

## Effects of Leaf Pruning and Nitrogen Fertilizer Application on the Growth and Yield of Sweet Corn (*Zea mays saccharata* Sturt)

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### ABSTRACT

*Sweet corn production in Indonesia is relatively low due to instability and many factors, including infestation of pests and diseases, inappropriate and inefficient cultivation techniques, and the varieties. Pruning the leaves below the cob and applying nitrogen fertilizer may improve yield. The aim of this research was to investigate the combined effect of leaf pruning and types of nitrogen fertilizer on the growth and yield of sweet corn plants. A plot experiment was performed in a Randomized Block Design with 2 factors, namely leaf pruning (no pruning, 1 leaf remaining, 2 leaves remaining, and 3 leaves remaining below the cob), and types of N fertilizer (Urea 4.5 g/plant, ZA fertilizer 9.6 g/plant, and KNO<sub>3</sub> fertilizer 15.5 g/plant). Results showed that the best type of N source was KNO<sub>3</sub> fertilizer with fresh weight of dehusked cobs (217.68 g), cob diameter (44.84mm), and sugar content (16.26%). Combination treatment of KNO<sub>3</sub> fertilizer and the 3 leaves remaining provided the best results on the parameters of fresh weight of husked cobs (308.50 g), cob length (18.83 cm), weight of husked cobs (10.12 kg/plot), and yield of husked cobs (28.11 ton/ha).*

## 1. INTRODUCTION

Sweet corn (*Zea mays saccharata* Sturt) is a horticultural commodity with high economic value and is one of the important food sources because it contains various nutrition benefit for human health. Sweet corn plays an important role in national and local agricultural development because it provides relatively high profits under good cultivation. Sweet corns have similarities with ordinary corn, but sweet corn contains relatively higher sugar content (5-6%) than that of ordinary corn with around (2-3%). Sweet corns are harvested at around 60 to 70 day after planting (DAP), shorter than those of ordinary corns which are harvested at an average age of 90 DAP (Irawan *et al.*, 2017).

The market demand for sweet corn has increased every year. However, the yield of sweet corn in Indonesia is still relatively low, due to production instability and is influenced by many factors including pest and disease infestation on plants, inefficient cultivation techniques, and the varieties used (Pribadi *et al.*, 2021). In order to obtain good yields and quality of sweet corn, it is necessary to develop efficient and sustainable cultivation techniques. Efforts that can be taken to encourage increased production are by improving cultivation methods and providing the right fertilizer. With the right dose of fertilizer, the required nutrients will be met. In terms of cultivation techniques, pruning the leaves below the cob can be done because basically these leaves are not productive. Some old leaves no longer act as photosynthetic producers but instead become competitors for other organs, including seeds in the partition of photosynthate from photosynthesis (Mapegau *et al.*, 2022). The right application of fertilizer is when the plant is in the growth phase, so that it will encourage an increase in corn produced at harvest. Syafruddin (2015) stated that the provision of nitrogen fertilizer can increase corn yields by 30-50%. In general, fertilizers used to plant sweet corn include nitrogen, phosphate, and potassium. Nitrogen is one of the important nutrients in plant growth including

branches, stems and leaves. It also helps in photosynthesis and the formation of chemical compounds of protein, fat, and organic compounds in the leaves (Faqih *et al.*, 2014).

In cultivating sweet corn, high levels of nutrients are required, including nitrogen nutrients. The main sources of nitrogen are Urea, ZA, and  $\text{KNO}_3$  fertilizers. The N element content in Urea fertilizer is 45-46%, while the N element content in ZA fertilizer is 21-23% (Bancin *et al.*, 2016). Potassium oxide or  $\text{K}_2\text{O}$ , is a combination of the elements nitrogen and potassium contained in  $\text{KNO}_3$  fertilizer, where the percentage of  $\text{K}_2\text{O}$  in  $\text{KNO}_3$  ranges between 45 – 46% and N 13%. Urea fertilizer has a fairly high N content, so it can optimize plant growth which is beneficial for vegetative growth (Basri *et al.*, 2017).  $\text{KNO}_3$  reacts neutrally, is neither acidic nor basic. So it is very effective to use as a source of nitrogen elements in acidic soil. As a source of nitrogen,  $\text{KNO}_3$  fertilizer is better than urea, because urea is acidic and acidifies the soil (Wijayanto & Sucahyono, 2019).

Pruning is the removal of a part of a plant to achieve more effective growth. Reducing and pruning branches can increase sunlight penetration into the canopy. Leaf arrangement determines not only the leaf area index, but also the effectiveness of sunlight absorption in the canopy (Dolot & Tumbelaka, 2021). Translocation of assimilates is greater towards the developing parts. Therefore, it is important to ensure that the leaves are able to produce as much photosynthate as possible when photosynthesizing. Pruning leaves below the cob is one way to make the distribution of photosynthate to the cob more efficient (Priyadi *et al.*, 2022). Pruning is done as an effort to control plants in terms of shape and size. Pruning can also stimulate and strengthen growth, and encourage increased yields in terms of quantity and quality. Reducing corn plant leaves is intended to reduce leaves that are no longer productive and cannot utilize assimilates, so that assimilates can be maximized in the formation of corn seeds and cobs (Affandi *et al.*, 2014). The purpose of this study was to determine the effect of the combination of pruning lower leaves and the types of N fertilizer on the growth and yield of sweet corn.

## 2. MATERIALS AND METHODS

### 2.1. Place and Methods

A plot experiment was carried out from February to May 2024 in Sumberpucung Village, Sumberpucung District, Malang Regency with an altitude of 250-314 masl (medium plains) with an average temperature of 22-34°C. The materials used in the research were sweet corn seeds of the Bonanza F1 variety, and Urea, ZA, and  $\text{KNO}_3$  fertilizers.

This research was performed in a factorial experiment with a Randomized Block Design using 2 treatment factors, namely the pruning of lower leaves below the cob (P) and the types of nitrogen fertilizer (U). Factor I (P) consisted of 4 levels, namely: P0 = no pruning (control), P1 = remaining 1 leaf below the cob, P2 = remaining 2 leaves below the cob, and P3 = remaining 3 leaves below the cob. Factor II (U) consisted of 3 levels, namely: U1 = Urea fertilizer at 373 kg/ha, U2 = ZA fertilizer at 800 kg/ha, and U3 =  $\text{KNO}_3$  fertilizer at 1,292 kg/ha. Using row spacing of 60 cm and plant spacing of 20 cm, the fertilizer application was equivalent to 4.5 g/plant for U1, 9.6 g/plant for U2, and 15.5 g/plant for U3. All treatment combinations was replicated three times resulted in 36 experimental units.

### 2.2. Measurement and Data Analysis

Plant height and number of leaves of sweet corn were observed weekly starting from 14 DAP to 49 DAP. Yield parameters included cob sizes (diameter and length), cob weight (husked and dehusked), and cob yield per ha. In addition, sugar content of the sweet corn was also measured by %Brix level. Analysis of variance (ANOVA) was performed to the collected data to determine if the treatment is significant. The analysis was continued by Tukey's Honestly Significant Difference (HSD) test at  $\alpha = 5\%$ .

## 3. RESULTS AND DISCUSSION

### 3.1. Plant Height

Results from ANOVA concluded that single treatment of leaf pruning did not significantly influence the height of sweet corn plant, but the treatment of N fertilizer types had a significant influence on the plant height of sweet corn at the age of 21-49 DAP. Results from HSD test show that treatment of  $\text{KNO}_3$  fertilizer resulted the highest sweet corn

plants, significantly different from the treatment of giving ZA fertilizer, but was not significantly different from Urea fertilizer treatment. KNO<sub>3</sub> fertilizer is better as a nitrogen source than Urea fertilizer. Urea fertilizer is acidic and acidifies the soil. In addition, KNO<sub>3</sub> fertilizer is a type of compound fertilizer with balanced nitrogen and potassium content. KNO<sub>3</sub> has a fairly large K<sub>2</sub>O content, namely 45-46% and N content of 13%. Sweet corn plants will respond well if given the right dose of K (Pangaribuan *et al.*, 2017). Potassium is needed for photosynthesis, carbon dioxide fixation, and transfer of photosynthates to various parts of plants (Irawan *et al.*, 2023).

Table 1. Effect of treatment on the average plant height of sweet corn at 14-49 DAP

| Treatment                    | Average plant height (cm) |         |          |           |           |           |
|------------------------------|---------------------------|---------|----------|-----------|-----------|-----------|
|                              | 14 DAP                    | 21 DAP  | 28 DAP   | 35 DAP    | 42 DAP    | 49 DAP    |
| <b>Pruning</b>               |                           |         |          |           |           |           |
| P0 (no pruning)              | 20.04                     | 47.71   | 96.15    | 130.11    | 170.67    | 183.7     |
| P1 (1 leaf remaining)        | 19.96                     | 49.96   | 97.85    | 125.19    | 164.48    | 183.45    |
| P2 (2 leaves remaining)      | 20.59                     | 48.89   | 101.11   | 128.18    | 167.93    | 179.78    |
| P3 (3 leaves remaining)      | 19.63                     | 47.33   | 96.95    | 127.26    | 169.56    | 181.63    |
| HSD 5%                       | tn                        | tn      | tn       | tn        | tn        | tn        |
| <b>Types of N Fertilizer</b> |                           |         |          |           |           |           |
| Urea                         | 20.22                     | 49.25 b | 99.25 b  | 128.47 ab | 168.86 ab | 182.33 ab |
| ZA                           | 19.83                     | 44.75 a | 92.55 a  | 123.44 a  | 164.70 a  | 179.28 a  |
| KNO <sub>3</sub>             | 20.11                     | 51.42 b | 102.25 b | 131.13 b  | 170.92 b  | 184.81 b  |
| HSD 5%                       | tn                        | 3.01    | 3.59     | 5.86      | 5.74      | 3.9       |

Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference; tn: not significant

### 3.2. Number of Leaves

The single factor of leaf pruning did not significantly influence the number of leaves, but types of N fertilizer had a significant effect on the number of leaves at age 14-49 DAP. A reason that pruning did not significant is because the pruning treatment was carried out during the generative phase. At ages of 21, 28 and 49 DAP, the application of KNO<sub>3</sub> fertilizer (Table 2) resulted in the highest number of leaves and was significantly different from the treatment with Urea and ZA fertilizer. However, at the ages of 35 and 42 DAP, the application of KNO<sub>3</sub> fertilizer was not significantly different from the treatment of giving Urea fertilizer. One reason that KNO<sub>3</sub> fertilizer resulted the highest average number of leaves is because it a compound fertilizer with balanced N and K that is able to provide the nutrients that must be met. This agrees with (Mare, 2015) where the growth of black and white sesame during vegetative phase is significantly higher when given KNO<sub>3</sub> fertilizer. Nitrogen originating from KNO<sub>3</sub> can encourage growth and increase the number of leaves in corn plants, where N and and K contained in KNO<sub>3</sub> are the most needed nutrients compared to other elements. Plants need nitrogen and potassium because these elements are easily absorbed and is important for vegetative growth of roots, stems, and leaves (Anggraini *et al.*, 2018).

Table 2. Effect of treatment on the number of leaves of sweet corn at 14-49 DAP

| Treatment                    | Average number of leaves |        |        |        |         |         |
|------------------------------|--------------------------|--------|--------|--------|---------|---------|
|                              | 14 DAP                   | 21 DAP | 28 DAP | 35 DAP | 42 DAP  | 49 DAP  |
| <b>Pruning</b>               |                          |        |        |        |         |         |
| P0 (no pruning)              | 3.48                     | 5.04   | 6.66   | 8.3    | 9.93    | 11.63   |
| P1 (1 leaf remaining)        | 3.55                     | 5.08   | 6.37   | 8.3    | 10.18   | 11.89   |
| P2 (2 leaves remaining)      | 3.74                     | 5.07   | 6.56   | 8.3    | 10.11   | 11.85   |
| P3 (3 leaves remaining)      | 3.52                     | 5.19   | 6.7    | 8.18   | 10      | 11.67   |
| HSD 5%                       | tn                       | tn     | tn     | tn     | tn      | tn      |
| <b>Types of N Fertilizer</b> |                          |        |        |        |         |         |
| Urea                         | 3.67                     | 5.03 a | 6.42 a | 8.36 b | 10.22 b | 11.64 a |
| ZA                           | 3.55                     | 4.75 a | 6.19 a | 7.89 a | 9.67 a  | 11.42 a |
| KNO <sub>3</sub>             | 3.5                      | 5.50 b | 7.11 b | 8.56 b | 10.28 b | 12.22 b |
| HSD 5%                       | tn                       | 0.44   | 0.45   | 0.41   | 0.52    | 0.53    |

Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference; tn: not significant

### 3.3. Fresh Weight of Cobs

The combination of leaf pruning treatment and N fertilizer application gave a significant interaction on the fresh weight of sweet corn cobs. Table 3 shows that the combination of pruning treatment with 3 remaining leaves and KNO<sub>3</sub> fertilizer (P3U3) was significantly different from the combination of P1U3 and P2U2 treatments, but not significantly different from other treatments. Based on Table 3, the combination of the number of remaining leaves and KNO<sub>3</sub> fertilizer application produced the highest average fresh weight of sweet corn cobs. This is thought to be because pruning can help allocate nutrients more efficiently to parts of the plant that can affect the harvest, namely the cobs. This is also in line with [Lubis \(2019\)](#) who stated that photosynthesis occurs in the leaves of corn plants producing photosynthates which are then used to form parts of the plant, including fruit cobs. Each part of the leaf has a different portion in the process of seed formation and filling, the development and filling of corn cobs are mostly influenced by the leaves near the cobs. The application of Urea fertilizer did not produce significantly different results compared to the application of KNO<sub>3</sub> fertilizer, but urea fertilizer has the disadvantage of being quickly lost due to evaporation and washing because urea fertilizer is mobile ([Putra et al., 2015](#)). This is what causes the efficiency of fertilization with Urea to be lower than those with KNO<sub>3</sub>.

Table 3. Effect of treatment on the average fresh weight (g) of husked cobs of sweet corn

| Types of N fertilizer | Lower Leaf Pruning |                  |                    |                    |
|-----------------------|--------------------|------------------|--------------------|--------------------|
|                       | No Pruning         | 1 leaf remaining | 2 leaves remaining | 3 leaves remaining |
| Urea                  | 279.28 ab          | 292.94 ab        | 286.75 ab          | 275.92 ab          |
| ZA                    | 272.28 ab          | 265.44 ab        | 260.58 a           | 271.11 ab          |
| KNO <sub>3</sub>      | 284.64 ab          | 258.36 a         | 294.22 ab          | 308.50 b           |
| HSD 5%                | 45.25              |                  |                    |                    |

Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference

### 3.4. Fresh Weight of Dehusked Cobs

The combination of leaf pruning treatment and N fertilizer application gave a significant interaction on the fresh weight of sweet corn cobs without husks. Table 4 shows that the single factor of N fertilizer treatment showed a significant difference in the fresh weight of sweet corn cobs without husks. The highest average fresh weight of cobs without husks was obtained from the U3 treatment (KNO<sub>3</sub> fertilizer) of 217.68 g, while the lowest result was obtained in the U2 treatment (ZA fertilizer) of 200.07 g. The results above show that the average fresh weight of cobs without husks in the KNO<sub>3</sub> fertilizer application treatment had the highest average. This is estimated because the potassium from KNO<sub>3</sub> fertilizer can meet the K nutrient element so that production results are higher. According to [Husain et al \(2015\)](#), potassium fertilizer can increase production results because potassium can improve the physiological properties of plants. Urea is a single fertilizer that contains high N, which is around 45-46% compared to KNO<sub>3</sub> fertilizer which contains only around 13% N. The nature of urea which dissolves quickly makes it quickly available to plants. However, this property can also be detrimental. If urea is applied on the surface and not incorporated into the soil, then the loss of N to the air can reach 40% of the N applied ([Ramadhani et al., 2016](#)).

Table 4. Effect of treatment on the average fresh weight (g) of dehusked cobs of sweet corn

| Treatment                   | Fresh weight of dehusked cobs (g) |
|-----------------------------|-----------------------------------|
| <b>Pruning</b>              |                                   |
| P0 (no pruning)             | 210.31                            |
| P1 (1 leaf remaining)       | 215.46                            |
| P2 (2 leaves remaining)     | 196.21                            |
| P3 (3 leaves remaining)     | 213.57                            |
| HSD 5%                      | tn                                |
| <b>Type of N Fertilizer</b> |                                   |
| Urea                        | 208.92 b                          |
| ZA                          | 200.07 a                          |
| KNO <sub>3</sub>            | 217.68 c                          |
| HSD 5%                      | 8.62                              |

Note: Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference

### 3.5. Cob Diameter

The combination treatment of leaf pruning and the provision of various types of N fertilizers gave no significant interaction on the diameter of sweet corn cobs. Table 5 shows that the single factor of the provision of N fertilizer types showed a significant difference in the diameter of sweet corn cobs. The highest average cob diameter results were obtained in the U3 (treatment with  $\text{KNO}_3$  fertilizer), which was 44.84 mm. The lowest average cob diameter results were obtained in U2 (ZA fertilizer) of 42.58 mm. The pruning of leaves below the cob did not significantly affect the cob diameter. This is in accordance with the results of research reported by [Nono \*et al.\* \(2023\)](#). They further stated that this may be due to the results of photosynthate which are not fully used in the formation of cob diameter, but are used more for increasing the length of the cob. The diameter of corn cobs is influenced by nitrogen nutrition, and the provision of optimal nitrogen doses can increase the size and quality of the cobs ([Valikelari & Asghari, 2014](#)). According to [Pangaribuan \*et al.\* \(2017\)](#) cob diameter, cob length, and number of seeds in sweet corn plants were significantly influenced by the application of potassium nitrate.

Table 5. Effect of treatment on the average diameter of dehusked cobs of sweet corn

| Leaf Pruning            | Cob diameter (mm) |
|-------------------------|-------------------|
| P0 (no pruning)         | 43.17             |
| P1 (1 leaf remaining)   | 45.19             |
| P2 (2 leaves remaining) | 43.50             |
| P3 (3 leaves remaining) | 43.49             |
| HSD 5%                  | tn                |
| Type of N Fertilizer    |                   |
| Urea                    | 44.08 a           |
| ZA                      | 42.58 a           |
| $\text{KNO}_3$          | 44.84 b           |
| HSD 5%                  | 1.54              |

Note: Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference

Table 6. Effect of treatment on the average cob length of sweet corn

| Types of N fertilizer | Leaf Pruning |                  |                    |                    |
|-----------------------|--------------|------------------|--------------------|--------------------|
|                       | No Trimming  | 1 leaf remaining | 2 leaves remaining | 3 leaves remaining |
| Urea                  | 17.47 ab     | 18.39 bc         | 17.44 ab           | 17.78 abc          |
| ZA                    | 16.80 a      | 17.58 ab         | 17.39 ab           | 18.06 bc           |
| $\text{KNO}_3$        | 17.33 ab     | 17.97 bc         | 18.36 bc           | 18.83 c            |
| HSD 5%                | 1.11         |                  |                    |                    |

Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference

### 3.6. Cob Length

The combination treatment of lower leaf pruning and the application of N fertilizer had a significant effect on the cob length (cm) of sweet corn. Table 6 shows that the combination treatment of the number of lower leaves of the cob and the application of N fertilizer types shows that the P3U3 treatment has the highest average but is not significantly different from the combination of treatments P1U1, P1U3, P2U3, P3U1, P3U2. [Irawan \*et al.\*, \(2023\)](#) state that addition of  $\text{KNO}_3$  fertilizer influence significantly on cob length. It is predicted that the cause is that the nutrient content is already sufficiently available. The existing nitrogen and potassium are sufficient to meet the nutrients needed by corn.

### 3.7. Weight of Husked Cobs per Plot

The combination treatment of lower leaf pruning and application of N fertilizer types provided a significant interaction on the weight of husked cobs of sweet corn per plot. Table 7 shows that the highest average weight of husked cobs per plot (4.05 kg) was obtained in the combination treatment of P3 (pruning with 3 leaves remaining) + U3 ( $\text{KNO}_3$  fertilizer). The lowest average weight of husked cobs per plot (3.10 kg) was obtained in the combination treatment P1 (pruning with 1 remaining) + U3 ( $\text{KNO}_3$  fertilizer). The pruning with 3 leaves remaining and application of  $\text{KNO}_3$  fertilizer resulted in the highest production of sweet corn. This may be related to the photosynthate used for seed development in the cob is optimal and the nutrients that are useful in cob development are sufficiently available.

According to (Sumajow *et al.*, 2016) that in the formation of cobs, sufficient nutrients are needed, where sufficient nutrients can lead to optimal cob growth. In addition, corn plants that did not have leaf reduction had smaller diameters, cob lengths and cob weights. This may be due to the photosynthate that occurs during the vegetative phase, apart from its use for seed development, it is also used by plant organs that have not undergone pruning, resulting in competition.

Table 7. Effect of treatment on the average weight of dehusked cobs of sweet corn (kg/plot)

| Types of N fertilizer | Lower Leaf Pruning |                  |                    |                    |
|-----------------------|--------------------|------------------|--------------------|--------------------|
|                       | No Pruning         | 1 leaf remaining | 2 leaves remaining | 3 leaves remaining |
| Urea                  | 8.19 a             | 8.75 ab          | 8.49 a             | 8.28 a             |
| ZA                    | 8.34 a             | 8.10 a           | 7.86 a             | 7.77 a             |
| KNO <sub>3</sub>      | 8.98 ab            | 7.74 a           | 8.59 ab            | 10.12 b            |
| BNJ 5%                | 1.5                |                  |                    |                    |

Note: In the 5% BNJ test the average value followed by the same letter indicates there is no significant difference

Table 7. Effect of treatment on the average yield of husked cobs of sweet corn

| Types of N fertilizer | Lower Leaf Pruning |                  |                    |                    |
|-----------------------|--------------------|------------------|--------------------|--------------------|
|                       | No Pruning         | 1 leaf remaining | 2 leaves remaining | 3 leaves remaining |
| Urea                  | 22.74 a            | 24.29 ab         | 23.58 a            | 23.00 a            |
| ZA                    | 23.17 a            | 22.50 a          | 21.82 a            | 21.59 ab           |
| KNO <sub>3</sub>      | 24.95 ab           | 23.89 a          | 23.85 a            | 28.11 b            |
| BNJ 5%                | 4.91               |                  |                    |                    |

Note: In the 5% BNJ test the average value followed by the same letter indicates there is no significant difference

### 3.8. Yield of Husked Cobs (Ton/Ha)

The combination treatment of the number of lower leaves on the cobs with the application of N fertilizer provided a significant interaction on the weight of husked cobs per hectare (ton/ha) of sweet corn. Table 7 shows that the combination treatment P3U3 (pruning with 3 leaves remaining and KNO<sub>3</sub> fertilizer application) resulted the highest average corn cob yield of 28.11 ton/ha although not significantly different from those of treatments P0U3, P1U1 and P3U2 with yield of respectively 24.95 ton/ha, 24.29 ton/ha, and 21.59 ton/ha.

The average yield of sweet corn in Indonesia is around 8.31 ton/ha, while the potential yield reaches 14-18 ton/ha (Pratama *et al.*, 2022). According to Sumajow *et al.*, (2016) that reducing the lower leaves of the cob creates an ideal environment for sweet corn plants to develop. This environmental condition is related to the efficient use of solar radiation effectively, resulting in an increase in photosynthesis yields and a large increase in distribution to the cobs, which then causes an increase in the length, diameter and weight of the cobs. Apart from that, providing sufficient nutrients also determines the yield of sweet corn plants. Agrees with (Suwandi *et al.*, 2021) that plants can achieve optimal harvest results depending on the availability and balance of macro and micro nutrients.

### 3.9. Corn Sweetness Index (%Brix)

Table 8 shows that combination treatment of pruning the lower leaves and the application of N fertilizer did not provide a significant interaction with the sweetness index of sweet corn. However, the single factor of N fertilizer in types is significant on the sweetness index. Furthermore, the KNO<sub>3</sub> fertilizer treatment (U3) resulted in the highest average sweetness index for sweet corn plants, namely 16.26%, while the lowest sweetness index (average of 15.26%) was produced from the U2 treatment (ZA fertilizer). The single factor of lower leaf pruning did not have a significant effect on the sweetness index.

The treatment of KNO<sub>3</sub> fertilizer on sweet corn sweetness index parameters has a significant difference from the treatment of Urea and ZA fertilizer because KNO<sub>3</sub> fertilizer causes an increase in potassium nutrients where potassium nutrients affect the sugar content in the fruit (Parmila *et al.*, 2019). Giving KNO<sub>3</sub> can increase the sugar content in sweet corn because the potassium element contained in KNO<sub>3</sub> can help convert carbohydrates into sugar so that the sugar content in the fruit increases (Ramadani *et al.*, 2022).

Table 8. Effect of treatment on the sweetness index (%Brix) of sweet corn

| Lower Leaf Pruning      | Sweetness Index (%Brix) |
|-------------------------|-------------------------|
| P0 (no treaming)        | 15.65                   |
| P1 (1 leaf remaining)   | 15.45                   |
| P2 (2 leaves remaining) | 15.46                   |
| P3 (3 leaves remaining) | 15.95                   |
| HSD 5%                  | tn                      |
| Type of N Fertilizer    |                         |
| Urea                    | 15.36 a                 |
| ZA                      | 15.26 a                 |
| KNO <sub>3</sub>        | 16.26 b                 |
| HSD 5%                  | 0.58                    |

Note: In the 5% HSD test the average value followed by the same letter indicates there is no significant difference

#### 4. CONCLUSION

The single treatment factor of N fertilizer application significantly affected the growth and yield of sweet corn plants. The N fertilizer from KNO<sub>3</sub> gave the best average results compared to other types of N fertilizers (Urea and ZA). KNO<sub>3</sub> fertilizer treatment produced the best growth and yield for sweet corn as indicated by the parameters of plant length 184.81 cm (at 49 DAP), number of leaves 12.2 (at 49 DAP), fresh weight of dehusked corn cobs (217.68 g), diameter of corn cobs (44.84 mm), and sugar content (16.26%). The single factor of pruning leaves under the cob did not significantly affect the growth and yield of sweet corn plants for all observed parameters. The combination of leaf pruning with application of N fertilizer types, however, resulted in significant effects on diameter, fresh weight, weight of dehusked, and yield of sweet corn cob. The combination treatment of KNO<sub>3</sub> and pruning with 3 leaves remaining produced the best results with weight of husked corn cobs of 308.50 g and 10.12 kg/plot, cob length of 18.83 cm, and yield of husked corn cobs of 28.11 ton/ha.

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