Effects of different potassium doses on yield and quality of two sweet corn hybrid combinations (*Zea mays* var. *saccharata*) in Ho Chi Minh City

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ABSTRACT

The study aimed to determine the appropriate amount of potassium for two newly selected sweet corn hybrid combinations of the Department of Genetics and Plant Breeding, Nong Lam University, Ho Chi Minh City. The experiment was conducted in the winter-spring crop of 2023 - 2024 in Thu Duc, Ho Chi Minh City with 4 potassium levels (70, 90, 110, and 130 kg K_2O/ha) and 2 combinations of sweet corn hybrids BN191, BN211 and control variety (Golden Cob). The results showed that different rates of potassium affected the yield, quality and resistance to pests and diseases of sweet corn hybrid combinations. The potassium dosage of 130 kg K_2O/ha gave the highest fresh ear yield, low pests, and infection rate and highest Brix for the two selected hybrid combinations and the Golden Cob variety.

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1. Introduction

Besides selecting good varieties, determining appropriate cultivation practices for the new varieties is an important solution to maximize the yield potential. Nguyen (2013) stated that fertilizers contributed 40% to crop yield, varieties contributed 30%, and plant protection products contributed 20%. Each corn variety has different growth characteristics and yield, so the fertilizer regime is also different. The growth and yield of corn depend significantly on nutrient supply, irrigation intensity, soil and environment.

Potassium is one of the essential macronutrients for plants. Potassium is required for the activity of enzymes, controlling stomatal opening, enhancing resistance to pests, drought and low temperatures. Potassium promotes photosynthesis, transports photosynthetic

products to accumulate in seeds. Potassium is necessary as an activator for over 60 enzymes in the meristematic tissue. The important factor in cell division is the effect of potassium on the extension of cells. With sufficient potassium, cell walls are thicker and cell tissue is more stable. Because of this effect, cells grow normally, strengthen resistance and resist pests (Beringer & Nothdurft, 1985). Based on this reality, determining the appropriate dose of potassium helps inhance productivity, quality and pest resistance for the two newly selected sweet corn hybrids BN191 and BN211.

2. Materials and Methods

2.1. Materials

The materials studied include two hybrid sweet corn varieties (BN191, BN211) researched and hybridized at the Department of Genetic and Plant Breeding, Nong Lam University of Ho Chi Minh City, with the control variety Golden Cob (which is the most commonly grown in Vietnam. This variety is imported from Thailand and distributed by East - West Seed Company. The Golden Cob sweet corn has a short growth period of 68 to 72 days, an average plant height, and an average weight of 490 to 520 g per ear. The kernels are aligned, bright yellow, and have a soft and sweet taste and chloride Potassium fertilizer (Phu My potassium: 61% K_2O) from Petrovietnam Fertilizer and Chemicals Corporation.

2.2. Methods

2.2.1. Field experiment set up

The experiment involved two factors arranged in a split-plot design with 12 treatments, 3 replications. The subplot factor included 4 levels of potassium (K1: 70 kg K_2O/ha, K2: 90 kg K_2O/ha (control), K3: 110 kg K_2O/ha, K4: 130 kg K_2O/ha) and the main plot factor included 2 hybrid sweet corn varieties and the Golden Cob variety (G1: BN191, G2: BN211, G3: Golden Cob (control). The total number of base plots was 36; base plot area: 2.8 m × 5 m = 14 m^2; planting distance: 70 cm × 25 cm; total experimental area: 600 m^2.

Amount of fertilizer (kg/ha): The amounts of nitrogen, phosphorus, and cow manure are the same across the treatments, specifically: 150 kg N - 80 kg P_2O_5 and 10 tons of decomposed cow manure. Urea (46% N) and DAP (18% N - 46% P_2O_5) were used. Amount of potassium: applied according to each experimental treatment. KCl (61% K_2O) was used.

Fertilization method: All cow manure and phosphorus fertilizer and 1/4 of urea were applied together at the time of sowing. There were 4 top dressing fertilizer applications in which the first application used 1/4 urea at 10 - 15 days after sowing (when the plant had 3 - 4 leaves), the second application used 1/4 urea + 1/3 potassium at 25 - 30 days after sowing (when the plant had 7 - 8 leaves), the third application used 1/4 urea + 1/3 potassium at 40 - 45 days after sowing (when the plant had 10 - 11 leaves), and the fourth application used 1/3 potassium at 50 - 55 days after sowing (when the plant had over 11 leaves).

The experiment was conducted during the winter-spring 2023 - 2024 season at the research station of the Faculty of Agronomy, Nong Lam University, Ho Chi Minh City on sandy soil (sand:silt:clay ratio of 62:28:10), slightly acidic soil (with pH values of 6.5 and 5.3 for H_2O and KCl, respectively); low organic matter content in the soil (1.7%); poor in total nitrogen and total potassium.

2.2.2. Criteria and monitoring methods

Monitoring criteria include agronomic traits, pest damage status, yield parameters and quality of sweet corn varieties. The monitoring criteria and data collection methods comply with the National Standards for Agricultural Crop Varieties - Experimental value of cultivation and utilization of corn varieties (TCVN, 2021).

Leaf area (dm^2) measured once at the tasseling stage (50 days after sowing). Leaf length (dm) measured from the leaf collar to the leaf tip, leaf width (dm) measured at the widest point of the leaf Blade, measuring all green leaves on the plant. Leaf area (S) calculated using the formula:

$S\ (dm^2) = \Sigma\ (D \times R \times 0.7)$.

Fresh ear yield (tons/ha): $FY = (EW \times 10^{-3})/(S_o \times 10^{-4})$. Where: EW is the weight (kg) of fresh ears in the middle of 2 rows; S_o is the area of the middle of 2 rows (m^2).

2.2.3. Methods for statistical data processing

The collected data were statistically processed using SAS 9.1 software.

3. Results and Discussion

3.1. Growth parameters

Table 1. Effect of potassium dose on tasseling, silking and harvesting stage of sweet corn hybrid combinations

Agronomic Trait	Potassium levels (kg K_2O/ha) (B)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Days to tassel (DAS)	70	47.0	48.7	48.0	47.9
	90	47.0	48.7	47.3	47.7
	110	46.7	48.3	47.3	47.4
	130	47.3	48.7	48.3	48.1
	Mean A	47.0^{b}	48.6^{a}	47.8^{ab}	
	CV (%) = 1.3	$F_A = 19.83^{**}$	$F_B = 1.95^{ns}$	$F_{AB} = 0.41^{ns}$	
Days to silking (DAS)	70	50.3	51.7	52.7	51.6
	90	51.0	52.3	52.3	51.9
	110	50.3	52.3	52.7	51.8
	130	50.7	51.7	53.0	51.8
	Mean A	50.6^{b}	52.0^{a}	52.7^{a}	
	CV (%) = 1.0	$F_A = 50.59^{**}$	$F_B = 0.66^{ns}$	$F_{AB} = 1.48^{ns}$	
Day to harvest (DAS)	70	68.3	68.3	71.3	69.3
	90	68.3	68.7	71.0	69.3
	110	68.7	68.3	71.7	69.6
	130	68.3	68.7	72.0	69.7
	Mean A	68.4^{b}	68.5^{b}	71.5^{a}	
	CV (%) = 0.8	$F_A = 111.08^{**}$	$F_B = 0.75^{ns}$	$F_{AB} = 0.75^{ns}$	

*In the same group of mean values, numbers with the same accompanying characters indicate statistically insignificant differences; ns: no difference; **: significant difference at the level of α = 0.01; DAS: days after sowing.*

The data evaluation results in Table 1 showed that the flowering and pollen shedding stage occurs in a relatively short period but is a crucial period for determining the productivity of corn plants as it affects the fertilization process, determining the number of seeds on the ear. During this stage, nutrients from the stemp and leaves directed towards to the reproductive organs and organic compounds start accumulating towards to the seeds (Tran, 2004). The experimental results showed that in the winter-spring crop of 2023-2024, the varieties affected the growth period of sweet corn; There were significant statistical differences in days to tasseling, silking and harvesting among the experimental hybrid combinations; different levels of potassium did not affect the growth period of the experimental hybrid combinations. The days to tassel of the hybrid combinations ranged from 46.7 to 48.7 days after sowing (DAS), the days to silking time ranged from 50.3 to 53 DAS and the fresh ear harvesting time ranged from 68.3 to 72 DAS. Hybrid combination, BN191, has an earlier flowering, pollen shedding and harvesting time than hybrid combinations BN211 and Golden Cob variety.

3.2. Plant parameters

Table 2 showed that: Plant heights ranging from 214.7 to 228.8 cm. Plant height tended to increase proportionally with potassium doses, with the lowest plant height at 70 kg K_2O/ha and the highest at 130 kg K_2O/ha. However, this influence on plant height was not significantly different; the differences are not statistically meaningful. The average plant heights of different varieties was not significantly different.

Varieties with low ear-setting height show good resistance to lodging and high mechanization capabilities, but affect the pollination process and are easily damaged by pests and diseases (Tran, 2004). The results in Table 2 showed significant differences in ear-setting height among experimental corn varieties, with the BN211 hybrid reaching the tallest ear-setting height at 109.2 cm and the Golden Cob variety having the shortest ear-setting height (85.3 cm). The potassium dosage did not affect the ear-setting height of the experimental hybrid combinations and the differences in ear-setting height among experimental treatments are not statistically significant.

Table 2. Effect of potassium doses on plant characteristics of sweet corn hybrid combinations

Agronomic Trait	Potassium levels (kg K_2O/ha) (B)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Plant height (cm)	70	214.7	228.8	222.0	221.8
	90	226.4	221.9	219.9	222.7
	110	221.5	225.4	222.3	223.1
	130	221.1	227.3	221.8	223.4
	Mean A	220.9	225.8	221.5	
	CV (%) = 3.5	$F_A = 1.44^{ns}$	$F_B = 0.07^{ns}$	$F_{AB} = 0.80^{ns}$	
Ear-setting height (cm)	70	88.2	108.5	85.3	94.0
	90	93.8	110.5	85.1	96.5
	110	89.5	107.2	86.1	94.3
	130	92.6	110.5	84.8	96.0
	Mean A	91.0	109.2	85.3	
	CV (%) = 5.5	$F_A = 67.81^{**}$	$F_B = 0.50^{ns}$	$F_{AB} = 0.29^{ns}$	
Plant diameter (cm)	70	2.9	2.7	2.7	2.8
	90	2.7	3.1	3.0	2.9
	110	2.7	3.0	2.9	2.9
	130	3.1	3.1	3.1	3.1
	Mean A	2.8	2.9	2.9	
	CV (%) = 9.9	$F_A = 0.37^{ns}$	$F_B = 1.61^{ns}$	$F_{AB} = 0.65^{ns}$	

*In the same group of mean values, numbers with the same symbol indicate a non-statistically significant difference; ns: no statistically significant difference; **: difference at a significance level of α = 0.01.*

The stem diameter reflects the growth status of the plant and was directly relate to the plant's ability to resist falling. The large stem diameter indicates good growth, nutrient absorption, root development and high resistance to falling for corn plants, whereas the small stem diameter indicates the opposite. In the winter-spring crop of 2023 - 2024, experimental hybrid combinations had stem diameters that ranged from 2.7 - 3.1 cm. with no differences in stem diameter between two hybrid combinations and the Golden Cob variety. Stem diameter tended to increase with increasing levels of potassium. with the smallest stem diameter of 2.8 cm at a potassium dose of 70 kg K_2O/ha. and the largest stem diameter of 3.1 cm at a potassium dose of 130 kg K_2O/ha.

3.3. Leaf morphology traits

Table 3 showed that the number of leaves per plant ranged from 17.5 to 18.4. In overall, which is consistent with previous studies by the author Tran (1993); 2 hybrid combinations and the check variety had similar leaf numbers in the experiment, which also matched the similar growth periods of these varieties.

Table 3. Effect of potassium dose on leaf morphological characteristics of sweet corn hybrids

Agronomic Trait	Potassium levels (kg K_2O/ha) (B)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Number of leaf (leaf)	70	17.9	17.8	18.5	18.1
	90	18.1	16.7	18.2	17.7
	110	18.5	17.8	19.3	18.5
	130	17.3	17.9	17.5	17.5
	Mean A	18.0	17.5	18.4	
	CV (%) = 5.2	$F_A = 2.42^{ns}$	$F_B = 2.11^{ns}$	$F_{AB} = 1.06^{ns}$	
Leaf area index	70	3.18	3.29	3.38	3.28^{c}
	90	3.33	3.31	3.45	3.36^{bc}
	110	3.46	3.38	3.50	3.42^{b}
	130	3.69	3.53	3.55	3.59^{a}
	Mean A	3.40	3.38	3.46	
	CV (%) = 2.9	$F_A = 2.26^{ns}$	$F_B = 16.23^{**}$	$F_{AB} = 1.57^{ns}$	

*In the same group of average values, numbers with the same characters indicate no statistically significant difference. ns: no statistically significant difference; **: difference at α = 0.01 significance level.*

The experiment results showed that the dosage of potassium significantly affects the leaf area index, which is directly proportional to the amount of potassium fertilizer; the minimum leaf area index is when applying 70 kg K_2O/ha (3.28) and the highest leaf area index is achieved at a potassium dosage of 130 kg K_2O/ha (3.59). Considering the factor of variety. there is no difference in leaf area index between the two hybrid combinations and the Golden Cob variety.

3.4. Pest infestation and lodging

Due to the hot and humid tropical climate, sweet corn plants are often attacked by various harmful pests and diseases. Some of the main harmful pests and diseases on corn include: fall armyworm, corn borers, ear borers, corn stalk rot. Damage caused by pests and diseases can reduce corn yield by 10 - 30%. Especially during the tasseling and silking stages, if heavily affected by pests and diseases, it can severely impact harvest yield. The results of monitoring the effects of potassium doses on the resistance to certain harmful pests, lodging and drought tolerance of sweet corn hybrids are presented in Table 4.

Fall armyworm (*Spodoptera frugiperda*) is a polyphagous species originating from America, causing frequent and severe damage to corn plants. Experimental results showed that the infestation rate of fall armyworm on corn plants varied significantly with different doses of potassium. The infestation rate significantly decreased and differed significantly when the potassium dose increases from 70 kg K_2O/ha to 130 kg K_2O/ha. The research findings indicated that potassium dosage significantly influenced the resistance to fall armyworm of sweet corn hybrids. The density of fall armyworm, the level of damage and the lowest infestation rate occur when applying potassium at a dose of 130 kg K_2O/ha (9.1%) and the highest at the 70 kg K_2O/ha level (17.7%). Considering the genetic factor, there seems to be no difference in the infestation rate of fall armyworm between the two hybrid combinations and Golden Cob variety.

Corn borer (*Ostrinia nubilalis*) is a particularly dangerous pest, capable of causing the most severe damage and directly affecting the yield and quality of corn varieties. Experimental results showed that the amount of potassium significantly affected the infestation rate of European corn borer in corn hybrids. The

lowest damage rate was observed when applying potassium at a dose of 130 kg K_2O/ha (8.2%), while the highest damage rate was recorded at 70 kg K_2O/ha (12.1%). The potassium dose of 110 kg K_2O/ha and 130 kg K_2O/ha resulted in low infestation rates with no significant difference between them, but there was a statistically significant difference compared to the rates of 70 kg K_2O/ha and 90 kg K_2O/ha. Regarding the factor of sweet corn variety, there was no significant difference in the infestation rate of European corn borer between the two hybrids and the Golden Cob variety.

Table 4. Effect of potassium dose on pest infestation and lodging in the experiment

Subject	Potassium levels (kg K_2O/ha)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Fall armyworm (%)	70	18.9	16.6	18.1	17.9^{a}
	90	13.9	15.3	14.1	14.5^{ab}
	110	11.7	9.4	14.0	11.7^{bc}
	130	7.5	8.1	11.6	9.1^{c}
	Mean A	13.0	12.4	14.5	
	CV (%) = 19.6	$F_A = 2.30^{ns}$	$F_B = 19.21^{**}$	$F_{AB} = 1.03^{ns}$	
Corn borer (%)	70	12.3	9.7	14.3	12.1^{a}
	90	10.6	11.0	11.9	11.1^{ab}
	110	9.3	8.0	9.0	8.8^{b}
	130	8.0	8.7	8.0	8.2^{b}
	Mean A	10.1	9.3	10.8	
	CV (%) = 28.9	$F_A = 0.79^{ns}$	$F_B = 3.73^{*}$	$F_{AB} = 0.51^{ns}$	
Ear borer (%)	70	12.0	15.0	11.7	12.9
	90	18.7	13.3	10.0	14.0
	110	12.7	11.7	12.3	12.2
	130	5.7	14.0	10.3	10.0
	Mean A	12.3	13.5	11.1	
	CV (%) = 33.7	$F_A = 1.02^{ns}$	$F_B = 1.49^{ns}$	$F_{AB} = 2.00^{ns}$	
Corn stalk rot (%)	70	6.0	10.3	9.0	8.4
	90	5.0	8.0	7.3	6.8
	110	8.7	4.0	8.3	7.0
	130	8.3	4.7	5.3	6.1
	Mean A	7.0	6.8	7.5	
	CV (%) = 55.4	$F_A = 0.11^{ns}$	$F_B = 0.56^{ns}$	$F_{AB} = 1.13^{ns}$	
Root lodging (Point 1-5)	70	1.0	2.0	1.0	1.3
	90	1.0	1.0	2.0	1.3
	110	1.0	1.0	1.0	1.0
	130	1.0	1.0	1.0	1.0
	TB A	1.0	1.3	1.3	

*In the same group of mean values, numbers with the same letter accompanying them indicate a non-statistically significant difference. ns: no statistically significant difference; *: difference at significance level α = 0.05; **: difference at significance level α = 0.01.*

The ear borer (*Heliothis armigera*) is a harmful factor that directly affects corn pollination ability, as well as productivity, quality and aesthetics of corn. The data in Table 4 showed that the rate of ear borer infestation in the experimental plots was low, belonging to level 2 (5% - 19%) on a scale of 5 levels, with no significant differences among the experimental plots.

Corn stalk rot caused by the fungus (*Rhizoctonia solani)* is harmful throughout the growth of corn plants but is most severe during the corn tasseling stage. Initially, the damage occurs on the lower leaves and under favorable conditions, the disease develops into streaks on the leaves. Experimental results indicated a low rate of stalk rot disease infection, with no significant differences among the experimental plots.

Root lodging is among the causes that reduce the productivity of corn because lodging can slow down or disrupt the plant's development. If the plant is lodged, the roots may break, affecting photosynthesis, limiting the transport of nutrients for plant growth and reducing productivity. The experiment was conducted in the Winter-Spring crop with favorable external conditions, therefore the rates of root lodging was low. The results from Table 4 showed that the rates of root lodging in corn was low. The lodging resistance of hybrid combinations and Golden Cob variety were good, not affecting the yield and ear quality.

From the results, it can be seen that potassium dosage significantly affects the resistance to pests (fall armyworm (7.5 - 14.6%); corn borer (9.3 - 10.8%); ear borer (11.1 - 13.5%) and lodging (point 1-2) of sweet corn varieties). The research results were consistent with the study findings of Ha et al. (2022).

3.5. Yield parameters

Ear length and ear diameter are factors related to yield. The longer the ear, the more kernels per row and vice versa. The more rows of kernels per ear, the larger the ear diameter and vice versa. These are also criteria that affect ear shape (Tran, 2004). The research results showed that the variety significantly affected ear length and ear diameter, while the potassium doses had unclear influence on ear diameter. Ear lengths of the varieties ranged from 18.7 to 20.9 cm, with the Golden Cob variety having the longest ear at 20.9 cm, statistically significantly different from the BN211 hybrid (19.1 cm). Ear diameters of the varieties ranged from 4.2 to 5.2 cm, with the BN191 hybrid having the largest ear diameter at 5.2 cm, statistically significantly different from the BN211 hybrid at 4.5 cm.

The number of rows of kernels on the ear is one of the genetic factors that greatly influences productivity. In addition, this factor is also influenced by external conditions as it affects the pollination and fertilization process (pollen shedding, silk emergence) under unfavorable weather conditions (heat, storms) causing unsuccessful fertilization of flowers, decrease in kernel rows, resulting in low productivity and vice versa. The results in Table 5 showed that the number of rows/ear of the varieties ranged from 14.7 to 16.1 rows; the variety factor significantly affected the number of kernel rows/ ear, the hybrid combination BN191 had the highest number of kernel rows/ear at 15.9 rows, which was statistically significant compared to the Golden Cob variety at 15.1 rows; the dosage factor of potassium did not significantly affect on the kernel row indicators.

Table 5. Effect of potassium dose on ear morphology traits of sweet corn hybrids

Trait	Potassium levels (kg K_2O/ha) (B)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Ear length (cm)	70	19.6	19.3	20.9	19.9
	90	19.1	19.0	20.9	19.6
	110	20.0	19.4	20.8	20.1
	130	19.7	18.7	21.0	19.8
	Mean A	19.6^{ab}	19.1^{b}	20.9^{a}	
	CV (%) = 3.1	$F_A = 27.54^{**}$	$F_B = 0.86^{ns}$	$F_{AB} = 0.62^{ns}$	
Ear diameter (cm)	70	5.1	4.6	4.9	4.9
	90	5.0	4.2	5.2	4.8
	110	5.2	4.4	5.1	4.9
	130	5.2	4.6	5.2	5.0
	Mean A	5.1^{a}	4.5^{b}	5.1^{a}	
	CV (%) = 4.1	$F_A = 40.61^{**}$	$F_B = 1.41^{ns}$	$F_{AB} = 1.29^{ns}$	
Kernel row/ ear (row)	70	15.6	15.6	14.7	15.3
	90	16.0	15.5	14.9	15.4
	110	16.0	15.3	15.5	15.6
	130	16.1	15.4	15.3	15.6
	Mean A	15.9^{a}	15.5^{ab}	15.1^{b}	
	CV (%) = 3.4	$F_A = 7.7^{**}$	$F_B = 0.75^{ns}$	$F_{AB} = 0.79^{ns}$	
Fresh Ear weight without husk (g)	70	362.5	311.9	342.4	339.0^{b}
	90	407.1	323.5	342.7	357.9^{ab}
	110	386.3	349.s5	405.1	380.6^{a}
	130	407.1	354.7	384.3	382.2^{a}
	Mean A	391.0^{a}	334.8^{b}	368.8^{ab}	
	CV(%) = 9.3	$F_A = 8.38^{**}$	$F_B = 3.33^{*}$	$F_{AB} = 0.78^{ns}$	
Fresh ear yield (Tons/ ha)	70	17.7	16.8	16.9	17.1^{b}
	90	18.2	16.5	17.7	17.5^{b}
	110	18.7	17.7	18.6	18.4^{a}
	130	18.8	17.9	18.9	18.5^{a}
	TB A	18.4^{a}	17.2^{b}	18.0^{ab}	
	CV (%) = 2,8	$F_A = 18.24^{**}$	$F_B = 17.34^{**}$	$F_{AB} = 0.98^{ns}$	

*Within the same group of mean values, numbers with the same letter indicate no statistically significant difference. ns: no statistically significant difference; *: difference at the significance level of α = 0.05; **: difference at the significance level of α = 0.01.*

The data in Table 5 showed that both varieties and potassium dosage influenced the earr weight without husks; the hybrid combination BN191 had the highest average weight of huskless ears at 391.1 g, significantly different from that of the BN211 hybrid with 224.8 g and the Golden Cob variety at 368.8 g. The huskless ear weight tends to increase when fertilized with a dosage increasing from 70 kg K_2O/ha to 130 kg K_2O/ha. with the weight being 333.9 g at 70 kg K_2O/ha and 382.2 g at 130 kg K_2O/ha.

The fresh ear yield is the yield obtained from the field and it is an important for producers. Experimental results showed that yields ranged from 16.5 to 18.9 tons/ha; both varieties and potassium dosages affected the fresh ear yield. The BN191 hybrid combination had the highest yield at 18.4 tons/ha, which was statistically different from the BN211 hybrid at 17.2 tons/ha and the Golden Cob variety at 18.0 tons/ha. Ear yields tended to increase with potassium doses, with yields reaching 17.1 tons/ha at 70 kg K_2O/ha. There was a statistical difference between potassium dosage of 110 kg K_2O/ha and 130 kg K_2O/ha, with the highest ear yield achieved at 130 kg K_2O/ha reaching 18.5 tons/ha.

3.6. Quality parameters

Table 6. Effect of potassium dose on the quality of sweet corn combination

Trait	Potassium levels (kg K_2O/ha)(B)	Hybrid combinations (A)			Mean B
		BN191	BN211	Golden Cob	
Brix level (%)	70	12.6	12.4	12.3	12.1^c
	90	12.8	13.3	12.7	12.8^b
	110	13.5	13.5	13.2	13.1^b
	130	14.0	14.0	13.6	14.0^a
	Mean A	13.2	13.3	13.0	
	CV (%) = 2.5	$F_A = 3.39^{ns}$	$F_B = 32.10^{**}$	$F_{AB} = 0.73^{ns}$	
Fragrance (point: 1-5)	70s	2.5	2.0	2.5	2.3
	90	2.0	2.5	2.0	2.2
	110	2.0	2.5	2.5	2.3
	130	2.0	2.5	2.5	2.3
	Mean A	2.1	2.4	2.4	
Flavor (point: 1-5)	70	2.0	1.8	2.0	1.9
	90	1.8	1.8	1.8	1.8
	110	1.8	2.0	2.0	1.9
	130	2.0	1.8	2.0	1.9
	Mean A	1.9	1.9	2.0	

*ns: no statistical significance; **: significance at α =0.01. For values within the same group, numbers with the same letter are not statistically different.*

The results in Table 6 showed that the Brix content of sweet corn ranged from 12.3 to 14.0%. The dosage of potassium significantly affected the Brix content of sweet corn varieties. Brix content increased with an increase in potassium dosage from 70 kg K_2O/ha to 130 kg K_2O/ha, with the highest Brix content achieved at 130 kg K_2O/ha which was statistically significant compared to that of other potassium doses. In terms of varieties, the Brix content of three hybrid combinations was not significantly different among the treatments.

4. Conclusions

Different potassium doses did not affect the growth period, but they significantly impacted the yield, quality and pest resistance of the hybrid combinations BN119, BN211 and Golden Cob variety. The potassium dosage of 130 kg K_2O/ha resulted in the best yield, quality and pest resistance and the BN191 hybrid combination yielded significantly higher than that of the BN211. There were no sighificant difference yields of the other treatments.

Conflict of interest

The authors have no conflicts of interest to declare.

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