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The Effect of N Fertilizer and Vermicompost Fertilizer on The Growth and Yield of Sweet Corn (*Zea mays saccharata Sturt*) Cultivar Exsotic Pertiwi F1

Khoirul Al Farisi[1], Muhammad Aji Abadillah[2], Mukhammad Fariz Ismail[3], Wijaya[4].
[1]Swadaya Gunung Jati University, Cirebon, Indonesia, khoirulalfarisi9@gmail.com
[2]Swadaya Gunung Jati University, Cirebon, Indonesia, abadebets@gmail.com
[3]Swadaya Gunung Jati University, Cirebon, Indonesia, ismailmukhammadfariz@gmail.com
[4]Swadaya Gunung Jati University, Cirebon, Indonesia, wijaya6104@gmail.com
Corresponding Author : wijaya6104@gmail.com

Abstract.
Background. Sweet corn (*Zea mays saccharata Sturt*) is one of the world's important food crops as a source of carbohydrates and nutrients, as well as a profitable raw material for the food and animal feed industries.
Aims. The purpose of this study is to ascertain how sweet corn growth and yield are impacted by urea and vermicompost fertilizer dosages. The experiment was conducted from to August 2024, at Mekar Jaya Village, Gantar District, Indramayu Regency.
Methods. Utilizing a randomized block design (RBD) consisting of 9 treatments of nitrogen fertilizer and vermicompost fertilizer with three replicates. The urea doses were 100, 200, and 300 kg/ha, and the vermicompost doses were 5, 10, and 15 tons/ha, resulting in 27 experimental plots. The variables observed included plant height, number of leaves, diameter of cobs, length of cobs, root volume, nitrogen uptake, weight of cobs per plant, and weight of cobs per plot. The data were analyzed using the F test and DMRT at the 5% level. The growth and yield of sweet corn (*Zea mays saccharata Sturt*) were greatly influenced by the dosage of nitrogen fertilizer (urea) and vermicompost applied.
Conclusion. Significant differences were found in various variables, such as plant height, number of leaves, stem diameter, root volume, cob diameter, cob length, cob weight per plant, and cob weight per plot.
Implementation. For the glucose content variable, there were no significant differences. In treatment I, the combination of 300 kg/ha of urea and 15 tons/ha of manure yielded the best results for most growth and yield variables.

Keywords: sweet corn, urea fertilizer, vermicompost fertilizer

INTRODUCTION

In Indonesia, sweet corn is widely cultivated in tropical regions such as Java, Sumatra, and Kalimantan, supporting the food self-sufficiency program (Wulandari & Jaelani, 2019). Sweet corn contains high glucose, low fat, and various nutrients such as carbohydrates, protein, vitamins A, B, and C, iron, phosphorus, calcium, and water (Herfandi Lamdo et al., 2019).

Fertilizers containing nitrogen (N) and vermicompost can help boost the yield of sweet corn. Nitrogen fertilizer is one of the essential elements for plant growth. The synthesis of proteins, chlorophyll, and other vital substances requires nitrogen. Vegetative plant development, such as plant height and leaf count, can be enhanced with the right application of nitrogen fertilizer. Furthermore, nitrogen fertilizer helps hasten the development of flowers and fruits (Ramadhani et al., 2016).

Vermicompost, also known as worm castings, can be used as a fertilizer for plants. Until now, this excrement has been discarded because it is considered dirty and smelly. Vermicompost, also called vermicompost, is excrement produced by earthworms. Vermicompost contains all the macro and micro nutrients that help plant growth. Elements: Vermicompost contains microbes and hormones that stimulate plant growth and are readily available for absorption by plants. High numbers and activity of microorganisms can accelerate the release of nutrients from vermicompost to plants (Ramadhaini et al., 2017).

Vermicompost fertilizer can increase the availability of nutrients in the soil, soil microorganism activity, and good soil structure. As a result, sweet corn plants can obtain nutrients more efficiently and grow better. In addition, the use of organic fertilizers can also increase soil water retention and reduce the risk of soil erosion (Akerina et al., 2021).

STUDI LITERATUR

Microorganisms, plants, and animals all depend on the chemical nitrogen for their survival. The production of protoplasm, the primary component of cells, chlorophyll molecules, which are essential for photosynthesis, nucleic acids, which form ribonucleic and deoxyribonucleic acids, and amino acids, which are the building blocks of proteins, are just a few of the biological processes that require nitrogen during plant growth. Numerous sources, including organic nitrogen molecules broken down from organic matter, nitrogen-fixing microorganisms, and inorganic nitrogen dissolved in soil water, can provide nitrogen to the soil. One kind of microbe that aids plants in obtaining more nitrogen is the rhizobium

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bacteria. These microbes can transform atmospheric nitrogen gas into nitrogen molecules that plants can utilize (Sari & Prayudyaningsih, 2015).

For plants to grow and develop, nitrogen is crucial, particularly for the stems and leaves. Proteins and chlorophyll, which are essential components of photosynthesis and protein synthesis, are formed in large part by nitrogen. Plants that have enough nitrogen available can develop stronger stems and larger leaves, which improve overall development and the efficiency of nutrient absorption. Insufficient nitrogen will cause plants to develop more slowly, resulting in a lower protein production (Waskito et al., 2018).

Vermicompost, or worm manure, is an option for organic fertilizer. Referred to as "premium organic fertilizer," vermicompost refers to the manure produced by earthworms, and is a highly effective organic fertilizer because the nutrients it contains are immediately available. Therefore, the quality of vermicompost is far superior to other organic fertilizers (Sinda et al., 2015).

Compared to ordinary compost, vermicompost has higher levels of nutrients like potassium (K), phosphorus (P), and nitrogen (N). They also contain soil microbes and plant growth regulators. The mix of chemicals, organisms, and earthworm compost guarantees that plants have absorbable nutrients, which can lower the need for additional fertilizers and enable the addition of inorganic fertilizers. This makes the use of inorganic fertilizers crucial for plant growth and output. Because inorganic fertilizers dissolve in the soil more quickly, plants can easily access nutrients. Phosphorus (P) and potassium (K), two macronutrients that are balanced in this fertilizer, encourage plant growth and development in the best possible way (Hidayatullah et al., 2020).

Plant height at 30 days, stem diameter at 50 days, and cob diameter without husks are all impacted by the interaction between the dose of goat dung and N, according to the findings of the study by Yunaning et al. (2022). The height of the plant at 15 and 45 days, the number of leaves at 15 and 45 days, the diameter of the stem at 50 and 45 days, and the length and weight of the cobs were all unaffected by these treatments. Plant growth was maximized by applying 20 tons of goat dung per hectare and 200 kg of urea fertilizer per hectare.

The findings of the Pernitiani et al. (2018) investigation demonstrate that the application of nitrogen fertilizer had a substantial impact on every variable that was studied. Applying different amounts of nitrogen to sweet corn plants boosted their yield and growth.

With a urea fertilizer treatment of 300 kg per hectare, better production was attained, with cob length of 31.44 cm and cob weight of 10.048 tons/ha.

On the other hand, because organic matter gives soil bacteria food and energy, it can boost microbial activity by supplying nutrients (Anggraini et al., 2015). Organic fertilizer can enhance the physical and biological characteristics of soil, boosting its nutrient-supplying capacity and delivering vital nutrients to plants in a sustainable manner through mineralization (Meena et al., 2015).

The results of research by Firmansyah et al. (2024) show the relationship between mycorrhizal organic fertilizer and vermicompost fertilizer at a dose of 15 g /plant (mycorrhizal fertilizer) and 6 tons/ha (vermicompost fertilizer). The plant height variable at 60 days after planting (DAP) showed a high average cob weight (332.80 g) and plant height at 60 DAP. The variables of flowering age with the fastest average (45.71 days after planting), 1000-grain weight with a high average (227.47 g), and plant weight with a high average (500.67 g) were significantly influenced by the single treatment of mycorrhizal organic fertilizer (15 g /plant).

The results of research by Nurlailah & Setyawan (2019) produced satisfactory results in the growth and yield of corn plants with a vermicompost fertilizer dose of 13.5 tons per hectare (P3) and the local Dampit corn variety (V1). The P3V1 combination yielded 2.66 kilograms of corn per bed and 1.15 kilograms of corn per bed.

METHOD

The experiment was conducted in Mekar Jaya Village, located in Gantar Subdistrict, Indramayu Regency, at an altitude of 30 meters above sea level. This study will be conducted from June to August 2024. The materials used were Exotic Pertiwi F1 sweet corn seeds, insecticide, urea fertilizer (N), and vermicompost fertilizer. The tools used for this research include hoes, writing instruments, plot labels, a 5-liter sprayer, scales, calipers, measuring tapes, watering cans, water hoses, raffia ropes, and other tools.

With a randomized block design (RBD) comprising nine treatments of nitrogen fertilizer and vermicompost fertilizer with three replicates, the experimental research method was employed. Three levels of urea (N) fertilizer dosage were used: N1: 100 kg/ha, N2: 200 kg/ha, and N3: 300 kg/ha. There were 27 experimental plots in all, with the vermicompost fertilizer (K) dosage being divided into three levels: K1: 5 tons/ha, K2: 10 tons/ha, and K3:

15 tons/ha. Each level was repeated three times. Five plant samples were utilized in each treatment.

Plant height, number of leaves per plant, stem diameter, root volume, cob diameter, cob length, cob weight per plant and per plot, and glucose content were all noted on days 14, 28, and 42. The F-test in analysis of variance was used to examine the experimental data. The Duncan Multiple Range Test (DMRT) was used to continue testing at a significance level of 5% if the treatment under investigation had a meaningful effect. SPSS and Microsoft Excel 2019 were used for data analysis. (Wijaya, 2018).

DISCUSSION

Plant Height

The analysis results showed that the application of N fertilizer and Vermicompost fertilizer had a significant effect on plant height at 14 DAP, 28 DAP, and 42 DAP. In Table 1, for the 14-day-old treatment, the highest plant height was recorded in treatment D (18.90 cm), with 200 kg/ha of urea and 5 tons/ha of vermicompost. Conversely, low plant height was recorded in treatment E (14.30 cm), with a combination of 200 kg/ha urea and 10 tons/ha vermicompost. According to Sahoo & Mohanty (2020), physiological stress can occur in plants due to overly moist soil during the early vegetative stage or excessive nitrogen application.

Table 1. Plant Height Analysis Results

Treatment	Plant Height (cm)					
	14 DAP		28 DAP		42 DAP	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	15,20	b	41,60	c	87,60	ab
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	16,20	c	49,30	d	108,00	bc
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	17,90	d	38,20	a	90,70	abc
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	18,90	e	39,50	b	110,90	bc
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	14,30	a	58,30	e	114,40	c
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	15,20	b	41,80	c	74,50	a
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	15,60	b	61,00	f	95,30	abc
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	16,30	c	61,10	f	95,90	abc
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	16,40	c	40,30	b	96,10	abc

Description: Average numbers accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level

Table 1 also shows that at 28 DAP, Treatment H (61.10 cm) with urea 300 kg/ha and vermicompost 10 tons/ha showed good results. However, treatment C (38.20 cm), with urea 100 kg/ha and vermicompost 15 tons/ha, showed low results. Too low a dose of urea does not meet nitrogen requirements during the vegetative phase, and a high dose of vermicompost cannot replace. the important role of nitrogen in leaf biomass formation. According to Mishra et al. (2024), nitrogen requirements in plants increase sharply during the active growth phase. At this stage, pure organic nitrogen sources are insufficient to meet plant needs, so additional nitrogen sources that are more readily available to plants are required.

Treatment E (114.40 cm), with 200 kg/ha of urea and 10 tons/ha of vermicompost, showed good results at 42 days after planting (DAP) when entering the vegetative phase before the generative phase. This indicates that the nitrogen supply from urea and vermicompost was adequate for the needs of the plants at this age. Meanwhile, treatment F (74.50 cm) at 42 DAP showed low results with 200 kg/ha of urea and 15 tons/ha of vermicompost. Excessive vermicompost can inhibit nutrient absorption. Plants struggle to absorb nutrients, roots are inhibited, and the soil can become too compacted, resulting in stunted plant growth. Teresa et al. (2021) state that to avoid nutrient antagonism, the mixture of organic and inorganic fertilizers must be adjusted to a balanced dose.

Number of Leaves

Analysis results show that the application of N fertilizer and vermicompost fertilizer significantly differs in leaf number, as shown in Table 2. At the 14 DAP treatment stage, treatment D (urea 200 kg/ha + vermicompost 5 tons/ha) had the highest number of leaves, with an average of 4.9 leaves, indicating that nitrogen dosage can aid leaf growth in the early vegetative phase. Treatment G (urea 300 kg/ha + vermicompost 5 tons/ha) produced the least number of leaves, only 3.2 leaves. These results indicate that applying too high a nitrogen dose can actually have a negative effect on vegetative growth, such as nutrient antagonism or physiological stress, which can potentially inhibit leaf formation in plants (Ye et al., 2022).

At 28 days after planting, treatment G showed good results with 7.1 leaves, indicating that high nitrogen doses began to promote leaf formation along with root growth and plant strength. Treatments A and E had lower fertilizer combinations and produced fewer leaves (around 5.7–5.8 leaves), indicating insufficient nitrogen intake during the vegetative phase.

Treatment E (200 kg/ha urea + 10 tons/ha vermicompost) had a high number of leaves, namely 11.3 leaves, at 42 days after planting.

This shows that the combination of urea and vermicompost doses in this treatment resulted in an optimal vegetative phase from the middle to the end of the phase. Treatment F, which had 200 kg/ha of urea + 15 tons/ha of vermicompost, had a low number of leaves, namely 8.7 leaves.

Table 2. Leaf Number Analysis Result

Treatment	Number of Leaves (cm)					
	14 DAP		28 DAP		42 DAP	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	3,70	cd	5,80	a	10,20	d
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	3,70	cd	6,20	b	9,20	b
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	3,30	ab	6,20	b	9,20	b
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	4,90	e	6,20	b	10,20	d
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	3,90	cd	5,70	a	11,30	f
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	4,00	d	6,60	c	8,70	a
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	3,20	a	7,10	d	9,70	c
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	4,00	d	6,30	bc	8,80	a
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	3,60	bc	5,70	a	10,80	e

Description : Average numbers accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level

According to research conducted from the early to late vegetative phase, treatment E with 200 kg/ha of urea and 10 tons/ha of vermicompost was the most effective in increasing the number of sweet corn leaves. This combination produced stable and high results in terms of leaf count. This was especially true during the critical growth phase of the plant (42 days after planting), when leaves play an important role in photosynthesis. This is reinforced by research conducted by Yunaning et al. (2022), which found that urea (inorganic fertilizer) and vermicompost (organic fertilizer) applied in balanced doses can optimally support vegetative growth, increase leaf width, and enhance the productivity of sweet corn plants.

Stem Diameter

The analysis results show that the use of nitrogen (N) fertilizer and vermicompost fertilizer has a significant effect on stem diameter, as shown in Table 3. Based on Table 3, 14 days after planting, treatment C (100 kg/ha urea fertilizer + 15 tons/ha vermicompost) showed the highest stem diameter, namely 0.45 cm. Meanwhile, treatment A showed the lowest stem diameter, which was only 0.35 cm.

This condition shows that the combination of urea and vermicompost fertilizer significantly supports stem growth in the early phase of the plant (Pitaloka et al., 2024). Stem diameter increased significantly 28 days after planting. Treatment E (200 kg/ha urea + 10 tons/ha vermicompost) had the largest stem diameter, namely 1.50 cm. This was much larger than the other treatments. Conversely, treatment A (0.80 cm), which used low doses of urea and vermicompost, had the lowest stem diameter at that age.

Table 3. Stem Diameter Analysis Results

Treatment	Stem Diameter (cm)					
	14 DAP		28 DAP		42 DAP	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	0,35	b	0,80	a	2,10	ab
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	0,40	c	1,05	d	2,04	bc
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	0,45	e	0,85	c	2,20	abc
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	0,40	d	0,90	b	2,50	bc
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	0,38	a	1,50	f	3,10	c
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	0,36	b	0,95	c	1,90	a
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	0,39	b	1,40	e	2,70	abc
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	0,41	c	1,45	f	2,80	abc
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	0,40	c	0,92	b	2,60	abc

Description : Average numbers accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level

Stem diameter growth appeared to be quite stable at 42 days after planting. Treatment E still had a large stem diameter of 3.50 cm, while treatment F produced a small stem diameter of only 1.90 cm at 42 days after planting. This could be the result of organic matter saturation, which effectively inhibits nitrogen absorption. According to Guo et al. (2022), a well-balanced mix of inorganic and organic fertilizers can boost microbial activity, improve soil structure, and improve nutrient uptake, particularly nitrogen, which is essential for the production of stem tissue.

Root Volume

The analysis results show that the use of N fertilizer and vermicompost fertilizer has a significant difference in root volume, as shown in Table 4. Based on Table 4, 14 days after planting (DAP), treatment E (urea 200 kg/ha + vermicompost 10 tons/ha) had the largest root volume, namely 3.50 ml. This indicates that this combination provides excellent initial stimulation for root development. Treatment H (urea 300 kg/ha + vermicompost 10 tons/ha) had the smallest root volume of 1.50 ml. This may be due to excess nitrogen or nutritional imbalance, which inhibits root growth in the early vegetative stage.

Table 4. Root Volume Analysis Results

Treatment	Root Volume (ml)					
	14 DAP		28 DAP		42 DAP	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	2,00	bc	4,80	bc	8,50	ab
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	2,50	cd	6,00	cd	11,00	bc
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	1,80	b	4,20	b	9,00	b
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	2,20	c	5,00	bc	12,00	cd
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	3,50	e	9,00	f	18,00	f
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	2,00	bc	6,50	de	13,00	de
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	2,40	cd	7,50	e	14,00	e
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	1,50	a	3,80	a	7,50	a
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	2,30	c	5,50	c	10,50	bc

Description : Average values accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level

The root growth trend became more apparent at 28 days after planting. Treatment E continued to show high root volume, namely 9 ml, but the combination of vermicompost (15 tons/ha) did not always have a positive effect, especially if it was not balanced with the right dose of urea, because low root volume was still found in treatments H (3.80 ml).

At the end of the observation period (42 days after planting), treatment E had a high root volume of 18 ml, far above the other treatments. Excessive or inappropriate application of urea can cause an increase in local salt concentration around the roots or cause nutritional imbalance, thereby inhibiting root growth. The addition of vermicompost played a role in improving soil conditions and balancing nutrient availability, thereby reducing this pressure and ultimately producing healthier roots with greater volume (Terefe et al. 2024).

Meanwhile, treatment H (7.50 ml) had a low root volume. This may have occurred because a high dose of vermicompost without nitrogen balance can inhibit root growth. This condition triggers soil microbes to bind mineral nitrogen (nitrogen immobilization), causing plants to lack nitrogen for root formation, resulting in shorter roots, fewer branches, and low volume (Kelley et al., 2022).

This aligns with the research by Pangalila et al. (2023), which found that the use of a balanced mixture of organic and inorganic fertilizers can improve the root system due to the simultaneous availability of macro and micro nutrients and improved soil structure.

Diameter of Corn Cob with Husk

The results of the study show that the application of N fertilizer and Vermicompost fertilizer has a significant effect on cob diameter, as shown in Table 5. Table 5 shows that although treatment I produced a large cob diameter (6.38 cm), treatment A produced a low diameter (4.90 cm).

Table 5. Results of Corn Cob Diameter With Husk Analysis

Treatment	Diameter of Corn Cob with Husk (cm)	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	4,90	a
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	5,81	abc
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	6,01	bc
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	5,50	ab
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	5,61	ab
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	5,92	bc
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	6,10	bc
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	6,00	bc
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	6,38	c

Description : Average figures accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level

This suggests that high concentrations of urea and vermicompost can effectively supply the nitrogen needs for cell division and cob filling. High diameters were also obtained by treatments G (6.10 cm), C (6.01 cm), H (6.00 cm), and F (5.92 cm), none of which differed statistically, suggesting that cob enlargement is typically correlated with higher fertilizer dosages. According to a study by Oesman et al. (2020), because macro and micronutrients are complementary, maize growth and productivity can be increased by using a combination of organic and inorganic fertilizers.

Length of Corn Cob with Husk

As indicated in Table 6, the study's findings indicate that cob length was significantly impacted by the administration of N and Vermicompost fertilizers. In Table 6, treatment A showed low cob length (23.98 cm) due to a lack of nutrients for cell division and elongation.

Treatment I, which provided complete nutrients from urea and vermicompost, resulted in a tall cob length (32.10 cm). Tall cob lengths were also obtained by treatments H (30.13 cm) and C (30.06 cm), which did not differ substantially from I.

This suggests that sweet corn cob length normally increases with higher fertilizer dosages. According to the study's findings, the length of the cobs generated is correlated with the amounts of urea and vermicompost fertilizer applied. The most successful treatment for lengthening sweet corn cobs was treatment I. Elfayetti (2017) asserts that using organic fertilizers, like worm vermicompost, can boost the growth of plants' generative parts and increase the effectiveness of using inorganic fertilizers.

Table 6. Results of Corn Cob Length with Husk Analysis

Treatment	Length of Corn Cob with Husk (cm)	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	23,98	a
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	28,00	de
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	30,06	fg
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	26,28	bc
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	27,04	cd
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	29,23	ef
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	26,02	b
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	30,13	fg
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	32,10	g

Description : Average numbers accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level.

Weight of Corn Cob with Husk per Plant and per Plot

According to Table 7, the weight of maize cobs per plant and per plot was significantly impacted by the application of N fertilizer and Vermicompost fertilizer. Treatment A included a low dose (100 kg/ha of urea plus 5 tons/ha of vermicompost) and a low cob weight (0.20 kg/plant and 5 kg/plot).

Treatment I produced high cob, namely (0.62 kg/plant and 15.50 kg/plot). Treatment I used a combination of 300 kg/ha of urea and 15 tons/ha of vermicompost. This combination also provided high nitrogen urea, and the organic matter and microorganism content of vermicompost helped cob growth and good seed filling.

According to the research findings, higher urea and vermicompost fertilizer dosages resulted in a considerable rise in the weight of maize cobs per plant and per plot. Treatment

I, which combined 300 kg/ha of urea with 15 tons/ha of vermicompost, was found to be the most successful in raising crop output for both individual plants and plots. According to Yue et al (2022), nitrogen availability affects amino acid synthesis and enzymes that support the seed filling process, thereby increasing cob weight.

Table 7. Results of Analysis of Weight of Corn Cob Per Plant And Per Plot

Treatment	Weight of Corn Cobs (kg)			
	per plant		per Plot	
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	0,20	a	5,00	a
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	0,40	cde	10,00	bcd
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	0,48	efg	12,00	cd
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	0,27	ab	6,75	ab
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	0,35	bcd	8,75	bc
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	0,45	def	11,25	cd
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	0,29	abc	7,25	ab
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	0,52	fg	13,00	d
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	0,62	g	15,50	d

Description : Average numbers accompanied by letters in the column indicate significant differences based on Duncan's test at a 5% significance level.

Glucose Content

According to the research findings, sweet corn's glucose content does not rise when N and vermicompost fertilizers are applied, as Table 8 illustrates. In other words, because of internal plant variables and the growing environment, sweet corn's sweetness stays constant even when the fertilizer combination can improve yield (such as cob length and weight).

Subaedah et al. (2021) claim that plant genotype and growing climate have a greater impact on the glucose and straightforward sugar content of sweet corn than fertilizer application. According to Feng et al (2020), increasing the nitrogen fertilizer dosage does result in an increase in yield, such as cob weight or length; however, it has no discernible impact on sugar content. Since glucose is the primary byproduct of photosynthesis, its concentration should remain constant as long as the plant is growing well and getting enough light, according to Chen et al (2022).

Table 8. Glucose content analysis results

Treatment	Glucose Content (%)
A (Urea 100 kg/ha, Vermicompost 5 ton/ha)	13,3 a
B (Urea 100 kg/ha, Vermicompost 10 ton/ha)	13,6 a
C (Urea 100 kg/ha, Vermicompost 15 ton/ha)	13,4 a
D (Urea 200kg/ha, Vermicompost 5 ton/ha)	13,3 a
E (Urea 200 kg/ha, Vermicompost 10 ton/ha)	12,8 a
F (Urea 200 kg/ha, Vermicompost 15 ton/ha)	13,4 a
G (Urea 300 kg/ha, Vermicompost 5 ton/ha)	12,1 a
H (Urea 300 kg/ha, Vermicompost 10 ton/ha)	12,7 a
I (Urea 300 kg/ha, Vermicompost 15 ton/ha)	12,8 a

Description : The average figures accompanied by letters in the column indicate no significant difference based on Duncan's test at a 5% significance level

CONCLUSION

The growth and yield of sweet corn (*Zea mays saccharata Sturt*) are greatly influenced by the dosage of nitrogen fertilizer (urea) and vermicompost fertilizer applied. Significant differences were observed in various variables, such as plant height, number of leaves, stem diameter, root volume, cob diameter, cob length, cob weight per plant, and cob weight per plot. For the glucose content variable, there were no significant differences. In treatment I, the combination of 300 kg/ha of urea and 15 tons/ha of manure yielded the best results for most growth and yield variables.

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