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Effect of Biotogrow Dosage on Black and White Sesame Varieties Quality (*Sesamum indicum L.)*

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ABSTRACT

Sesame (*Sesamum indicum L.*) as an industrial plant commodity product has functional properties and has good benefits for health and is needed for various industries, foodstuffs, and edible oil producers, as well as raw materials for industries: pharmaceuticals, margarine, soap, cosmetics , pesticides etc., because it contains > 40% unsaturated fat, minerals, protein, antioxidants (sesamin, and sesamolin). This research will provide solutions to cropping patterns and improve the welfare of the local community. This cultivation technique is able to optimize the planting medium to improve soil properties physically, chemically, biologically, can hold water and provide nutrients, which then makes it a source of plant needs in a sustainable manner. Research using Complete Randomized Block Design. Location of Trucuk Klaten. Treatment Factors Kinds of Sesame Varieties. The varieties are as follows, M1 = black sesame variety, M2 = white sesame variety, Biotogrow: D0 : without biotogrow 0 ml/l (as control), D1 : with a biotogrow dose of 1.5 ml/l, D2 : with a biotogrow dose of 2 ml/lD3 : with a biotogrow dose of 3 ml/l. Observation parameters included agronomic observations (flowering time, number of pods, weight of 1000 seeds, wet and dry stover) growing media conditions, agronomy and sesame growth. The data obtained were investigated for variance and continued with BNT 5%. As the fat content of white sesame is higher than black sesame which is 37% and 35.50%.

INTRODUCTION

Indonesia is an agricultural country that is rich in natural resources. Various natural resources in the form of food plants grow in Indonesia in a flourishing manner. One of them is the sesame plant (Sesamum Indicum L.) (Krismawati, 2020).

Sesame or a bush plant which has a Latin name (Sesamum indicum L.) is one of the annual plants belonging to the Pedaliaceae family. Plants have many benefits, such as a source of vegetable oil. This vegetable oil is extracted from the seeds and then the result is an oil that is better known as sesame oil. It is suspected that this plant originally came from tropical Africa, which then spread to eastern regions such as India and China (Ediwirman & Zaharnis, 2010).

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Sesame (Sesamum indicum L.) belongs to herbaceous plants with upright growth, this plant can grow to a height ranging from 30-200 cm, some of these plants have branches, some do not have branches, these plants are included in woody-stemmed plants with 4 indented, grooved, with knuckle stems, covered with downy hairs. For leaf morphology, the sesame plant has a single, long, alternate leaf with different shapes and sizes between the lower, middle and upper leaves. Sesame plants can be harvested when they are 2.5 – 5 months old, sesame plants are plants that can live on dry land, during their growth sesame plants require rainfall between 400 – 650 mm. Each plant certainly has various types of varieties, as is the case with sesame plants. Sesame plants also have several types of varieties, for example black sesame plants and white sesame plants. In each variety, of course, has the advantages of each that is different (Nurhayati et al, 2018).

The demand for imported sesame is increasing every year, the production of sesame in Indonesia alone is only 2,500 tons per year, while the demand for domestic consumption reaches 4,500 tons per year. Judging from this need, of course there are still many opportunities for us to develop sesame plants in the country (Baidowi, 2017).

Sesame can grow well on fertile soil, in this study sesame will be planted on regosol soil. This regosol soil is included in volcanic soil, this soil is fertile with a coarse grain texture that is gray to yellowish in color. The pH of this soil is around 6.6, so this soil is suitable for cultivating sesame plants. Even though this soil can be said to be fertile, to get maximum results, of course, it also requires additional treatment.

One way to increase the level of productivity of sesame plants, of course, can be started by fulfilling the intake of nutrients. One of them is by giving biotogrow. Biotogrow (BGG) is an organic fertilizer in liquid form, this fertilizer will later be tested for its ability to improve soil conditions at the research site. This Biotogrow contains various kinds of nutrients, both macro nutrients and micro nutrients. In addition, this fertilizer also contains several microorganisms and growth regulators, such as gibberellins, auxins, cytokinins. As for the microorganisms such as Tricoderma, Azoto bacter sp, Lactobacillus sp, Bacillus sp, Actinomycetes, Azotobacter sp etc. while the organic matter content includes 2%, 7.5% organic, 2.35% N, 3.5% P2O5, 2.24% K2O, 1.1% CaO, 0.1% MgO, 1% S, 0.0% Fe ,58 %, Mn 0,3 %,

This study aims to determine the effect of various doses of biotogrow and the best dose of biotogrow on the quality of black sesame and white sesame (Sesamum indicum L.).

The benefit of this research is to increase students' knowledge and insight about the effect of various doses of biotogrow and the best dose of biotogrow on the quality of black sesame and white sesame (Sesamum indicum L.). The use of these superior varieties in coastal sandy soil is not necessarily efficient in nutrient use. Therefore it is necessary to carry out a series of research activities to improve planting media in sandy soil by determining suitable varieties through community empowerment education which plays an important role in increasing sesame productivity.

METHOD

The research was carried out for ten months from February to November 2022. The research was located in the village of Mlese, Cawas, Klaten Regency. The research design used for this study was a Complete Randomized Block Design (RAKL) with 2 factorials, namely the dose of biotogrow, and the type of sesame plant variety. The factorial pattern in this study was 4 x 2 with 4 repetitions.

A. Agronomic Observations

1) Plant Height (cm)
   Observation of plant height was measured from the neck of the root to the tip of the highest leaf using a meter in units of centimeters. Observation of plant height is carried out every 2 weeks
2) During flowering (Days)
   Observations were made when the first flowers appeared on sesame plants.
3) Number of flowers
   This observation was made by counting the number of flowers that appear on sesame plants starting when the first flowers appear.
4) Number of pods planted
   This observation was made by counting the number of pods per sesame plant. This observation was made when the sesame was 80 days old or 1 week before harvesting.
5) Weight of the pods planted (g)
   The weight of the pods per plant is carried out by weighing all the pods on the plant and then weighing it with a scale.
6) Weight of a thousand seeds (g)
   The weight of 1000 sesame seeds is done by counting the seeds up to 1000 seeds and then weighing them with a scale. Observations were made after harvest.
7) Fat level
8) Antioxidant

B. Data Analysis Test

The observed results were analyzed by analysis of variance, if the treatment had a significant effect on the observed variables, it would be followed by a 5% BNT test.

RESULTS AND DISCUSSION

Each plant certainly has various types of varieties, as well as sesame plants. Sesame plants also have various types of varieties, for example black sesame plants, and white sesame plants (Norma, 2014).

The white sesame variety is the most common sesame variety, and the easiest to find in the market. This variety is a local variety that is widely cultivated by Indonesian people. The white sesame seed variety is widely used by the community, because of its easy availability in the market, and it is a local variety that is cultivated by many residents. Apart from white sesame, there are also varieties of black sesame, where black sesame usually has a sharper aroma, while white sesame has a lighter and more fragrant aroma. In addition, regarding the ash content contained in this black sesame variety is also greater than that of white sesame (Nurhayati et al, 2015).

In this study the white sesame used was sesame with the Sbr 4 or Sumberrejo 4 variety code. This variety is very suitable for planting in paddy fields after rice. Sbr. 4 because it is more early maturing, it can be planted on MK-2i.e. 75 - 85 days, especially for rainfed areas that grow rice with the upland scaffolding system and walik straw in a year (Tobacco, 2015).

A. Biotogrow

Bioto Grow Gold (BGG) is one of the biological organic fertilizers that will be tested for its ability to improve soil conditions in this research location. BGG contains macro and micro

nutrients, also equipped with microorganisms and growth regulators, such as Auxins, Cytokinins, and Gibberellins (Wenda et al, 2017).

Microorganisms contained in BGG include Actinomycetes, Azotobacter sp, Azospirillium sp, Rhizobium sp, Psedomonas, Lactobacillus sp, Bacillus sp, Cytophaga sp, Streptomycetes sp, Saccharomyces, Cellulotic, BPF, Mycoriza, Tricoderma, while the organic matter content includes 2% , organic 7.5 %, N 2.35 %, P205 3.5 %, K2O 2.24 %, CaO 1.1 %, MgO 0.1 %, S 1 %, Fe 0.58 %, Mn 0, 3%, B 2250.80 ppm, Mo 0.01%, Cu 6.8 ppm, Zn 0.2%, Cl 0.001% and also growth regulators Auxin 170 ppm, Gibberellin 225 ppm, Kinetin 99.7 ppm, Zeatin 99.5 ppm (Aritonang, 2018).

B. Previous Research

1. Study of Nurhayati, et al (2015)

   Study of Nurhayati, et al (2015), entitled "Sesame Varieties (Sesamum Indicum L.) Yield Components In Beach Sand Land That Are Influenced By Fertilization Time". This study used the Complete Randomized Block Design or RAKL method. This study aims to produce a sesame cultivation technology package by differentiating when fertilizing. Based on the research that has been done, it can be concluded that applying fertilizer in the form of chicken manure and NPK at a dose of 11.25 tons/ha and NPK an organic fertilizer equivalent to a dose of 18.75 tons/ha at planting gives significantly different results for the number of flowers. seed/plant weight, pod + seed dry weight, on SBr 1 variety.
2. Study of Nurhayati & Martana (2017)

   Nurhayati and Martana's research (2017) entitled "Response of Winas 1 and Winas 2 Sesame Varieties (Sesamun indicum, L.) to Active Charcoal in Sand Soil Media". This study used a completely randomized design or RAL method. This study aims to determine the effect and determine the combination of activated charcoal on the best growing media for sesame seeds Winas 1 and Winas 2. Based on the research that has been done, it can be concluded that the Winas 2 variety tends to grow faster.
3. Study of Nurhayati, et al (2018)

   Study Nurhayati, et al (2018) it is entitled "The Effect of Fertilization Time in Two Planting Seasons on Sesame Sbr-1 and Sbr-3 Characters in Beach Sand Land". This study used a split plot design method. This study aims to determine the best fertilization time for yield on several varieties of sesame plants.

   Based on the research that has been done, it can be concluded that the application of fertilizer in the form of chicken manure at a dose of 24.75 g and NPK inorganic fertilizer: 1.45 g; N: 0.74g; P: 1.25 g K/plant given at the time of planting in the dry season, had the best effect on the growth characteristics of Sbr-1 and Sbr-3 sesame planted in Beach Sand Land.

   Sesame is a plant that is quite popular in Indonesia. In Indonesia, the sesame plant is highly used in the manufacture of vegetable oil, this oil is obtained through the extraction process from the sesame seeds which will produce oil called sesame oil. In addition, sesame contains protein, antioxidants, minerals and vitamins which are beneficial to health. Therefore, it is undeniable that the demand for sesame in Indonesia has increased every year, while the production of sesame in Indonesia itself can be said to be quite low. In Indonesia, there are many types of sesame varieties, for example, black sesame varieties and white sesame varieties. Where each type of variety certainly has its own advantages.

Sesame is one of the most important oil-producing crops from sub-tropical to tropical regions. In addition, sesame plants are a source of protein in dry areas (Weiss, 1971).

C. When Flowering

The results of the analysis of variance showed that the dosing treatment (D) had a very significant effect on the appearance of sesame plant flowers, the sesame variety (V) had a very significant effect on the parameters when the sesame plants appeared, while for the interaction of biotogrow doses with sesame varieties (VD) it had a significant effect on the parameter when the sesame plant flowers appear. To get further analysis, it was tested using the BNT test with a level of 5% which is in table 1.

Table 1
Effect of Biotogrow Dose Treatment On Sesame Varieties On Parameters Appear Flowers (hst) Sesame Plants (hst)

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	43.25 a	42.50c
D1	43.00 a.m	42.25c
D2	42.75a	39.25 ab
D3	42.00 a.m	38.50a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

From the results of the BNT analysis test above on the black sesame variety (V1) with treatment D0 (control) without biotogrow fertilizer, it gave an average yield of 43.25 flowers, showing no significantly different results for each treatment, both treatment D1 (1.5 ml/ l) with an average yield of 43.00, treatment D2 (2 ml/l) with an average yield of 42.75, and treatment D3 (3 ml/l) with an average yield of 42.00. Whereas the white sesame variety (V2) in treatment D0 (control) without biotogrow fertilizer gave an average yield of 42.50 when flowers appeared, showing no significant difference to treatment D2 (2 ml/l) with an average yield of 42.25 , but significantly different from treatment D2 (2 ml/l) with an average yield of 39.25, and treatment D3 (3 ml/l) with an average yield of 38.25.

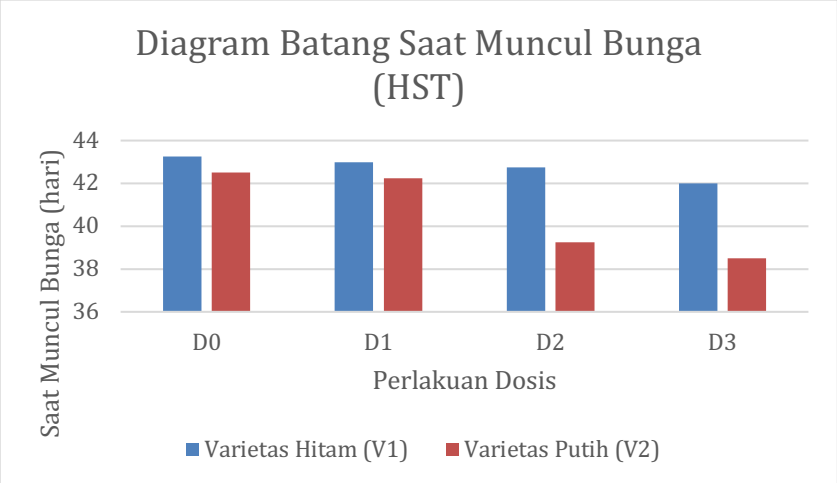

Figure 1. Bar chart of when flowers (HST) appear in sesame plants, on the treatment of biotogrow doses againts sesame plant varieties

From the diagram above when flowers appear, it can be seen that at the treatment dose of Biotogrow D3 (3 ml/l), it has a significantly different effect on the appearance of flowers on sesame plants. In this parameter, especially for white sesame varieties, the higher the biotogrow dose given, the faster the appearance of flowers on sesame plants. This is presumably because the application of biotogrow fertilizer contains the nutrient phosphorus (P), the nutrient phosphorus is one of the macronutrients which plays a role in stimulating the formation or emergence of flowers, besides that the nutrient phosphorus also plays a role in cell growth, the formation of fine roots and hair. roots, strengthen straw so that plants do not easily overturn, improve the quality of plants, fruit and seeds, and strengthen resistance to disease (Baidowi, and Wibowo, 2017). In addition to the availability of phosphorus for plants, there are also microorganisms that can help dissolve phosphate, for example Actinomycetes.

D. Interest Amount

The results of observing the number of sesame plant flowers at the age of 7 MST are in Appendix 17, while the results of the analysis of variance are in Appendix 18. The results of the analysis of variance showed that the treatment of biotogrow (D) doses showed significantly different results on the parameter of the number of flowers, on sesame varieties (V) showed significantly different results on the number of flowers parameter, as well as the interaction between biotogrow doses and sesame varieties (VD) was not significantly different on the number of flowers parameter. Further analysis uses the BNT test with a level of 5% which is in table 2.

Table 2
Effect of Biotogrow Dose Treatment on Sesame Varieties on Parameters of Sesame Plant Flower Number

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	23.50a	23.50c
D1	25.75 a	26.25 bc
D2	26.50a	29.50 ab
D3	27.50a	31.50a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

In table 2 the BNT test results show the black sesame variety (V1) with D0 treatment (control) without biotogrow fertilizer producing an average number of flowers of 23.50 showing no significant difference to all treatments, both to treatment D1 (1.5 ml/l) with an average yield of 25.75, in treatment D2 (2 ml/l) with an average yield of 26.50, and in treatment D3 (3 ml/l) with an average yield of 27.50. Meanwhile, in the white sesame variety (V2), it can be seen that in treatment D0 (control) without biotogrow fertilizer, it gave an average yield of 23.50, which showed that the results were not significantly different from treatment D1 (1.5 ml/l) with an average yield of 26. ,25. However D0 (control) with an average yield of 23.50 was significantly different from treatment D2 (2 ml/l) with an average yield of 29.50, and in treatment D3 (3 ml/l) with an average yield of 31, 50.

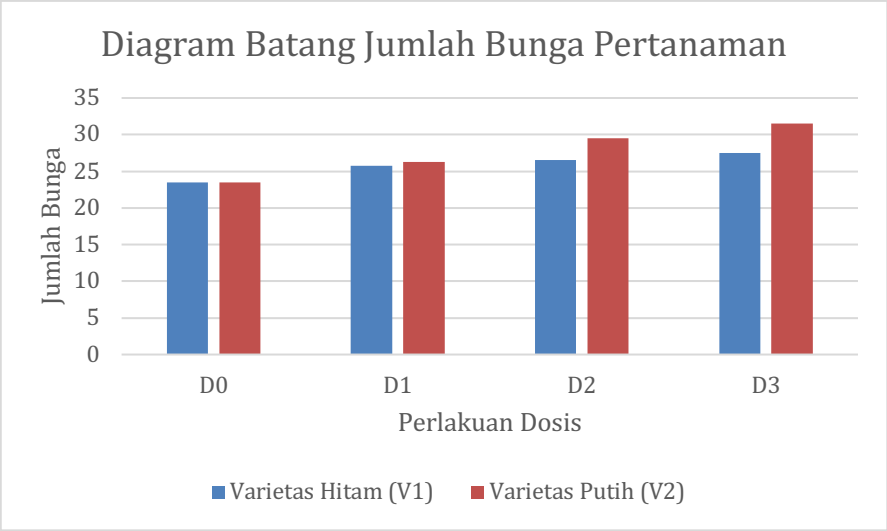

Figure 2. Bar Chart of the Number of Sesame Flowers at the age of 43 HST-53 HST, on the treatment of biotogrow doses againts sesame plant varieties

From the diagram above, the biotogrow dose treatment shows a significantly different effect on the number of flowers in sesame plants and white sesame varieties. In each treatment the dose of biotogrow certainly gives different results. In the D3 treatment (3 ml/l) it had a significantly different effect on the parameter number of flowers on white sesame varieties. This is due to the application of biotogrow fertilizer which contains various kinds of nutrients, both micro nutrients and macro nutrients. For example, the nutrient P205, the nutrient phosphorus, is one of the macronutrients that is needed by plants. Besides functioning to stimulate the growth of plant roots, strengthen stems, phosphorus also functions to accelerate the formation of flowers, which will later become the pods of the sesame plant (Aritonang & Surtinah, 2018).

E. Number of Planted Pods

The results of the analysis of variance showed that the treatment of biotogrow fertilizer doses (D) had a very significantly different effect on the parameter of plant pod weight, the sesame variety (V) had a very significantly different effect on the parameter of the number of pods planted. However, the interaction between biotogrow dose and sesame variety (VD) was not significantly different from the number of pods planted. Further analysis uses the BNT test with a level of 5% which is in table 3.

Table 3
Effect of Biotogrow Dose Treatment on Sesame Varieties On Parameters of The Number of Sesame Plant Pods

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	212.50b	217.25b
D1	215.75 a	218.50b
D2	219.00 a	221.25b
D3	221.25 a	230.00 a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

From the BNT test results in the table above, the black sesame variety (V1) with treatment D0 (control) without biotogrow fertilizer gave an average yield of 212.50, showing significantly different results from treatment D1 (1.5 ml/l) with an average yield - average 215.75, treatment D2 (2 ml/l) with an average result of 219.00, and in treatment D3 (3 ml/l) with an average result of 221.25. However, the D3 treatment (3 ml/l) was not significantly different from the D1 treatment (1.5 ml/l) and the D2 treatment (2 ml/l), but significantly different from the DO treatment (control). The white sesame variety (V2) with treatment D0 (control) without biotogrow fertilizer gave an average yield of 217.25, which was not significantly different from all good treatments D1 (1.5 ml/l) with an average yield of 218.50, and in the D2 treatment (2 ml/l) with an average yield of 221.25.

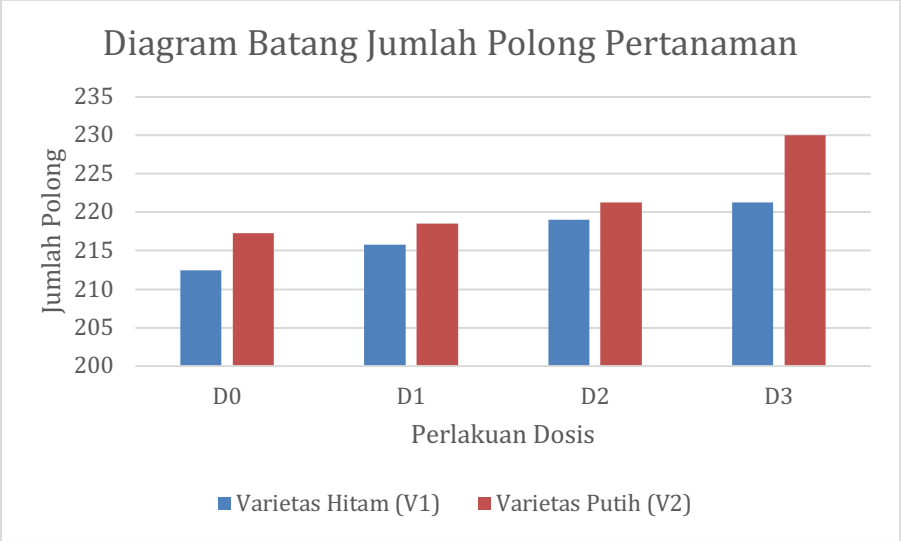

Figure 3. Bar Chart of the Number of Land Pods, on the treatment of biotogrow doses against sesame plant varieties

From the diagram of the number of pods planted above, it can be seen that the treatment of biotogrow doses gave significantly different results to the parameter number of pods planted. It is suspected that in the application of liquid biotogrow fertilizer, there are various nutrient contents such as phosphorus (P) and potassium (K), where phosphorus and potassium will play a role in stimulating the flowering process (Riyanto, et al, 2020). In addition, there are also various microorganisms that play an important role in plants, for example, phosphate solubilizing bacteria that can provide available phosphate for plants. So that these bacteria also play a role in the flowering process which later these flowers will become pods (Aritonang, and Surtinah, 2018).

F. Planting Pod Weight

The results of observing the weight of the number of pods can be seen in Appendix 21, while the results of the analysis of variance are in Appendix 22. The results of the analysis of variance showed that the treatment dose of biotogrow (D) was either dose D1 (1.5 ml/l), D2 (2 ml) /l), and D3 (3 ml/l) had a significant effect on the weight of the pods planted, the sesame variety (V) also had a very significant effect on the parameters of the pod weight of the plants, but the interaction between sesame varieties and the dose of biotogrow (VD) was

not significantly different on the parameters of the weight of the pods planted. For further analysis results were tested using the BNT test with a level of 5% which is in table 4.

Table 4
Effect of Biotogrow Dose Treatment on Sesame Varieties on Weight Parameters of Sesame Plant Pods (g)

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	212.50b	218.50b
D1	219.25 a	222.25 ab
D2	221.75 a	224.75 ab
D3	227.00 a	229.25 a

Note: The mean of treatments followed by the same letter in the same column showed no significant difference at the BNT level of 5%.

From the results of the BNT test above the black sesame variety (V1) with treatment D0 (control) without biotogrow fertilizer gave an average yield of 212.50 which was significantly different for each treatment, both treatment D1 (1.5 ml/l) with an average yield 219.25, treatment D2 (2 ml/l) with an average yield of 221.75, and in treatment D3 (3 ml/l) with an average yield of 227.00. Whereas the white sesame variety (V2) in treatment D0 (control) without biotogrow fertilizer gave an average yield of 218.50, which showed that the results were not significantly different from treatment D1 (1.5 ml/l) with an average yield of 222.25. and in treatment D2 (2 ml/l) with an average yield of 224.75, but significantly different from treatment D3 (3 ml/l) with an average yield of 229.25. The D3 treatment (3 ml/l) was not significantly different from the D2 treatment (2 ml/l), and the D1 treatment (1.5 ml/l).

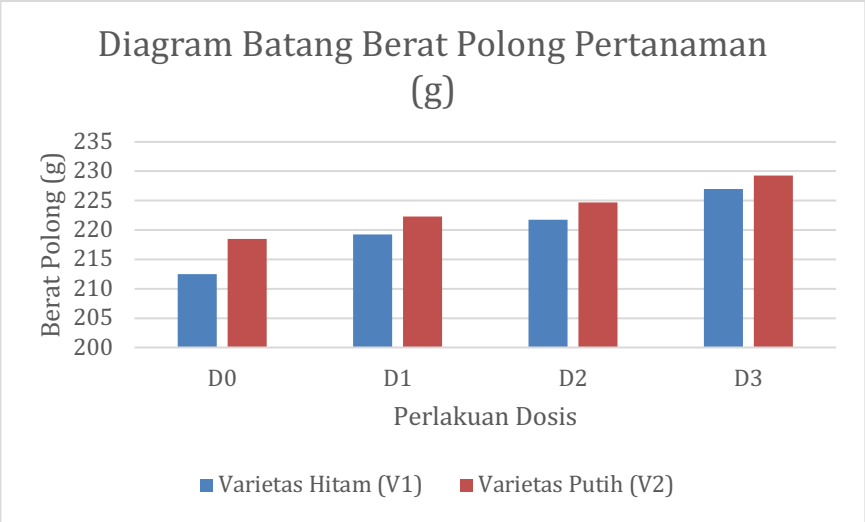

Figure 4. Bar Chart of Weight of Land Pods, on biotogrow dosage treatment against sesame plant varieties

From the diagram above, it can be seen that the biotogrow dose treatment gave significantly different results to the sesame seed pod weight parameter. This is because there are various kinds of ingredients in biotogrow fertilizers that affect the weight of sesame plant pods, such as the nutrient phosphorus (P). Which besides playing a role in cell growth, the formation of fine roots and root hairs, strengthening the straw so that the plants do not fall

over easily, improving the quality of the plants, phosphorus also plays a role in stimulating flowering which will later become pods, phosphorus also plays a role in filling the seeds in the pods. In addition there are also other nutrient elements, which play an important role in plant growth (Nurmasari, et al, 2014). The addition of fertilizer significantly results in seed weight per plant. Because fertilizer provides the nutrients needed to carry out vegetative and generative growth (Nurhayati, et al, 2020).

G. The Weight of a Thousand Seeds

The results of observing the weight of 1000 seeds are in Appendix 23, while the results of the analysis of variance are in Appendix 24. The results of the analysis of variance showed that the sesame variety treatment (V) gave highly significant different results to the weight parameter of 1000 seeds, the biotogrow dose treatment (D) also gave results significantly different from the weight parameter of 1000 seeds, and the interaction between sesame varieties and biotogrow (VD) doses gave highly significant different results to the parameter weight of 1000 seeds. For further tests using the BNT test with a level of 5% is in table 5.

Table 5
Effect of Biotogrow Dose Treatment on Sesame Varieties on Weight Parameters of Thousand Sesame Plant Seeds (g)

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	3.04b	3.03c
D1	3.06 ab	3.07 bc
D2	3.06 ab	3.09 ab
D3	3.09a	3,13 a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

From the BNT analysis test table above, it shows that the black sesame variety (V1) with treatment D0 (control) without biotogrow fertilizer gave an average yield of 3.04, not significantly different from treatment D1 (1.5 ml/l) with an average yield average 3.06, and in treatment D2 (2 ml/l) with an average result of 3.06, but D0 (control) was significantly different in treatment D3 (3 ml/l) with an average result of 3.09. Treatment D3 (3 ml/l) was not significantly different from treatment D2 (2 ml/l), and treatment D1 (1.5 ml/l). Whereas the white sesame variety (V2) in treatment D0 (control) without biotogrow fertilizer gave an average yield of 3.03, not significantly different from treatment D1 (1.5 ml/l) with an average yield of 3.07, and in treatment D2 (2 ml/l) with an average yield of 3.09, but D0 (control) was significantly different from treatment D3 (3 ml/l) with an average yield of 3.13.

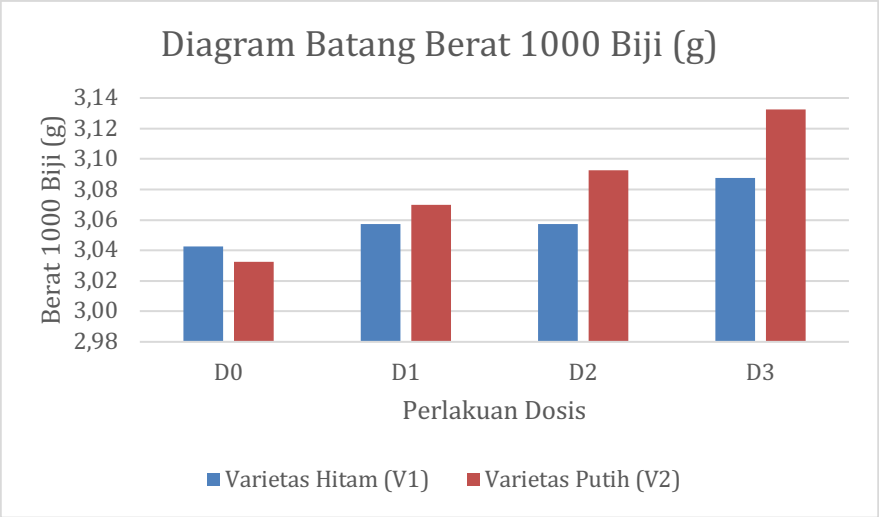

Figure 5. Bar Chart of Weight of 1000 Seeds of Sesame Plants, on the treatment of biotogrow dosage against sesame plant varieties

From the diagram of the weight of 1000 seeds above, it can be seen that the biotogrow dose treatment gave significantly different results to the parameter weight of 1000 seeds in sesame plants. This is presumably due to the content contained in biotogrow fertilizer, both macro, micro nutrients, microorganisms, and other organic matter. For example, the nutrient phosphorus (P). Besides playing a role in stimulating the emergence of flower buds, phosphorus also plays a role in filling the seeds in the pods. With sufficient nutrient content for plant metabolism, the seed formation process will be optimum and seed weight per plant can be further increased (Nurmasari, et al, 2014). The higher the photosynthesis used for growth plans and cultivation, the higher photosynthesis assumption will be trans-location and the dry weight will increase (Nurhayati, et al, 2020).

H. Wet Stove Weight

The results of observing the wet stover are in Appendix 25, while the results of the analysis of variance are in Appendix 26. The results of the analysis of variance showed that the treatment with the dose of biotogrow (D) had a significantly different effect on the weight of the wet stover sesame plants. The treatment of sesame varieties (V) had a significantly different effect on the weight of the wet stover sesame plants, but the interaction between the varieties and the dose of biotogrow (VD) was not significantly different on the weight of the wet stover sesame plants. For further analysis using the BNT test with a level of 5% contained in table 6.

Table 6
Effect of Biotogrow Dose Treatment on Sesame Varieties on Weight Parameters of Wet Stover Sesame Plant (g)

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	396.50b	398.00b
D1	398.00 ab	400.00 ab
D2	400.75 ab	402.75 ab
D3	402.25 a	405.25a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

From the BNT table data above it can be seen in the black sesame variety (V1) in treatment D0 (control) with an average yield of 396.50 showing results not significantly different from treatment D1 (1.5 ml/l) with an average yield of 398 .00, and in treatment D2 (2 ml/l) with an average yield of 400.75, however, treatment D0 (control) with an average yield of 396.50 was significantly different from treatment D3 (3 ml/l) with an average result - average 402.25. In treatment D3 (3 ml/l) with an average yield of 402.25, the results were not significantly different from treatment D2 (2 ml/l) and treatment D1 (1.5 ml/l). The white sesame variety (V2) with treatment D0 (control) without biotogrow fertilizer gave an average yield of 398.00, not significantly different from treatment D1 (1.5 ml/l) with an average yield of 400.00, and to treatment D2 (2 ml/l) with an average yield of 402.75, but D0 (control) was significantly different from treatment D3 (3 ml/l) with an average yield of 405.25. The D3 treatment (3 ml/l) with an average yield of 405.25 was not significantly different from the D2 treatment (2 ml/l) and the D1 treatment (1.5 ml/l).

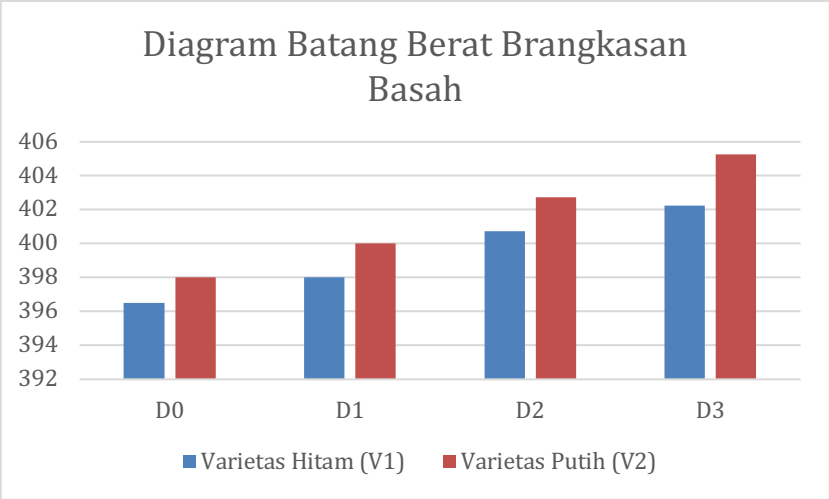

Figure 6. Bar Chart of Wet Stover sesame plants, on biotogrow dosage treatment against sesame plant varieties

Based on the wet stover diagram, it shows that the biotogrow dose treatment, especially in the D3 treatment (3 ml/l), gave significantly different results on the weight parameter of the sesame plant wet stover. This is presumably because biotogrow organic liquid fertilizer contains quite a variety of macro and micro nutrients, growth regulators, such as Auxins, Cytokinins, and Gibberellins, microorganisms such as Actinomycetes, Azotobacter sp, Azospirillium sp, Rhizobium sp, Psedomonas, Lactobacillus sp. , Bacillus sp, Cytophaga sp, Streptomycetes sp, Saccharomyces, Cellulotic, BPF, Mycoriza, Tricoderma, and organic matter content including 2%, 7.5% organic, 2.35% N, 3.5% P2O5, 2.24 K2O %, CaO 1.1 %, MgO 0.1 %, S 1 %, Fe 0.58 %, Mn 0.3 %, B 2250.80 ppm, Mo 0.01 %, Cu 6.8 ppm, Zn 0 .2 %, Cl 0.001 % (Aritonang, and Surtinah, 2018).

I. Dry Stoves

The results of the analysis of variance showed that the treatment doses of biotogrow (D) and sesame varieties (V) had a very significant effect on the weight of dry stover of sesame plants, but the interaction between varieties and doses of biotogrow (VD) was not significantly

different on the weight of dry stover of sesame plants. For further analysis using the BNT test with a level of 5% contained in the table below.

Table 9
Effect of Biotogrow Dose Treatment On Sesame Varieties On Weight Parameters Of Dry Stover Sesame Plant (g)

Biotogrow dosage	Sesame Varieties	
	Black (V1)	White (V2)
D0	143.50b	147.25b
D1	144.75b	147.75 b
D2	145.25 ab	149.50 ab
D3	146.25a	151.75 a

Note: The treatment means followed by the same letter in the same column showed no significant difference at the 5% BNT level.

The BNT test results with a level of 5% above showed that the black sesame variety (V1) with treatment D0 (control) without biotogrow fertilizer produced dry stover weight with an average of 143.50 showing results not significantly different from treatment D1 (1.5 ml /l) with an average yield of 144.75, and treatment D2 (2 ml/l) with an average yield of 145.25, but D0 (control) with an average of 143.50 was significantly different from treatment D3 (3 ml /l) with an average yield of dry stover 146.25. However, treatment D3 (3 ml/l) was not significantly different from treatment D2 (2 ml/l). In the white sesame variety (V2) with treatment D0 (control) without biotogrow fertilizer, it produced an average weight of 147.25, showing results that were not significantly different from treatment D1 (1.5 ml/l) with an average yield of 147.75, and against treatment D2 (2 ml/l) with an average yield of 149.50, but D0 (control) was significantly different from treatment D3 (3 ml/l) with an average yield of 151.75. Treatment D3 (3 ml/l) was not significantly different from treatment D2 (2 ml/l), but significantly different from treatment D1 (1.5 ml/l), and treatment D0 (control).

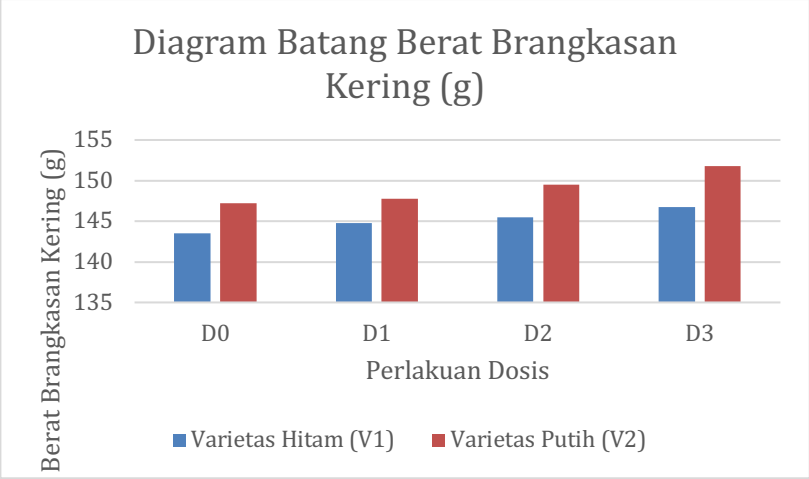

Figure 7. Bar Chart of Dry Stover Sesame Plants, on biotogrow dosage treatment against sesame plant varieties

From the dry stover weight diagram above, it can be seen that the biotogrow dose treatment gave significantly different results to the dry stover weight parameter. The actual weight of dry stover is also influenced by the weight of wet stover, in which the wet stover

will be dried, reduced by the water content, so that a dry stover with a lower water content is obtained. In addition, the high dry stover is also related to the high absorption of nutrients (including calcium) by plants which will be used in the formation of complex compounds that form parts of the plant body such as roots, stems and leaves (Syamsiyah, and Rahina, 2017). Fat level from the data that can be submitted, the fat content of white sesame is higher than black sesame, namely 37% and 35.50%.

CONCLUSION

The dose of biotogrow liquid fertilizer at a dose of 3 ml/l gave significantly different results on growth, and yields of black sesame and white sesame plants on the parameters when flowers appeared, number of flowers planted, number of pods planted, weight of pods planted, weight of one thousand seeds, weight wet stover, and the weight of dry stover and the highest fat content in white sesame, the fat content of white sesame is higher than black sesame, namely 37% and 35.50%

REFERENCES

Aritonang, S., & Surtinah, S. (2018). Stimulasi Hasil Melon (Cucumis melo, L) Dengan Menggunakan Bioto Grow Gold (BGG). *Jurnal Ilmiah Pertanian*, *15*(1), 35–41. https://doi.org/10.31849/jip.v15i1.1481 Google Scholar

Blitar, C. U., Dan, P., Tanaman, H., & Sesamum, W. (2017). *Mohamad Baidowi & Agung Setya Wibowo , 2017 . Dosis Pupuk Phospat dan Takaran Pupuk Kandang Sapi pada Pertumbuhan dan Hasil Tanaman Wijen Copyright @ UNISBA Blitar , http://viabel.unisbablitar.ejournal.web.id Mohamad Baidowi & Agung Setya Wibowo , 2017 . . 2*, 29–38. Google Scholar

Krismawati, A. (2020). Respon Varietas Wijen (Sesamum indicum L.) Secara Tumpangsari Dengan Jarak Kepyar (Ricinus communis L.) Terhadap Pertumbuhan Dan Hasil. *Jurnal Penelitian Tanaman Industri*, *14*(1), 7. https://doi.org/10.21082/jlittri.v14n1.2008.7-15 Google Scholar

Nurhayati, D. R., & Martana. (2017). *Respon Varietas Wijen (Sesamun indicum, L.) Winas 1 dan Winas 2 Terhadap Arang Aktif Dalam Media Tanah Pasir*. Google Scholar

Nurhayati, D. R., Yudono, P., Taryono, & Hanudin, E. (2015). *Komponen Hasil Varietas Wijen (Sesamum Indicum L .) Di Lahan Pasir Pantai Yang Dipengaruhi Oleh Saat Pemupukan*. *14*(1), 12–20. Google Scholar

Nurhayati, D. R., Yudono, P., Taryono, T., & Hanudin, E. (2018). Pengaruh Waktu Pemupukan pada Dua Musim Tanam terhadap Karakter Wijen Sbr-1 dan Sbr-3 di Lahan Pasir Pantai. *Caraka Tani: Journal of Sustainable Agriculture*, *33*(1), 19. https://doi.org/10.20961/carakatani.v33i1.19442 Google Scholar

Pantai, D., Indonesia, D. I. Y., Ratna, N. D., Wibowo, E., Indrastuti, L., Universitas, P., & Indonesia, S. (2020). *Jurnal Penelitian Langsung Ilmu Pertanian dan Pangan Pemberdayaan Ekonomi dan Pendidikan Masyarakat melalui Program Penanaman Wijen di Bugel*. *8*(1996). Google Scholar

Riyanto, T., Ihsan, M., Pamujiasih, T., Pertanian, S., Surakarta, U., Teknik, P. F., Pertanian, S., Surakarta, U., Pengajar, S., Teknik, F., Pertanian, S., & Surakarta, U. (2020). *Peningkatan*

Hasil Tanaman Okra (Abelmoschos esculentus L Moench) DENGAN KOMPOSISI Media Tanam Dan Pupuk Cair Hayati Peningkatan Hasil Tanaman Okra (Abelmoschos esculentus L Moench) Dengan Komposisi Media Tanam Dan Pupuk Cair Hayati. *1*(2), 6–9. Google Scholar

Sesamum, L. (2014). Pengaruh Macam Pupuk Kandang Terhadap Pertumbuhan dan Hasil Wijen Hitam dan Wijen Putih (Sesamum indicum L.). *Vegetalika*, *2*(3), 45–53. https://doi.org/10.22146/veg.3997 Google Scholar

Syamsiyah, J., & Rahina, W. (2017). *Ketersediaan dan Serapan Ca Pada Kacang Tanah di Tanah Alfisols yang Diberi Abu Vulkanik Kelud dan Pupuk Kandang*. *19*(2), 51–57. Google Scholar

Tobacco, I. (2015). Varietas Unggul Wijen Sumberrejo 1 dan 4 untuk Pengembangan di Lahan Sawah sesudah Padi. *Perspektif: Review Penelitian Tanaman Industri*, *6*(1), 1–9. https://doi.org/10.21082/p.v6n1.2007. Google Scholar

Wenda, M., Hidayati, S., & Purwanti, S. (2017). Aplikasi pupuk organik cair dan komposisi media tanam terhadap hasil tanaman selada (Lactuca sativa l). *Gontor AGROTECH Science Journal*, *3*(2), 99–118. https://doi.org/10.21111/agrotech. Google Scholar