

PRIMARY SEED PRODUCTION ACTIVITIES CARRIED OUT ON THE MAIZE VARIETY “UZBEKISTAN-2018”

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Abstract

This article presents the results of primary seed production activities conducted on the newly developed maize variety “Uzbekistan-2018”. Maize is one of the most important agricultural crops worldwide and serves as a valuable source of food, feed grain, and silage. In Uzbekistan, more than 150 thousand hectares are annually cultivated for grain production and over 200 thousand hectares are used for silage production as a secondary crop. The “Uzbekistan-2018” maize variety was developed by scientists of the Research Institute of Livestock and Poultry Farming and was included in the State Register of Agricultural Crops in 2019. Maintaining varietal purity through scientifically based primary seed production is essential for preserving genetic characteristics and producing high-quality elite seeds. The study evaluated morphological traits, including plant height and thousand-kernel weight, under field conditions. The average plant height ranged from 265.8 to 269.0 cm among the selected families, while the average weight of 1,000 seeds was 345 g. Elite seed production was successfully organized on 3 hectares of experimental fields, resulting in the production of 36 tons of elite seeds.

Keywords: Maize, variety, seed production, elite seed, plant height, grain yield, silage, thousand-kernel weight.

Introduction

Maize (*Zea mays* L.) is one of the most productive cereal crops and plays a crucial role in ensuring feed security and agricultural sustainability. Due to its high adaptability, nutritional value, and productivity, maize is extensively cultivated for grain and silage production. Under favorable environmental conditions, grain yields may exceed 10 t ha⁻¹, while green biomass production can reach 80–100 t ha⁻¹.

Maize grain is characterized by a high nutritional value and is widely utilized in animal feeding systems. One hundred kilograms of maize grain contains approximately 134 feed units and 7.8 kg of digestible protein. Furthermore, maize serves as an important raw material for producing starch, vegetable oil, sugar, flour, cereals, and bioethanol. The crop occupies a leading position among feed crops globally and ranks third after wheat and rice in terms of cultivated area.

The newly developed maize variety “Uzbekistan-2018” was bred by researchers of the Research Institute of Livestock and Poultry Farming and officially registered in the State Register of Uzbekistan in 2019. The preservation of varietal purity and the production of high-generation seed



material require scientifically based primary seed production programs. Therefore, the objective of this study was to evaluate the morphological characteristics and seed production performance of the maize variety “Uzbekistan-2018” under field conditions.

Materials and Methods

The research was conducted according to the methodology “Production of Elite and Super-Elite Seeds of Grain and Legume Crops” (1982). Field experiments were carried out on the experimental fields of the Research Institute of Livestock and Poultry Farming.

The experimental soil was classified as an irrigated typical gray soil with a heavy mechanical composition. Groundwater occurred at a depth of 3.0–4.0 m. Soil analysis indicated a humus content ranging from 1.02 to 1.59%, total nitrogen content of 0.14–0.29%, available phosphorus (P_2O_5) of 0.31 mg kg⁻¹, and exchangeable potassium of 333 mg kg⁻¹.

Prior to planting, 100 kg ha⁻¹ of superphosphate fertilizer was applied and incorporated through autumn plowing at a depth of 30–35 cm. During the growing season, crops received 250 kg ha⁻¹ of nitrogen fertilizer. Agronomic practices included thinning, two inter-row cultivations, six irrigations, and two field inspections.

Morphological evaluations were performed on selected families within the breeding nursery. Plant height and thousand-kernel weight were measured following standard seed production protocols.

Results and Discussion

The maize variety “Uzbekistan-2018” demonstrated stable morphological characteristics under field conditions. Seedlings exhibited a light green coloration, and plants generally produced two ears per stalk. Plant height ranged from 250 to 300 cm, with strong resistance to lodging and stem breakage, making the variety suitable for mechanized harvesting.

The variety is characterized by a thick and dense stem containing 14–15 internodes and 16–18 leaves. Leaves are large, lanceolate, and dark green, reaching lengths of up to 100 cm.

The vegetation period is 110–115 days for grain production and 85–90 days for silage production. The average green biomass yield reaches 450–500 centners ha⁻¹, while grain yield ranges between 90 and 100 centners ha⁻¹ under irrigated conditions.

The assessment of plant height in the selection nursery revealed relatively low variability among the evaluated families. Mean plant height values were recorded as follows:

- Family 1: 269.0 ± 2.4 cm
- Family 2: 265.8 ± 2.3 cm
- Family 3: 268.4 ± 2.4 cm

The coefficient of variation ranged from 6.6 to 7.0%, indicating a high level of uniformity and varietal stability.

Laboratory analysis showed that the average thousand-kernel weight of the variety was 345 g. The values recorded for the individual families were 345 g, 350 g, and 340 g, respectively, confirming the consistency of seed quality characteristics.

Primary seed production activities were conducted on 3 hectares of experimental fields. As a result, a total of 36 tons of elite seed material was produced, demonstrating the suitability of the variety for large-scale seed multiplication programs.

Conclusion

The results of the study confirmed the effectiveness of primary seed production activities conducted on the maize variety “Uzbekistan-2018”. The variety exhibited stable morphological and agronomic characteristics, including an average plant height ranging from 265.8 to 269.0 cm and a thousand-kernel weight of 345 g.

The successful production of 36 tons of elite seeds from a 3-hectare area indicates the high seed productivity and genetic stability of the variety. These findings support the wider adoption of “Uzbekistan-2018” for grain and silage production under irrigated conditions in Uzbekistan and provide a scientific basis for further seed multiplication and dissemination programs.

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