SELECTION OF BREAD WHEAT LINES SUITABLE FOR RAINFED AREAS WITH LOW RAIN IN THE REPUBLIC OF UZBEKISTAN

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Abstract: This article describes the results of experiments on the selection of high-quality lines of bread wheat, as well as the yield of bread wheat in the conditions of rainfed areas, and their transfer to the next stages. The experiment used 33 lines and 2 local check varieties created by local hybridization. Yield of bread wheat lines, 1000 grain vans, grain nature and grain quality indicators were selected for the next stages of selection work by selecting lines higher than the local check varieties.

Key words: bread wheat, variety, line, 1000 kernel weight, test weight, protein, gluten, vitreous.

Introduction. Increasing the yield of grain crops for rainfed areas requires the creation of varieties with higher yields of 3-5 c / ha than existing bread wheat varieties and grain quality indicators that fully meet the requirements of a strong wheat class [5, 8, 11, 19, 23, 29, 32, 38, 43, 47, 54, 55, 56].

For this purpose, the evaluation of hybrid lines, which have remained unchanged as a result of selection work, in different soil climatic conditions, on the basis of selection indicators and the selection of the most productive lines and their introduction into production is an urgent task [6, 9, 13, 16, 22, 26, 34, 36, 41, 48, 53, 57, 58, 59].

The high grain weight of 1000 grains in grain formation is a decisive sign of an abundant and stable yield. Lack of moisture in the soil, high temperatures, damage by fungal diseases lead to a decrease in grain weight of 1000 grains [1, 4, 12, 17, 24, 27, 31, 37, 42, 46, 51, 60, 61, 62].

According to scientists, the protein content of wheat grains can range from 8% to 19%, depending on different natural climatic conditions and grain cultivation [2, 7, 15, 20, 21, 28, 33, 39, 44, 49, 63, 64, 65].

According to the experiments of scientists, due to the increase in air temperature in Karshi in 2011 compared to 2010 by 1.4 ºC, the protein content of the grain of "Gozgan" decreased by 1.1 %, gluten increased by 2.3 %, yield increased by 9.8 c / ha. showed a decrease. Consequently, high air temperatures

and drought conditions have been observed to increase the amount of bread wheat protein and decrease the yield and increase the amount of gluten [3, 10, 14, 18, 25, 30, 35, 40, 45, 50, 52, 66, 67, 68].

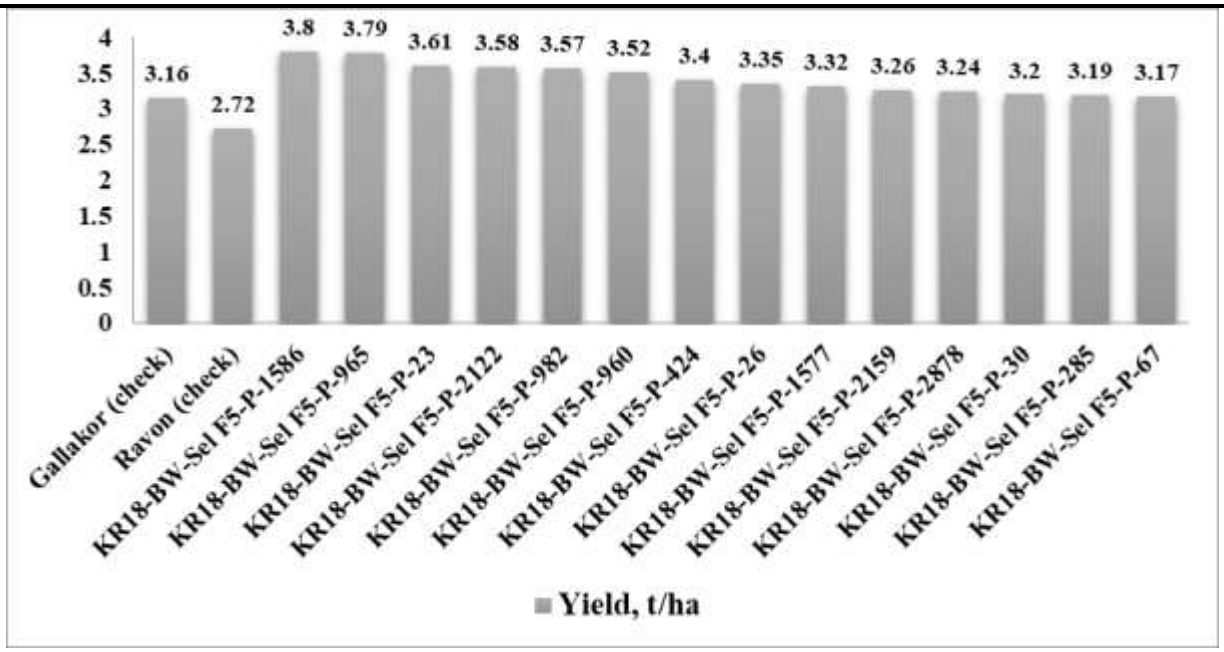
Research methods and materials. Experimental placement and experimentation were carried out according to the method of phenological observation, calculation and analysis (All-Union Institute of Botany VIR, 1984) and biometric analysis according to the method of the State Variety Testing Commission of Agricultural Crops (1985, 1989). Mathematical and statistical analysis of the experimental results was carried out on the basis of the method of BA Dospekhov (1985). In the research study, the scheme of field experiments was based on the Alpha lattice design of the GenStat 13 program.

Technological quality indicators of winter wheat grain grown in the experimental field "Methodical recommendations for the evaluation of the quality of grain", "Methods of biochemical research of plants", gluten content GOST 13586-1-68, grain glass GOST 10987-76 93, grain nature was studied in comparison with GOST 3040-55, 1000 grain weight in accordance with GOST 10842-89.

The study was conducted in the field experimental field of the Kashkadarya branch of the Research Institute for Grain and Leguminous Crops, located in the territory of Kamashi district, Kashkadarya region. In the experimental field, in the selection nursery of high-yielding, high-quality lines of bread wheat, 35 entry of 2 replication and Gallakor and Ravon varieties were planted as local check varieties. The crop area of each line is 5 m2.

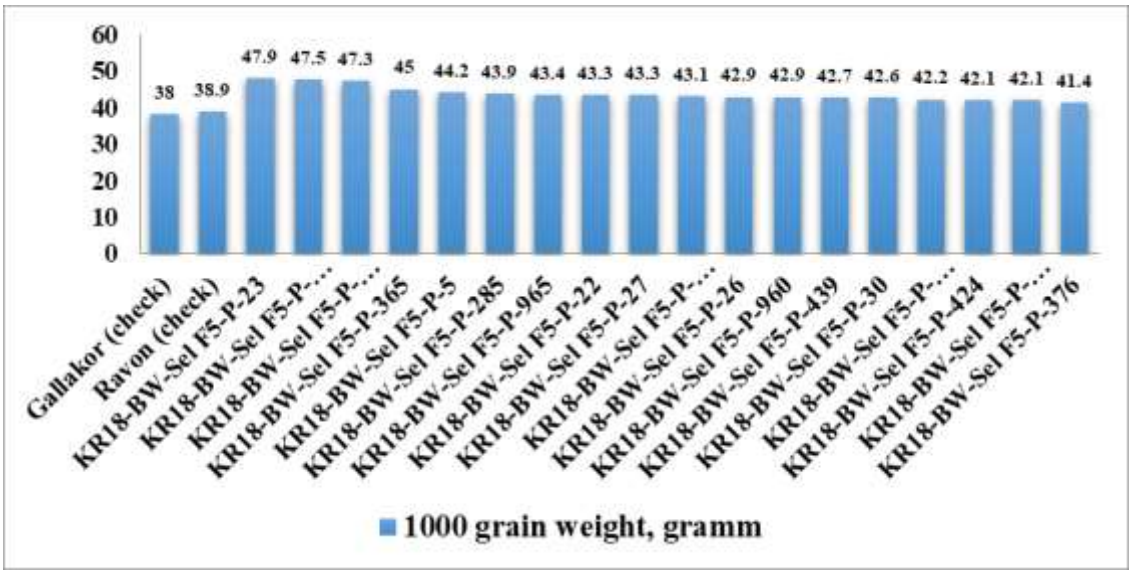
Results. One of the necessary indicators characterizing the technological properties of grain depends on the amount of gluten in wheat grain and its properties in the physicochemical composition of the protein that forms mainly gluten in the baking process.

Yields of bread wheat varieties and lines ranged from 1.07 to 3.80 t / ha, while the average yield was 2.92 t / ha. Yield was 3.16 t / ha for local check Gallakor variety and 2.72 t / ha for Ravon variety, while 14 bread wheat lines yielded higher yields than local check varieties.



Picture 1. Higher grain yield lines of bread wheat.

The weight of 1000 grains is one of the main indicators of high productivity. Of the 35 varieties and lines studied, 1000 grains weighed 32.1 to 47.9 g, while the average 1000 grains weighed 40.9 g. A grain weight of 40 grams or more per 1000 grains has a great positive effect on increasing productivity. It was found that the local check grain weight was 38.0 g per 1000 grains, the Ravon variety was 38.9 g, and there were 24 bread wheat lines with higher performance than the local check varieties.



Picture 1. Higher 1000 grain weight lines of bread wheat.

The high grain weight of 1000 can be explained by the fact that in the early stages of selection work the main focus is on grain size. KR18-BW-Sel F5-P-2122, KR18-BW-Sel F5-P-2650, KR18-BW-Sel F5-P-23 lines with a grain weight of 47 grams and more per 1000 grains can be widely used in selection work and recommended in dryland conditions.

Table 1

Productivity and grain quality indicators of bread wheat lines

№	Нав номи	Grain yield, t/ha	1000 grain weight, g	Test weight, g/l	Protein content, %	Grain moisture, %	Gluten content, %	IDK indicators	Grain vitriousity, %
1	Gallakor (check)	3.16	38.0	817.2	16.4	7.2	28.1	87.1	43.8
2	Ravon (check)	2.72	38.9	783.0	14.5	6.8	24.9	85.3	39.5
3	KR18-BW-Sel F5-P-5	2.04	44.2	787.0	15.3	7.1	24.3	79.1	30.8
4	KR18-BW-Sel F5-P-22	2.59	43.3	775.4	14.0	7.0	21.0	86.4	41.0
5	KR18-BW-Sel F5-P-23	3.61	47.9	774.3	14.2	7.0	29.0	92.2	59.8
6	KR18-BW-Sel F5-P-24	2.79	40.4	802.2	14.2	7.2	27.4	83.7	42.8
7	KR18-BW-Sel F5-P-26	3.35	42.9	803.7	15.0	7.1	28.2	87.8	51.5
8	KR18-BW-Sel F5-P-27	2.23	43.3	736.9	14.3	7.1	24.4	91.4	30.8
9	KR18-BW-Sel F5-P-30	3.20	42.6	793.6	15.4	5.8	29.0	94.5	62.8
10	KR18-BW-Sel F5-P-67	3.17	36.6	784.9	14.0	7.1	22.2	75.7	42.8
11	KR18-BW-Sel F5-P-68	3.06	38.4	791.4	14.4	7.0	18.2	80.4	36.3
12	KR18-BW-Sel F5-P-261	2.53	40.0	806.3	14.7	7.2	26.0	83.3	33.3
13	KR18-BW-Sel F5-P-285	3.19	43.9	791.0	14.6	7.2	23.0	92.1	32.0
14	KR18-BW-Sel F5-P-365	2.99	45.0	816.8	15.3	7.3	28.0	74.7	56.3
15	KR18-BW-Sel F5-P-376	2.47	41.4	785.5	14.1	7.9	20.9	83.4	30.8
16	KR18-BW-Sel F5-P-424	3.40	42.1	791.8	15.1	7.3	28.7	83.2	52.3
17	KR18-BW-Sel F5-P-439	2.66	42.7	790.2	15.8	6.9	27.0	75.4	46.0
18	KR18-BW-Sel F5-P-889	2.53	33.0	802.9	14.2	7.0	26.3	79.7	39.8
19	KR18-BW-Sel F5-P-923	2.40	39.7	798.9	13.5	7.5	22.9	94.4	42.8
20	KR18-BW-Sel F5-P-960	3.52	42.9	794.7	15.8	7.3	28.2	88.3	57.3
21	KR18-BW-Sel F5-P-965	3.79	43.4	803.7	15.7	7.2	28.8	80.7	62.8
22	KR18-BW-Sel F5-P-982	3.57	34.8	766.3	14.8	7.1	21.9	101.3	35.5
23	KR18-BW-Sel F5-P-1205	1.07	42.2	789.5	15.2	7.3	20.1	87.6	38.8
24	KR18-BW-Sel F5-P-1212	2.19	32.2	796.3	13.6	6.8	18.9	82.8	21.8
25	KR18-BW-Sel F5-P-1404	2.78	42.1	803.5	13.9	7.4	18.2	84.6	33.3
26	KR18-BW-Sel F5-P-1577	3.32	38.8	743.0	14.2	7.2	16.2	91.4	40.8
27	KR18-BW-Sel F5-P-1579	2.86	38.0	799.1	14.7	7.3	26.2	92.7	40.8
28	KR18-BW-Sel F5-P-1586	3.80	37.0	817.2	14.7	6.8	28.4	81.3	53.3
29	KR18-BW-Sel F5-P-1589	3.03	36.4	803.9	15.2	7.4	28.5	74.3	45.8
30	KR18-BW-Sel F5-P-2122	3.58	47.3	804.5	14.6	7.2	28.6	74.7	54.8
31	KR18-BW-Sel F5-P-2159	3.26	40.8	807.8	14.3	7.4	25.8	85.3	50.8
32	KR18-BW-Sel F5-P-2650	2.80	47.5	805.3	14.2	7.0	28.1	91.5	38.3
33	KR18-BW-Sel F5-P-2825	2.86	43.1	760.8	13.4	7.2	16.3	102.6	23.3
34	KR18-BW-Sel F5-P-2878	3.24	40.1	793.7	14.4	6.8	26.3	92.6	35.0
35	KR18-BW-Sel F5-P-2880	2.60	39.9	808.3	15.4	9.4	30.2	92.6	27.8
	Minimum	10.7	32.15	736.9	13.35	5.8	16.2	74.3	21.75
	Mean	29.22	40.9	792.3	14.6	7.2	24.8	86.1	42.1
	Maximum	38.00	47.9	817.2	16.4	9.35	30.15	102.6	62.75
	LSD (0.05)	0.39	1.01	15.06	0.40		1.08		
	LSD (0.05), %	1.34	2.46	1.90	2.73		4.35		
	CV %	1.6	1.2	0.9	1.3		2.1		

The gluten content of the grain was 28.1% in the local check Gallakor variety and 24.9% in the Ravon variety. It was found that the grain content of gluten was higher in 11 lines than in both local check varieties. KR18-BW-Sel F5-P-2880 had a grain gluten content of 30.2%, KR18-BW-Sel F5-P-30 and KR18-BW-Sel F5-P-23 had a grain gluten content of 29% was found to have reached. The IDK index was 87.1 in the Gallakor variety and 85.3 in the Ravon variety, and in 12 samples it was found to belong to the II class in the range of 85-79 and in 5 samples the IDK index belonged to the I class in the range of 75-74 (Table).

When analyzing the swelling of the studied variety and lines, it was found that the grain viscosity was higher in 12 samples than in the local check Gallakor and Ravon cultivars. The vitreousness of the local check grain variety was 43.8% in the lines KR18-BW-Sel F5-P-30, 62.8% in the lines KR18-BW-Sel F5-P-965, 59.8 in the line KR18-BW-Sel F5-P-23, 8% and 57.3% in the KR18-BW-Sel F5-P-960 line.

Conclusion. According to the results of the experiment, 14 lines with higher yields than local check varieties, 22 lines with 1000 grain weight above local check varieties and 40 grams, 28 lines with grain protein content above 14%, 12 lines with grain gluten content above 28% was found to be present. Bread wheat lines with higher performance than local check varieties were recommended for testing in the next stages of selection and for use in hybridization work.

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