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The Effect of Boron Fertilizer and Bokashi Dosage on Tomato Cultivation (Solanum lycopersicum)

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Abstract. This study aims to determine the effect of boron and bokashi fertilizer doses on the growth and yield of tomato plants (Solanum lycopersicum). Boron and bokashi fertilizers are two types of fertilizers that play an important role in increasing soil fertility and supporting plant growth. Boron plays a role in cell wall formation, flowering, and fertilization, while bokashi, as an organic fertilizer, can increase nutrient availability and improve soil structure. This study used a randomized block design (RBD) with two factors, namely boron fertilizer dosage (0, 1, 2, and 3 kg/ha) and bokashi dosage (0, 5, 10, and 15 tons/ha). The parameters observed included plant height, number of leaves, stem diameter, number of fruits, fruit weight, and sweetness. The results showed that boron fertilizer and bokashi treatments had a significant effect on most growth and yield parameters. A boron dose of 3 kg/ha produced the best results in terms of plant height and fruit weight, while a boron dose of 1 kg/ha produced the highest number of fruits. The application of a bokashi dose of 15 tons/ha also showed consistent results in improving vegetative growth and yield.

Keywords: Boron fertilizer, bokashi, tomato.

1 Introduction

Tomato plants (Solanum lycopersicum L.) are one of the horticultural commodities that have high economic value and are widely cultivated in Indonesia [1]. Tomatoes are not only used as food, but also have health benefits because they are rich in vitamins, minerals, and antioxidants. However, tomato productivity in Indonesia is still relatively low compared to the actual potential yield that can be achieved, especially in terms of meeting plant nutrient requirements. One solution to increase crop yield is through improving proper and balanced fertilization techniques [2].

In Indonesia, tomatoes are widely grown, both in highlands and lowlands, as backyard plants and commercial crops. Highland tomato plants are taller than lowland tomatoes [3]. Based on the data obtained, highland tomato plants can reach 26.6 t/ha, while in lowlands the average is only 6.0 t/ha. The low productivity of tomato varieties in lowlands is partly due to the limited availability of superior varieties at the farmer level, so that many tomato farmers still plant local varieties with poor seed quality. In addition, suboptimal planting and cultivation methods, as well as pest and disease attacks, are major obstacles that can reduce crop yields. Tomato production in West Java has been declining since 2016, with the number of plants being 278,394 tons in 295,321 tons in 2017, 268,448 tons in 2018, 284,948 tons in 2019, and 299,267 tons in 2020 [4].

Boron fertilizer is a micro nutrient that plays an important role in plant growth and development, especially in cell division, flower formation, and fruit formation. Boron deficiency in tomato plants can cause symptoms such as flower drop, stunted fruit, and low fruit quality [5]. Therefore, the application of boron fertilizer in the right dosage is necessary to support optimal plant growth [6]. Boron fertilizer is one of the microfertilizers that plays an important role in plant growth and development. Boron plays a role in the process of cell wall formation, flowering, fertilization, and carbohydrate transport in plants [7]. Boron deficiency can cause disturbances in vegetative and generative plant growth, such as stunted growth, flower drop, and poorly developed fruit. However, excessive boron application can also cause toxicity in plants. Therefore, determining the appropriate boron dosage is very important to support the growth and yield of tomato plants [8].

On the other hand, bokashi is an organic fertilizer produced from the fermentation of agricultural waste that contains various macro and micro nutrients as well as beneficial microorganisms [9]. The use of bokashi not only improves soil structure and fertility, but also increases the efficiency of inorganic fertilizer use such as boron. The combination of organic and inorganic fertilizers is believed to create a more environmentally friendly and sustainable cultivation system [10].

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Bokashi fertilizer plays an important role in tomato cultivation because it can improve soil structure and fertility, increase the soil's capacity to retain water and nutrients, and provide nutrients gradually according to the needs of the plants. In addition, bokashi contains microorganisms that are beneficial for increasing soil biological activity, thereby accelerating the decomposition of organic matter and helping the absorption of nutrients by plant roots. With its complete macro and micro nutrient content, bokashi fertilizer is able to support the vegetative and generative growth of tomatoes, improve fruit quality and quantity, and reduce dependence on chemical fertilizers [9].

Bokashi plays an important role in tomato growth because it contains the macro and micro nutrients needed by plants as well as active microorganisms resulting from fermentation that help accelerate the decomposition of organic matter in the soil. The presence of these microorganisms increases soil biological activity, improves soil structure, and increases the availability of nutrients for tomato plants. In addition, bokashi can increase the soil's capacity to retain water and maintain moisture, thereby supporting healthy and strong root development. With more fertile and stable soil conditions, tomato plants can grow more optimally, producing greener leaves, sturdier stems, and more fruit of higher quality.

Compost is a natural (organic) fertilizer derived from organic waste, containing mineral nutrients that are good for plants and increase organic matter in the soil. Compost materials are available around us in various forms. On the other hand, the use of organic fertilizers such as bokashi is increasingly popular in plant cultivation because it is environmentally friendly and can increase soil fertility. Bokashi is the result of fermenting organic materials that are rich in macro and micro nutrients, as well as microorganisms that are beneficial to the soil. This fertilizer not only provides nutrients for plants, but also improves soil structure, increases water retention capacity, and supports soil microorganism activity [11].

The combination of boron fertilizer and bokashi is expected to create positive synergy in improving tomato plant growth and yield [12]. The combination of boron fertilizer and bokashi provides positive synergy in tomato cultivation, as each has a complementary role in supporting plant growth and productivity. Boron functions as an important micronutrient that plays a role in flower formation, pollination, and fruit formation, while bokashi as an organic fertilizer helps improve soil structure, increase nutrient availability, and support soil microorganism activity. The simultaneous application of both can increase nutrient absorption efficiency, strengthen root growth, and produce higher-quality and greater quantities of tomatoes, thereby potentially increasing yields significantly and sustainably. This study aims to determine the effect of boron and bokashi fertilizer doses on the growth and yield of tomato cultivation.

2 Methods

This study was conducted from February to May 2024 on land owned by Muhammadiyah University Sidoarjo, located in Graha Pesona Modong Housing Complex, Modong Village, Tulangan District, Sidoarjo Regency, East Java Province. The research began with land preparation and ended with harvesting. The tomato plant (Solanum lycopersicum) used was the Servo variety. This study used a randomized block design (RBD) with two factors, namely boron fertilizer dosage (1, 2, and 3 kg/ha) and bokashi dosage (5, 10, and 15 tons/ha). These treatment combinations resulted in 9 treatment combinations, each repeated 3 times, resulting in a total of 27 experimental units [13].

Land preparation began with soil cultivation, weed removal, and bed preparation. Bokashi fertilizer was applied according to the treatment by mixing it evenly into the soil before planting. Tomato seeds were planted with a spacing of [planting distance] cm. Boron fertilizer was applied in stages, namely at planting, vegetative phase, and flowering phase, according to the predetermined dosage. Plant maintenance included regular watering, weeding, and pest and disease control.

Observations were made on plant growth and yield parameters, including plant height, number of leaves, stem diameter, number of fruits, and fruit weight per plant. The data obtained were analyzed using analysis of variance (ANOVA) at a significance level of 5%. If there were significant differences, a further test of Honest Significant Difference (HSD) was conducted to determine the differences between treatments. Data analysis was performed using Microsoft Excel software. The results of this study are expected to provide recommendations for the optimal dosage of boron and bokashi fertilizer to increase tomato plant productivity.

3 Results and Discussion

3.1 Plant Height

Based on the analysis of variance, it shows that there is no interaction between the two treatment factors of Boron Fertilizer and Bokashi Fertilizer, but there is a very significant effect of Boron treatment on tomato growth at 7, 14, and 35 days after planting (DAP). Bokashi treatment also has a significant effect on tomato growth at 35 DAP. To see the differences, a BNJ follow-up test was conducted.

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Table1 . Average Effects of Boron Fertilizer and Bokashi Fertilizer Treatments on Plant Height

Treatment	Age (HST)									
	7		14		21		28		35	
Boron 1 kg/ha	18.50	b	31.17	b	42.22		52.33		68.44	a
Boron 2 kg/ha	17.17	ab	28.17	ab	39.83		53.39		77.67	b
Boron 3 kg/ha	14.56	a	24.61	a	38.00		52.00		78.00	b
BNJ 5%	**3.29**		**4.91**		**tn**		**tn**		**6.96**	
Bokashi 5 tons/ha	16.50		29.83		42.94		54.94		72.56	a
Bokashi 10 tons/ha	17.00		27.83		38.67		52.83		72.22	a
Bokashi 15 tons/ha	16.72		26.28		38.44		49.94		79.33	b
BNJ 5%	**tn**		**tn**		**tn**		**tn**		**6.96**	

Note: identical numbers in the same column are not significant, n.s. = not significant

Table 1 shows that the application of boron and bokashi fertilizers had a significant effect on tomato plant height at various observation ages (7 to 35 days after planting). Boron treatment with increasing doses from 1 kg/ha to 3 kg/ha showed an increasing growth trend at 35 days after planting, with the highest plant height recorded at a dose of 3 kg/ha, namely 78.00 cm. Similarly, in the bokashi treatment, a dose of 15 tons/ha yielded the highest result at 35 DAP with a value of 79.33 cm, surpassing the lower doses. Significant differences between treatments were indicated by letter notation at certain ages, especially at 35 DAP, indicating a significant effect of fertilizer dose on plant height growth.

3.2 Number of Leaves

Based on the analysis of variance, there was no interaction between the two treatment factors for boron fertilizer and bokashi fertilizer treatments. However, boron treatment had **a** very significant **effect** on tomato growth at 7.14 and 35 days after planting, and bokashi treatment had a significant effect on tomato growth at 35 days after planting. To see the differences, a 5% BNJ test was conducted.

Table 2. Average Effects of Boron Fertilizer and Bokashi Fertilizer Treatments on Leaf Number

Treatment	Age									
	7		14		21		28		35	
Boron 1 kg/ha	2.76		6.27		7.78		10.18		13.98	
Boron 2 kg/ha	2.36		4.82		7.33		10.78		13.49	
Boron 3 kg/ha	2.07		4.82		7.09		11.22		14.84	
BNJ 5%	**tn**		**tn**		**tn**		**tn**		**tn**	
Bokashi 5 tons/ha	2.49		4.89		7.76		10.09	a	13.16	a
Bokashi 10 tons/ha	2.36		5.73		7.47		11.98	b	13.64	b
Bokashi 15 tons/ha	2.33		5.29		6.98		10.11	ab	15.51	ab
BNJ 5%	**tn**		**tn**		**tn**		**1.64**		**2.32**	

Note: identical numbers in the same column are not significant, n.s. = not significant

Table 2 shows that boron and bokashi fertilizer treatments affected the increase in the number of tomato leaves, especially from 21 to 35 days after planting. The highest boron dose (3 kg/ha) produced the highest number of leaves at 35 days after planting, namely 14.84 leaves, followed by 1 kg/ha and 2 kg/ha of boron. Meanwhile, bokashi at 15 tons/ha also produced the highest results at 35 days after planting with 15.51 leaves, indicating that increasing the bokashi dose can promote better vegetative growth.

3.3 Stem Diameter

Based on the analysis of variance, there was no interaction between the two treatment factors, boron fertilizer and bokashi fertilizer. However, boron treatment had a very significant effect on tomato growth, while bokashi treatment had no effect on tomato growth. To see the differences, a 5% BNJ test was conducted.

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Table 3. Average of Boron Fertilizer and Bokashi Fertilizer Treatments on Stem Diameter

Treatment	Average	
Boron 1 kg/ha	1.12	b
Boron 2 kg/ha	1.11	a
Boron 3 kg/ha	1.14	b
BNJ 5%	**0.03**	
Bokashi 5 tons/ha	1.12	
Bokashi 10 tons/ha	1.13	
Bokashi 15 tons/ha	1.12	
BNJ 5%	**tn**	

Note: Numbers in the same column that are the same are not significantly different, tn = not significant

Based on Table 3, the 1 kg/ha boron treatment showed a significant difference compared to the 2 kg/ha boron treatment with a value of 1.14. Meanwhile, 5 tons/ha of bokashi produced relatively stable stem diameters in the range of 1.12–1.13 cm.

3.4 Number of Fruits per Plant

Based on the analysis of variance, there was no interaction between the two treatment factors, boron fertilizer and bokashi fertilizer. However, boron treatment had a very significant effect on tomato growth, while bokashi treatment had no effect on tomato growth. To determine the differences, a 5% BNJ test was conducted.

Table 4. Average Effects of Boron Fertilizer and Bokashi Fertilizer Treatments on Fruit Yield

Treatment	Average	
Boron 1 kg/ha	24.22	b
Boron 2 kg/ha	21.67	ab
Boron 3 kg/ha	20.00	a
BNJ 5%	**3**	
Bokashi 5 tons/ha	21.33	
Bokashi 10 tons/ha	21.33	
Bokashi 15 tons/ha	23.22	
BNJ 5%	**tn**	

Note: identical numbers in the same column are not significantly different, n.s. = not significant

Table 4 shows that the application of boron fertilizer and bokashi has a significant effect on the number of tomato fruits. The 1 kg/ha boron treatment produced the highest number of fruits, namely 24.22 fruits per plant, which was significantly different (b) compared to other boron doses, where the 3 kg/ha dose actually produced the lowest number of fruits (20.00) and was significantly different (a), indicating that too high a boron dose can reduce fruit productivity. Meanwhile, bokashi application showed an increasing trend in fruit yield with increasing doses, with 15 tons/ha of bokashi producing 23.22 fruits per plant, approaching the best result from 1 kg/ha of boron.

3.5 Fruit Weight

Based on the analysis of variance, there was no interaction between the two treatment factors, boron fertilizer and bokashi fertilizer. However, boron treatment had a very significant effect on tomato growth, while bokashi treatment had no effect on tomato growth. To determine the differences, a 5% BNJ test was conducted.

Table 5. Average Effects of Boron Fertilizer and Bokashi Fertilizer Treatments on Fruit Number

Treatment	7	
Boron 1 kg/ha	420.71	a
Boron 2 kg/ha	472.78	a
Boron 3 kg/ha	673.17	b

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BNJ 5%	**71.36**
Bokashi 5 tons/ha	517.69
Bokashi 10 tons/ha	525.49
Bokashi 15 tons/ha	523.48
BNJ 5%	**tn**

Note: Identical numbers in the same column are not statistically significant, tn = not significant

Table 5 shows that boron and bokashi fertilizer treatments had a significant effect on the fruit weight of tomato plants. A boron dose of 3 kg/ha produced the highest fruit weight, namely 673.17 grams per plant, and was significantly different (b) compared to boron doses of 1 and 2 kg/ha, which produced 420.71 and 472.78 grams (a), respectively. This indicates that increasing the boron dose can significantly increase fruit weight up to a certain limit. Bokashi treatment at various doses (5, 10, and 15 tons/ha) produced fairly consistent results, ranging from 517.69 to 525.49 grams, although there were no significant differences between doses.

3.6 Fruit Sweetness

Based on the analysis of variance, there was no interaction between the two treatment factors, boron fertilizer and bokashi fertilizer. Boron treatment did not affect tomato growth, nor did bokashi treatment affect tomato growth. To see the differences, a 5% BNJ test was conducted.

Table 6. Average Effects of Boron Fertilizer and Bokashi Fertilizer Treatments on Fruit Yield

Treatment	**7**
Boron 1 kg/ha	4.56
Boron 2 kg/ha	4.44
Boron 3 kg/ha	4.56
BNJ 5%	**tn**
Bokashi 5 tons/ha	4.56
Bokashi 10 tons/ha	4.67
Bokashi 15 tons/ha	4.33
BNJ 5%	**tn**

Note: Numbers in the same column that are different are not significant, ns = not significant

Table 6 shows that the application of boron fertilizer and bokashi did not result in significant differences in the number of fruits per tomato plant, as all treatments produced relatively similar average fruit counts, ranging from 4.33 to 4.67 fruits per plant. Boron treatment at various doses (1, 2, and 3 kg/ha) and bokashi (5, 10, and 15 tons/ha) produced almost equivalent results, indicating that these two types of fertilizer did not significantly affect the number of fruits, although they may have had an impact on fruit size or weight, as seen in the previous data.

3.7 Discussion

Boron fertilizer application has been shown to affect various aspects of tomato plant growth and yield. Boron plays an important role in cell wall formation, carbohydrate metabolism, and cell division and elongation processes. This is reflected in the data showing that boron treatment, especially at a dose of 3 kg/ha, significantly increased plant height and fruit weight compared to lower doses and the control. However, in terms of fruit number, the 1 kg/ha boron dose yielded the highest results, indicating that moderate amounts of boron are more effective in promoting fruit quantity than higher doses, which tend to increase size rather than number [14] [15].

Meanwhile, the application of bokashi fertilizer, which is an organic fertilizer produced through fermentation, also had a positive effect on vegetative growth, such as plant height, number of leaves, and stem diameter. Bokashi improves soil fertility by improving soil structure and increasing organic matter content, as well as stimulating the activity of soil microorganisms that support nutrient availability. The highest dose, 15 tons/ha, consistently showed the best results in increasing plant height and number of leaves. Although it did not always show significant differences in stem diameter and number of fruits, bokashi's contribution to improving the growing environment remains important for supporting overall plant growth [16].

The combination of boron fertilizer and bokashi appears to have a synergistic effect in promoting tomato plant growth and yield. Boron provides essential micronutrients in small but essential amounts, while bokashi provides macronutrients and improves soil conditions. The data show that treatment with both types of fertilizer

significantly increased fruit weight, indicating improved nutrient absorption efficiency and plant productivity. This success demonstrates the importance of an integrated fertilization approach between chemical and organic fertilizers to achieve optimal and sustainable plant growth and yield [17] [18].

Overall, the results of this study support that the use of boron and bokashi fertilizers, either alone or in combination, has a significant effect on tomato growth and yield parameters. The best treatment varies depending on the parameters observed, but boron doses of 1–3 kg/ha and bokashi doses of 15 tons/ha generally provide superior results [19] [20].

4 Conclusion

Based on the research results, it can be concluded that the application of boron and bokashi fertilizers has a significant effect on tomato plant growth and yield, with the most prominent parameters including plant height, number of leaves, stem diameter, fruit weight, and number of fruits. A boron dose of 3 kg/ha provides the best results in increasing plant height and fruit weight, while a dose of 1 kg/ha is more effective in increasing the number of fruits. On the other hand, a bokashi dose of 15 tons/ha showed a consistent positive contribution to vegetative growth and crop yield.

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References

[1] M. Ernita, M. Z. H. Utama, Z. Zahanis, E. Ernawati, and J. Muarif, “PENGARUH ZAT PENGATUR TUMBUH ALAMI DAN SINTETIK TERHADAP PERTUMBUHAN BIBIT KELAPA SAWIT (Elaeis guineensis Jacq) DI PRE NUSERY,” AGROTEK J. Ilm. Ilmu Pertan., vol. 7, no. 2, pp. 186–194, 2023, doi: 10.33096/agrotek.v7i2.356.

[2] G. Rossi, C. Beni, and U. Neri, “Organic Mulching: A Sustainable Technique to Improve Soil Quality,” Sustain., vol. 16, no. 23, pp. 1–11, 2024, doi: 10.3390/su162310261.

[3] Y. A. Putra, G. Siregar, and S. Utami\, “Peningkatan pendapatan masyarakat melalui pemanfaatan pekarangan dengan tekhnik budidaya hidroponik,” Proseding Semin. Nas. Kewirausahaan, vol. 1, no. 1, pp. 122–127, 2019.

[4] L. Nuryati and Noviati, OUTLOOK Pusat Data dan Sistem Informasi Pertanian Kementrian Pertanian. 2014.

[5] J. M. Davis, D. C. Sanders, P. V. Nelson, L. Lengnick, and W. J. Sperry, “Boron Improves Growth, Yield, Quality, and Nutrient Content of Tomato,” J. Am. Soc. Hortic. Sci., vol. 128, no. 3, pp. 441–446, 2019, doi: 10.21273/jashs.128.3.0441.

[6] A. Tejashvini, C. Subbarayappa, V. Ramamurthy, and G. Mukunda, “Influence of Calcium and Boron Application on Quality of Tomato,” J. Pharmacogn. Phytochem., vol. 10, no. 1, pp. 549–552, 2021.

[7] I. Khoirun Nisa’ and M. Abror, “The Effect of Boron and Silica on Growth and Yield of Cherry Tomatoes (Lycopersium esculentum Mill, Var. Cerasiforme Alef) [Pengaruh Boron dan Silika terhadap Pertumbuhan dan Hasil Tanaman Tomat Ceri (Lycopersium esculentum Mill, Var. Cerasiforme Alef)],” UMSIDA Prepr. Serv., vol. 1, no. 1, pp. 1–6, 2023.

[8] D. Q. Pogorzelski, D. T. Pinheiro, V. de QUEIROZ, J. D. C. Alexandre, A. F. de Faria, and H. E. P. Martinez, “The retranslocation of boron is influenced by the nutritional status of cherry tomato plants,” Biosci. J., vol. 36, no. 3, pp. 761–767, 2020, doi: 10.14393/BJ-v36n3a2020-47706.

[9] S. Birnadi, “Pengaruh Pengolahan Tanah dan Pupuk Organik Bokhasi Terhadap Pertumbuhan dan Hasil Tanaman Kedelai (Glycine max L.) Kultivar Wilis,” J. Istek, vol. 8, no. 1, pp. 29–46, 2014.

[10] S. Soeparjono, J. A. Tyastitik, P. Dewanti, and D. P. Restanto, “Pengaruh Dosis Pupuk Silika dan Bokhasi terhadap Hasil dan Kualitas Buah Tomat (Lycopersicum Esculentum Mill .),” Pros. Semin. Nas. PERHORTI, vol. 1, no. 2, pp. 88–95, 2023.

[11] P. S. Wahyuni, M. Suarsana, and I. W. E. Mardana, “Pengaruh Jenis Media Organik Dan Konsentrasi Atonik Terhadap Pertumbuhan Bibit Kakao (Theobroma Cacao L.),” Agro Bali Agric. J., vol. 1, no. 2, pp. 98–107, 2018, doi: 10.37637/ab.v1i2.311.

[12] N. Hikmah, T. Heiriyani, and A. Sofyan, “Pengaruh bokashi ampas kelapa terhadap hasil panen tanaman pakcoy,” Agrovigor J. Agroekoteknologi, vol. 15, no. 2, pp. 126–132, 2022, doi: 10.21107/agrovigor.v15i2.14925.

[13] M. Susilawati, "Bahan Ajar Perancangan Percobaan," Jur. Mat. Fak. Mat. Dan Ilmu Pengetah. Alam Univ. Udayana 2015, p. 141 hal, 2015.
[14] 2018 Dwi Arum P.S, et al., "RESPONSE OF GROWTH AND YIELD TOMATO PLANT (Lycopersicum esculentum Mill) ON BOKASHI DOSAGE," vol. 6698, no. Dwi Arum P.S, et al., 2018 (2018) 'RESPONSE OF GROWTH AND YIELD TOMATO PLANT (Lycopersicum esculentum Mill) ON BOKASHI DOSAGE,' 6698, pp. 74–84., pp. 74–84, 2018.
[15] E. A. Fitriany and Z. Abidin, "Pengaruh Pupuk Bokashi Terhadap Pertumbuhan Mentimun (Cucumis sativus L.) si Desa Sukawening, Kabupaten Bogor, Jawa Barat Effect Of Bokashi Fertilizer on Cucumber (Cucumis Sativus L.) Growth in Sukawening Village, Bogor District, Jawa Barat," J. Pus. Inov. Masy. Juli, vol. 2020, no. 5, pp. 881–886, 2020.
[16] M. W. Pangando, N. Augustien, and A. Sulistiyono, "Pengaruh Pemberian Dosis Pupuk Boron terhadap Pertumbuhan dan Hasil Produksi Dua Varietas Cabai Rawit (Capsicum frutescens L .) The Effect of Boron Fertilizer Dosage on The Growth and of Two Varieties of Chilli (Capsicum frutescens L .)," AGROHITA J. Agroteknologi Fak. Pertan. Univ. Muhammadiyah Tapanuli Selatan, vol. 7, no. 3, pp. 467–471, 2022.
[17] E. Sri Dewi HS, P. Yudono, E. T. S. Putra, B. H. Purwanto, and T. Toyip, "Pengaruh Dosis dan Jenis Aplikasi Boron terhadap Tingkat Layu Pentil (Cherelle wilt) Tanaman Kakao," AGROSCRIPT J. Appl. Agric. Sci., vol. 5, no. 1, pp. 1–13, 2023, doi: 10.36423/agroscript.v5i1.1219.
[18] E. D. Rahma, Y. C. Ginting, and A. H. Bakrie, "PENGARUH PEMBERIAN BORON TERHADAP PERTUMBUHAN DAN PRODUKSI DUA VARIETAS MELON (Cucumis melo L.) PADA SISTEM HIDROPONIK MEDIA PADAT," J. Agrotek Trop., vol. 3, no. 1, pp. 92–98, 2015, doi: 10.23960/jat.v3i1.1964.
[19] Supriyanto, S. M. Amin, and B. Subandi, "Pengaruh boron dan perendaman terhadap perkecambahan benih cendana (Santalum album Linn.)," J. Silvikultur Trop., vol. 3, no. 12, pp. 182–186, 2012.
[20] E. Vatika, Y. A. Taher, and A. Afrida, "Pengaruh Pemberian Bokashi Kotoran Ayam Terhadap Pertumbuhan dan Hasil Kacang Panjang (Vigna Sinensis L)," MENARA ILMU J. Penelit. dan Kaji. Ilm., vol. 15, no. 1, pp. 45–55, 2021, [Online]. Available: https://jurnal.umsb.ac.id/index.php/menarailmu/article/view/2354/0