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BREEDING OF PRODUCTIVE GENOTYPES OF WINTER BREAD WHEAT WITH HIGH YIELD, GRAIN QUALITY INDICATORS

Dilmurodov Sherzod Dilmurodovich *- Candidate of Agricultural Science, Senior scientific researcher, Southern research institute of Agriculture, Karshi city, Kashkadarya region, Uzbekistan.*

Abstract: *While high temperatures adversely affect grain yield, weight, and grain number in plants, drought reduces the amount of organic matter accumulation in plants, slows leaf growth, reduces the working leaf surface through which basic photosynthesis takes place, and results in lower yields, no pointing, and technological quality of grain. The selection of primary material when creating and introducing into the production of new highly productive bread wheat varieties in the irrigated lands of the Republic is the main factor. The need for high-yielding wheat varieties is growing day by day when growing high-quality crops on existing sown areas. The study investigated the relationship between the weight of 1000 grains, natural weight and yield of 47 lines created and selected in local conditions. Based on the results of the research results on productivity indicators, 9 lines were selected and transferred to the next stages.*

Key words: *bread wheat, heat stress, full-scale grain weight, 1000-grain weight, yield, line.*

Wheat (Triticum aestivum L.) is one of the most important cereal crops in world agriculture. The world produces 760 million tons of grain annually. Bread wheat occupies 17% of the total crop area [1, 3, 6].

For the cultivation of high yields and quality grain in different regions, taking into account the soil and climatic conditions, it is important to create and place scientifically based varieties of cereals that give a stable yield, consistent grain quality indicators [2, 5, 7].

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In recent years, the Republic of Uzbekistan has been carrying out a number of scientific and practical works on the creation of new varieties of cereals, especially bread wheat [4, 9, 10]. As a result of many years of scientific research and practice, it is known that heat, drought, disease, bed rest of wheat plants have a significant impact on the decline in yield, non-yield characteristics and technological quality of grain [12, 14, 21].

Wheat grains contain 11-20% protein, 63-74% starch, around 2% fat as much fiber and ash. Important indicators that determine the quality of wheat are the presence of protein and gluten in the grain, the amount of protein determines the scope of application of wheat. For example, bakery has 14-15% protein, pasta needs 17-18% protein. The greatest value has high-quality strong, valuable and durum wheat varieties. The basis for the classification of bread wheat according to the strength of flour (strong, medium and weak) lies in the quality of protein, gluten and gluten in the grain [13, 15, 16].

Strong wheat includes only varieties of bread wheat with 14% protein and 28% gluten in the first group. Gluten-free bread should be able to provide high-quality bread (large in size and crispy) not only in pure form, but also when weak wheat is added to the bali [5, 11, 17, 22].

The soil and climatic conditions of the southern regions differ sharply from other regions of the Republic due to their heat and drought, with a significant increase in average air temperature in the middle of spring and low rainfall, which negatively affects grain yield and grain quality [8, 20].

According to Juraev D. et al (2020), high temperature rises under natural conditions slow down the accumulation of dry matter and drastically reduce grain quality, as well as high temperatures affect the reproductive organs of the plant, not fully fertilized during flowering. If this happens during the grain filling period, the grain will be empty without filling, and the yield will drop sharply due to the weight loss of 1000 grains [1, 18, 19].

In this regard, in order to select drought-resistant, disease-resistant, high-yielding and high-quality wheat varieties and create new varieties on this basis, the

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lines brought through the International Center - ICARDA were planted in the field field experiment.

50 varieties and lines studied under the heat stress conditions were planted in 1 row, 5 m2. Gozgan, Bunyodkor and Hisorak varieties, which are grown on large areas of the republic, were selected as standard varieties.

Phenological monitoring was carried out during the growing season. The results were recorded in a timely manner and early ripening lines were isolated.

Varieties and lines under the project were planted and irrigated on October 8. All varieties and lines germinated by October 18th.

In the experiment, special attention was paid to the quality of the studied varieties and lines. As a standard variety, it was compared to Gozgan, Bunyodkor and Hisorak varieties. Varieties are divided into 4 groups according to the weight of 1000 seeds: 1) very large grains - more than 50 g, 2) large - 41-50 g, 3) medium large - 31-40 g, 4) small - less than 30 g.

According to the results of the analysis of 1000 grain weights of varieties and lines, it was noted that 50 varieties and 24 lines studied were 1000 grains higher than the standard varieties Gozgan and Hisorak.

The sample weight of 1000 grains in Gozgan variety was 41.5 g, in Hisorak variety - 39.6 g. In the selected lines, 1000 grains were found to weigh 45.1–53.2 g. In particular, it was found that there are 5 very large grain weights - more than 50 g, 1000 large - 41-50 g - 40, the average large - 31-40 g - 5 lines. No small lines of less than 30 g belonging to 4 groups were observed (Table 1).

Table 1

Yield and grain quality indicators of selected varieties and lines (Karshi, 2019)

№	Name	1000 kernel weight, g	Test weight, g/l	Protein, %	Gluten, %	IDK	Grain yield, c/ha
1	Gozgon (check)	41,5	772,4	15,6	29,5	81,6	73,6

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2	Bunyodkor (check)	54,3	803,5	17,3	29,8	83,4	48
3	Hisorak (check)	39,6	770,4	14,2	27,3	95,6	70,4
4	Gal19-19th-FWW-AWYT-27	45,1	802,8	17,5	30,1	77,2	55,6
7	Gal19-19th-FWW-AWYT-54	47,3	816	17,5	29,6	84,3	59,6
10	Gal19-19th-FWW-AWYT-66	53,2	806,7	16,7	28,1	102,6	59,2
15	Gal19-19th-FWW-AWYT-135	46,4	811,8	16,3	28,5	86,3	53,2
16	Gal19-19th-FWW-AWYT-136	45,1	824,7	17,3	28,1	87,3	52,4
18	Gal19-19th-FWW-AWYT-148	46,7	823,9	15,7	28,6	93,4	55,6
26	Gal19-19th-FWW-AWYT-277	53,2	778,5	17,7	29,9	83,1	69,6
27	Gal19-19th-FWW-AWYT-278	48,2	810,1	18,4	29,5	91,9	60,8
29	Gal19-19th-FWW-AWYT-296	49,1	817,4	16,3	29,6	80,6	60,8
30	Gal19-19th-FWW-AWYT-297	48,1	818,4	16,8	26,3	92,6	58,8

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31	Gal19-19th-FWW-AWYT-298	47,4	814,3	15,2	28,3	93,8	58
32	Gal19-19th-FWW-AWYT-299	47,4	796,6	13,9	27,4	101,3	46,4
34	Gal19-19th-FWW-AWYT-313	50,2	824,8	14,8	28,6	90,7	59,6
37	Gal19-19th-FWW-AWYT-102	47,1	775,2	13,8	26,8	103,5	55,2
38	Gal19-19th-FWW-AWYT-111	47,5	806,4	14,2	27,1	96,3	54,4
47	Gal19-19th-FWW-AWYT-306	47,6	795,2	17,1	28,3	94,7	62
48	Gal19-19th-FWW-AWYT-308	47,8	780	16,3	28,3	84,5	50,4

When analyzing the grain nature of varieties and lines, in the mass of grain in one liter, the standard was 772.4 g / l in Gozgan, 770.4 g / l in Hisorak and 803.5 g / l in Bunyodkor, 806.4 g The number of lines with a grain size of / l to 824.8 g / l was 14.

According to the results of the analysis, the grain protein content of varieties and lines was 15.6% in the Gozgan variety, 17.3% in the Bunyodkor variety and 14.2% in the Hisorak variety.

Lines with high protein content in grain were identified in relation to Bunyodkor navigation.

In particular, 17.5% on the Gal19-19th-FWW-AWYT-54 and Gal19-19th-FWW-AWYT-27 lines, 17.7% on the Gal19-19th-FWW-AWYT-277 lines, and Gal19-19th-FWW-AWYT- 278 lines were found to contain 18.4% protein.

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The amount of gluten in the grain was found to be in the range of 25.7-30.6% in varieties and lines.

In the standard Gozgan variety, the gluten was 29.5%, in the Bunyodkor variety - 29.8% and in the Hisorak variety - 27.3%, while the highest rate was 30.1% in the Gal19-19th-FWW-AWYT-27 range.

According to the results of the analysis of grain yield of varieties and lines studied under the project, varieties and lines were compared with standard varieties and selection work was carried out. In the process of selecting the systems, the productivity indicator was taken as the main factor and other valuable economic characteristics and features were also evaluated. In addition, the resistance of cultivars and lines to yellow rust in field conditions was observed. Observations showed no lesions with yellow rust disease in 27 lines. Between plant height and yield r = 0.3, with the last link r = 0.13, with grain nature r = 0.08, with grain protein r = 0.5 and with grain gluten r = 0.6 positive a correlation was found. 16 lines with higher yields than the standard Bunyodkor variety (48 c / ha) were selected.

In conclusion, 19 varieties and lines studied in Sel from 19th FWW-AWYT GALLAOROL1 were selected for early ripening, 16 for yield, 1000 grain weight, high grain nature, high grain quality indicators compared to standard varieties. Taking into account all the indicators, 9 lines were transferred to the next selection stage.

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