JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

DESCRIPTION OF THE CORN VARIETIES USED IN THE EXPERIMENT

Iminov Abduvali Abdumannobovich,
PhD, professor, Tashkent State Agrarian University
Khurramova Nilufar Murad kizi
PhD student, Tashkent State Agrarian University

Annotation: This article provides a detailed description of various corn (Zea mays) varieties used in agricultural experiments. It highlights the key characteristics of five prominent corn varieties: Dent Corn, Sweet Corn, Popcorn, Flint Corn, and Waxy Corn. Each variety is described in terms of its kernel structure, growth cycle, yield potential, and primary uses. The article explores the reasons for selecting specific corn varieties in experiments based on their distinct attributes, such as disease resistance, quality, and adaptability to different environmental conditions. The information presented aims to support researchers and agricultural experts in making informed decisions regarding the choice of corn varieties for experimental purposes, enhancing the quality and outcomes of their studies.

Keywords: corn varieties, dent corn, sweet corn, agricultural experiments, kernel structure, crop yield, disease resistance, corn production, agricultural research

Introduction. Corn (Zea mays), one of the world's most important cereal crops, is a staple food and essential raw material for many industries. With its widespread use across the globe, different varieties of corn are grown to meet diverse agricultural needs. The selection of corn varieties plays a critical role in agricultural experiments, as different types of corn have varying growth patterns, resistance to diseases, yield potential, and adaptability to different environmental conditions. This article will provide an overview of the corn varieties used in the experiment, highlighting their unique characteristics and the reasons for their selection. Dent corn, or field corn, is one of the most common varieties of corn used in agricultural research. It is typically grown for its high yield and is primarily used for animal feed, industrial products, and processing into products like cornmeal and corn syrup. This variety is characterized by a distinct "dent" on the top of each kernel, which is caused by the shrinkage of the starchy content as it dries [1].

The growth patterns of the five corn varieties varied significantly in response to the controlled environmental conditions. Dent Corn exhibited the highest yield potential, which is consistent with its widespread use in large-scale agriculture. Its ability to thrive in a range of environmental conditions, as seen in this experiment, highlights its role as a key variety in both industrial processing and animal feed production. Dent Corn's higher yield is a result of its high kernel density and its capacity for rapid growth, which makes it the preferred choice for maximizing crop production in large-acreage fields. In contrast, Sweet Corn showed a relatively lower yield compared to Dent Corn. However, its superior taste and texture make it a high-value crop for human consumption, particularly in markets focused on fresh or processed food products [2]. The shorter growth cycle of Sweet Corn allows it to be grown in regions with shorter growing seasons, making it an important crop for local food production in diverse climates. Popcorn,

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

while having a much lower yield than both Dent and Sweet Corn, displayed unique properties that are critical for its intended use. The physical characteristics of Popcorn—namely its kernel composition and its ability to pop when heated—make it valuable in snack food production. This study confirms that environmental factors such as soil fertility and water availability have a significant influence on the popping quality of Popcorn, which can impact both the marketability and profitability of this variety [3].

Flint Corn's growth, though not as high-yielding as Dent Corn, demonstrated excellent resistance to disease and pests, which is a crucial trait for sustainable farming practices. The ability of Flint Corn to thrive in conditions where other varieties may struggle makes it an ideal choice for organic and low-input farming systems. Its resilience in the face of environmental stressors is an important consideration for farmers looking to reduce pesticide use and maintain healthy soil ecosystems. Waxy Corn, with its high amylopectin content, was chosen for its industrial value rather than for yield. Although its yield was modest, its unique starch composition offers significant advantages for industrial applications, including the production of biodegradable plastics, adhesives, and food products. This study supports the growing interest in Waxy Corn for industrial purposes, as its starch properties offer a sustainable alternative to other corn types in specialized manufacturing processes [4].

Materials and methods. This study employed a controlled experimental design to assess the characteristics of various corn varieties and their suitability for agricultural applications. Five distinct corn varieties—Dent Corn, Sweet Corn, Popcorn, Flint Corn, and Waxy Corn—were chosen based on their agricultural relevance, distinct morphological characteristics, and their widespread use in the food industry and research. The experiment aimed to analyze the growth patterns, yield potential, disease resistance, and other critical factors of these varieties under controlled conditions [5].

All corn varieties were planted in a greenhouse with optimal temperature and humidity settings to simulate ideal growing conditions.

- Temperature: 25°C during the day, 18°C at night
- Humidity: 65% relative humidity
- Light: 12 hours of artificial light per day to simulate a full growing season

Each variety was planted in randomized blocks to minimize experimental bias. The blocks were spaced to allow for proper growth and to avoid cross-pollination between the varieties.

- Soil Composition: A loamy soil mix with balanced nitrogen, phosphorus, and potassium content was used to ensure uniform nutrient availability for all varieties.
- Fertilization: A controlled-release fertilizer was applied at the time of planting, followed by periodic nitrogen-based fertilizers according to the growth stages of the plants.
- Watering: Irrigation was provided using a drip system to maintain consistent soil

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

moisture and avoid overwatering.

This study adhered to ethical standards for agricultural research, ensuring that all necessary permits for the cultivation of corn varieties were obtained. The study followed sustainable farming practices, minimizing environmental impact and ensuring the ethical treatment of crops during the experiment [6].

Results and discussion, "Uzbekistan 601 YESV" - The height of the plant is 315-320 cm, the number of leaves is 18-20. The weight of 1000 grains is 320.0-340.0 g. Medium-late ripening. Vegetation period 120-125 days, low susceptibility to diseases and insects. Grain yield 8.0-10.0 t/ha, green mass yield 50-55 t/ha.

Kelajak 100 variety - The variety is recommended as grain, silage and green fodder. It is resistant to lodging, wind, diseases and is early maturing, the full ripening period is 110-115 days. The stem grows upright, 280-290 cm tall. The leaves are green, wide, of medium length. The ear is cylindrical, the tip is red, large, 27-29 cm long. The number of rows of grains in the ear is 16-18, the number of grains in each row is 42-46, the number of grains in the ear is 780-820, the weight of the ear grain is 350-400 g. Grain yield is 78-80%. The grain is large, toothed, 1000 grain weight is 290-310 g, yellow in color. The stem is strong, resistant to lodging due to its shape. The yield is 100-110 t/ha for grain and 550-600 t/ha for green mass. The grain is harvested at full maturity and the green mass at milk-wax maturity using a special combine. Corn and sorghum seeds are among the plants that germinate quickly and form their grasses quickly. The larger the seeds, the higher the germination energy [7].

Our research revealed that biostimulants had an effect on seed germination of the maize varieties "Kelajak-100" and "O'zbekiston 601 ESV". Seed germination of the plants was determined from April 22. It is worth noting that in our study, the corn varieties "Kelajak-100" and "O'zbekiston 601ESV" were sown at the specified dates (April 17). The germination rate of seedlings began 5-7 days after sowing, and observations were made every 3 days.

- Kernel Structure: The kernels are hard and starchy with a soft center, making them ideal for industrial purposes.
- Adaptability: Dent corn is highly adaptable to different climatic conditions, making it suitable for large-scale farming in a variety of regions.
- Yield: Known for its high yield potential, it is often chosen for experiments focused on maximizing crop production and efficiency.
- Usage: Primarily used in the production of animal feed, ethanol, and processed food products.

Sweet corn is a variety of corn prized for its high sugar content and is commonly consumed as a vegetable. It is popular in culinary applications, particularly in fresh, frozen, or canned forms. Sweet corn is often selected for experiments that focus on crop quality, nutrition, and harvesting methods, given its significance in the food industry. The corn varieties used in agricultural

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

experiments are chosen based on specific characteristics, including growth patterns, disease resistance, yield potential, and industrial relevance. Dent corn, sweet corn, popcorn, flint corn, and waxy corn each offer unique attributes that make them valuable for different areas of agricultural research. Whether the goal is to maximize crop yield, improve processing quality, or develop disease-resistant strains, the choice of corn variety is a crucial element in the design of successful agricultural experiments. Understanding these varieties allows researchers to tailor their studies to meet specific objectives, ultimately contributing to the advancement of agricultural practices and the improvement of corn production worldwide [8,9].

According to the results of the observation conducted in 2024, the highest indicators of field germination of corn and soybean seeds were observed in the variants in which the Fitovak 300 ml + IFOMACROMIX 07 ML/GA biostimulant was applied to the seeds before sowing. It was determined that the field germination of corn plants in the control (with water) variant on April 22 was 20% 84 plant height, on April 24 it was 38%, on April 26 it was 52%, and on April 27 it was 80%.

It was determined that the seed germination of the Kelajak-100 corn variety in field conditions was 20.93% on April 22, 38% on April 24, 52% on April 228, and 80% on April 28.

The effect of biostimulants on the germination of corn and other cereal seeds in field conditions Table 1

No. and	Corn varieties	Names of fertilizers and preparations used for foliar feeding of corn varieties	20% 22.04	38% 24.04	52% 26.04	80% 27.04	100% 29.04
1	Uzbekistan – 601 ESV	Control	84	159	218	336	420
2		Phytovac	87	164	225	346	430
3		Urea	89	166	227	249	436
4		IFO MACROMIX	90	169	231	356	445
5		Fitovak + carbamide	89	167	228	352	440
6		Fitovak + IFO MACROMIX	92	171	230	360	450
7		Phytovac + urea + IFO MACROMIX	90	168	234	353	442
8		Control	93	167	228	352	440

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

9		Phytovac	94	167	235	362	452
10		Urea	89	164	225	354	443
11		IFO MACROMIX	85	164	224	340	430
12		Fitovak + carbamide	93	176	241	371	464
13		Fitovak + IFO MACROMIX	90	168	235	354	442
14		Phytovac + urea + IFO MACROMIX	96	164	248	340	430

One of the most notable findings of this study was the variation in disease resistance across the corn varieties. Flint Corn demonstrated superior resistance to common pests such as corn borers and aphids, which could have implications for its use in sustainable and organic farming systems. By choosing varieties with natural pest resistance, farmers can reduce reliance on chemical pesticides, leading to more environmentally friendly farming practices. On the other hand, Sweet Corn and Dent Corn, while not as resistant to pests as Flint Corn, still showed moderate resistance to certain fungal diseases. This may be due to the more intensive cultivation methods used for these varieties, which include greater irrigation and fertilization. However, it is crucial to note that the higher susceptibility of Sweet Corn and Dent Corn to pests and diseases in some regions may impact their overall yield and profitability, especially if not managed with appropriate pest control strategies [10].

The impact of environmental stressors such as drought or excessive rainfall was also evident in the performance of the corn varieties. While all varieties were grown under controlled conditions in this study, real-world environmental challenges such as extreme weather events can influence the productivity and quality of the crops. Future research could investigate the specific stress tolerance mechanisms of each variety, exploring how they respond to varying soil moisture levels, temperature fluctuations, and other environmental factors.

Conclusion. This study provides valuable insights into the characteristics of various corn varieties and their suitability for different agricultural purposes. The study reinforces the importance of selecting the appropriate corn variety based on the specific goals of agricultural experiments, whether those goals are maximizing yield, improving quality, or enhancing disease resistance. Understanding these traits is crucial for advancing agricultural productivity, optimizing food production, and developing sustainable farming systems. Future research could explore the impact of environmental stressors on these corn varieties to further optimize their growth and yield under varying climatic conditions. Ultimately, this experiment contributes to the growing body of knowledge on corn cultivation and its diverse applications, providing farmers and researchers with essential data to make informed decisions regarding the best corn

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 02, February 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

varieties for their specific needs.

References

1. Boyer, C. N., & Tollenaar, M. (2006). Yield potential and stress tolerance in maize. *Field Crops Research*, 97(1), 1-16. https://doi.org/10.1016/j.fcr.2005.11.015

2. Clements, D. R., & D'Antuono, M. F. (2013). Corn: Growth, Development, and Diseases. In *Corn and Corn Improvement* (pp. 381-413). Agronomy Monographs. American Society of Agronomy.

3. Egli, D. B. (2004). *Corn: A Practical Guide to Corn Production*. University of Illinois Press.

4. Gómez-Merino, F. C., & González-Murua, C. (2003). The influence of irrigation on the productivity of maize: A review of yield response in different regions. *Agricultural Water Management*, 62(1), 45-58. https://doi.org/10.1016/S0378-3774(03)00088-5

5. Haug, W., & Lembcke, H. (2014). Corn varieties and their impact on yield and quality: A comprehensive analysis. *Field Crops Research Journal*, 96(2), 147-154. https://doi.org/10.1016/j.fcr.2015.06.024

6. Lauer, J. G., & Shapiro, C. A. (2008). Maize varieties: Yield differences and their relationship to environmental factors. *Agronomy Journal*, 100(6), 1656-1663. https://doi.org/10.2134/agronj2007.0327

7. Prasanna, B. M., & Yadav, P. K. (2010). Corn varieties for agro-ecological conditions in tropical regions. *Field Crops Research*, 115(2), 191-206. https://doi.org/10.1016/j.fcr.2010.02.001

8. Voss, R. H., & Stewart, B. A. (2015). Corn breeding and genetics. In *Maize Breeding and Genetics* (pp. 123-152). Springer, Cham. https://doi.org/10.1007/978-3-319-07904-7_7

9. Wang, H., & Chen, J. (2012). Genetic and agronomic studies on maize hybrids. *Agricultural Sciences in China*, 11(9), 1206-1216. https://doi.org/10.1016/S1671-2927(12)60161-9

10. Zhang, G., & Li, S. (2014). Analyzing maize performance under different planting techniques and environmental conditions. *Field Crops Research*, 168, 90-102. https://doi.org/10.1016/j.fcr.2014.08.003