TESTING OF WHEAT CULTIVARS (Triticum aestivum L.) IN POLLOG REGION NORTH MACEDONIA

Valmir SALIJI [2], Alirami SALIJI [1], Nikollaq BARDHI [3], Bardhyl LIMANI [1], Denada DERVISHI [3], Zejnedije ADEMI [1]

[1*] *Faculty of Agriculture and Biotechnology, University of Tetova, NMK, Department of Manufacturing Plant.*
[2] *Department of Plant Biotechnology, University "Ss. Cyril and Methodius" NMK*
[3] *Faculty of Agriculture and Environment, Agricultural University of Tirana, Albania.*
[*]*Corresponding Author: e-mail: alirami.saliji@unite.edu.mk*

Abstract

Wheat is the most important field crop in the world. Two types of wheat are known: soft wheat (*Triticum aestivum L.)* used for flour production and hard wheat (*Triticum durum L.)* used for pasta production. The world area planted with wheat is 220,000,000 ha, varying over the years by 10% according to world price trends. The world production is 784 000 000 tons providing the basic food for the population of the world. Over 350 food items are produced from wheat, which are widely used in the world. The creation of new cultivars and their testing in different ecological zones has influenced the increase in wheat yields in the world. Even in North Macedonia, wheat is a basic crop in the agriculture of this country and is planted in an area of 80,000 ha with an average yield of 35 kv/ha, providing over 40% of the population's needs with the production of this crop which is very important in the Balkans.

The cultivar testing is and remains the subject of ongoing scientific research and trials to determine the best cultivar according to specific ecological zones and soil conditions.

Four cultivars were included in this study: Pobeda, Apache, Amazon, and Orovçanka. As seen from the name, the cultivars are from different areas and with different genetic origins. Their testing is necessary to determine their suitability and to select the best cultivar.

The experiment was set up according to the classical methodology and the randomized block scheme with four variants and four replications. The dimensions of the variant are 5 x 4 m, thus with an area of 20 m2 of each variant. Biometric measurements and production indicators were made according to the methodology. The data were subjected to statistical processing to increase the accuracy of drawing conclusions and provide accurate advice.

Keywords: test, cultivar, variant, nutrition, indicators, yield and morphological.

1. Introduction

Agricultural production is one of the main pillars of the economy, accounting for 3% of the world's GDP and almost 30% of global employment. Wheat (*Triticum vulgare*) as part of this production is one of the most cultivated cereals in the world, both in terms of production areas and in terms of use. The countries with the highest wheat production are China (134.3 million tons), India (107.6 million tons), Russia (85.9 million tons), USA (49.7 million tons), Canada (35.2 million tons), France (30.1 million tons), Pakistan (25.2 million tons), Ukraine (24.9 million tons), Germany (22.2 million tons), Turkey (20.5 million tons). Over 350 food items are produced from wheat, which are widely used in the world.

Even in North Macedonia, wheat is a basic crop in the agriculture of this country and is planted in 80,000 ha with an average yield of 3500 kg/ha, providing over 40% of the population's needs with the production of this crop. Cultivar testing is and remains the subject of ongoing scientific research and trials to determine the best cultivar according to specific ecological zones and soil conditions.

2. Material and methods

Four cultivars were specifically included in this study: Pobeda, Apache, Amazon and Orovçanka. As seen from the name, the cultivars are from different areas and with different genetic origins. Their testing is necessary to determine their suitability and to select the best cultivar.

The experiment was set up according to the classical methodology and the randomized block scheme with four variants and four replications. The dimensions of the variant are 5 x 4 m, that is, with an area of 20 m2 of each variant. Biometric measurements and production indicators were made according to the methodology. The data was subjected to statistical processing to increase the accuracy of drawing conclusions and provide accurate advice.
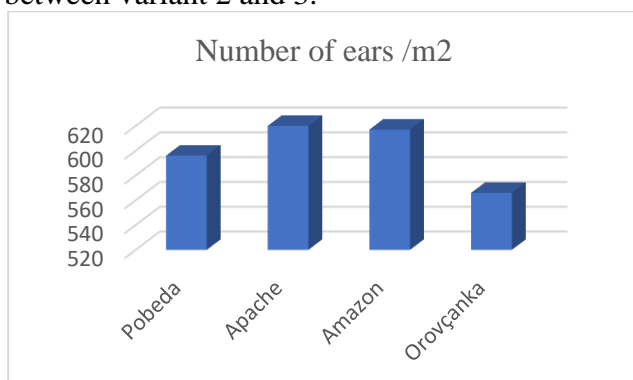
Cultivars	The height of the plant (cm)
Pobeda	86.3a
Apache	80.3c
Amazon	85.7a
Orovçanka	83.1b
LSD 0.05	2.03

These parameters were analyzed in the experiment:
- the number of ears per m2
- the height of the plant
- the number of grains in the ear
- the weight of the ear
- the weight of the grains in the ear
- The presence of grains in the ear
- yield per ha

3. Results and discussion

- **Number of ears** - Based on the obtained results, it can be observed that the Apache 620 cultivar has the highest number of ears per m2, while the Orovçanka 566 cultivar has the lowest number. In this parameter, we have statistical significance between variant 4 and all other variants, between variant 1 and variants 2 and 3, while we have no statistical significance between variant 2 and 3.
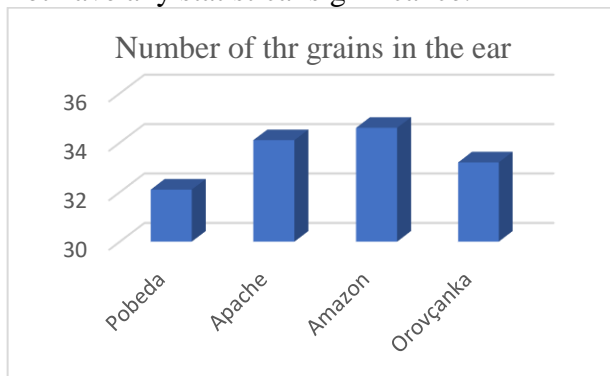

Cultivar	Number of ears / m2
Pobeda	596b
Apache	620a
Amazon	617ab
Orovçanka	566c
LSD 0.05	19.57

- **The height of the plant** - Based on the obtained results, it can be observed that the height of the plants of different cultivars is also different, from 83.1 cm in the Orovçanka cultivar to 86.3 cm in the Pobeda cultivar. In this parameter, we have statistical significance between variant 4 and all other variants, between variant 2 and variants 1 and 4, while we have no statistical significance between variant 1 and 3.
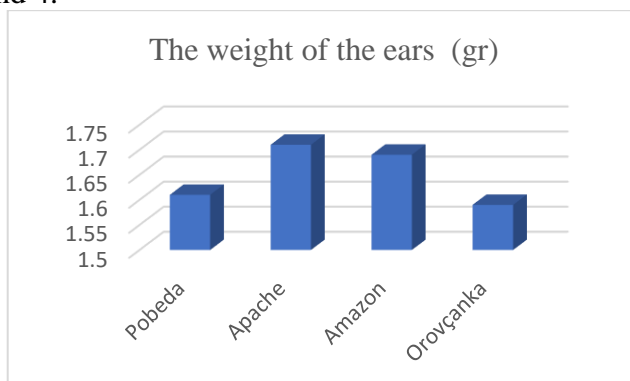
The height of plant (cm)
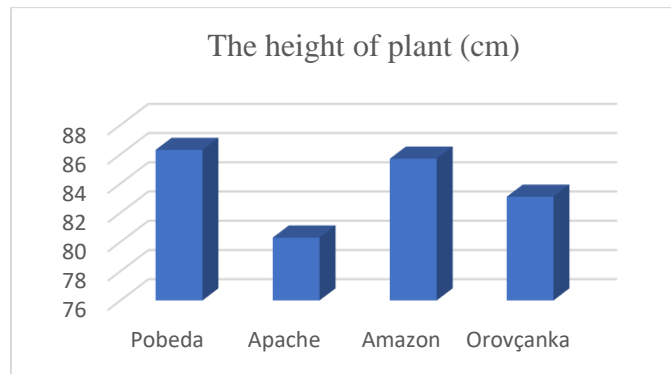
- **The number of grains in the ear-** Based on the obtained results, it can be observed that the number of grains in the ear in the different cultivars is different, but this difference is small and does not have any statistical significance.


Number of thr grains in the ear

- **The weight of the ears-** We have a greater weight of the ear in the Apache cultivar, while it is smaller in the Orovçanka cultivar**.** In this parameter, we have statistical significance between variant 1 and variants 2 and 3, between variant 2 and variant 4, between variant 3 and variants 1 and 4, while we have no statistical significance between variant 2 and 3 and variants 1 and 4.

Cultivars	Number of grains on the ear
Pobeda	32.1
Apache	34.1
Amazon	34.6
Orovçanka	33.2
LSD 0.05	Ns

The weight of the ears (gr)

- **The weight of grains on the ear** - We have the largest weight of grains in the ear in the Amazon cultivar, 1.29 gr. while we have a smaller weight of grains in the ear in the cultivar Orovcanka 1.18 gr. In this parameter, we have statistical significance between variant 1 and variants 2 and 3, between variant 2 with variants 1 and 4, and between variant 3 with variants 1 and 4, while we have no statistical significance between variants 2 and 3 and variants 1 and 4.

Cultivar	Weight of the ears/gr.
Pobeda	1.61b
Apache	1.71a
Amazon	1.69a
Orovçanka	1.59b
LSD 0.05	0.05
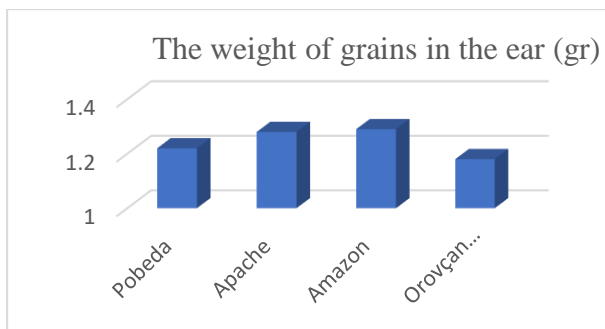
Cultivars	The weight of grains on the ear /gr.
Pobeda	1.22b
Apache	1.28a
Amazon	1.29a
Orovçanka	1.18b
LSD 0.05	0.04

The presence of grains in the ear - The largest presence of grains in the ear is found in the cultivar Amazon 76.3%, while the smallest in the cultivar Orovçanka 74.6. This difference has no statistical significance.
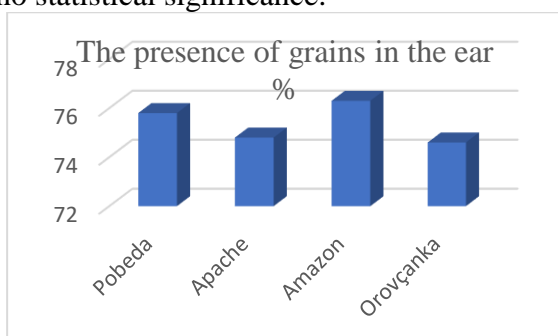
Cultivars	The presence of grains in the ear %
Pobeda	75.8
Apache	74.8
Amazon	76.3
Orovçanka	74.6
LSD 0.05	Ns

The yield- We have the highest yield in the Amazon cultivar 7.96 t/ha, the lowest in the Orovçanka cultivar 6.68 t/ha. Statistical significance is observed between variant 1 and variants 2, 3 and 4, between variant 2 and variant 1 and 4, between variant 3 and variant 1 and 4 while we have no statistical significance between variant 2 and 3.
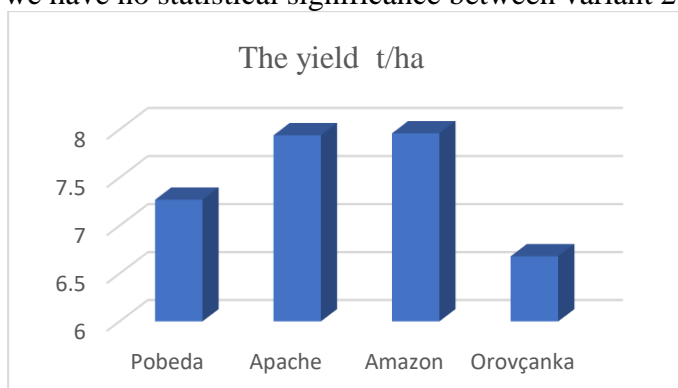
Cultivars	Yield t/ha
Pobeda	7.27b
Apache	7.94a
Amazon	7.96a
Orovçanka	6.68c
LSD 0.05	0.21

4. Conclusions and recommendation

From the general analysis of the biometric and productive indicators as well as from the data processing we manage to draw some conclusions and give advice on the best cultivar. The cultivars Pobeda and Amazona have the best report. Among the conclusions drawn, we can point out some of them that are even more important:

1. Cultivars present variations in plant height.
2. Cultivars present changes in the number of ears/m2, demonstrating different fraternization coefficients.
3. There are no significant differences in the number of grains per ear.

4. The weight of the ears varies and the cultivars: Apache and Amazon have the highest weight. Meanwhile, the Apache and Amazon cultivars have the highest corn grain weight

5. The ratio of ear grains to straw shows significant changes.

6. From the general analysis and the yield results, we recommend that the Apache and Amazon cultivars be spread in large production.

Cultivars	Number of ears /m2	The height of the plant cm	Number of grains on the ear	The weight of the ear (gr).	Weight of grains on the ear (gr).	The presence of grains in the ear %	Yield t/ha
Pobeda	596b	86.3a	32.1	1.61b	1.22b	75.8	7.27b
Apache	620a	80.3c	34.1	1.71a	1.28a	74.8	7.94a
Amazon	617ab	85.7a	34.6	1.69a	1.29a	76.3	7.96a
Orovçanka	566c	83.1b	33.2	1.59b	1.18b	74.6	6.68c
LSD 0.05	19.57	2.03	Ns	0.05	0.04	Ns	0.21

References

[1]. Butorac, A. Opća agronomija. Zagreb: Školska knjiga, 1999.
[2]. Drezner, G. Općenite preporuke za sjetvu sorti pšenice Istituta Osijek,2015.
[3]. Duvnjak J. Proizvodnja ozime pšenice na Opg-u Erceg"Osijek, 2015.
[4]. Grup Autor, Tiranë, 1987.
[5]. Egumenovski P. et al. Specialno poledelstvo. Shkup, 1998.
[6]. FAOSTAT (2022.): www.faostat.org (11.05.2022.)
[7]. Hrgović, S., Pajić, S., Međimurec, T. (2014): Pravilnom agrotehnikom do visokih prinosa pšenice dobre kakvoće, http://savjetodavna.hr (10. 5. 2022.)
[8]. Jukić I. Proizvodnja ozime pšenice (Triticum aestivum L.)-Osijek-2022.
[9]. Kashta. F., BARDHI. N., RROÇO. Bimët e arave (Drithërat dhe Bishtajoret) Tiranë, 2010. 10. Mađarić, Z. Suvremena proizvodnja pšenice: Osijek,1985.
[10]. Shehu. R. Thjerza, Broshur, Tiranë 1998.
[11]. Shkodrani. J. Kultivimi i Fasules. Tiranë, 1973.
[12]. Zimmerman.M.J. Breeding for yield, in mixturesof comon beans (*Phaseolus vulgaris L*) and maize (*Zea mayis L*). Euphytica 92 (1-2):129-134.
[13]. Španić, V. Pšenica. Poljoprivredni institut Osijek,2022.