



SELECTION OF PROMISING POTATO VARIETY SAMPLES FOR EARLY PLANTING

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Abstract

This paper presents the results of evaluating potato (*Solanum tuberosum* L.) varieties under the agro-climatic conditions of the Tashkent region and selecting promising samples for early planting. The study analyzed phenological and biometric characteristics of 36 potato varieties and breeding lines of both local and foreign origin. The results showed that some varieties emerged 1–3 days earlier than the control, and also exhibited higher growth and development parameters as well as increased yield.

In particular, Evolution, Red Bullet, Romantika, Mikado, Arizona, Desirée, Spunta, Gala, Kuroda, Sineglazka, Tashkent early, as well as lines №01, №02, №05, №9, and №12 demonstrated high performance.

These varieties and lines were identified as promising for early planting.

Keywords: Potato, variety, yield, early planting, breeding, Tashkent region, Uzbekistan.



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1. Introduction

Potato (*Solanum tuberosum* L.) is recognized as one of the most important agricultural crops globally, and its production has been steadily increasing in recent years, highlighting its strategic role in ensuring food security. At the same time, ongoing challenges such as climate change, limited availability of water resources, and the gradual decline in soil fertility necessitate the development of new, highly productive, and environmentally adaptable potato varieties.

In this context, the evaluation of potato varieties developed through both local and international breeding programs under the specific agro-climatic conditions of Uzbekistan, particularly in the Tashkent region, represents a task of considerable scientific and practical relevance. The present study is therefore aimed at identifying the most promising varieties suitable for early planting conditions.

Potato cultivation in Uzbekistan dates back to the second half of the 19th century, when it was first introduced as an agricultural crop. By the early 20th century, the cultivated area reached approximately 1.4 thousand hectares; this area expanded to 23.6 thousand hectares by 1940 and further increased to 40 thousand hectares by 1991. During this period, the average yield was reported at 8.5 t/ha, total production reached 341.2 thousand tons, and per capita consumption amounted to 16–17 kg.

At present, potato is cultivated in 138 countries worldwide on an area of 20–22 million hectares, with total production ranging between 320 and 335 million tons. The leading potato-producing countries include China (72 million tons), Russia (35.7 million tons), India (26.3 million tons), Ukraine (19.1 million tons), the United States (17.7 million tons), Germany (11.6 million tons), Poland (11.2 million tons), Belarus (8.5 million tons), the Netherlands (7.2 million tons), and France (6.3 million tons). The average global productivity is estimated at 15–17 t/ha [1;3].

It is well established that potato yield is influenced by a wide range of factors; however, the genetic potential of the variety, as expressed in both plant characteristics and seed material, plays a decisive role. Consequently, the selection of suitable varieties, along with the use of high-quality seed tubers, is considered one of the key approaches to increasing productivity. Under optimal conditions,



proper selection and planting of seed material can enhance yield by 1.5–2 times [5;6].

2. Methods

The experimental study was conducted at the Scientific Research Institute of Vegetable, Melon Crops and Potato under the agro-climatic conditions of the Tashkent region.

A total of 36 potato varieties and breeding lines of both local and foreign origin were included in the trial. The planting was carried out on March 25 using a 70 × 25 cm spacing scheme in experimental plots consisting of two rows, each measuring 5 m in length [6;7;9].

Prior to planting, the tubers were subjected to pre-sprouting in a controlled environment with an air temperature of +14–18°C and relative humidity of 70–80% for a period of 20–25 days, ensuring uniform and high-quality sprout development.

The experimental design and methodology were based on the guidelines proposed by Azimov and Azimov (2002), while statistical analysis of the obtained data was performed using the analysis of variance (ANOVA) method according to Dospekhov (1985) with the application of Microsoft Excel [2;4].

Phenological stages (emergence, budding, and flowering) as well as biometric parameters (number of stems, plant height, and yield) were systematically recorded. The local potato variety Pskom was used as a control and was planted after every ten tested varieties.

3. Results and Discussions

The obtained results demonstrated noticeable differences among the studied varieties in terms of emergence rate, growth dynamics, and yield performance.

In the first group, varieties such as Evolution, Red Bullet, Romantika, Mikado, Smega, and Arizona exhibited earlier emergence, occurring 1–2 days prior to the control variety Pskom. Moreover, these varieties showed an increased number of stems per plant, exceeding the control by 0.2–0.7 stems.



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In the second group, varieties including Desirée, Arizona, Spunta, Gala, and Kuroda also demonstrated earlier emergence compared to the control, whereas Adretta, Manitou, and Quvonch 1656 showed similar emergence timing.

Further evaluation revealed that Sineglazka, Tashkent early, Botant, Balatoni rossa, White lady, Demon, and Balatoni sarga varieties not only emerged earlier but also exhibited superior yield characteristics, with increases ranging from 47.9% to 63.6% relative to the control.

No significant differences in emergence were observed for Sarnav and Red Scarlet varieties when compared with the control.

The newly developed breeding lines (№01, №02, №05, №9, №12) demonstrated promising agronomic performance, including earlier emergence by 1–2 days, an increase in stem number (0.1–0.5 stems), greater plant height (by 5.2–13.3 cm), and higher yield levels, exceeding the control by 33.5–58.2%.

4. Conclusions

The evaluation of 36 potato varieties under early spring conditions in the Tashkent region made it possible to identify highly productive and adaptable genotypes. The results indicate that varieties such as Evolution, Red Bullet, Romantika, Mikado, Arizona, Desirée, Spunta, Gala, Kuroda, Sineglazka, and Tashkent early, along with Botant, Balatoni rossa, White lady, Demon, Balatoni sarga, and breeding lines №01, №02, №05, №9, №12, demonstrated superior performance compared to the control variety Pskom.

These varieties were characterized by earlier development (by 1–3 days), improved growth parameters, and significantly higher yield (40–50% and above), which confirms their suitability for early cultivation under the agro-climatic conditions of Uzbekistan.

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