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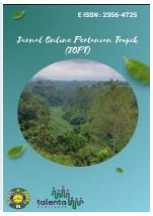

Testing fertilizer application on melon plant growth and yield (*Cucumis melo* L.)

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ABSTRACT

This study aims to investigate the effect of KNO_3 fertilizer application on the growth of melon plants during the vegetative and early generative phases. Melon was selected due to its high economic value; however, its productivity has declined as a result of suboptimal cultivation techniques, particularly in fertilizer management. The research was conducted at the Center for Agricultural Application and Modernization (BRMP) in West Nusa Tenggara using a one-factor Completely Randomized Design (CRD) with five KNO_3 dosage treatments (1, 3, 5, 7, and 9 g/L), each replicated three times. Observed parameters included plant height, number of leaves, number of male and female flowers, number of fruit initials, and fruit diameter. Data were analyzed using ANOVA followed by the DMRT post-hoc test at a 5% significance level. The results indicated that although the 5 g/L treatment tended to yield better results, particularly in the number of flowers and fruit diameter, statistically, all treatments showed no significant effect. Constraints such as pest attacks, pollination disturbances, and plant diseases were identified as non-nutritional factors affecting crop outcomes.
Keyword: fertilizer, melon, plant growth

ABSTRAK

Penelitian ini bertujuan untuk Mengetahui pengaruh pemberian pupuk KNO_3 terhadap pertumbuhan tanaman melon pada fase vegetative dan fase generative awal Tanaman melon dipilih karena memiliki nilai ekonomi tinggi, namun produktivitasnya menurun akibat teknik budidaya yang kurang optimal, termasuk pengelolaan pemupukan. Penelitian dilaksanakan di Balai Penerapan dan Modernisasi Pertanian (BRMP) NTB menggunakan Rancangan Acak Kelompok (RAK) satu faktor dengan lima perlakuan dosis KNO_3 (1, 3, 5, 7, dan 9 g/L), masing-masing diulang tiga kali. Parameter yang diamati meliputi tinggi tanaman, jumlah daun, jumlah bunga jantan dan betina, jumlah bakal buah, serta diameter buah. Data dianalisis menggunakan ANOVA dan uji lanjutan DMRT pada taraf 5%. Hasil penelitian menunjukkan bahwa meskipun perlakuan dosis 5 g/L menunjukkan kecenderungan memberikan hasil lebih baik terutama pada parameter jumlah bunga dan diameter buah, secara statistik seluruh perlakuan tidak memberikan pengaruh signifikan. Kendala dalam pertumbuhan tanaman seperti serangan hama, gangguan penyerbukan, serta penyakit tanaman menjadi faktor non-nutrisi yang memengaruhi hasil panen.
Kata Kunci : melon, pertumbuhan tanaman, pupuk

1. Introduction

In Indonesia, horticultural commodities such as fruits have high economic value and are an important part of the development of national agribusiness. One of the most popular fruit commodities with great market potential is melon (*Cucumis melo* L.). In addition to its sweet and refreshing taste, melon also contains high

levels of water, vitamins, and minerals that are beneficial for the health of the body. Melon is the top choice for many farmers because of its promising selling value. However, in recent years, melon production in Indonesia has decreased. Based on data from the Central Statistics Agency (CSA), melon production in 2021 was recorded at 129,147 tons, then decreased to 117,794 tons in 2023. This decline is not only caused by technical factors in cultivation, but also by environmental conditions, climate change, and incompatibility of varieties and planting media used.

One of the main problems in melon cultivation is the low level of sweetness of the fruit produced, which directly affects the selling value. Suboptimal fruit quality is usually related to the lack of availability of nutrients, especially nitrogen (N) and potassium (K), which are essential in supporting both vegetative and generative growth phases. Therefore, fertilization strategies are a very vital aspect in efforts to improve the yield and quality of melons. KNO_3 (potassium nitrate) fertilizer is one of the compound fertilizers that contains nitrogen and potassium in a form that is easily absorbed by plants. The element nitrogen plays a role in the formation of chlorophyll, protein, and the growth of leaves and stems, while potassium plays a role in the formation of sugars, strengthens plant tissues, and increases resistance to environmental stresses. The combination of these two elements is believed to increase productivity and overall quality of melons.

In addition to fertilization, the cultivation system also plays an important role in the success of melon farming. One of them is the use of polybags as a planting medium that allows better control of moisture, aeration, and nutrient delivery. This method is widely used in intensive agriculture, especially in narrow or urban areas, as it is more efficient and environmentally friendly. However, the effectiveness of applying KNO_3 fertilizer in various doses to the growth and yield of melon plants still needs to be further researched. Some previous studies have shown that a plant's response to fertilizer is not always significant due to environmental factors or pest infestation. Therefore, a more specific and systematic empirical study is needed to understand the effect of KNO_3 fertilizer application on the scale of melon cultivation practices. With the aim of knowing the effect of KNO_3 fertilizer application on melon plant growth in the vegetative phase and early generative phase.

2. Methods

This research was carried out at the West Nusa Tenggara Agricultural Assembly and Modernization Center (BRMP), which is located on Jalan Raya Pereviewuan, Narmada District, West Lombok Regency. The implementation time starts from March to June 2025. The tools used in this study were polybags, gembor, sprayer, rope, bamboo, hoe, sieve, scissors, meter and janga chong. The materials used in this study are rock melon seeds, KNO_3 White Pearl fertilizer 1 pcs/ 2kg, NPK 16.16.16 2 kg, gandasil/POC leaf fertilizer, insecticides, fungicides, and water. Planting media includes (soil, manure and burnt husks).

This study used an experimental method with a one-factor Group Random Design (RAK), consisting of five doses of KNO_3 fertilizer doses, each repeated three times, resulting in a total of 15 experimental units. The dosage of KNO_3 fertilizer used as a treatment is:

- P1 = 1g/L water
- P2 = 3 g/L water
- P3 = 5 g/L water
- P4 = 7 g/L water
- P5 = 9 g/L water

The planting medium used consists of a mixture of soil, manure, and burnt husks in a ratio of 1:1:1, put into a polybag measuring ±1 kg. Before planting, each polybag is given 5 grams of NPK 16:16:16. Seed seedlings are carried out on seedling trays, then transferred to polybags after 12–14 days of age. KNO_3 fertilizer is given in kocor (solution is watered to the base of the plant) in doses according to the treatment, given once a week as much as 200 ml per plant. Additional fertilization using KCl is given in the fertilization phase. All plants are cared for with standard maintenance activities such as watering, weeding, loosening media, and pest and disease control using insecticides and fungicides. Observations were made on the vegetative and generative parameters of the plant. Vegetative parameters include:

- Plant height (cm): measured weekly from 1 to 5 weeks of age after planting (mst).
- Number of leaves (strands): observed weekly from the age of 1 to 5 mst.

The observed generative parameters include:

- Number of male and female flowers: calculated from the 7th segment at the age of 21 and 28 days after planting (hst).

- The number of potential fruits: calculated at the age of 35 hst.
- Fruit diameter (cm): measured weekly from 4 to 8 mst.

The procedures for the activities carried out are as follows:

a. Preparation of planting media
The preparation of planting media begins with providing soil media, manure and burnt husks. Then mix all the media with a ratio of 1:1:1, after which 15 polybags are filled into polybags. Each polybag will be sprinkled with NPK 5 g / polybag basic fertilizer.

Figure 1. Mixing of planting media
(Source: BRMP-NTB, 2025)

b. Nursery
The seedbed is carried out using the seeding tray, the media tray is filled with mixed soil and manure. Then 1 melon seed per hole is planted on the tray. The seeds of the melon plant are treated until they become seedlings. The age of seedlings before transplanting is 12-14 days.

Figure 2. Sowing melon seeds
(Source: BRMP-NTB, 2025)

c. Planting
The seedlings of melon plants that have been sown will be transplanted to a larger polybag media to a 1 kg polybag. melon seedlings that have been transplanted are previously selected with the aim of standardizing plant growth at the beginning of treatment.

Figure 3. Transplanting
(Source: BRMP-NTB, 2025)

d. Fertilization
The application of NPK fertilizer 16.16.16 was given during the preparation of planting media in polybags with a dose of 5 gr/plant as a basic fertilizer and was given at the age of 1 mst. After that, fertilization is carried out using KNO_3 according to the treatment, this fertilization is carried out once

1 week with a cor system and given 200 ml/plant and for fertilization KCl is given to the fertilization vase.

Figure 4. Fertilization
(Source: BRMP-NTB, 2025)

e. Maintenance
Maintenance in melon cultivation includes several activities including watering, media fertilization, fertilization, weeding, pest and disease control, and harvesting.
1. Watering
Watering is carried out when the soil conditions are dry so that the growth and production process run optimally, this watering can be done in the morning or evening.
2. Media bulk
Loosening is carried out 1 time a week before fertilization, loose planting medium allows the roots of melon plants to grow freely.
3. Weeding
Weeding is the activity of cleaning weeds or grass that grows around plants. Weeding can be done manually.
4. Fertilization
The application of NPK fertilizer 16.16.16 was given during the preparation of planting media in polybags with a dose of 5 gr/plant as a basic fertilizer and was given at the age of 1 mst. After that, fertilization is carried out using KNO_3 according to the treatment, this fertilization is carried out once 1 week with a cor system and given 200 ml/plant and for fertilization KCl is given to the fertilization vase.
5. Pest and disease control Pest and disease control is carried out when symptoms of attack on plants appear. This is done using insecticides (Movento) and fungicides (Amistartop).
6. Harvesting
Melon fruits are ready to be harvested if they have characteristics such as large size, cracks at the base of the fruit and the skin of the fruit changes color to yellowish-green.

The data obtained was analyzed using multiple fingerprints (ANOVA) with the help of SAS 9.0 software. If there is a real effect, then a follow-up test is carried out using Duncan's Multiple Range Test (DMRT) at a significance level of 5%. The purpose of this analysis is to find out the differences between treatments statistically to each observed parameter. During the study, some of the obstacles faced include extreme weather, pest attacks, and limited facilities. Control is carried out through routine observation, application of organic and chemical pesticides according to doses, and improvement of land sanitation.

3. Results and Discussion

Melon (Cucumis melo L.) is one of the tropical fruits of the Cucurbitaceae family that has great potential to be developed as a superior fruit product through plant breeding. Melon is also a fruit that is popular with the public, apart from its high nutritional content, melon contains 90% water and 10% refreshing carbohydrates when consumed (Susilo, 2020). Melon is one of the fruit commodities that is loved by the public because it has advantages in sweet taste, varied meat color, crispy meat texture, and distinctive aroma. This advantage makes the prospect of melons quite high so that production and quality need to be considered (Daryono, 2016). Melon is a horticultural commodity that has a high selling value.

Polybags as a planting medium provide a number of advantages in plant cultivation, especially in melon plants. The use of polybags allows for better control of the soil, water, and nutrient conditions of the plant. According

to research by Prasetyo *et al*. (2021), polybag media allows for better moisture and drainage regulation, as well as reducing the risk of soil erosion that can interfere with the growth of melon plants. In addition, polybags make it easier for farmers to manage nutrients because plants can be given fertilizer according to specific needs in each phase of their growth.

The use of KNO_3 fertilizer on melon plants planted in polybag media provides positive results for plant growth and productivity. Applying the right dose of KNO_3 fertilizer can improve fruit quality, improve disease resistance, and produce larger, sweeter fruits. By using polybag media, melon plants are more controlled in terms of nutrient availability, so that fertilization with KNO_3 can be carried out more efficiently and effectively (Utami *et. al*. 2023).

The use of polybags provides advantages in terms of more targeted and efficient fertilizer management. Polybag media allows the fertilizer to be better absorbed by the plant's roots, so that the melon plant gets enough nutrients needed at each stage of its growth. This also reduces the possibility of soil pollution due to overfertilization (Budianto et al., 2022). In addition, polybags also provide flexibility in terms of soil pH and moisture regulation which is essential for the optimal growth of melon plants.

KNO_3 (potassium nitrate) fertilizer contains two essential elements, namely nitrogen (N) and potassium (K). Nitrogen plays an important role in increasing plant vegetative growth, accelerating the process of photosynthesis, and increasing the formation of proteins and chlorophyll that support the growth of melon plants (Sulastri et al., 2023). Potassium, which is also found in KNO_3 fertilizer, plays a role in improving fruit quality, improving plant resistance to diseases, and helping the formation of sugar in melons, which affects the taste and quality of fruit (Kurniawan et al., 2022). Applying the right KNO_3 fertilizer can increase melon yields both in terms of quantity and fruit quality.

Nitrogen is an important nutrient in promoting vegetative growth of plants. According to research by Wulandari et al. (2021), the application of nitrogen-containing fertilizers such as KNO_3 can increase the number of leaves, stem length, and number of branches of melon plants. Thus, the melon plant will have more leaf surfaces that can maximize the photosynthesis process, which ultimately increases the number and size of melon fruits. The availability of sufficient nitrogen also plays a role in accelerating the formation of larger, quality melons. Potassium has a very important role in the formation of fruit quality, especially in melon plants. Research by Widodo et al. (2022) shows that potassium helps in the formation of sugars that enhance the sweetness of melons. In addition, potassium also plays a role in increasing plant resistance to disease and damage due to extreme weather (Wahyudi et al., 2023). The potassium in KNO_3 fertilizer also plays a role in improving the resistance of melon plants to unstable environmental conditions, such as erratic rainfall and drought.

KNO_3 fertilizer has a significant influence on the productivity of melon plants grown in polybag media. Proper application of KNO_3 fertilizer can increase the quantity and quality of melons, as well as improve plant resistance to diseases. Efficient fertilization, with the right dosage, and optimal use of polybag media will support better melon plant growth and maximum yields. Therefore, the use of KNO_3 fertilizer on melon plants planted in polybags is one of the effective alternatives in increasing melon agricultural yields.

Plant Height

Based on the results of the variety-assortment analysis (ANOVA) at the level of 5%, the dose of KNO3 fertilizer did not have a significant effect on the average height of melon plants from the age of 1 MST – 5 MST. This shows that the nutrients provided through KNO3 fertilizer are not capable enough or have not been optimally needed by plants in the Vegetative phase.

Table 1. Average plant height with KNO3 Fertilizer Testing with different doses at ages 1-5 MST.

Treatment KNO3 fertilizer (g/L)	Plant height (cm) MST				
	1tn	2tn	3tn	4tn	5tn
(1 g/L)	13.70	34.96	74.66	90.00	103.00
(3 g/L)	15.10	35.50	74.33	108.00	144.00
(5 g/L)	14.66	36.90	73.33	108.67	130.33
(7 g/L)	13.90	35.70	71.33	93.67	109.67
(9 g/L)	15.60	33.26	71.33	92.67	99.33

Remarks: tn = no real difference at α 5%.

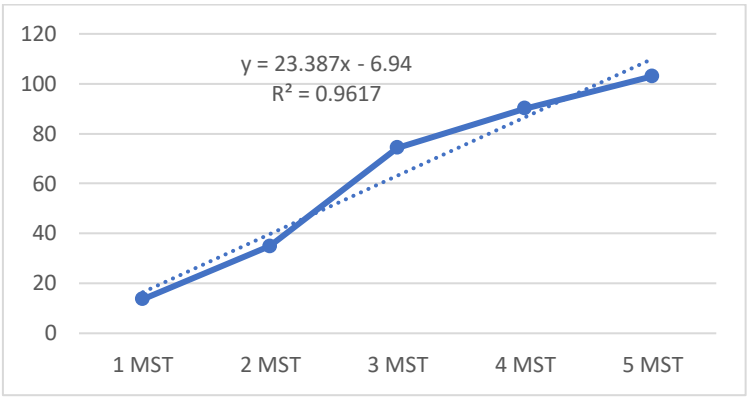

Figure 5. Graph of Average Plant Height in Treatment 1

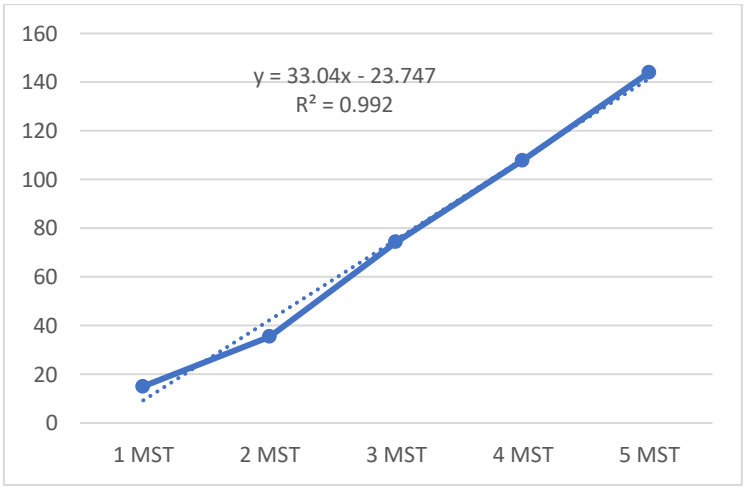

Figure 6. Graph of Average Plant Height in Treatment 2

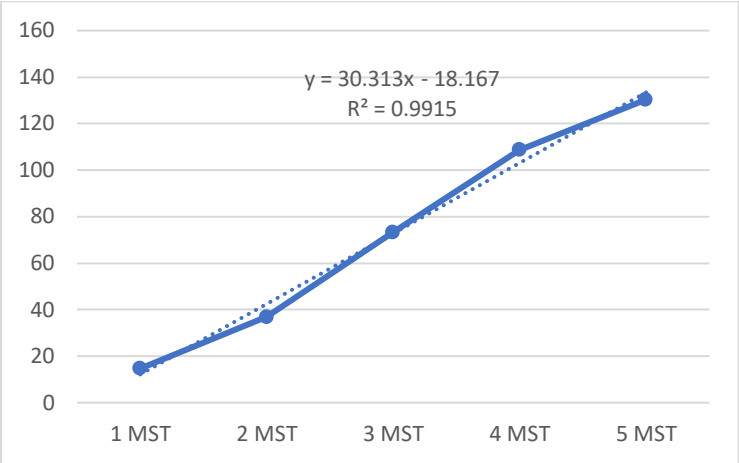

Figure 7. Graph of Average Plant Height in Treatment 3

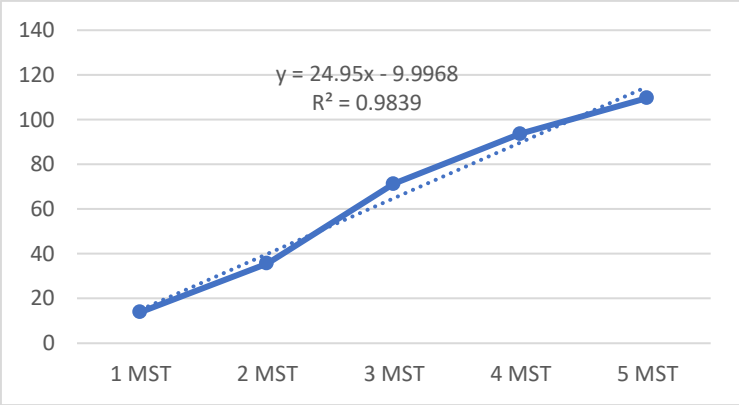

Figure 8. Graph of Average Plant Height in Treatment 4

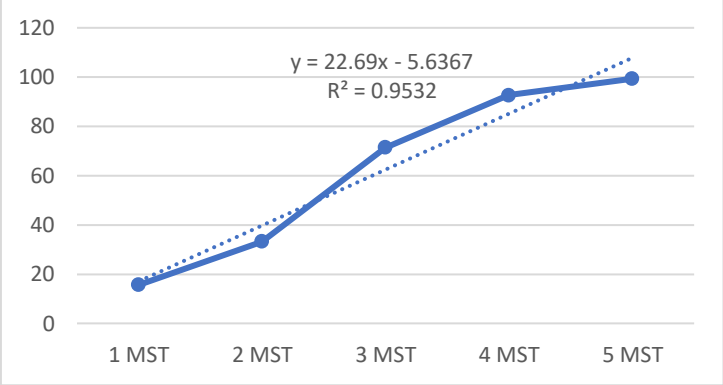

Figure 9. Graph of Average Plant Height in Treatment 5

Based on the data on the height of melon plants in various treatments of KNO_3 fertilizer from the first week (1 mst) to the fifth week (5 mst), it is known that the average height of the plants shows variations between treatments in each week. In the first week (1 mst), the average height of the highest plant was obtained in the 9 g/L treatment with a height of 15.60 cm, while the lowest in the 7 g/L treatment was 13.90 cm. In the second week (2 mst), the 5 g/L treatment produced the highest height of 36.90 cm, while the lowest height was found in the 9 g/L treatment, which was 33.26 cm. Entering the third week (3 mst), the 1 g/L treatment produced the highest plant height of 74.66 cm, and the lowest of 71.33 cm was found in the 7 g/L and 9 g/L treatments. In the fourth week (4 mst), the highest plant height was recorded in the 5 g/L treatment of 108.67 cm, followed by 3 g/L of 108.00 cm, while the lowest was found in the 9 g/L treatment of 92.67 cm. In the fifth week (5 mst), the 3 g/L treatment recorded the highest plant height of 144.00 cm, while the 9 g/L treatment produced the lowest plant height of 99.33 cm. From the overall data, it can be seen that the 3 g/L treatment tends to provide more optimal growth results for melon plants, especially in the final weeks of observation. This shows that at such doses, nutrients nitrogen (N) and potassium (K) are available in sufficient and balanced quantities

according to the physiological needs of the melon plant in the vegetative phase. This is not in line with the research of Prasetya et al. (2020) in *the Journal of Tropical Agronomy* reporting that the application of KNO_3 fertilizer with a moderate concentration (around 3–4 g/L) exerts a significant influence on the increase in vegetative growth of melon plants, while excessively high doses indicate a decrease in growth response. Thus, although the 3 g/L treatment does not show a statistically significant difference, a consistent growth improvement pattern may be the basis for recommending the dose as an efficient and agronomic treatment in the cultivation of melon plants.

Based on research (Ramadani *et al*, 2022) The results of the variety-analysis data showed that the treatment of KNO_3 dosage had a very significant effect on flowering age, but did not have a real effect on plant height and stem diameter of 15, 30, and 45 hst, fruit diameter, fruit weight per fruit, and potential yield. The results of this study did not differ significantly in the height of the plant and the diameter of the stem when they were 15, 30, and 45 hst. It is suspected that because the nitrogen and potassium elements contained in the compost meet the needs of plants, but they are slightly absorbed by plants due to climatic factors such as rainfall during the application of KNO3 fertilizer, some nutrients cannot be absorbed by plants so that they will be disturbed to the growth of melon plants

Number of Leaves

Table 2. Average number of leaves with KNO3 fertilizer testing against Number of leaves on melon plants aged 1 – 5 mst

KNO3 Fertilizer Treatment (g/L)	Number of Leaves (strands) MST				
	1tn	2tn	3tn	4tn	5tn
(1 g/L)	4.33	9.66	15.33	22.00	24.00
(3 g/L)	4.66	9.33	16.00	23.33	28.33
(5 g/L)	5.00	9.33	14.66	22.33	25.00
(7 g/L)	4.66	9.33	14.66	20.33	23.33
(9 g/L)	4.66	9.33	14.66	21.00	24.00

Remarks: tn = no real difference at α 5%.

Based on data on the number of leaves of melon plants in various treatments of KNO_3 fertilizer from the first week (1 mst) to the fifth week (5 mst), it is known that the average number of leaves shows variations between treatments in each week. In the first week (1 mst), the highest number of leaves was recorded in the 5 g/L treatment of 5.00 leaves, while the lowest number of leaves in the 1 g/L treatment was 4.33 leaves. In the second week (2 mst), all treatments (except 1 g/L) showed a relatively similar number of leaves, which is 9.33 leaves, while the 1 g/L treatment is slightly higher at 9.66 leaves. In the third week (3 mst), the 3 g/L treatment produced the highest number of leaves at 16.00 leaves, while the other treatments (5 g/L, 7 g/L, and 9 g/L) had the same number of leaves at 14.66 leaves. The treatment of 1 g/L was slightly below at 15.33 sheets. Entering the fourth week (4 ms), the highest number of leaves was achieved by the 3 g/L treatment of 23.33 leaves, while the lowest was the 7 g/L treatment with 20.33 leaves. In the fifth week (5 ms), the highest number of leaves was also obtained from the 3 g/L treatment, which was 28.33 leaves, and the lowest from the 7 g/L treatment of 23.33 leaves.

The increase in the number of leaves at the 3 g/L treatment is supported by the nitrogen and potassium content in KNO_3 which play a major role in the process of division and elongation of leaf cells. Nitrogen promotes vegetative growth, while potassium strengthens metabolism and leaf tissue formation (Putra & Handayani, 2021). Meanwhile, too high doses such as 9 g/L can actually disrupt nutrient balance, cause physiological stress, and inhibit plant growth (Yuliani *et al*., 2020).

According to research (Shinta, F. S., & Nur, W. S. (2022)) based on the results of multiple fingerprint analysis at a confidence level of 5%, it is known that the administration of KNO_3 fertilizer dosage does not have a real effect on the number of leaves in melon plants. The difference in the number of leaves in melon plants can be influenced by environmental conditions, water availability, and pest activity in the experimental field. Attacks from pests can cause the leaves on melon plants to become damaged, hollow, dry and fall off.

Number of Male Flowers

Based on the observations in Table 3.4, the application of KNO_3 fertilizer in graded doses (1 g/L to 9 g/L) showed no significant difference in the number of male flowers of melon plants at the age of 21 and 28 hst. This is indicated by the same letter notation across treatments, which indicates that statistically, there is no significant difference between treatments. The number of male flowers recorded at the age of 21 hst ranged from 4,667 to 6,000 flowers, while at the age of 28 hst increased to 5,333 to 6,667 flowers per plant. Although the treatment of giving the most KNO3 7 g/L fertilizer is still not significantly different in all treatments. This is not in line with the research of Ramdani *et al,* 2022 which states that the application of KNO3 fertilizer has an effect on the Number of Flowering.

Table 3. Testing of KNO_3 Fertilizer Against the Number of Male Flowers of Plants Melon at the age of 21 HST and 28 HST

Treatment KNO3 Fertilizer (g/L)	Number of Male Flowers HST	
	21tn	28tn
(1 g/L)	4.66	5.33
(3 g/L)	6.00	5.66
(5 g/L)	6.00	6.00
(7 g/L)	6.00	6.66
(9 g/L)	5.33	6.00

Remarks: tn = no real difference at α 5%.

Physiologically, the formation of male flowers in melon plants is not only influenced by nutrients, but also by genetic factors, environment (especially temperature and light intensity), and hormonal interactions in plants. Although potassium and nitrogen contained in KNO_3 fertilizers play a role in flower formation through enzyme regulation and cell division (Havlin et al., 2014), increasing the fertilizer dose does not necessarily have a direct impact on increasing the number of flowers.

According to research by Widodo et al. (2019), the application of KNO_3 fertilizer in different doses does not always result in a noticeably different flowering response, as plant physiological factors have a threshold for nutrient absorption. When the nutrient requirements have been met, further doses are no longer significant in terms of morphological or generative parameters. Therefore, although the 7 g/L treatment produced the highest number of male flowers on average, the results did not differ significantly from the other treatments. This suggests that melon plants have the adaptive ability to variations in KNO_3 dosage within a given range, and that the male flower count parameters are relatively stable under such conditions.

Number of Female Flowers

Table 4. Testing of KNO_3 Fertilizer Against the Number of Female Flowers of Plants Melon at the age of 21 HST and 28 HST

Treatment KNO3 Fertilizer (g/L)	**Number of Female Flowers HST**	
	21tn	**28tn**
(1 g/L)	2.33	3.33
(3 g/L)	3.00	3.00
(5 g/L)	2.66	3.66
(7 g/L)	2.33	3.33
(9 g/L)	2.33	3.00

Remarks: tn = no real difference at α 5%.

The administration of various doses of KNO_3 fertilizer showed no significant difference in the number of female flowers at the age of 21 hst and 28 hst. The average number of flowers at age 28 hst was produced by

the treatment (5 g/L) and did not differ significantly from the other treatments, while the least number of female flowers was produced by the treatment of 3g/L and 9 g/L. Although observations were carried out thoroughly, the results obtained still showed that the application of KNO_3 fertilizer has not been able to significantly increase the formation of male flowers. This is due not only to the limited response of plants to KNO_3 treatment, but also to the physiological disturbances experienced by plants during the observation period, especially the symptoms of shoot wilting. Some plants show symptoms of necrosis, wilting, and drying of the ends of the plant, especially on young shoots and branches, which are the initial location of male flower formation. The wilting of these shoots generally indicates impaired water and nutrient absorption, as well as possible infection with pathogens such as *Fusarium oxysporum* or *Erwinia spp.*, which attacks the vascular tissue of the plant.

The condition of bud wilt causes impaired meristem growth and inhibits the formation of male flowers on the top of the plant. As a result, the number of flowers recorded in the observation becomes less compared to the maximum potential of the plant under healthy conditions. According to Hidayat et al. (2021), physiological disorders such as withering of shoots can directly inhibit the generative expression of plants because metabolic energy is more focused on tissue repair than the formation of reproductive organs. In addition, the effects of KNO_3 fertilizer that are supposed to support generative growth are not optimal because not all parts of the plant can respond actively under these conditions of physiological stress.

Although KNO_3 fertilizer serves as an essential source of potassium and nitrogen nitrate in the generative phase, the presence of physiological stresses such as bud wilting and environmental influences also affect the effectiveness of the treatment. To obtain optimal flowering results, it is necessary to control diseases from an early age, selective observation of healthy parts of the plant, and an integrated fertilization strategy that pays attention to the physiological condition of the plant as a whole.

Fruit Will

Based on the results of the analysis of Anova's variety at the level of 5%, it shows that the application of KNO_3 fertilizer with various doses (1 g/L to 9 g/L) does not have a real effect on the number of potential melon plants at the age of 35 hst. The number of prospective fruits formed throughout the treatment is relatively uniform, with an average ranging from 3.0000 to 3.6667 fruits per plant. Although the P3 treatment (5 g/L) showed the highest value, at 3.6667 pieces, the difference was not statistically significant compared to the other treatments. This condition shows that the addition of KNO_3 fertilizer in a dose of 5 g/L is quite effective in increasing the number of potential fruits in the early generative phase of melon plants.

Table 5. Testing of KNO_3 Fertilizer on the Number of Potential Fruits of Plants Melon at the age of 35 hst

Treatment KNO3 Fertilizer (g/L)	Number of Potential Fruits HST 35tn
(1 g/L)	3.33
(3 g/L)	3.00
(5 g/L)	3.66
(7 g/L)	3.33
(9 g/L)	3.00

Remarks: tn = no real difference at α 5%.

In addition, many of the fruit that is formed does not develop further into perfect fruit. This is caused by two main factors, namely disease disorders and pollination failure. Some plants show symptoms of disease in the prospective fruit, such as rotting or wilting, which indicates the presence of a pathogenic attack such as *Fusarium* spp. or *Didymella bryoniae*. The infection causes the fruit to fall off before undergoing a perfect growth and ripening process. In addition to disease factors, fruit development failure is also affected by suboptimal pollination. Cross-pollination between male and female flowers is essential in melon plants, and pollination failures often occur due to a lack of pollinating insects or unfavorable environmental conditions. Without perfect pollination, the future fruit will not grow normally and tend to fall off.

Thus, while nutrients such as KNO_3 are important in supporting the generative phase of the plant, the success of fruit formation is also highly dependent on plant health factors and pollination success. Therefore, to get maximum results, in addition to proper fertilization, it is also necessary to carry out regular disease control and efforts to support pollination activities, for example through the introduction of bees or artificial pollination.

Fruit Diameter

Based on the results of the analysis of the Anova variety at the level of 5%, it shows that the application of KNO_3 fertilizer with various doses (1 g/L to 9 g/L) does not have a real effect on the number of potential melon plants at the age of 4-8 mst.

Table 6. Testing of KNO_3 fertilizer on the diameter of melon plant fruits at the age of 4 mst – 8 mst

Treatment KNO_3 Fertilizer (g/L)	Fruit Diameter MST				
	4tn	5tn	6tn	7tn	8tn
(1 g/L)	0.00	0.00	0.00	0.00	0.00
(3 g/L)	0.30	0.60	0.86	0.93	0.93
(5 g/L)	0.00	0.00	0.00	0.00	0.00
(7 g/L)	0.50	0.76	1.30	1.73	1.96
(9 g/L)	0.00	0.00	0.00	0.00	0.00

Remarks: tn = no real difference at α 5%.

Based on the average diameter of the fruit from 4 mst to 8 mst, it can be seen that only the P2 (3 g/L) and P4 (7 g/L) treatments showed progressive growth in the diameter of the fruit, while the other treatments (P1, P3, and P5) showed no development in the diameter of the fruit (diameter = 0.0000 cm). This happens because the P1, P3, and P5 treatments fail in fruit formation, which is caused by disease attacks on the prospective fruit so that it does not develop into perfect fruit. The 7 g/L treatment showed better results among the treatments, but it was not significantly different from the other treatments.

This condition shows that not only the dose of fertilizer affects the formation and growth of fruits, but also plant health factors, especially in the flowering phase and the formation of fruit futures.

Figure 10. Prospective Fruit Affected by Disease

When plants are affected by diseases in the generative phase, even though nutrients are available, the process of fruit development can be hampered or even fail completely. Diseases such as fungal infections of *Fusarium* spp. or *Didymella bryoniae*, which commonly attack melon plants, can cause flower abortion, fruit rot, and fruit loss before developing (Ribeiro *et al*., 2019; Lee *et al.*, 2020). According to Fitriyah and Rahmawati (2021), pathogenic infections in the early phases of fruit formation can cause permanent physiological barriers that cannot be repaired with the addition of nutrients alone.

Thus, the growth of fruit diameter that is limited or does not occur in some treatments is not solely due to inappropriate fertilizer dosage, but also due to biotic disorders in the form of diseases that attack the fruit in the early generative phase of melon plants and extreme weather conditions.

3. Conclusion

The application of KNO_3 fertilizer in graded doses (1 g/L to 9 g/L) did not show a statistically significant difference in the growth and flowering parameters of melon plants, such as plant height, number of male and female flowers, and the number of prospective fruits. However, 3 g/L and 5 g/L dose treatments showed a tendency to provide better growth outcomes in the early vegetative and generative phases.

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