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Applications Of Oil Palm Ash And Various Types Of Organic Fertilizer On Acid Soil (Ultisol) For Onion (*Allium ascalonicum L*)

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ABSTRACT

Onion production in Riau Province is still low, while the demand is quite large. Therefore, it is necessary to increase production. This study aimed to determine the effect of the application of oil palm ash and various types of organic fertilizers on ultisol soils on the growth and production of shallots. The design used was a completely randomized factorial design consisting of 2 factors. The first factor was the provision of oil palm ash which consisted of 4 levels of treatment, namely: 0, 200,400, and 600 g/plot. The second factor is various types of organic fertilizers which consist of 4 levels of treatment, namely: without giving organic fertilizer, chicken manure, tankos compost and corn litter bokashi. The parameters observed were plant height, number of tubers per clump, wet tuber weight per clump, dry tuber weight, percentage of tuber weight loss, relative growth rate and nutrient uptake. plants, number of tubers, wet weight per clump, dry weight per clump and tuber weight loss, the best treatment was giving palm ash 400 g/plot and corn litter bokashi. The main effect of giving palm ash bunches was real on all observation parameters, the best treatment was 400 g/plot. The main effect of organic fertilizer was real on all observed parameters. The best treatment was corn litter bokashi.

Keywords: *Shallots, Palm Ash Janjang, Organic Fertilizer.*

1. INTRODUCTION

Shallots (*Allium ascalonicum*. L) is a horticultural commodity that is widely consumed by the public as a mixture of cooking spices. The use of shallots, apart from being used as a cooking spice after chili, is also processed in processed forms such as onion extract, spices, essential oils, and even as a medicine to lower cholesterol levels.

Shallots are not only known for their food seasoning, but also have other functions that come from the content in them and can be beneficial for the body. Shallots are known to act as antioxidants and lower blood cholesterol. (Ismawati. et al. 2012)

According to Napitupulu and Winarto (2010) the onion plant is an important vegetable commodity because it contains high nutrition. Every 100 g of red onion contains 39 calories, 150 mg protein, 0.30 g fat, 9.20 g carbohydrates, 50 vitamin A, 0.30 mg vitamin B, 200 mg vitamin C, 36 mg calcium, 40 mg phosphorus and 20 mg of red onion. g water.

Shallot production in Riau continues to fluctuate from year to year, in 2015 it was 140 tons, in 2016 it was 303 tons, in 2017 it was 262 tons, in 2018 it was 187 tons, in 2019 it was 507 tons and again it decreased in 2020 which was 263 tons. (BPS, 2021)

Shallot production in Riau has not been able to meet the needs of the community, to meet the needs of shallots supplied from outside the region, including West Sumatra, North Sumatra and Java Island. The need for shallots has not been fulfilled due to the low productivity of shallots in Riau. This is because Riau Province is one of the areas that naturally has low productivity land. The lands that have been cleared or are still available for agricultural expansion are mostly acidic and nutrient-poor soils, consisting of acidic mineral soils and peat soils. So that in its utilization there must be special treatment so that the cultivated plants grow and produce maximum. One of the efforts that can be done is to utilize the ash of oil palm bunches and add organic fertilizer.

Oil palm bunch ash contains 30-40% K2O, 7% P2O5, 9% CaO, and 3% MgO. In addition, it also contains micro elements, namely 1,200 ppm Fe, 1,000 ppm Mn, 400 ppm Zn and 100 ppm Cu. (Fauzi, et al. 2014).

The application of organic and inorganic ameliorants into the soil can improve soil conditions and increase plant growth (Okwuagwu, et al. 2013).

Kurnianingsih (2010) explained that the application of oil palm ash bunches increased plant growth and wet weight of aloe vera midrib. Research by Indra et al, (2022) Treatment of 5.0 tons/ha of oil palm bunch ash was the best treatment in giving oil palm ash bunches to growth and production of shallot (Allium ascallonicum L.) in peat soil.

Organic fertilizers improve the physical and chemical properties of the soil. Provide nutrients for plants, maintain soil moisture, prevent soil erosion, increase soil fertility and increase plant growth and production. One of the organic fertilizers that can be used to increase ultisol soil fertility is bokashi.

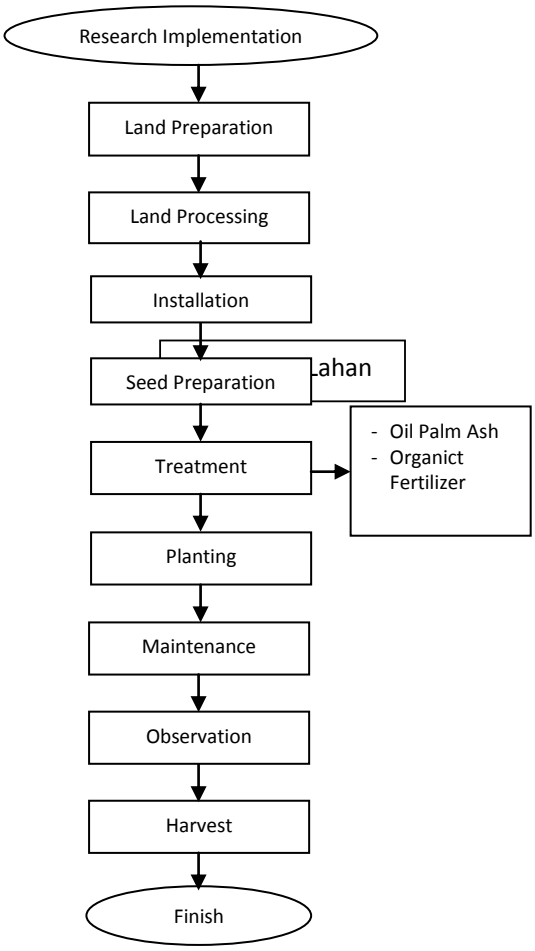
Bokashi is a fertilizer that can replace the presence of chemical fertilizers to increase soil fertility and repair damage to soil physical properties due to excessive use of chemical fertilizers. Bokashi is a fermented organic material derived from agricultural waste, other livestock manure, bran, molasses and water using EM-4 (Gao et al, 2012).

2. RESEARCH METHOD

This research was carried out in the experimental garden of the Faculty of Agriculture, Islamic University of Riau, for 4 months starting from January to April 2020. The materials used in this study were cloves of onion of the bima brebes variety, Abu janjang of oil palm, tankos compost, Bokashi corn litter, manure chicken, Urea, TSP, KCl, ZA, Dithane M-

45, Regent, zinc plate and paint. The tools used in this study were hoes, machetes, rakes, scissors, gembor, handsprayer, tape measure, hammer, nails, saws, analytical scales, measuring cup, raffia rope, cater knife, digital camera and stationery.

The design used in this research is a factorial Completely Randomized Design consisting of 2 factors. The first factor is palm ash ash, and the second factor is various types of Organic Fertilizers consisting of 4 levels of treatment, so there are 16 treatment combinations consisting of 3 replications so that there are 48 experimental units, each experimental unit has 25 plants, and 4 plants are used as observation samples. . The implementation of the research included land preparation, namely cleaning of weeds and garbage, loosening the land using a hoe, then plotting the land with a size of 1 m x 1 m, with a distance between plots of 50 cm. The distribution of ash from the palm trees is carried out two weeks before planting by sowing the ash and then stirring it with a rake to mix it evenly with the soil. The provision of oil palm ash was adjusted to the predetermined treatment dose, the application of organic fertilizer was carried out 1 week before planting, all organic fertilizers were mixed with the soil until smooth using a rake. Before planting the bulbs, cut 1/3 of the ends of the tubers, how to plant onion cloves in a single way. By immersing 2/3 of the clove into the ground. The spacing used is 20 x 20 cm, each planting hole consists of one clove. Basic fertilizer was applied at the time of planting, using urea (100 kg/ha), TSP (150 kg/ha) and KCl (200 kg/ha). The application of fertilizer is done by running and then backfilling the fertilizer with soil. Plant maintenance includes, watering, weeding, pest and disease control. Parameters observed were plant height, number of tubers per clump, wet tuber weight per clump, dry tuber weight, tuber weight loss, relative growth rate. Data from observations, each treatment was analyzed statistically. If the F-count is greater than the F-table, then it is continued with the 5% Honest Significant Difference Test (BNJ).



Picture 1. Research implementation diagram

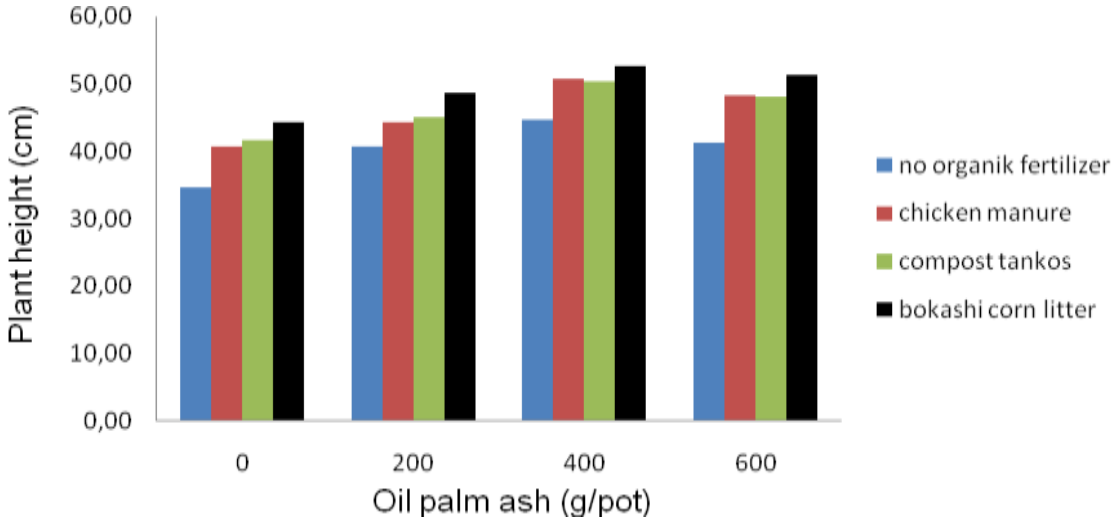
3. RESULTS AND DISCUSSION

Plant height

The results of the analysis of variance showed that the main interaction and main effect of oil palm ash and various types of organic fertilizers was significant on plant height. The average results of observations of onion plant height can be seen in Figure 1.

The high onion plants produced in a combination of oil palm ash and various organic fertilizers, this is because the application of oil palm ash ash has been able to increase the pH of the ultisol soil so that the soil condition becomes better then combined with

organic fertilizer it can improve soil conditions to become more fertile with Thus, nutrients are available in the soil and can be well absorbed by the roots of shallot plants.



Picture 2. Diagram of shallot plant height with oil palm ash treatment and various organic fertilizers (cm)

Based on Figure 2, the application of 400 g/plot of palm ash bunches and corn litter bokashi resulted in the highest shallot plant height, at this treatment level it could increase the fertility of ultisol soil so that nutrients could be well available. The application of oil palm bunch ash can also increase base saturation. This increase in base saturation will have an effect on increasing the availability of bases in the soil. This of course can increase the nutrient uptake of bases and better plant metabolism so that it affects the increase in seedling height. According to Utomo et al., (2016), the higher the base saturation, the easier it is for nutrients to be released into the soil solution or in other words, the more readily available nutrients to plants.

The results of laboratory analysis showed that the long ash contained quite high levels of potassium (K) and sodium (Na), which were 30% K2O and 26% Na2O, respectively (Prasetio. 2009), these elements are very important for plants for growth. By giving the ash of palm oil bunches, it also contributes nutrients Ca and Mg, where these elements can neutralize the content of Al and Fe while the Mg element is part of the chloroplast or the core of green leaf grains which play a very important role in the photosynthesis process.

Giving bokashi corn litter has been able to change the condition of the ultisol soil to be more fertile, so the roots of shallot plants will more easily absorb nutrients, especially N, P and K which are needed. Roidah (2013) Soil fertility is the ability or quality of a soil that provides plant nutrient elements in sufficient quantities for plant needs, in the form of compounds that can be utilized by plants, and in an appropriate balance for plant growth.

Number of tubers per clump (Cultivation)

The results of the analysis of variance showed that the interaction and the main effect of oil palm ash and various types of organic fertilizers significantly affected the number of tubers per clump. The average observation result of the number of tubers per clump after further testing by BNJ at the 5% level can be seen in Table 1.

Table 1. Average number of bulbs per clump of shallots treated with oil palm ash and various organic fertilizers (cloves)

Oil Palm Ash (g/plot)	Organic fertilizer (kg/plot)				Average
	No Organic Fertilizer	Chicken manure	Compost Tankos	Bokashi Litter Corn	
0	5.25 h	6.58 efg	6.83 defg	7.42 cdef	6.52 d
200	6.25 g	7.42 cdef	7.67 cd	8.00 c	7.33 c
400	7.50 cde	9.67 ab	9.33 b	10.50 a	9.04 a
600	6.50 fg	7.92 c	8.08 c	9.83 ab	8.04 b
Average	6.38 c	7.77 b	7.98 b	8.81 a	

The numbers in the rows and columns followed by the same lowercase letters show that they are not significantly different according to the BNJ follow-up test at the 5% level.

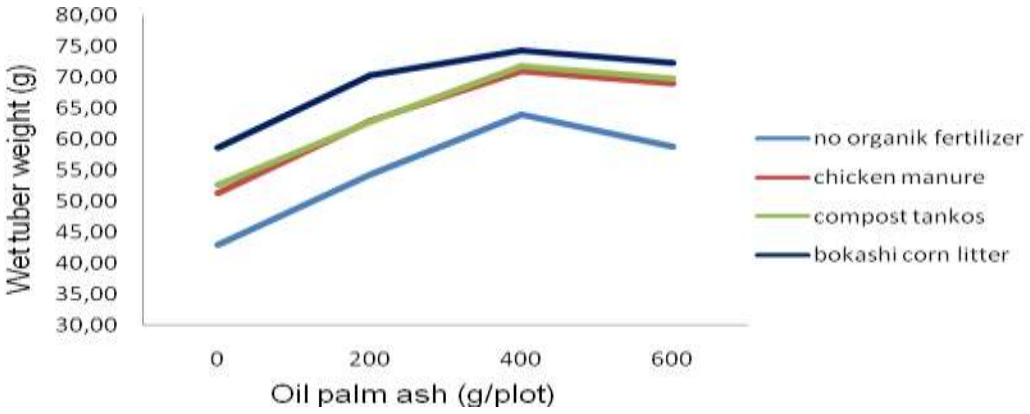
The data in Table 1 shows the interaction of giving oil palm ash and various organic fertilizers a significant effect on the number of tubers per clump, where the application of 400 g/plot of oil palm bunch ash and the application of corn litter bokashi was a combination of treatments that produced the highest number of tubers per clump which did not differ. with a combination of 600 g/plot of oil palm janjang ash and corn litter bokashi and a combination of 200 g/plot of oil palm janjang ash and chicken manure fertilizer.

The application of oil palm ash is thought to have reduced the high aluminum saturation in Ultisol soil and contributed K, Mg and Ca nutrients for plants. In addition, the application of palm oil ash has been able to increase soil pH and can have an effect on increasing the effective cation exchange capacity and base saturation. Sari (2011) suggested that ash tends to increase the availability of P, K, Ca, Mg nutrients and increase N nutrients for plants. Bokashi corn litter is organic material that has undergone a decomposition process due to the interaction between decomposer microorganisms in EM-4 that work in it. Where the provision of organic matter can improve soil conditions to become more fertile and nutrients will be more available in accordance with what is needed by plants and will be easily absorbed by plant roots so that the growth of shallots will run well, it will have an impact on the formation of onion bulbs.

The formation of shallot bulbs will increase under suitable environmental conditions where lateral shoots will form new discs and subsequently form bulbs. Each bulb that grows can produce 2-20 new shoots and will grow and develop into tillers, each of which will produce onion bulbs.

Wet tuber weight per clump

The results of the analysis of variance showed that the interaction and the main effect of oil palm ash and various types of organic fertilizers were significant on the weight of wet tubers per clump. The average results of observations of wet tuber weight per clump can be seen in Figure 3.



Picture 3. Graph of wet bulb weight of shallots with oil palm ash treatment and various organic fertilizers (g)

Based on Figure 3, the interaction of giving oil palm ash and various organic fertilizers significantly affected the wet bulb weight of shallots per clump, where the combination of oil palm ash and corn litter bokashi was the combination treatment which resulted in the highest wet tuber weight, followed by a combination of coconut janjang ash. palm oil 600 g/plot and corn litter bokashi as well as palm ash 400 g/plot and tankos compost.

The high wet weight of shallots per clump resulted from the combination of oil palm ash treatment which was balanced with organic fertilizer on Ultisol soil, where through the application of oil palm ash, it could provide a good response to the improvement of Ultisol soil conditions so that nutrients in the soil would be more available. , the provision of palm ash ash can contribute nutrients that are needed for plant growth such as K, P, Ca and Mg elements and increase the N element for plants then combined with organic fertilizers it will further increase the activity of microorganisms and cation exchange capacity thus plants will easily absorb nutrients.

Palm ash contains 30-40% potassium. Hanafiah (2010) suggests that potassium plays a role in maintaining the osmotic potential of plants such as regulating the opening and closing of stomata so that plants are able to maintain water conditions in plants which have a positive impact on increasing photosynthesis and distributing assimilate from leaves. all parts of the plant.

The occurrence of differences in the weight of wet bulbs of shallots with the application of oil palm bunches of ash, this indicates that the potassium nutrients contained in oil palm ash can be well absorbed by plants so that they can support various processes in plants such as photosynthesis, thereby affecting the weight of wet bulbs. According to Lakitan (2015), the element of potassium plays a role as activator of various enzymes involved in protein and starch synthesis, plays a role in regulating the osmotic potential of cells, especially in regulating turgorcell pressure in the process of opening and closing stomata which affects the photosynthesis process.

Result of research by Bancin et al, 2016. Treatment of palm ash ameliorant on peat soil against shallots resulted in higher fresh weight of tubers per plot compared to the other ameliorant.

Giving corn litter bokashi has been able to improve the planting medium where the soil becomes more loose and ultimately facilitates the development of onion plant roots and will be more optimal in absorbing nutrients so that it affects the wet weight of tubers.

The fulfillment of nutrients as needed will be able to increase plant growth because nutrients are very important in the photosynthesis process which ultimately affects the yield component, namely tubers. Rasyad et al, (2014) one of the environmental factors that

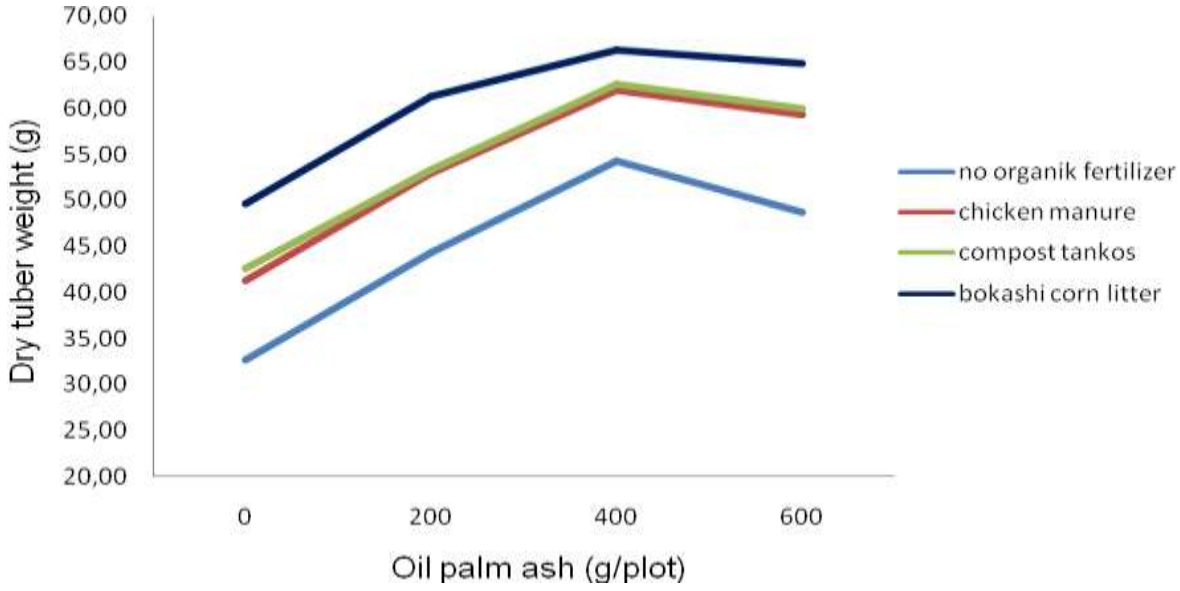
determine plant development is the nutrient status in the soil when the plant is cultivated. Fertilization is an effort to provide nutrients that aim to increase the supply of nutrients needed to increase plant growth and development.

Lawenga et al, (2015) stated that the application of organic fertilizer of 30 tons/ha can improve soil physical properties, especially soil density, porosity and permeability. The results of the study through the application of organic fertilizers can also increase the fertility of ultisol soils, this can be seen from the growth and production of better shallots.

Bua et al. (2017) stated that organic fertilizers had a positive effect on the growth and production of onions. Wet weight, dry weight, tuber diameter, and onion bulb production were higher.

Tuber Dry Weight

The results of the analysis of variance showed that the main interaction and influence of oil palm ash and various types of organic fertilizers was significant on the weight of dry tubers per clump. The average dry tuber weight observations per clump can be seen in Figure 3.



Picture 3. Graph of dry bulb weight of shallots with oil palm ash treatment and various organic fertilizers (g)

Heavier dry onion bulbs per clump produced in the combination of 400 g/plot oil palm bunch ash and corn litter bokashi in this treatment has been able to give a positive response to the improvement of Ultisol soil conditions, the soil becomes more fertile and can provide the needed nutrients. by plants and combined with organic fertilizer bokashi corn litter, the plants are better able to absorb the nutrients available in the soil as needed. With sufficient nutrients, metabolic processes such as photosynthesis in the body of shallot plants can take place properly which in the end the assimilation produced will also increase and can produce a more maximal dry weight.

Palm ash ash contains Ca, Mg and K where the Ca element can increase the bases in the soil so that Ultisol soil acidity can be reduced and release P nutrients. plants so that tuber weight increases

Lakitan (2015) suggested that the element potassium plays a role in increasing photosynthetic activity so that the accumulated photosynthate can be translocated to generative organs, especially shallot bulbs.

Result of research by Bancin et al, 2016. Treatment of palm ash ash ameliorant on peat soil on shallots was

the best treatment compared to other ameliorant treatments.

There was a decrease in the dry weight of shallot bulbs produced in oil palm ash of 600 g/plot because the dose had exceeded the requirement thus inhibiting plant growth, according to Romheld (2012) explaining that nutrient toxicity caused by high levels of nutrients in plant tissue can be seen with plant growth rates that do not increase much. in oil palm ash 200 g/plot, this dose has not been able to fully improve the condition of the ultisol soil, it is suspected that the nutrients needed by plants have not been fulfilled properly. Lakitan (2015) states that sufficient plant nutrient needs will increase growth and vice versa, if plant nutrient requirements are insufficient, plant growth will be stunted.

Heavier dry tuber produced is also due to the influence of corn litter bokashi. Bokashi corn litter is also an organic fertilizer that can improve ultisol soil conditions, both physically, chemically and biologically. The results of Pangaribuan's (2008) research, the application of bokashi can increase nutrients in the soil, especially N, P and K as well as other nutrients. In addition, bokashi can also improve soil air and groundwater, so that plant roots will develop properly and can absorb more nutrients.

Magdi et al. (2009) reported that organic fertilizers will produce onion bulbs that are heavier than inorganic fertilizers.

The results of research by Anisyah et al, (2014) showed that the application of organic straw compost fertilizer increased tuber dry weight per sample the highest by 36.02 g compared to other organic fertilizers. Furthermore, Firmansyah's research results (2015) The dose of 3000 kg/organic fertilizer + 50kg/biological fertilizer which gave the highest dry bulb weight of eskip onion, which was 23.22kg/15m2. If it was converted in 1 hectare, the yield was 15.48 t/ha.

Meanwhile, from the results of the study, when converted from the combination of the best treatments, 66.33 g/plant was equivalent to 16.58 tons/ha. Then when compared with the description where the variety used is bima brebes with a potential yield of 9.9 tons of dry tubers per ha, the results are already above the plant description.

Nutrients play a role for plants in fulfilling their life cycle. The function of plant nutrients cannot be replaced by other nutrients and if a plant lacks nutrients, the metabolic activities of the plant will be disrupted which causes a decrease in plant growth and yield.

Weight loss of tubers (%)

The results of the analysis of variance showed that the interaction effect and the main effect of oil palm ash and various types of organic fertilizers had a significant effect on tuber weight loss. The average results of observations of tuber weight loss after further testing by BNJ at a level of 5% can be seen in Table 2.

Table 2. The average weight loss of shallot bulbs with the treatment of oil palm bunch ash and various organic fertilizers (%)

Oil Palm Ash (g/plot)	Organic fertilizer (kg/plot)				Average
	No Organic Fertilizer	Chicken manure	Compost Tankos	Bokashi Litter Corn	
0	25.73 h	19.47 g	18.99 g	15.35 cde	19.88 d
200	18.40 fg	15.86 def	15.13 cde	12.79 bc	15.55 c
400	15.10 cde	12.67 bc	12.76 bc	9.49 a	12.51 a
600	17.26 efg	12.01 bcd	14.07 cd	11.06 ab	14.10 b
Average	19.12 c	15.50 b	15.24 b	12.17 a	

The numbers in the rows and columns followed by the same lowercase letters show that they are not significantly different according to the BNJ follow-up test at the 5% level.

The data in Table 2 shows the interaction of oil palm ash bunches and organic fertilizers has a significant effect on the weight loss of shallot bulbs, the best treatment is the combination of 400 g/plot combination of oil palm cassava ash and corn litter bokashi with tuber weight loss of 9.49% which was not significantly different. with a combination of 600 g/plot of palm oil bunch ash and corn litter bokashi that was 11.06 %, then followed by 400 g/plot of oil palm bunch ash and 12.67 % of chicken manure, 400 g/plot of oil palm bunch ash and 12.79 % of tankos compost. , the highest tuber weight loss was produced without oil palm ash and organic fertilizer, which was 25.73%.

Shrinkage of tubers can be used as a parameter to determine quality as seen from the weight loss of tubers produced. Where the lower tuber weight loss value indicates that the quality of the onion bulbs is good, this also affects the shelf life of the bulbs, where the lower the tuber weight loss, the longer the tuber's shelf life.

Sanjaya (2013) suggested that the provision of palm ash bunches can also contribute nutrients Ca and Mg, where these elements can neutralize the Al and Fe content while the Mg element is part of the chloroplast or the core of green leaf grains which play a very important role in the process. photosynthesis.

Bokashi corn litter is an organic fertilizer made from corn plant residues that have been fermented with EM-4, Indriani (2010) suggested that the EM used in making bokashi is a mixed culture of various beneficial microorganisms, especially photosynthetic bacteria, Lactobacillus sp bacteria, yeast and Actinomycetes. The decomposition activator is one of the leading microbes such as Lactobacillus sp, yeast and fungus and Cellulolyticbacillus as a decomposer of organic matter. EM can be used as an inoculant to increase soil microbial diversity. The use of EM in making bokashi can improve soil health and quality as well as improve plant growth and production.

Elisabet at al, (2012) suggested that the role of organic matter from the plant aspect comes from the weathering of organic matter which is thought to contain organic acids that can increase the availability of nutrients for plants and can be absorbed by plants immediately. Kusumastuti (2013) states that good plant growth and development conditions make plant roots produce root exudates (the result of root metabolism) of more quality and quantity so that they can affect microorganisms that help provide nutrients for plants.

Relative growth rate/LPR

The results of observing the relative growth rate of shallot plants at the age of 21-28, 28-35 and 35-42 DAP after analysis of variance showed that the interaction of oil palm cassava ash and various organic fertilizers did not affect the relative growth rate of shallots on ultisol soils, however. The main treatment of oil palm ash and various organic fertilizers had a significant effect. The average results of observations of the relative growth rate of shallots after the BNJ test at a level of 5% can be seen in Table 3.

Table 3. Average relative growth rate of shallots treated with palm ash and various organic fertilizers (g/day)

HST	Oil Palm Ash (g/plot)	Organic fertilizer (B)				Average
		No Organic Fertilizer	Chicken manure	Compost Tankos	Bokashi Litter Corn	
21-28	0	0.062	0.095	0.102	0.131	0.098 d
	200	0.116	0.148	0.144	0.169	0.144 c
	400	0.148	0.182	0.188	0.237	0.189 a
	600	0.133	0.162	0.164	0.192	0.163 b
	Average	0.115 c	0.147 b	0.149 b	0.183 a	
28-35	0	0.143	0.195	0.199	0.224	0.190 d
	200	0.177	0.228	0.225	0.248	0.219 c
	400	0.216	0.255	0.263	0.300	0.259 a
	600	0.191	0.234	0.249	0.270	0.236 b
	Average	0.182 c	0.228 b	0.234 b	0.261 a	
35-42	0	0.175	0.211	0.227	0.257	0.218 d
	200	0.217	0.253	0.249	0.276	0.249 c
	400	0.279	0.303	0.312	0.342	0.309 a
	600	0.248	0.266	0.279	0.306	0.275 b
	Average	0.230 c	0.258 b	0.267 b	0.295 a	

The numbers in the rows and columns followed by the same lowercase letters show that they are not significantly different according to the BNJ follow-up test at the 5% level.

Based on the data in Table 3, it can be seen that the relative growth rate of shallot plants at the age of 21-28, 28-35 and 35-42 DAP, with the provision of oil palm ash at each level gives a different effect, where the LPR is the highest. found in the provision of oil palm ash 400 g/plot.

The decrease in the LPR rate in the administration of 600 g/plot of oil palm janjang ash was due to the fact that the given dose of oil palm ash had exceeded the required dose so that it could affect the growth of the shallot plant, whereas the administration of 200 g/plot of oil palm janjang ash had not been able to provide adequate results. a good effect on improving ultisol soil conditions, the nutrients needed by plants cannot be fully met, thus inhibiting the growth of shallot plants. Agustina (2004) suggests that the nutrients given to plants are too much or too much so that plant growth will be disrupted or plants will be poisoned.

The ash of empty palm kernel shells contains a high element of K, which is 30-40%. According to Silahooy (2008), element K is needed in the process of transporting water and nutrients, causing nutrient and water uptake to increase which ultimately increases photosynthesis and plant metabolism. The results of the study at the right dose of jajang ash, which was 400 g/plot, were able to increase the relative growth rate of shallot plants.

The relative growth rate increased due to an increase in plant growth and the process of photosynthesis. Improved photosynthesis process increases plant biomass. (Jumin, et al. 2014)

The data in Table 6, shows that the application of various organic fertilizers has an effect on the relative growth rate of shallot plants both at observations 21-28, 28-35 and LPR 35-42 DAP, where the best treatment is in the provision of corn litter bokashi which is significantly

different from the treatment. other organic fertilizers.

The relative growth rate shows the ability of plants to accumulate organic matter accumulated in plants (biomass) which results in weight gain. The formation of plant biomass includes all plant material derived from photosynthesis and the absorption of nutrients and water that are processed in the biosynthetic process. The growth process leads to the accumulation of dry weight of the plant and this process will occur if sufficient assimilation results are available. Where it also depends on the availability of nutrients, the condition of nutrients available in the soil and can be absorbed by plant roots so that the maximum photosynthesis process takes place, the plant will produce more assimilated material.

The results of Zahrah's research (2020) Application of organic fertilizer compost from oil palm fronds on mung bean plants has a significant effect on the relative growth rate.

Harmonadi (2012) that organic fertilizer contains macro and micro nutrients which are very important for plants. These nutrients can be easily dissolved and more quickly absorbed by plants, so that they can stimulate plant growth and development.

Nutrient Uptake N, P and K

The results of the analysis of the uptake of N, P and K nutrients with the application of palm ash and various organic fertilizers on shallot plants can be seen in table 4.

Table 4.Nutrient uptake of N, P and K of shallots treated with palm ash and various organic fertilizers (mg/plant)

Oil Palm Ash (g/plant)	Absorption N (mg/tanaman)				Average
	No Organic Fertilizer	Chicken manure	Compost Tankos	Bokashi Litter Corn	
0	62.40	118.40	141.60	144.90	116.83
200	97.60	172.00	109.40	252.50	157.88
400	171.00	233.60	256.00	300.00	240.15
600	164.80	198.60	209.60	262.10	208.78
Average	123.95	180.65	179.15	239.88	
	P uptake (mg/plant)				
0	12.00	37.60	43.20	47.60	35.10
200	20.00	46.40	47.30	57.80	42.88
400	43.20	67.20	73.80	83.00	66.80
600	24.80	44.30	57.00	64.00	47.53
Average	25.00	48.88	55.33	63.10	
	K uptake (mg/plant)				
0	21.20	54.40	69.60	73.60	54.70
200	55.20	58.40	75.20	82.40	67.80
400	72.80	89.60	92.70	102.40	89.38
600	68.00	74.40	76.80	92.00	77.80
Average	54.30	69.20	78.58	87.60	

Based on table 4, it shows that the administration of palm ash janjang at a dose of 400 g/plant is the treatment that produces the best N, P and K nutrient uptake. good.

Palm ash ash is the result of burning from empty oil palm fruit bunches, in general, ash is alkaline so it can increase soil pH. From research that has been carried out through the application of oil palm janjang ash, it has been able to increase the pH of Ultisol soil, where before the application of oil palm janjang ash the soil pH was obtained an average of 5.2 then two weeks after the application of oil palm janjang ash the average was obtained at a dose of 200 g/plot was 5.7, the dose of 400 g/plot was 6.8 and the dose of 600 g/plot was 7.1.

The presence of empty palm ash ash such as Ca, Mg and K can increase the bases in the soil so that soil acidity can decrease and release P.Salsi (2011) states that the increase in pH also affects the increase in K and P content, the higher the pH value of the decomposition process by organisms, so that it can increase soil nutrients including K and P.

The application of various organic fertilizers showed that corn litter bokashi was the treatment that produced the best N, P and K uptake. This indicated that through the application of corn litter bokashi, the soil conditions of ulrisols were improved so that the roots of shallot plants could absorb nutrients more optimally. from the ground.

The root system is one of the most important plant components in supporting plant growth and development. With the availability of water and nutrients, it will make it easier for the roots to absorb the nutrients and water that plants need

Bokashi corn litter is an organic fertilizer made from corn plant residues that have been fermented with EM-4. Research by Surtinah (2013) compost with corn litter material still contains C 10.5%, N 1.05%, C/N ratio 9 .97, P2O5 1.01%, K2O 0.18%, and Ca 1.89 me/100g.

Organic matter has important roles such as: (1) providing macronutrients (N, P, K, Ca, Mg, and S) and micro nutrients (Zn, Cu, Mo, Co, B, Mn, and Fe), although their amounts are relatively small. a little; (2) increase the cation exchange capacity; and (3) can form complex compounds with metal ions that are toxic to plants such as Al, Fe, and Mn.

Kaderi (2004) suggested that the application of organic matter into the soil can help plant roots penetrate the soil deeper and wider so that plants are better able to absorb more nutrients and water. Magdi et al. (2009) also reported that organic fertilizers will produce onion bulbs that are heavier than inorganic fertilizers. It is suspected that in the application of organic fertilizer the absorption of N, P and K nutrients is higher in shallots.

Picture 4. Appearance of onion bulbs found at harvest from 16 combinations of treatment with palm ash and various organic fertilizers.

4. CONCLUSION

1. The main effect of oil palm ash was significant on all observation parameters, the best treatment was giving 400 g/plot of oil palm ash.
2. The main effect of various organic fertilizers was significant on all observed parameters, the best treatment being the application of corn litter bokashi.
3. Interaction of oil palm bunch ash and various organic fertilizers had a significant effect on plant height, number of tubers, wet weight per clump, dry weight per clump and tuber

weight loss, the best treatment was giving oil palm ash 400 g/plot and corn litter bokashi.

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