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DOSIS OF AMELIORAN PLUS AND TECHNIQUE OF CUTTING THE UMBI OF RED CHICKEN (Allium ascalonicum L.) ON GROWTH AND HARVEST RESULTS

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ABSTRACT

This study aims to study the effect of Shallot Bulb Cutting Technique (Allium ascalonicum L.) and Dodis Amelioran Plus on Growth and Yield. The experiment was conducted in Rancalega Village, Sukaresmi District, Garut Regency. with a place altitude of 750 m above sea level from February 2023 – May 2023. The research design used was a factorial pattern Group Random Design (RAK) consisting of 2 factors and each factor consisting of 4 levels of treatment, the first factor is P = cutting techniques including p0 = Control, p1 = Cut 1/4 part, p2 = Cut 1/2 part, p1 = Cut 1/3 part. Factor 2 is A = amelioran dose plus including a0 = 0 tons/ha, a1 = 2 tons/ha, a2 = 4 tons/ha, a3 = 6 tons/ha repeated 2 times so that there are 32 experimental plots placed randomly. The results showed that there was an interaction between the technique of cutting onion bulbs (Allium ascalonicum L.) and The ameliorant dose of 0 tons / ha gives an optimum value of 156.79, p1 is the dose of amelioran 2 tons / ha with a weight per plant of 184.59, p2 is an ameliorant dose of 4 tons / ha with an optimum weight of 195.06 and p3 is an ameliorant dose of 6 tons / ha with a weight per plant of 215.64

Keywords : melioran Plus, Shallots, Bulb Cutting Technique

INTRODUCTION

Shallot (Allium ascalonicum L.) is a national superior commodity from the horticultural group that is mostly consumed as a seasoning by the community. Shallots have good market opportunities because the potential for development is very broad in meeting domestic and foreign needs according to (Muhyidin et al., 2020). One of the factors for the increase in demand for shallots due to the increasing consumption needs of the community in planting shallots, the majority of farmers still use bulbs according to (Saidah et al., 2019) the bulbs planted are bulbs from the previous harvest which are bulbs for consumption. Shallots can be planted vegetatively, including the use of bulbs by cutting 1/3 of the bulb from the tip of the bulb. Cultivation measures are inevitably influenced by yield and post-harvest conditions. Starting from soil selection, garden sanitation, weeding, selecting varieties, sowing seeds, care, fertiliser, pest prevention according to (Syahir, 2018). Proper cutting of tubers, most farmers do not know the benefits of cutting at the end of the tuber is not widely known to farmers. According to (Sufyati & Fajri, 2010) Cut the tip of the tuber about 1/3 or 1/4 the length of the tuber, aiming for the tuber to grow uniformly, can stimulate germination, encourage plant growth, can stimulate the growth of lateral tubercles and can encourage branching. (Sukmawati, D. 2017).

In addition to cutting techniques that must be considered is the planting media, which is done in this study is the provision of ameliorants plus. The type of ameliorant plus that is applied to soil aggregates has a different effect on soil fertility physically, chemically and biologically, depending on the constituent ingredients, thus encouraging different plant growth and development (Harini et al., 2021). Application of ameliorants plus into the soil can increase soil fertility by improving the physical, chemical and biological properties of the soil, especially by increasing the soil's binding capacity to water and increasing the availability of nutrients for the soil (Harini et al., 2021). The application of ameliorants plus compost and dolomite can improve soil physical properties (reducing BD, increasing total pore space, permeability, composite stability index, fast pore drainage, available pore water, water content (field capacity) and improve soil chemistry (organic C-, N-total, CEC, KB, P-available) (Putra et al., 2012). Based on the results of research by Yosef et al. (2019), it shows that giving a dose of ameliorant plus 4 tonnes/ha can increase C-organic, soil pH, the best BPF population and increase the yield of chilli plants by 44.9%.

MATERIALS AND METHODS

The method used in this research is verification so that field experiments are carried out. The research activities were carried out in Rancalega Sub-district Sukaresmi District Garut. The altitude of the research location is at 731 metres above sea level (Semarang District). The research was conducted from February 2023 to May 2023.

The materials used in this experiment were shallot bulbs of Batu Ijo variety ZA fertiliser, ameliorant plus, insecticide Furadan 3G, fungicide Dithane M-45 80 WP, insecticide Curacorn 40 WSC. While the equipment used were hoes, forks, raffia threads, bamboo stakes, knives, metres, buckets, emrat, stationery, plastic and analytical scales.

NThe research was carried out with an experimental approach, namely for the characteristics of plant growth and yield using a Randomised Group Design (RAK) factorial pattern consisting of 2 factors and each factor consists of 4 treatment levels, the first factor is P = cutting technique including p0 = Control, p1 = Cut 1/4 part, p2 = Cut 1/2 part, p1 = Cut 1/3 part. The second factor is A = dose of ameliorant plus including a0 = 0 tonnes/ha, a1 = 2 tonnes/ha, a2 = 4 tonnes/ha, a3 = 6 tonnes/ha repeated 2 times so that there are 32 experimental plots placed randomly.

The model used in this research is Randomised Group Design (RAK) with the formula:

$Yijh = \mu + ri + vj + nh + (vn)jh + eijh$

Yijh = The results of observations in the i-th experimental unit that obtained the j-th treatment combination of the P factor.

treatment combination of the jth level of the P factor, and the hth level of the K

μ = general mean

ri = The i-th effect of the group/repeat factor

pj = Effect of the jth level of factor p

ah = Effect of the hth level of factor a

RESULTS AND DISCUSSION (Arial 10)

Plant Height

Based on the results of variance analysis, there is an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on plant height as shown in Tables 1, 2 and 3.

Table 1. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on Plant Height at 14 HST

Treatment	Plant Height 14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	28,74 a A	46,04 a A	41,20 ab A	51,10 b A
a1 2 ton/ha	35,84 ab A	37,76 ab A	51,50 ab A	52,10 b A
a2 4 ton/ha	43,16 a B	45,16 ab B	53,88 b B	61,78 b B
a3 6 ton/ha	44,20 a B	49,76 ab B	54,26 ab B	80,02 c C

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Table 2. Cutting Technique of Red Onion Bulbs and Ameliant Dosage Plus on Plant Height at 28 HST

Treatment	Plant Height 14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
	53,18 a	62,26 a	60,52 ab	74,44 c

ao 0 ton/ha	A	A	A	A
a1 2 ton/ha	58,78 a	63,52 ab	66,02 b	67,56 b
	A	A	A	A
a2 4 ton/ha	57,36 ab	65,96 ab	77,58 b	84,32 b
	B	A	B	B
a3 6 ton/ha	59,38 a	61,60 ab	73,94 b	80,02 b
	B	B	B	B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Table 3. Cutting Technique of Red Onion Bulbs and Ameliant Plus Dosage on Plant Height at 42 HST

Treatment	Plant Height 14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	79,00 a	81,00 ab	88,00 b	93,00 b
	A	A	A	A
a1 2 ton/ha	88,46 ab	88,14 ab	89,90 b	90,52 ab
	A	A	A	A
a2 4 ton/ha	88,14 ab	89,90 a	89,14 ab	105,54 ab
	A	B	B	A
a3 6 ton/ha	86,62 a	89,14 ab	92,68 b	100,80 c
	A	B	C	A

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Number of Leaves

Based on the results of variance analysis, there is an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the number of leaves as shown in Tables 4, 5 and 6.

Table 4. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Number of Leaves at 14 HST

Treatment	Number Of Leaves On14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	15,00 a	23,00 b	24,40 ab	29,20 b
	A	A	A	A
a1 2 ton/ha	19,20	20,00	29,60	30,40
	B	AB	AB	AB
a2 4 ton/ha	18,20	22,80	27,00	37,00
	AB	B	B	B
a3 6 ton/ha	25,80 a	27,60 ab	28,00 b	53,00 c
	B	B	C	C

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Table 5. Cutting Technique of Red Onion Bulbs and Ameliant Plus Dosage on Number of Leaves at 28 HST

Treatment	Number Of Leaves On14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	26,20 a	35,00 b	43,00 ab	46,80 c
	A	A	A	A
a1 2 ton/ha	34,20 a	35,60 ab	47,00 b	48,80 b
	A	A	AB	AB
a2 4 ton/ha	39,60 ab	41,80 a	48,80 b	61,00 c
	AB	AB	B	B
a3 6 ton/ha	38,80 a	42,80 ab	50,80 b	53,00 b
	B	B	B	C

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Table 6. Cutting Technique of Red Onion Bulbs and Ameliant Plus Dosage on Number of Leaves at 42 HST

Treatment	Number Of Leaves On14 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	26,20 a	35,00 b	43,00 ab	46,80 c
	A	A	A	A
a1 2 ton/ha	34,20 a	35,60 ab	47,00 b	48,80 b
	AB	AB	AB	AB
a2 4 ton/ha	39,60 ab	41,80 a	48,80 b	61,00 c
	B	B	B	B
a3 6 ton/ha	38,80 a	42,80 ab	50,80 b	53,00 b
	B	B	A	C

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Wet Weight of Bulbs Per Clump

Based on the results of variance analysis, there is an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the wet weight of bulbs per clump as shown in Table 7.

Table 7. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Wet Weight of Bulbs Per Clump at 65 HST

Treatment	Wet Weight Of Tubers Per Clump 65 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	62,78 a	92,20 a	125,96 a	149,90 a
	AB	A	A	A
a1 2 ton/ha	71,38 a	100,62 ab	136,16 b	157,02 b
	A	AB	AB	AB
	82,22 a	112,28 ab	146,20 b	195,04 b

a2 4 ton/ha	B	B	B	B
a3 6 ton/ha	90,92 a B	113,78 ab B	148,72 b B	232,74 c B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Based on the results of variance analysis, there was an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the wet weight of bulbs per plot as shown in Table 8.

Table 8. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Wet Weight of Bulbs Per Plot at 65 HST

Treatment	Wet Weight Of Tubers Per Plot 65 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	565,02 a AB	829,80 a A	1133,64 a A	1349,10 a A
a1 2 ton/ha	642,42 a A	905,58 ab AB	1225,44 b AB	1413,18 b AB
a2 4 ton/ha	739,98 a B	1010,52 ab B	1315,80 b B	1755,36 b B
a3 6 ton/ha	818,28 a B	1024,02 ab B	1338,48 b B	2094,66 c B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Number of Bulbs Per Clump

Based on the results of variance analysis, there is an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the number of bulbs per clump as shown in Table 9.

Table 9. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Number of Bulbs Per Clump at 65 HST

Treatment	Wet Weight Of Tubers Per Clump 65 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	7,60 a A	10,20 ab A	11,80 a A	15,00 b A
a1 2 ton/ha	7,00 a AB	8,60 ab AB	13,40 b AB	15,40 b AB
a2 4 ton/ha	8,40 a B	11,00 ab B	16,40 b B	17,20 b B
a3 6 ton/ha	9,40 a A	11,60 ab B	17,00 b B	17,30 b B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

Number of Bulbs Per Plot

Based on the results of variance analysis, there is an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the number of bulbs per plot as shown in Table 10.

Table 10. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Number of Bulbs Per Plot at 65 HST

Treatment	Wet Weight Of Tubers Per Plot 65 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	68,40 a A	91,80 a A	106,20 ab A	135,00 b A
a1 2 ton/ha	63,00 a AB	77,40 ab AB	120,60 b AB	138,60 b AB
a2 4 ton/ha	75,60 a B	99,00 ab B	147,60 b B	154,80 b B
a3 6 ton/ha	84,60 a B	104,40 ab B	153,00 b B	155,70 b B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at 5% level.

Tuber Diameter

Based on the results of variance analysis, there was an interaction between the technique of cutting shallot bulbs and the dose of ameliorant plus on the diameter of the bulbs as shown in Table 11.

Table 11. Cutting Techniques of Shallot Bulbs and Doses of Ameliorant Plus on the Diameter of Bulbs at 65 HST

Treatment	Tuber Diametr 65 HST			
	p0 Without Cut	p1Cut ¼	p2 Cut 1/2	p3 Cut 1/3
ao 0 ton/ha	25,53 a A	26,32 ab A	25,86 b A	31,20 c A
a1 2 ton/ha	26,50 ab AB	27,38 a AB	29,08 b AB	33,66 c A
a2 4 ton/ha	29,16 a B	29,40 ab B	30,68 b B	39,23 b AB
a3 6 ton/ha	28,06 a B	29,14 ab B	31,15 b B	33,24 b B

Notes: Means followed by the same letter in each column are not significantly different using Duncan's multiple range test at the 5% level.

The data in the table above shows that in each treatment 1/3 the number of shallots is much more than without cuttings. According to (Sufyati &; Fajri, 2010) cut the bulbs with a clean and sterile knife about 1/3 or 1/4 of the total length of the bulbs so that they grow evenly and accelerate the growth of the bulbs. Plants can stimulate budding, can encourage branch formation, and can stimulate the growth of lateral tubercles. Another alternative (Sufyati &; Fajri, 2010) is to add leek seeds before planting at the end of 1/2 to 1/3 of the cut bulbs, depending on the condition of the seeds.

If the bulbs are not cut, plant growth and production are inhibited and yields are reduced. However, be careful when cutting, do not cut the shoots inside the bulbs (RAHAYU et al., 2006). In

addition (Hamzah et al., 2020) chive leaves are added before planting to the end of 1/3 - 1/4 of the cut tubers, depending on the nursery conditions. (Marina, I., dkk. 2017)

Leaves are the main organ where photosynthesis takes place. Therefore, in addition to plant height, the optimal number of leaves also promotes optimal chives growth. Cutting the bulbs to the size of 1/3 of the plant can stimulate the buds to close because the bulb skin dries and the leaves develop well and vice versa, cutting to the size of 1/4, 1/2 and not cutting does not stimulate fewer buds, causing worse growth. (Rahma, A. O., & Marina, I. 2023).

As stated by Sutedjo (2010) that the main nutrient for plant growth such as leaves and stems is nitrogen (Ari, 2005), cutting tubers can accelerate plant growth. In addition, the tuber trimming treatment can accelerate plant growth and the number of leaves because the purpose of trimming tubers is to homogenise growth, stimulate shoot growth, and accelerate the rate of plant growth. 3 parts of the total length of the tuber plant, tuber growth becomes even (uniform), tubers grow rapidly, the number of leaves and the number of sprouts increase.

In both treatments, the tuber cutting treatment also received an additive improver, both treatments showed an interaction with all parameters observed. Ameliorants plus can be in the form of organic or inorganic materials (Rahmawati & Khumairah, 2023). The results of research (Fauziah et al., 2016) explain that the addition of organic matter can reduce the weight content of 0.16 gcm-3, increase aggregate stability to 21.33 and increase porosity by 13.67% in decomposed soil. Indriani (2007) explained that the use of organic matter in the form of compost can increase soil organic carbon content.

(Arifiati, 2017) added that the increase in organic C in the soil can be caused by organic C released from compost. The difference in the value of organic matter is due to its effect on the supply of organic matter and its decomposition by soil microorganisms. Sutanto (2002) explained that organic matter produced by organic fertilisers is used by bacteria as a source of energy in livestock and the content of organic matter depends on the microbial population. In soil, soil bacteria use organic matter for energy and microbial growth. Coconut charcoal is a source of carbon and energy for bacteria in biofertilisers. This is supported by the results of research by (Rahmayuni et al., 2018) which showed the highest viability of phosphate solubilising microorganisms in coconut shell biochar carriers. Biochar application can increase pH in acidic soils, increase soil CEC (Mapegau et al., 2023), provide nutrients N, P and K (Schnell et al., 2012) and remediate soil polluted with heavy metals (Pb, Cu, Cd, Ni) (Ippolito et al., 2012).

The addition of dolomite to the improved alkaline mixture can reduce soil acidity, improve nutrient balance so that plants can absorb nutrients (Brown et al., 2007). OH- provides a certain amount of lime in the soil solution that reacts with H+ into water and causes the H+ concentration to decrease, thus increasing the soil pH. In addition, lime can also provide Ca2+ ions to form complexes with humic acids. According to Jeong et al. (2005), the level of complexity is highly dependent on the level of protons in the soil solution. Ameliant doses had a significant effect on increasing soil pH.

An increase in the N present in guano fertiliser can increase its content. The main function of the nitrogen element in guano manure is as a raw material for protein, chlorophyll and amino acids that play a role in wide growth enzymes to increase leaf width (Dikdik, 2014).

Suwarno and Idris (2007) explained that an increase in soil pH, soil CEC, and concentrations of N, P, K and available P was the result of guano fertilisation. Suwarno (1998) in a pot experiment on the application of phosphate fertiliser to soybean plants growing in soil belonging to the Andisol order of the Kanuma order, Tochigi, it was found that the yield of plants when treated with phosphate fertiliser was not significantly different from the yield in the superphosphate (SP36) treatment. .

CONCLUSIONS

Conclusion

Based on the experimental results and discussion, the following conclusions can be drawn:

1. There is an interaction between the technique of cutting shallot bulbs (Allium ascalonicum L.) and the dose of ameliorant plus on growth and yield.
2. Ameliant dose of 0 tonnes/ha gives an optimum value of 156.79, p1 is ameliorant dose of 2 tonnes/ha with weight per plant 184.59, p2 is ameliorant dose of 4 tonnes/ha with optimum weight 195.06 and p3 is ameliorant dose of 6 tonnes/ha with weight per plant 215.64.

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