

Response Growth And Production Plant Mustard Bitter (*Brassica juncea* L.) Regarding Time Intervals and Dosages Giving Fertilizer Organic Liquid Azolla With System Drip Irrigation

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Published: Januari, 2024



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Abstract: Availability content material organic its low ground and time application proper fertilizer _ is a factor inhibitor For increase growth and production plant mustard bitter . POC Azolla has very high N content because Azolla is symbiotic with N 2 fixing cyanobacteria into ammonia ie Annabaena Azollae. Study This aim For know influence of time interval Azolla POC administration , dosage administration of Azolla POC, and interactions between time intervals and doses administration of Azolla POC to growth and production plant mustard bitter (*Brassica juncea* L.). Study This held month , December 2021 - March 2022 in Lahan Test Faculty Agriculture, Muhammadiyah University of Jember . Study This use Randomized Block Design (RCBD) Factorial consisting of from two factor . Two factor the namely the time interval administering POC Azolla (I) in 3 levels , namely : I1 = 4 days once , I2 = 5 days once , I3 = 6 days once and dose giving POC Azolla (P) in 4 levels , namely P0 = 0ml/m² , P1 = 100 ml/m² , P2 = 200 ml/m² , P3 = 300 ml/m² , each repeated 3 times. Research result show treatment interval time and dose giving POC Azolla has an effect to growth and production plant mustard bitter , and present interaction between treatment interval time and dose administration of Azolla POC.

Keywords : Mustard greens Bitter (*Brassica juncea* L.), Time interval , Dosage giving POC Azolla, Drip irrigation .

INTRODUCTION

Plant mustard bitter (*Brassica juncea* L.) is plant cultivated vegetables _ with sub- tropical climate , however capable adapt with good for the climate tropical (Ibrahim & Tanaiyo, 2016) . Plant mustard bitter known as mustard green is one of the commodity lots of vegetables popular with the public and have mark high economics (Oviyanti , 2016 in Fitriani et al., 2019) . Content nutrition in 100g of ingredients fresh mustard greens on mustard greens bitter is calories 22.00 cal , protein 2.30g, fat 0.30g, carbohydrates 4.00g, fiber 1.20g, calcium (CA) 220.50mg, phosphorus (P) 38.40mg, iron (FE) 2.90mg, vitamin A 969.00 SI, vitamin B1 0.09mg , vitamin B2 0.10mg, vitamin B3 0.70mg and vitamin C 102.00mg (Sepriani et al., 2016) . His height market demand will vegetables specifically plant mustard bitter , then need improved still in the cultivation process plant mustard bitter For fulfil market needs . According to Kholidin et al. (2016) that one _ obstacles faced in cultivation _ plant mustard is content material organic the land is low so that not enough support growth plant . For fulfil required nutrient content plant mustard bitter can use Azolla liquid organic fertilizer . According to Hasbi (2012) in Mamang et al. (2017) that , Azolla is kind mini water spikes measuring 3-4 cm which are symbiotic with N- fixing cyanobacteria viz *Annabaena Azollae*. Symbiosis This causing Azolla to have quality good nutrition . _ Whereas fertilizer organic liquid Azolla is results Azolla fermentation with bacteria parser For made as nutrient provider _ plant . Other obstacles faced in cultivation plant mustard bitter is plant This need lots of water however No can flooded Because can cause plant dead . According to Haryati et. Al. (2011) in (Witman, 2021) , that efficiency land water use agriculture can optimized through use technique proper irrigation , besides _ That technique drip irrigation capable maintain water conditions in the root zone plants on the range capacity roomy and pointy withered permanent .

METHOD

Study This held for 3 months , starting December 13 , 2021 to March 13 , 2022. Research This carried out on the land Test Faculty Agriculture, Muhammadiyah University of Jember , Village Summersari with height +89m spot above surface sea .

Study This held with use Randomized Block Design (RCBD) Factorial consisting of from two factor . Two factor the namely the time interval administering POC Azolla (I) in 3 levels and doses administering POC Azolla (P) in 4 levels , each repeated 3 times. Analysis study This use Analysis Of Variance (ANOVA), if results treatment show influential real , then continued further testing with Duncan Multiple Range Test (DMRT) level 5%. Factor first time interval administration of POC Azolla (I) in 3 levels , namely : I1 = 4 days once , I2 = 5 days once , I3 = 6 days very . Factor second is Azolla (P) POC dosage in 4 levels , namely : P0 = 0ml/m² , P1 = 100 ml/m² , P2 = 200 ml/m² , P3 = 300 ml/m² . Variable observation among them tall plants (cm), quantity leaves (strands), wide leaves (cm), length leaves (cm), weight wet per sample (g), wt wet per plot (g).

RESULTS AND DISCUSSION

As for the summary results analysis variety for each variable observations presented in Table 1. As _ following :

Table 1. Summary of F- Count results analysis variety to all variable observation .

| Parameter | F – Count | | |
|--------------------------|---|-----------------------|---------------------|
| | Time Interval for Giving POC Azolla (I) | Azolla (P) POC dosage | Interaction (IxP) |
| Plant height 14 dap | 212.35 ** | 30.83 ** | 1.85 ns |
| Plant height 21 hst | 203.13 ** | 29.21 ** | 1.26 ns |
| Plant height 28 hst | 1.32 ns | 15.44 ** | 2.07 ns |
| Amount Leaves 14 hst | 0.39 ns | 1.95 ns | 1.43 ns |
| Amount Leaves 21 HST | 30.53 ** | 59.33 ** | 2.84* |
| Amount Leaves 28 HST | 21.38 ** | 59.96 ** | 0.25 ns |
| Leaf length 14 dap | 23.04 ** | 26.36 ** | 0.60 ns |
| Leaf length 21 dap | 11.39 ** | 8.47 ** | 6.88 ** |
| Leaf length 28 dap | 0.41 ns | 13.65 ** | 2.78* |
| Leaf Width 14 hst | 14.04 ** | 31.42 ** | 1.22 ns |
| Leaf Width 21 hst | 13.37 ** | 18.48 ** | 0.13 ns |
| Leaf Width 28 hst | 8.37 ** | 14.13 ** | 0.63 ns |
| Heavy Wetness per Sample | 4.10* | 6.94 ** | 3.39* |
| Heavy Wet per Plot | 4.35* | 13.05 ** | 4.11 ** |

Description = ns: no influential real , *: influential real , **: very influential real .

Plant height

Table 2. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) Azolla against high average plant mustard bitter .

| Time Interval for Giving Azolla POC | Plant Height (cm) | | |
|-------------------------------------|-------------------|---------|---------|
| | 14 hst | 21 hst | 28 hst |
| I1 (4 days very) | 6.38 c | 10.38 c | 14.33 a |
| I2 (5 days very) | 7.23 b | 11.18 b | 14.01 a |
| I3 (6 days very) | 7.47 a | 11.50 a | 14.53 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 2. In the distance test Duncan's multiple shows I3 treatment is different real with treatment and observation tall plant ages 14 DAP and 21 HST . Meanwhile on 28 hst time interval treatment

The administration of POC Azolla is different No real between treatment . Treatment I3 is treatment best with high average plants 7.47 cm (14 days after planting) , 11.50 cm (21 days after planting) , and 14.53 cm (28 days after planting) . With carried out at different time intervals in giving nutrients , make plant own growth is different and shows _ _ best interval results growth tall plant . According to Yanto *et al.*, (2019) that , enough plants _ get supply nutrients will _ capable produce growth and yield optimal plants . Absorption lacking nutrients _ maximum Can caused by time application . In line with That Rosmarkam and Yuwono (2011) also stated that time and manner giving Proper fertilizer is very important , especially during _ supply fertilizer limited , then use fertilizer must appropriate time given and correct method the application so that increase results optimally Possible .

Table 3. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) Azolla against high average plant mustard bitter .

| Azolla POC dosage | Plant Height (cm) | | |
|-----------------------------|-------------------|---------|----------|
| | 14 hst | 21 hst | 28 hst |
| P0 (0 ml/m ²) | 6.73 d | 10.77 c | 12.87 c |
| P1 (100 ml/m ²) | 6.94 c | 10.91 b | 14.39 b |
| P2 (200 ml/m ²) | 7.11 b | 11.04 b | 14.61 ab |
| P3 (300 ml/m ²) | 7.33 a | 11.36 a | 15.30 a |

Information : The numbers that follow with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 3. In the distance test Duncan's multiple shows P3 treatment is different real with treatment others on 14 and 21 HST . On 28 hst P3 treatment is different No real with treatment other but different real with treatment and P0. P3 treatment is treatment best with high average plant namely 7.33 cm (14 DAP), 11.36 cm (21 DAP), and 15, 30 cm (28 DAP). This matter allegedly dose 60 ml/m² fertilizer organic liquid Azolla is capable provide nitrogen nutrients so can fulfil need plant nutrient N. _ Necessary plants _ the nitrogen nutrient fulfilled will give response good growth _ for plant . In accordance with opinion Handayanto (1998) *in* Triadiawarman & Rudi (2019) , gift material high organic _ can add essential nutrients and can also increase availability internal nutrients _ land for plant especially the nutrient N which has function main For development vegetative plant like growth tall plant .

Amount Leaf

Table 4. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) of Azolla against the average amount leaf plant mustard bitter .

| Time Interval for Giving Azolla POC | Amount Leaves (strands) | | |
|-------------------------------------|---------------------------|--------|--------|
| | 14 hst | 21 hst | 28 hst |
| I1 (4 days very) | 6.47 a | 5.64 b | 6.64 b |
| I2 (5 days very) | 6.47 a | 6.03 a | 6.83 b |
| I3 (6 days very) | 6.25 a | 6.11 a | 7.19 a |

Information : The numbers that follow with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 4 In the distance test Duncan's doubles show at 14 hst time interval treatment The administration of POC Azolla is different No real . Whereas at 21 HST I3 treatment is different real with treatment but different No real with treatment I2. Meanwhile, at the age of 28 HST I3 treatment is different real with treatment and I2, but I1 treatment is different No real with treatment I2. Treatment I3 is treatment best with the average number leaf the most namely 6.25 strands (14 DAP), 6.11 strands (21 DAP), and 7.19 strands (28 DAP). This matter allegedly Because moment 14 years old plant mustard bitter attacked by pests grasshopper , pest the eat leaves _ _ plant . So that amount leaves on plants mustard more Lots reduce rather than increasing Because eaten by grasshoppers earlier . According to Pattiwael (2018) grasshopper (still young and mature) usually eat leaves plants in parts edge leaf until bones leaf so that give rise to holes in the leaves . Meanwhile on 21 HST and 28 HST ability root in absorb the given POC is optimal because of the given interval different . Research result Daryanti & Dewi (2017) also show that the administration interval

fertilizer organic liquid influential real to wide leaf widest and heaviest dry plants , as well very real effect to amount leaves , plant fresh weight and weight consumption plant Pakchoy in polybag .

Table 5. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) of Azolla against the average amount leaf plant mustard bitter .

| Azolla POC dosage | Amount Leaves (strands) | | |
|-----------------------------|---------------------------|--------|--------|
| | 14 hst | 21 hst | 28 hst |
| P0 (0 ml/m ²) | 5.96 a | 5.41 d | 6.26 d |
| P1 (100 ml/m ²) | 6.67 a | 5.85 c | 6.67 c |
| P2 (200 ml/m ²) | 6.44 a | 6.07 b | 7.11 b |
| P3 (300 ml/m ²) | 6.44 a | 6.37 a | 7.52 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 5. In the distance test Duncan's multiple shows treatment giving Azolla POC dosage is different No real at 14 HST . whereas P3 treatment has an effect real to treatment others on the quantity parameter leaf plant mustard bitter aged 21 HST and 28 HST . P3 treatment is treatment best with high average plant namely 6.44 (14 DAP) , 6.37 cm (21 DAP) and 7.52 (28 DAP) . Allegedly Because moment 14 years old plant mustard bitter attacked by pests grasshopper , pest the eat leaves __ plant . So that amount leaves on plants mustard more Lots reduce rather than increasing Because eaten by grasshoppers earlier . According to Pattiwael (2018) grasshopper (still young and mature) usually eat leaves plants in parts edge leaf until bones leaf so that give rise to holes in the leaves . Whereas treatment dose giving fertilizer organic liquid (POC) Azolla delivers influence real to variable observation amount leaves at 21 HST and 28 HST . This matter happen allegedly Because nutrients provided to plants _ Already sufficient need plant nutrients . _ The largest nutrient contained in fertilizer _ organic Azolla's liquid is Nitrogen. Azolla is one of them source from material organic that is source of nitrogen (N) and also can made as fertilizer green (Setiawati *et al.* , 2019 in Syamsiyah *et al.*, 2021) . Nitrogen has role important in the process of photosynthesis , esp moment phase vegetative plant . Rajak *et al.*, (2016) role main N divide plant is For stimulate growth in a way overall , esp stems , branches , and leaves . Besides that N plays a role important in formation forage Very useful leaves in the process of photosynthesis . The nutrient N plays a very important role in growth vegetative plant for example tall plants and quantities leaf plant mustard .

Leaf Length

Table 6. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) of Azolla against the average length leaf plant mustard bitter .

| Time Interval for Giving Azolla POC | Leaf Length (cm) | | |
|-------------------------------------|------------------|---------|---------|
| | 14 hst | 21 hst | 28 hst |
| I1 (4 days very) | 7.24 b | 10.61 b | 14.70 a |
| I2 (5 days very) | 7.34 b | 10.71 b | 14.73 a |
| I3 (6 days very) | 7.53 a | 11.05 a | 14.94 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 6. In the distance test multiple Duncan interactions time interval treatment giving fertilizer organic liquid (POC) Azolla against variable long leaf show I3 treatment is different real to treatment others , but in treatment I1 with treatment I2 did not show different real at 14 HST and 21 HST . Meanwhile on 28 hst time interval treatment The administration of POC Azolla is different No real between treatment . Treatment I3 is treatment best with average value of the number leaf namely 7.53 cm (14 DAP) , 11.05 cm (21 DAP) , and 14.94 cm (28 DAP) . Treatment giving POC 6 days very in accordance with needs and power absorb root plant in accordance results study Rajak *et al.*, (2016), that administering POC at 6 day intervals _ once on a plant mustard give influence real on growth parameters leaves , appropriate For sufficient need nutrients and suitability with ability Power absorbed by the roots plant .

Table 7. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) of Azolla against the average length leaf plant mustard bitter .

| Azolla POC dosage | Leaf Length (cm) | | |
|-----------------------------|------------------|---------|---------|
| | 14 hst | 21 hst | 28 hst |
| P0 (0 ml/m ²) | 7.14 c | 10.55 b | 13.63 c |
| P1 (100 ml/m ²) | 7.32 b | 10.74 b | 14.77 b |
| P2 (200 ml/m ²) | 7.47 a | 10.74 b | 15.00 b |
| P3 (300 ml/m ²) | 7.56 a | 11.10 a | 15.74 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 7. In the distance test double Duncan treatment dose giving fertilizer organic liquid (POC) Azolla against variable long leaf show P3 treatment is different No real with treatment P2, however different real with treatment others at the age of 14 HST . Treatment P3 has an average length leaf namely 7.56 cm. while on 21 HST and 28 HST P3 treatment is different real with treatment others , however treatment other different No real with others except on 28 HST treatment and P2 are different real with P0. P3 treatment (dose giving fertilizer organic liquid Azolla 300 ml/m²) has an average length leaf namely 11.10 cm (21 HST) and 15.74 (28 HST) .

Table 8. Analysis results distance Duncan's multiple time interval interaction giving fertilizer organic liquid (POC) Azolla and dosage giving fertilizer organic liquid (POC) of Azolla against the average length leaf plant mustard bitter .

| Interaction | Leaf Length (cm) | | |
|-------------|------------------|-----------|-----------|
| | 14 hst | 21 hst | 28 hst |
| I1P0 | 7.04 a | 10.34 f | 13.12 e |
| I1P1 | 7.18 a | 10.47 eph | 14.88 BC |
| I1P2 | 7.36 a | 10.93 BC | 15.29 b |
| I1P3 | 7.38 a | 10.68 de | 15.50 b |
| I2P0 | 7.09 a | 10.68 de | 14.02 d |
| I2P1 | 7.34 a | 10.76 cds | 15.12 b |
| I2P2 | 7.41 a | 10.67 cde | 14.89 BC |
| I2P3 | 7.52 a | 10.73 cds | 14.88 BC |
| I3P0 | 7.28 a | 10.62 de | 13.76 de |
| I3P1 | 7.43 a | 11.01 b | 14.32 cds |
| I3P2 | 7.66 a | 10.67 de | 14.82 BC |
| I3P3 | 7.77 a | 11.90 a | 16.86 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 8. In the distance test multiple Duncan interactions time interval treatment giving fertilizer organic liquid (POC) Azolla and dosage giving fertilizer organic liquid (POC) Azolla against variable long leaf shows at 14 hst different No real between combination treatment . Meanwhile on 21 HST and 28 HST interaction I3P3 treatment is different real with treatment other . I3P3 treatment is treatment best with long average value leaf namely 7.77 cm (14 DAP) , 11.90 cm (21 DAP) and 16.86 cm (28 DAP) . Fertilizer organic Azolla liquid is given own content The nutrient N is large and plays a role in the process of photosynthesis plant mustard bitter . Fertilizer organic liquid Azolla has Lots nutrients contained _ in it . Content nutrients present _ in Azolla *sp.* namely N (1.96-5.30%), P (0.16-1.59%), Si (0.16-3.35%), Ca (0.31-5.97%), Fe (0.04-0.59%), Mg (0.22-0.66%), Zn (26-989ppm), Mn (66-2944 ppm)(Indarmawan *et al.*, 2012 *in* Surdina *et al.*, 2016) . according to Hasbi (2012) nitrogen (N) is absolute macro nutrients __ required by plants , which play a role in formation chlorophyll , protein, coenzyme as well as push formation part vegetative plants , enough containing nitrogen, plants become leafy wide and colorful green old , photosynthesis walk good and growth fast .

Leaf Width

Table 9. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) of Azolla to the average width leaf plant mustard bitter .

| Time Interval for Giving Azolla POC | Leaf Width (cm) | | |
|-------------------------------------|-----------------|--------|--------|
| | 14 hst | 21 hst | 28 hst |
| I1 (4 days very) | 5.00 c | 6.85 b | 8.21 b |
| I2 (5 days very) | 5.25 b | 7.16 a | 8.26 b |
| I3 (6 days very) | 5.47 a | 7.41 a | 8.59 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 9. In the distance test multiple Duncan time interval treatments giving fertilizer organic liquid (POC) Azolla against variable wide leaf show I3 treatment is different real to treatment others at 14 HST and 28 HST . Meanwhile, on 21 Hst I3 treatment with treatment I2 did not show different real . Treatment I3 is treatment best with width average value leaf namely at 14 HST namely 5.47 cm, 21 HST namely 7.41 cm, and 28 HST namely 8.59 cm. This matter happen allegedly Because administering POC Azolla at 6 day intervals very in accordance with ability root plant in absorb nutrients provided . _ Root plant own Power different absorption , with _ _ _ 6 days treatment very plant mustard bitter can maximizing Power absorb nutrition provided . _ Research result Daryanti & Dewi (2017) also show that the administration interval fertilizer organic liquid influential real to wide leaf widest and heaviest dry plants , as well very real effect to amount leaves , plant fresh weight and weight consumption plant Pakchoy in polybag .

Table 10. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) of Azolla to the average width leaf plant mustard bitter .

| Azolla POC dosage | Leaf Width (cm) | | |
|-----------------------------|-----------------|--------|--------|
| | 14 hst | 21 hst | 28 hst |
| P0 (0 ml/m ²) | 4.81 d | 6.70 c | 7.99 b |
| P1 (100 ml/m ²) | 5.04 c | 7.02 b | 8.23 b |
| P2 (200 ml/m ²) | 5.39 b | 7.24 b | 8.48 a |
| P3 (300 ml/m ²) | 5.73 a | 7.61 a | 8.71 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 10. In the distance test double Duncan treatment dose giving fertilizer organic liquid (POC) Azolla against variable wide leaf show P3 treatment is different real with treatment others at 14 HST and 21 HST , while at 28 HST P3 treatment is different No real with treatment P2, however different real with treatment other . P3 treatment is treatment best with average width leaf plants at 14 hst namely 5.73 cm, 21 HST namely 7.61 cm, and 28 HST namely 8.71 cm. This matter Because amount leaf lots of plants causes the process of photosynthesis become more optimal because the quantity is large . According to Duaja (2012) , that leaf is a plant organ place synthesise food For need plant nor as reserve food . Leaf own chlorophyll plays a role in do photosynthesis . With thereby the more Lots amount formed leaves _ so potential create room growth vegetative plant can grow with Good . Rajak *et al.*, (2016) add that the process of photosynthesis in leaves will produce possible energy _ used For growth and development leaves and plants in a way whole . Enhancement amount leaf will influence amount the resulting assimilate ultimately _ also influences formation leaves and other plant organs.

Heavy Wet Per Sample

Table 11. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) of Azolla to the average weight wet per sample plant mustard bitter .

| Time Interval for Giving Azolla POC | Heavy Wetness per Sample (grams) |
|-------------------------------------|----------------------------------|
| I1 (4 days very) | 86.72 b |
| I2 (5 days very) | 92.92 ab |
| I3 (6 days very) | 108.33 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 11. In the distance test multiple Duncan interactions treatment I3 is different real with treatment I1, however different No real with treatment I2. Treatment I3 is treatment best with average weight wet per sample plant namely 108.33 grams. According to Lakitan (2011) the more increase tall plants and quantities leaves , then will the more also increases the fresh weight of the plant the . Vice versa , when _ growth plant hampered so fresh weight of the plant will low . Hey there agree with Prasetya et al. (2009) who stated that fresh weight of the plant influenced by height plants and quantities leaves , increasingly tall plants and more Lots amount the leaves so fresh fresh weight plant will the more tall .

Table 12. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) of Azolla to the average weight wet per sample plant mustard bitter .

| Azolla POC dosage | Heavy Wetness per Sample (grams) |
|-----------------------------|----------------------------------|
| P0 (0 ml/m ²) | 76.81 b |
| P1 (100 ml/m ²) | 96.15 b |
| P2 (200 ml/m ²) | 93.44 b |
| P3 (300 ml/m ²) | 117.56 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 12. In the distance test multiple Duncan interactions treatment dose giving fertilizer organic liquid (POC) Azolla against variable heavy wet per sample plant show P3 treatment is different real with treatment others , however treatment other different No real One with other . P3 treatment is treatment best with average weight value wet per sample plant namely 117.56 grams. This matter happen Because need plant nutrients _ adequate , esp needs N. According Suprayogi *et al.*, (2018) that state that addition of N can stimulate growth vegetative ie branches , stems and leaves which constitute component compiler amino acids , proteins and formation protoplasm cells that can works in stimulate growth tall plant . Increased Nitrogen Uptake cause Nitrogen requirements in phase vegetative plant will sufficient , so will increase biomass plant .

Table 13. Analysis results distance multiple Duncan time intervals giving fertilizer organic Azolla liquid and dosage giving fertilizer organic liquid (POC) of Azolla to the average weight wet per sample plant mustard bitter .

| Interaction | Heavy Wetness per Sample (grams) |
|-------------|----------------------------------|
| I1P0 | 66.56 e |
| I1P1 | 89.33 cds |
| I1P2 | 97.11 BC |
| I1P3 | 93.89 bcd |
| I2P0 | 76.44 de |
| I2P1 | 113.00 b |
| I2P2 | 82.67 cde |
| I2P3 | 99.56 BC |
| I3P0 | 87.44 cds |
| I3P1 | 86.11 cde |
| I3P2 | 100.56 BC |
| I3P3 | 159.22 a |

Description : Numbers to follow _ with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 13. In the distance test multiple Duncan interactions treatment dose giving fertilizer organic liquid (POC) Azolla against variable heavy wet per sample plant mustard bitter show interaction I3P3 treatment is different real with treatment other . I3P3 treatment is treatment best with average weight wet per sample namely 159.22 grams. allegedly because of the administration interval fertilizer organic Liquid Azolla is suitable with ability root plant in absorb nutrition provided _ with maximum , as well dose fertilizer given _ can sufficient need will plant nutrients . _ According to Yanto *et al.*, (2019) that , enough plants _ get supply

nutrients will _ capable produce growth and yield optimal plants . Absorption lacking nutrients _ maximum Can caused by time application . Fertilizer organic Azolla liquid is given own content The nutrient N is large and plays a role in the process of photosynthesis plant mustard bitter . In accordance with opinion Rajak *et al.*, (2016) that role main N divide plant is For stimulate growth in a way overall , esp stems , branches , and leaves . Besides that N plays a role important in formation forage Very useful leaves in the process of photosynthesis . The nutrient N plays a very important role in growth vegetative plant for example growth leaf plant mustard .

Heavy Wet Per Plot

Table 14. Analysis results distance multiple Duncan time intervals giving fertilizer organic liquid (POC) of Azolla to the average weight wet per plant plot mustard bitter .

| Time Interval for Giving Azolla POC | Heavy Wetness per Plot (grams) |
|-------------------------------------|--------------------------------|
| I1 (4 days very) | 388.83 ab |
| I2 (5 days very) | 345.42 b |
| I3 (6 days very) | 472.75 a |

Information : The numbers that follow with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 14. In the distance test multiple time interval treatment giving fertilizer organic liquid (POC) Azolla against variable heavy wet per plant plot show I3 treatment is different No real with treatment I1, however different real with treatment I2. Treatment I3 is treatment best with the average value heavy wet per plot is 472.75 grams . This matter in accordance with results study Susilo (2019) show that the administration interval fertilizer organic liquid to growth Pakcoy (*Brassica rapa* L.) give influence real to the number parameter leaf . Frequency giving different fertilizers and dosages _ will influence production amount different leaves too . Amount leaf highest in the 6 day time interval treatment very in accordance with results study Daryanti & Dewi (2017) show that the administration interval fertilizer organic liquid influential real to wide leaf widest and heaviest dry plants , as well very real effect to amount leaves , plant fresh weight and weight consumption plant Pakchoy in polybag .

Table 15. Analysis results distance multiple Duncan doses giving fertilizer organic liquid (POC) of Azolla to the average weight wet per plant plot mustard bitter .

| Azolla POC dosage | Heavy Wetness per Plot (grams) |
|-----------------------------|--------------------------------|
| P0 (0 ml/m ²) | 297.11 b |
| P1 (100 ml/m ²) | 367.33 b |
| P2 (200 ml/m ²) | 353.89 b |
| P3 (300 ml/m ²) | 591.00 a |

Information : The numbers that follow with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 15. In the distance test double Duncan treatment dose giving fertilizer organic liquid (POC) Azolla against variable heavy wet per plant plot show P3 treatment is different real with treatment other . P3 treatment is treatment best with average weight value wet per plant plot namely 591.00 grams. This matter in accordance with Suprayogi *et al.*, (2018) that addition of N can stimulate growth vegetative ie branches , stems and leaves which constitute component compiler amino acids , proteins and formation protoplasm cells that can works in stimulate growth tall plant . Increased Nitrogen Uptake cause Nitrogen requirements in phase vegetative plant will sufficient , so will increase biomass plant .

Table 16. Analysis results distance multiple Duncan interactions time interval treatment giving fertilizer organic liquid (POC) Azolla and dosage giving fertilizer organic liquid (POC) of Azolla to the average weight wet per plant plot mustard bitter.

| Interaction | Heavy Wetness per Plot (grams) |
|-------------|--------------------------------|
| I1P0 | 319.00 ef |
| I1P1 | 368.33 bcd |
| I1P2 | 400.33 bcd |
| I1P3 | 467.67 b |
| I2P0 | 226.33 f |
| I2P1 | 407.67 bcd |
| I2P2 | 307.33 eph |
| I2P3 | 440.33 bc |
| I3P0 | 346.00 de |
| I3P1 | 326.00 def |
| I3P2 | 354.00 bcd |
| I3P3 | 865.00 a |

Information : The numbers that follow with the same letters in the same column show different No evident in the distance test Duncan's multiple level is 5%.

Based on Table 16. In the distance test multiple Duncan interactions time interval treatment giving fertilizer organic liquid (POC) Azolla and dosage giving fertilizer organic liquid (POC) Azolla against variable heavy wet per plant plot show interaction treatment I3P3 interactions are different real with treatment other . I3P3 treatment is treatment best with average weight value wet per plot is 865.00 grams . This matter In accordance opinion Lakitan (2011), that the more increase tall plants and quantities leaves , then will the more also increases the fresh weight of the plant the . Vice versa , when _ growth plant hampered so fresh weight of the plant will low .

Another optimizing factor fresh weight of the plant is with use system drip irrigation . According to Rezky (2018) sufficient water availability is useful for the photosynthesis process to be able to walk smoothly , so elongation , division and differentiation cell will become more good as can be push growth tall plants and quantities leaf . Besides lower growth tall plants and quantities leaf plants , water shortage will also lower heavy safe wet and heavy safe dry .

CONCLUSION

With exists utilization technology will make it easier man in transfer data as well make it easier work, and With Thus, utilization technology, incl features advanced in Microsoft Word such as AI Editor and Track Changes, no only makes it easier to transfer data and work, but also provides protection as well as guard security information in document. This matter show that technology, esp when applied with method new like cryptography and steganography, can give significant benefits in data processing and protection.

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