**UDC: 633.111.1;631.527.3**

# PRODUCTIVITY AND GRAIN QUALITY INDICATORS OF WINTER BREAD WHEAT

***Abdimajidov Jaloliddin Raxmatulla ogli***
*Junior researcher;*
*Southern Research Institute of Agriculture; Republic of Uzbekistan*
***Dilmurodov Sherzod Dilmurodovich***
*Senior researcher (PhD);*
*Southern Research Institute of Agriculture; Republic of Uzbekistan*
***Shodiyev Sherzod Shomiljon ogli***
*Junior researcher;*
*Southern Research Institute of Agriculture; Republic of Uzbekistan*

**Abstract:** The article describes the productivity and grain quality indicators of varieties and lines planted on the central experimental field of the Southern Research Institute of Agriculture - a competitive seed nursery of winter bread wheat in 2022-2023. The purpose of the study is to evaluate the main economic and biological indicators of winter bread wheat in a competitive variety testing nursery, as well as to identify samples that have a complex of economically valuable traits and traits that maintain a stable level of productivity. The object of the study is 18 lines of winter bread wheat, bred at the Southern Agricultural Research Institute. The regionalized bread winter wheat varieties Shams and Krasnodar-99 were used as a model. The sample was selected due to its high yield of 91.3 c/ha, weight of 1000 grains of 46.7 g, grain quality of 776.9 g/l, protein content of 14.6%, gluten of 29.5%, transfer to the variety testing center is indicated. In addition, lines KR20-BWF5IR-3150, KR21-28FAWIR-106 and KR21-28FAWSA-44 were tested again in variety trials the following year.

**Key words:** variety, line, yield, grain quality indicators.

Study of collection varieties and samples of wheat (Triticum aestivum L.) in the world, localization of them, as well as local hybrids obtained based on synthetic selection, comprehensive study of lines, transfer of lines with higher performance than model varieties into variety trials. Research and implementation. into production is one of the main tasks of breeding [1].

One of the main factors in increasing the grain yield of bread wheat is the effective use of newly created varieties of intensive type, competitive, suitable for the soil and climatic conditions of the regions. [2]

The yield of wheat depends on the structure of the plant, metabolism and

substances contained in the grain. Every physiological phenomenon can be modified by genotype and environment, and there is an inherent relationship between genotype and environment [3].

Today, the creation of early ripening varieties is one of the main tasks of breeding. After all, the shorter the period from seed germination to full ripening, the better the yield and quality indicator. Under irrigated farming conditions, it produces two to three harvests per year from early varieties [4, 5, 6, 7].

100 genotypes of bread wheat were sown at optimal and late dates and the effect of heat during heading and ripening on grain quality indicators was studied. According to this, although high grain quality depends on the genetic characteristics of varieties and lines, it has been found that grain quality decreases sharply in hot conditions [9].

The productivity of the studied varieties and rows of bread winter wheat was considered as the main indicator in the selection of varieties and was determined as a result of harvesting plants from the entire part of the paddy field. Yields were determined on the cuttings and the average yields of varieties and rows were determined for 3 repetitions.

The yield was 63.3 c/ha for the Shams variety and 56.5 c/ha for the Krasnodarskaya-99 variety. According to the results of statistical mathematical analysis, it was noted that the productivity of varieties and beds was in the range of 54.2-91.3 c/ha. According to the results of statistical analysis using the method of B. A. Dospehov, the error between yield indicators was 2.2 c/ha or 3.3 percent.

Table 1

**Indicators of productivity and grain quality of varieties and beds (Karshi, 2022-2023 years)**

| № | Genotypes | Grain yield, c/ha | 1000 kernel weight, g | Test weight, g/l | Protein content, % | Gluten content, % | IDK | Vitre-ousity, % |
|---|---|---|---|---|---|---|---|---|
| 1 | **Shams (Check-New)** | 63.3 | 41.4 | 759 | 15.5 | 28.5 | 121.1 | 89.7 |
| 2 | **Krasnodar-99 (Check-Benchmark)** | 56.5 | 37.9 | 783 | 14.6 | 24.1 | 118 | 78.3 |
| 3 | GL19FWW-AWYT-277 | 64.4 | 49.7 | 769.9 | 14.7 | 24.9 | 116.7 | 43.3 |
| 4 | KR20-LBWPYT-145 | 69.5 | 41.6 | 760.7 | 15.8 | 22.1 | 115.1 | 80.7 |
| 5 | KR20-LBWPYT-092 | 56.1 | 50.5 | 775.4 | 12.2 | 21.8 | 119.7 | 84.7 |
| 6 | KR20-BWF5IR-2463 | 91.3 | 46.7 | 776.9 | 14.6 | 29.5 | 110.9 | 77.3 |
| 7 | KR20-BWF5IR-2644 | 71.3 | 46.1 | 763.2 | 17.2 | 33.3 | 91.6 | 80 |
| 8 | KR20-BWF5IR-2435 | 75.6 | 39.4 | 797.6 | 15.7 | 29.1 | 115.7 | 93.3 |
| 9 | KR20-BWF5IR-3150 | 76.2 | 40.5 | 751.5 | 15 | 29.3 | 124.7 | 71.7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10 | KR20-BWF5IR-2113 | 61.3 | 43.8 | 768.2 | 13.9 | 25.1 | 116 | 85.7 |
| 11 | KR20-27-FAWIR-39 | 60.5 | 46.5 | 782.6 | 16.9 | 21.8 | 117.7 | 81.7 |
| 12 | KR20-27-FAWIR-142 | 65.3 | 47.5 | 783 | 14.8 | 22.9 | 106.2 | 89.7 |
| 13 | KR21-28FAWIR-60 | 68.5 | 44.7 | 797.5 | 14.3 | 24.1 | 109.7 | 88.7 |
| 14 | KR21-28FAWIR-106 | 77.4 | 39.7 | 793.4 | 14.9 | 28.6 | 114.7 | 91.7 |
| 15 | KR21-28FAWSA-44 | 80.8 | 37.9 | 792.8 | 13 | 29.3 | 117.2 | 83.7 |
| 16 | KR21-28FAWIR-44 | 66.7 | 42.3 | 778.7 | 15.8 | 20.7 | 110.9 | 89.3 |
| 17 | 24IWWYT-IR-9808 | 69.1 | 44.7 | 785 | 13.2 | 22.4 | 135.5 | 90.7 |
| 18 | 24IWWYT-IR-9809 | 70.8 | 41.6 | 785.2 | 17.2 | 30.9 | 108.2 | 93.3 |
| 19 | 24IWWYT-IR-9811 | 54.2 | 51.3 | 768.1 | 15.3 | 12 | 110.7 | 88 |
| 20 | 24IWWYT-IR-9823 | 62.4 | 37.9 | 780.4 | 15 | 30.6 | 96.1 | 78.7 |
| | **Minimum** | **54.22** | **37.9** | **751.5** | **12.2** | **12** | **91.6** | **43.3** |
| | **Mean** | **68.06** | **43.6** | **777.6** | **15** | **25.6** | **113.8** | **83** |
| | **Maximum** | **91.33** | **51.3** | **797.6** | **17.2** | **33.3** | **135.5** | **93.3** |
| | **LSD** | **2.2** | **1.59** | **13.5** | **0.63** | **0.86** | | |
| | **LSD %** | **3.3** | **3.64** | **1.74** | **4.2** | **3.35** | | |
| | **CV %** | **2** | **2.2** | **1** | **2.5** | **2** | | |

Differences in productivity were determined compared to the standard Shams variety and, according to the differences; they were divided into 3 groups. These groups included varieties, beds with higher, equal, and lower yields than the model variety Shams. Based on the results of the analysis, it was established that the Shams variety has 11 high yielding, 4 equal-yielding and 3 low-yielding lines. The highest yield was observed on line KR20-BWF5IR-2463 91.3 s/ha, line KR21-28FAWSA-44 80.8 s/ha, line KR21-28FAWIR-106 77.4 s/ha.

The weight of 1000 grains of varieties and lines was determined in the nursery for competitive variety testing of winter bread wheat. It was established that the weight of 1000 grains of 20 studied varieties and lines was in the range of 37.9-51.3 g. The average weight of 20 varieties and lines was 43.6 g. It was established that the weight of 1000 grains of the Shams variety was 41.4 g, for the Krasnodar-99 variety - 37.9 g. According to the results of statistical analysis, it was found that 10 lines are higher, 4 lines have the same index and 4 lines are lower compared to the Shams variety.

It was found that the graininess index of varieties and lines was in the range of 751.5-797.6 g/l for 20 studied varieties and lines. The average cost of 20 varieties and lines was 777.6 g.

It was established that the grain size of the Shams variety was 759.0 g, and that of the Krasnodar-99 variety - 783.0 g. Based on the results of statistical analysis, it was established that 12 lines are higher than the Shams variety, and 6 lines have the same indicators.

It was noted that the protein content in the grain of varieties and combs was in the

range of 12.2-17.2% for 20 studied varieties and combs. The average for 20 varieties and varieties was 15.0%. It was established that the amount of protein in the model variety Shams was 15.5%, in the variety Krasnodar-99 – 14.6%. According to the results of statistical analysis, it was found that 3 lines are higher, 7 lines have the same index and 8 lines are lower than those of the model variety Shams.

It was found that the amount of gluten in the grain of varieties and combs was in the range of 12.0-33.3% for 20 studied varieties and combs. The average for 20 varieties and lines was 25.6%. It was established that the amount of gluten in the Shams variety was 28.5%, in the Krasnodar-99 variety - 24.1%. According to the results of statistical analysis, it was found that 3 lines are higher, 5 lines have the same index and 10 lines are lower compared to the Shams variety.

The IDK index of varieties and lines was also assessed and it was observed that it was in the range of 91.6-135.5 indicators. According to the IDK indicator, all lines belong to class 3.

One of the indicators of grain quality of varieties and combs was also assessed by the grain glassiness index. It was noted that the glassiness of the grains of the genotypes was in the range of 43.3-93.3%.

In conclusion, it should be noted that as a result of the analysis of all indicators of 20 studied genotypes in the nursery of a competitive test of winter bread wheat for irrigated fields, the KR20-BWF5IR-2463 line is 3 days earlier than the local check varieties, the yield is 91.3 c/ha, the weight of 1000 grains 46.7 g, grain quality 776.9 g/l, protein content 14.6%, gluten 29.5%, selected and recommended for delivery to the variety testing centerIn addition, lines KR20-BWF5IR-3150, KR21-28FAWIR-106 and KR21-28FAWSA-44 were retested in a subsequent competitive variety trial.

### References:

1. Дилmuродов Ш. Д. Подбор исходного материала для селекции пшеницы озимой мягкой для условий Узбекистана на основе изучения хозяйственно ценных характеристик //Аграрная наука. – 2018. – №. 2. – С. 58-61.

2. Juraev, D. T., Dilmurodov, S. D., Kayumov, N. S., Xujakulova, S. R., & Karshiyeva, U. S. (2023). Evaluating Genetic Variability and Biometric Indicators in Bread Wheat Varieties: Implications for Modern Selection Methods. Asian Journal of Agricultural and Horticultural Research, 10(4), 335-351.

3. Dilmurodovich, D. S., Rustamovna, M. S., & Usmanovna, H. S. (2022, May). SELECTION OF EARLY MATURING AND HIGH YIELDING LINES OF DURUM WHEAT FOR IRRIGATED AREAS. In Conference Zone (pp. 124-131).

4. Dilmurodovich, D. S., & Odirovich, J. F. (2023). Growth, Development And Productivity Indicators Of Bread Wheat Lines Established In Local Conditions. Texas Journal of Agriculture and Biological Sciences, 15, 95-102.

5. Dilmurodovich, D. S., Bekmurodovich, B. N., Shakirjonovich, K. N., Shomiljonovich, S. S., & Raxmatullayevich, A. J. (2021). Study of morpho-biological properties and resistance to yellow rust disease of new lines of winter bread wheat. InterConf.

6. DILMURODOVICH, D. S., Bekmurodovich, B. N., Shakirjonovich, K. N., Shomiljonovich, S. S., & Raxmatullaevich, A. J. (2021). Productivity, quality and technological characteristics of bread wheat (Triticum aestivum L.) variety and lines for the southern regions of the Republic of Uzbekistan. Plant cell biotechnology and molecular biology, 22(7-8), 63-74.

7. Dilmurodovich D. S., Khushvaktovich M. A., Orifovna B. F. SELECTION OF EARLY MATURING DONOR VARIETIES AND LINES OF BREAD WHEAT //ИННОВАЦИИ В НАУКЕ, ОБЩЕСТВЕ, ОБРАЗОВАНИИ: сборник статей. – 2021. – С. 16.

8. Дилмуродов Ш. Д., Каюмов Н. Ш., Бойсунов Н. Б. THE VALUE OF BIOMETRIC AND PRODUCTIVE INDICATORS IN THE CREATION OF WHEAT WITH A COMPLEX OF VALUABLE PROPERTIES //Life Sciences and Agriculture. – 2020. – №. 2-3. – С. 50-54.

9. Dilmurodovich, D. S., Usmanovna, H. S., & Sultonovna, M. M. (2021). Selection of Bread Wheat Lines for Resistant to The Southern Hot Climate Conditions of the Republic of Uzbekistan. Наука и образование сегодня, (2 (61)), 37-40.