP 125, 250 and 375 ppm were not significantly different, but the three treatments were significantly different with BAP concentrations of 0 ppm. The BAP concentration which resulted in the fastest emergence of the first leaf was found at a concentration of 125 ppm BAP, which was 75.75 days.

Based on the results of observations of the appearance of the first leaf, there was no interaction between giving BAP concentrations of 0 ppm, 125 ppm, 250 ppm and 375 ppm with the use of 10 cm, 20 cm and 30 cm shoots from the shoots. The treatment affected to appearance of the first leaves was the administration of 125 ppm BAP concentration. This is because each plant has a different response to a given growth regulator. Higher concentrations can inhibit growth or vice versa [13].

The effect of BAP concentration treatment on the appearance of the first leaf was significantly different. The appearance of the first leaves with the provision of relatively low concentrations of BAP occurs because the nutrient content and growth regulators in plants have

Table 3. Average appearance of the first leaf with different concentrations of BAP and origin of shoots (days)

Origin of shoots (cm)	Concentrations BAP (ppm)				Average
	k0 = 0	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	80.50	77.75	78.00	76.75	78.25
t1 = 20	82.25	76.75	78.50	78.00	78.88
t2 = 30	82.25	72.75	74.25	78.00	76.81
Average	81.67 b	75.75 a	76.92 a	77.58 a	

Notes: Numbers followed by the same letter in the same row show no significant difference in the LSD test at the 5% level (LSD k = 1.85)

been sufficient so that shoot growth accompanied by the appearance of the first leaves is relatively fast even with the addition of concentration of 125 ppm BAP. The success of grafting, which is marked by the appearance of the first leaf blade, is supported by the application of NPK and ZA fertilizers alternately every week on grafting seedlings. The success rate of grafting requires adequate nutrient intake so that it is easier to link. If the nutrients are not available, then plant growth will be hampered [14].

The effect of treatment from shoot origin on the appearance of the first leaf was not significantly different. The origin of shoots 10 cm and 20 cm from the shoot did not affect the number of open leaves, presumably due to the physiological conditions of the buds. The growth rate of the shoots was also influenced by the dormant state of the shoots, namely, the shoots did not show any growth but were still green because shoot differentiation did not occur and because of the lack of one of several compounds that were translocated by the roots to the shoots, such as water, mineral salts and water. Growth regulators contained in the plant itself [5].

3.4. Length of grafting shoots at 90 days after grafting (DAG)

The results of the analysis of variance showed that the effect of BAP concentration, shoot origin and the interaction between the two were very significantly different on shoot length of grafting durian seedlings aged 90 HSO. The average length of grafting shoots can be seen in Table 4.

The results of further analysis using 5% BNT the effect of interaction between treatment concentrations of BAP and shoot origin of Lai (*Durio kutejensis*) on shoot length of grafting showed that between treatment interactions BAP concentrations of 0 ppm, 125 ppm, 250 ppm, 375 ppm, shoots origin 10 cm, 20 cm and 30 cm differ very markedly. The interaction of BAP concentration treatment and shoot origin that produced the highest grafting shoot length was found at 250 ppm BAP concentration and 30 cm shoot origin, which was 17.70 cm. BAP is a type of cytokinin that functions as a stimulant of shoot growth, reduces apical dominance, and promotes lateral shoot initiation [15]. Cytokinin have a positive role in shoot growth, support cell division and increase meristem size [16]. The availability of carbohydrates found at the origin of 30 cm shoots will trigger the growth rate of buds of grafting seedlings. Carbohydrates and PGR, both auxins and cytokinin's are transferred through water molecules to meristematic areas, including shoot tips [17].

The results of further analysis using LSD 5% the effect of BAP concentration on bud grafting length showed that the concentrations of BAP 125 and 375 ppm were not significantly different, but the two treatments were significantly different with BAP concentrations of 0 and 250 ppm. The concentration of BAP which produced the highest shoot length was found at a concentration of 250 ppm BAP, which was 15.16 cm, while the control produced the lowest shoot length, which was 7.98 cm. Based on these results, it can be seen that the administration of BAP at a high enough concentration affects the length of grafting shoots. The addition of 250 ppm BAP concentration can stimulate shoot growth, reduce apical dominance, and encourage lateral shoot initiation [15]. Cytokinin play a positive role in supporting cell division and increasing meristem size [16]. The Cytokinin content in BAP growth regulator will be effective if given at the right dose or concentration [7].

The results of further analysis using 5% BNT the effect of shoot origin of lai (*Durio kutejensis*) on shoot length of grafting showed that between 20 and 30 cm shoot origin was not significantly different, but the two treatments were significantly different with 10 cm shoot origin. The origin of the shoot that produced the highest grafting shoot length was found at the origin of the 30 cm shoot, which was 12.69 cm. The original treatment of shoots 30 cm from the shoot had better shoot length growth because the bark on the 30 cm branch of the shoot was easier to peel, this indicated that the cells or cambium tissue were still actively dividing. A good Entres eye is an Entres eye with the condition of the bark of the branches being easily separated from the wood (exfoliated). The inside of this bark (cambium) will look watery, this indicates that the cambium is active, so that if the buds are immediately grafted it will accelerate the linkage with the rootstock [18].

Table 4. Average shoot length of grafting with treatment with different concentrations of BAP and shoot origin (cm) at 90 DAG

Origin of shoots (cm)	Concentrations BAP (ppm)				Average
	k0 = 0	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	7.45 Aa	10.10 Ba	11.08 Ca	9.90 Ba	9.63 a
t1 = 20	9.20 Ab	11.05 Bb	16.70 Db	12.68 Cb	12.41 b
t2 = 30	7.28 Aa	13.18 Bc	17.70 Cc	12.63 Bb	12.69 b
Average	7.98 a	11.44 b	15.16 c	11.73 b	

Note: Numbers followed by the same letter in the same row and column show no significant difference in the LSD test at the 5% level (LSD k = 0.43; LSD t = 0.37; and LSD kt = 0.74)

Table 5. Average bud diameter of grafting with treatment with different concentrations of BAP and origin of shoots (cm) at 90 DAG

Origin of shoots (cm)	Concentrations BAP (ppm)				Average
	k0 = 0	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	0.45 Aa	0.50 Ba	0.45 Aa	0.46 Aa	0.46 a
t1 = 20	0.49 Aa	0.64 Bb	0.48 Aa	0.47 Aa	0.52 b
t2 = 30	0.47 Aa	0.70 Cc	0.57 Bb	0.54 Bb	0.57 c
Average	0.47 a	0.61 c	0.50 b	0.49 a	

Note: Numbers followed by the same letter in the same row and column show no significant difference in the LSD test at the 5% level (LSD k = 0.018; LSD t = 0.016; and LSD kt = 0.032)

3.5. Diameter of bud grafting age 90 days after grafting (DAG)

The results of the analysis of variance showed that the effect of BAP concentration, shoot origin and the interaction between the two was very significantly different on the bud diameter of grafting durian seedlings aged 90 DAG. The average diameter of grafting shoots can be seen in Table 5.

Based on the results of observations of the effect of BAP concentration, the effect of shoot origin and the interaction of the two on the diameter of grafting buds was significantly different. Observation of bud diameter grafting on durian seedlings showed that the administration of 125 ppm BAP concentration and the use of 30 cm shoot origin from the shoot had the fastest average shoot diameter growth compared to other treatments. The use of shoots origin 30 cm from shoots or older shoots has the ability to grow higher shoots because the plant cambium is in a maximum state so that the growth rate of shoots is not inhibited [19].

The results of the analysis of variance showed that the effect of BAP concentration treatment on the diameter of grafting shoots was very significantly different. The use of low concentrations of BAP was able to increase the growth of bud diameter grafting durian seedlings. This is because the number of cytokinins produced by the durian plant has met the needs of the shoots to grow and develop, so that even at a fairly low concentration the growth of shoot diameter continues to increase. The size of the average shoot diameter is also due to better cambium activity, so that the linking process occurs faster and further shoot development takes place more quickly [6].

The results of the analysis of variance showed that the effect of the treatment from the origin of the shoots on the diameter of the shoots was very significantly different. The size of the diameter with a shoot origin of 30 cm from the shoot is relatively the same as the diameter of the rootstock, this causes the linkage between the rootstock and the buds to occur immediately, and the differentiation process can start immediately. One of the requirements for a good entry is that the diameter of the branch for the shoot must be proportional to the diameter of the rootstock [20]. One of the factors that need to be considered in plant propagation by grafting is the size of the trunk diameter of the two trees that will be combined. In choosing the diameter of the rods, both must be the same size or close to the same, the most important thing is not to let there be a large difference in these sizes [8].

3.6. Number of leaves

The results of the analysis of variance showed that the effect of BAP concentration was significantly different while the effect of shoot origin and the interaction between the two was not significantly different on the number of grafted leaves of durian seedlings. The average number of leaves can be seen in Table 6.

Table 6. Average number of leaves treated with BAP concentrations and different shoot origins (strands)

Origin of shoots (cm)	Concentrations BAP (ppm)				Average
	k0 = 0	k1 = 125	k2 = 250	k3 = 375	
t0 = 10	9.25	10.25	9.75	9.75	9.75
t1 = 20	8.50	10.75	12.75	12.75	11.19
t2 = 30	8.75	8.50	10.25	13.25	10.19
Average	8.83 a	9.83 b	10.92 c	11.92 d	

Notes: Numbers followed by the same letter in the same row show no significant difference in the LSD test at the 5% level

Observation of the number of leaves on durian grafting seedlings showed that there was no interaction between the administration of BAP concentrations of 0 ppm, 125 ppm, 250 ppm and 375 ppm with the use of shoots of 10 cm, 20 cm and 30 cm from the shoot. The treatment that had an effect on the number of leaves was the administration of 375 ppm BAP concentration. This can happen because the increase in the concentration of cytokinins will cause the shoot system to form branches in greater numbers and faster [6]. In some plants the effects of cytokinins which are transported from roots to stems or through other plant organs are able to activate the growth of side shoots so that the plant has many branches and becomes lush accompanied by an increase in the number of leaves [7].

The results of the analysis of variance showed that the effect of BAP concentration treatment on the number of leaves was significantly different. Giving a high concentration of BAP was able to have an effect on the number of leaves. The thing that can cause an increase in the number of leaves is the availability of endogenous cytokinin hormones in plants. It is suspected that the cytokinin hormone contained in durian grafting seeds has not been fulfilled, so that the addition of growth regulators with high concentrations can increase shoot growth and number of leaves. Plant growth is naturally controlled by endogenous hormones and these hormones are present in plants in small amounts. Giving these synthetic compounds will change the hormonal balance in the plant to cause a certain response [6]. An increase in the number of leaves with BAP concentration of 375 ppm can occur because the physiological role of cytokinin's in general is to encourage the expansion of leaves produced due to cell enlargement [7].

The results of the analysis of variance showed that the effect of the treatment from shoots on the number of leaves was not significantly different. The origin of shoots 10 cm and 20 cm from the shoot did not affect the time of bud break, it was suspected that the shoot buds had very young tissue with thin and weak bark, resulting in incompatibility or incompatibility between the rootstock and the scion (entrees). time after grafting or attachment. The grafting is successful if the shoots remain alive together with the rootstock (a callus is formed), then shoots appear and leaves are formed so that the shoots continue to grow. The success of grafting also requires compatibility between the scion and rootstock as well as the ability of the scion itself to break and grow [5].

4. CONCLUSIONS

Based on the results of the study it can be concluded that:

1. Both treatments have an effect on the growth of grafted durian seedlings. The treatment with 125 ppm BAP concentration and 30 cm shoot origin from the shoot optimized the growth of grafted durian seedlings.
2. The concentration of BAP affects the growth of durian seedlings. The concentration of BAP 125 ppm was the best treatment concentration in optimizing the growth of durian grafting seedlings.
3. The use of stem shoots from lai (*Durio kutejensis*) affects the growth of durian seedlings. The origin of scion shoots 30 cm from the shoot is the best treatment of shoot origin in optimizing the growth of durian grafting seedlings.

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