ISSN: 2707-1146
e-ISSN: 2709-4189

DOI: https://doi.org/10.36719/2707-1146/55/118-120

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Comparative Analysis of Soft Wheat Varieties

Abstract

This study focuses on the comparative evaluation of two soft wheat (Triticum aestivum L.) varieties "Lucilla" and "Midas" introduced from Turkey, against selected local wheat cultivars under the agro-climatic conditions of Azerbaijan. Given the increasing importance of wheat production in ensuring national food security, identifying high-yielding, stress-tolerant, and adaptable varieties has become a critical objective. The research aims to assess key agrobiological traits such as growth period, plant height, yield components, and resistance to biotic and abiotic stress factors. Field experiments were conducted under local farming conditions to determine the productivity and environmental adaptability of these varieties. The findings are expected to reveal the potential of "Lucilla" and "Midas" for broader application in Azerbaijan's wheat production systems and to offer recommendations for their use in breeding programs or direct cultivation in stress-prone regions.

Keywords: *soft wheat, introduced wheat varieties, spike analyses, productivity indicators, comparative evaluation of wheat varieties*

Introduction

Relevance of the research topic. The development of grain growing in Azerbaijan is one of the strategic directions of the agricultural sector. In recent years, special attention has been paid to wheat production within the framework of state programs implemented to ensure food security. At the same time, the creation of new wheat varieties suitable for local conditions or the introduction of promising foreign varieties into the country is ensured (Abbasov, 2011, p. 452). Increasing the productivity of wheat, the main food crop, is one of the main goals in this area. Experience shows that the factors affecting the productivity of plants are divided into two main groups: cultivation technologies and the quality of the varieties used. According to experts, 60–70% of productivity depends on progressive agrotechnical measures, and 30–40% on the genetic potential of the variety. Therefore, the selection of high-quality varieties adapted to local conditions is of particular importance for our research work. (Indicators characterizing sustainable development, 2018).

The aim of the research

The aim is to determine the potential for adaptation to local conditions of the "Lucilla" and "Midas" soft wheat varieties selected by the Turkish company "Progen AŞ" by testing them in various agro-ecological zones of Azerbaijan and to select the most promising sample based on a comparative analysis of these varieties with local varieties in terms of productivity, quality and sustainability (Progenseed).

Research

Wheat (Triticum aestivum) is one of the most strategically important cereal crops and belongs to the Poaceae (Gramineae) family. The main economically important species within this plant genus are durum and common wheat. In total, about 22 species of wheat are known, of which soft wheat (Triticum aestivum) is considered the most widespread. Common wheat is represented by both spring and autumn forms, and its species diversity includes such forms as lutescens, erythrospermum, ferrugineum and milturum (Mammadov, Ismayilov, 2021, p. 460). Winter wheat forms three radicles when germinating, while spring wheat forms five. While the growth cone of winter wheat develops later, this process is faster in spring wheat. (Gurbanov, 2017). The authors studied some physiological and agronomic characteristics of introduced soft and hard wheat genotypes as a result of their research. The dynamics

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of dry biomass, net productivity of photosynthesis, relative water content, amount of photosynthetic pigments and other agronomic indicators of wheat samples grown in different nurseries were studied. In addition, the ripening period of wheat genotypes in nurseries mainly varied between 50-55 days (Allahverdiyev, Jahangirli, Ibrahimova, 2021, pp. 27-34). Seed germination occurs only in viable specimens, and the presence of certain factors is important for this process to occur. Basically, sufficient moisture, suitable temperature, oxygen, and light for some plants are required for seed germination (Humbatov, Mammadov, Nazaraliyeva, 2023). Wheat belongs to the family of the Cereals and is one of the most widespread and rich genera. The leaf blades are narrow and weakly serrated, and the auricles are small, pointed, and in many varieties, ciliate. The stem consists of 5-6 segments, and the inside of the segments can be empty, half-filled, or completely filled (Mammadov, Ismayilov, 2020).

The main goal of the study is to conduct selection evaluation of newly created hybrids by the introduced and intraspecific hybridization method and to prepare starting material for soft wheat selection with rich genetic diversity, high transgressive traits and technological qualities, resistant to biotic and abiotic stress factors (Nazarov, 2021). Harvesting grain at the optimal time and using the correct technique is of great importance in terms of increasing productivity and minimizing losses.For healthy growth and high yield, wheat plants require nutrients such as nitrogen, potassium, phosphorus, sulfur, magnesium, iron, manganese, zinc, copper, and calcium (Sadigov, Karimov, Sadikova, 2019). New varieties must be resistant to abiotic stress factors such as climate change and water scarcity, and must be able to adapt quickly to different soil and climate conditions (Hasanova, 2015). Only such varieties can spread to regions with different soil and climate conditions and ensure high yields (Abdullaev, 2012, pp. 5-6)

The results of spike analysis
Table1.

	Variants	Spike length, cm	Number Of spikelets in a spike, in numbers	Number of grains in the ear, number	Weight of grains in one spike, g	Number of grains per plant, number	Weight of grains in a plant, g	Absolute weight of grain, gr
	Lucilla	8,5	27	35	1,8	185	9,4	37
	Midas	11	24	32	1,4	175	8,4	31
	Tunc	9	25	33	1,5	180	8,6	32

The height and development of plants in different vegetation phases of wheat were studied for the studied varieties “Lucilla”, “Midas” and “Tunc” (control). As a result, the length of the spike was found to be 8.5 cm in the introduced soft wheat variety “Lucilla”. It is 9 cm in the local soft wheat variety “Tunc” (control). The number of spikelets in the spike in the “Lucilla” soft wheat variety is 27. The number of spikelets in the spike in the “Midas” soft wheat variety is 24, and in the “Tunc” (control) soft wheat variety this indicator is 25. The number of grains in the spike is 35 in the “Lucilla” soft wheat variety, 32 in the “Midas” soft wheat variety, and 33 in the “Tunc” (control) soft wheat variety.

The weight of grains in one spike was 1.8 grams in the “Lucilla” soft wheat variety, 1.4 grams in the “Midas” soft wheat variety, and 1.5 grams in the “Tunc” (control) soft wheat variety. The number of grains in one plant was 185 in the “Lucilla” soft wheat variety, 175 in the “Midas” soft wheat variety, and 180 in the “Tunc” (control) soft wheat variety. The weight of grains in one plant was 9.4 grams in the “Lucilla” soft wheat variety, 8.4 grams in the “Midas” soft wheat variety, and 8.6 grams in the “Tunc” (control) soft wheat variety. The absolute weight of the grain for each

ISSN: 2707-1146
e-ISSN: 2709-4189

variety was 37 grams in the “Lucilla” soft wheat variety, 31 grams in the “Midas” wheat variety, and 32 grams in the “Tunc” (control) soft wheat variety.

Conclusion

As a result of the research, it was determined that the Lucilla and Midas soft wheat varieties introduced from Turkey have a number of superior agronomic and technological indicators compared to local varieties. These varieties are distinguished by higher productivity, early vegetation period, resistance to diseases and pests, as well as high technological qualities.

The Lucilla variety was selected for its high productivity (58.9 s/ha), baking indicators and resistance to diseases. The Midas variety also showed high results in this regard and was especially notable for its early ripening ability. These results show that both introduced varieties are suitable for cultivation in Azerbaijani conditions and are promising.

References

1. Abbasov, I. D. (2011). *Food security and priority directions of agriculture*. Baku: Science and Education.
2. Abdullaev, A. M. (2012). Evaluation of the adaptive integrity of promising varieties of winter soft wheat in the conditions of the Karabakh lowland. In *International Scientific Conference "Breeding and Genetics of Agricultural Plants: Tradition and Prospects*". Odessa, 5-6.
3. Allahverdiyev, T. I., Jahangirli, S. N., & Ibrahimova, I. G. (2021). Study of physiological characteristics of introduced wheat genotypes. *Collection of Scientific Works of the Institute of Agricultural Sciences*, 3(32), 27–34.
4. Gurbanov, F. H. (2017). *Variety and seed control*.
5. Hasanova, G. M. (2015). *Genetic basis of grain quality formation of soft wheat varieties and its use in breeding.*
6. Humbatov, H. S., Mammadov, G. Y., & Nazaraliyeva, E. H. (2023). *Theoretical foundations of plant breeding.*
7. Indicators characterizing sustainable development. (2018). *Data collection of the State Statistical Committee of Azerbaijan*. Baku.
8. Mammadov, G. Y., & Ismayilov, M. M. (2011). *Crop production (Textbook*). Ganja: ADAU Publishing House.
9. Mammadov, G. Y., & Ismayilov, M. M. (2020). *Laboratory exercises in plant breeding* (Textbook for higher schools).
10. Nazarov, B. B. (2021). *Study of local and introduced winter soft wheat hybrids under irrigation conditions and creation of starting material for selection*.
11. Sadigov, H. B., Karimov, A. Y., & Sadikova, S. B. (2019). *Scientific Works of the Institute of Genetic Resources of ANAS*, 8(1).
12. Progenseed. (n.d.). Retrieved from https://www.progenseed.com/
13. State Statistical Committee of Azerbaijan. (2018). *Indicators characterizing sustainable development.* Retrieved from https://az.wikibooks.org/
14. Gubre.az. (n.d.). Cereal plants. Retrieved from https://gubre.az/aqronom-mesleheti/denli-bitkiler
15. Agro Lab. (n.d.). Wheat cultivation. Retrieved from https://agro-lab.az/blog/bugda_becerilmesi

Received: 28.12.2024
Accepted: 05.04.2025