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SELECTION OF DROUGHT-RESISTANT AND HIGH GRAIN QUALITY LINES OF FACULTATIVE BREAD WHEAT FOR RAINFED AREAS

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Abstract: Bread wheat is sown in dry areas in our republic after the first rainfall in the fall period, in the spring period, at the end of February and the first ten days of March. Therefore, it is desirable that the new varieties created for dryland areas should be drought- and disease-resistant, productive, as well as bi-seasonal, varieties that can produce high biomass in a short growing period.

Key words: Bread wheat, drought, yield, 1000 grain weight, early maturing.

In the conditions of dryland areas, the amount of rainfall has decreased in recent years, the temperature has risen as a result of global climate change, and the creation and introduction into production of new varieties of two-season Bread wheat, resistant to drought and rust diseases, with high yield and high grain quality, remains one of the urgent tasks [5, 8, 14, 32].

Currently, most of the wheat varieties grown in wet areas are biological autumn varieties and cannot be planted in the dry season. Therefore, if two-season wheat varieties are created and introduced, high results can be obtained in autumn and spring periods. In addition, the creation of two-season spring varieties is a guarantee of high yield when they are planted late in the autumn and winter months without precipitation [2, 6, 18, 24].

The decrease in rainfall as a result of global climate change in recent years requires the creation of new drought-resistant wheat varieties in dryland conditions. Potentially higher yields are also available from drought tolerant cultivars when planted in late winter and early spring [1, 3, 11, 15, 17, 29].

Most studies have shown that wheat grows significantly at temperatures from +2+30 C to +37+400 C. When the temperature exceeds +400 C, the formation of dry matter stops, although the plant retains its ability to live. If winter wheat is sown late, the seeds will go into winter with bulging [4, 7, 10, 22, 30].

In cereals, flowering time is a crucial stage in crop production, as it regulates the ability of plants to adapt to the environment [9, 12, 28].

In addition, in the new varieties created in wheat selection, the possibilities of the morphological and anatomical structure of the plant and the tissues serve to increase the number of grains in one ear [13, 21].

Drought resistance and high productivity are rarely combined in one variety. Drought tolerant and drought tolerant cultivars showed significant differences in plant biomass, primary spike weight and grain weight [16, 25].

Scientists say that dry conditions are harmful at all stages of plant development.

Wheat is more sensitive to moisture deficit, especially during the flowering and pollination phases, from the formation of anthers in the generative organs. The response of these stages to air drought is considered serious [20, 27].

Arid conditions are one of the main features of the climate of regions where wheat is grown in Uzbekistan. Frequent droughts in Uzbekistan during the growing season of wheat have a negative effect on the plant, causing a decrease in productivity and grain quality. Drought reduces the amount of organic matter accumulation in plants, slows down the growth of leaves, and reduces the working surface where the main photosynthesis takes place [19, 23, 26].

Precocious plants are characterized by a lack of leaves, as a rule, with low crowding, high photosynthetic productivity. Mainly, it is possible to include the types of wheat with a root structure that develops quickly and penetrates deep into the ground.

Scientific selection of wheat in Central Asia began in 1909. More than 400 local wheat varieties have been studied at the Turkestan Agricultural Experiment Station. In 1913, cereal crops were planted on the territory of Uzbekistan on an area of about 1 million 540 thousand hectares, of which 460 thousand hectares were winter wheat, 470 thousand hectares were spring wheat, 38 thousand hectares were corn, and the remaining 570 thousand hectares were barley, rice, oats and millet crops. In those times, local wheat and barley lines with low productivity were planted. In 1913, the science of grain breeding was founded. At the scientific institution "Zarafshan experimental field" established in the city of Kattakorgan, Samarkand region, the selection, seed production and agrotechnics of grain crops on dry lands were studied [8, 14, 18].

When wheat is planted in the spring, it grows in difficult conditions caused by the dryness of the soil and air, often suffering from extremes of temperature. To overcome these shortcomings, it is necessary to create new drought-resistant varieties.

When the yield indicators of two-season Bread wheat varieties planted for the harvest of 2022 were analyzed in comparison to the standard Janub gavhari, Gallakor and Kokbuloq varieties, it was found that the productivity of 5 lines was higher than the standard varieties. The grain yield of Andoza Janub Gavhari, Gallakor and Kokbulok varieties was 5.29 t/ha, 4.79 t/ha and 4.47 t/ha, respectively. The lines with the highest grain yield were KR20-20thDSBWYT-02 (7.24 t/ha), KR20-20thDSBWYT-04 (6.81 t/ha), KR20-20thDSBWYT-12 (6.30 t/ha), KR20- It was found that 20thDSBWYT-30 (6.80 ts/ha), KR20-20thDSBWYT-44 (6.32 ts/ha) (Table 1).

Grain yield of other lines studied within the framework of the project was 1.44-4.42 ts/ha, much lower than standard varieties.

The weight of 1000 grains of the studied lines was 26.7-34.7 grams. The mass of 1000 grains of Andoza Janub gavhari, Gallakor and Kokbulok varieties was 30.6 g, 30.6 g and 30.3 g, respectively.

Table 3.8

Early maturity and yield indicators of varieties and lines, Kamashi-2023.

№	Name of variety	Maturity date	Grain yield, c/ha	1000 kernel weight, g	Test weight, g/l

1	J.Gavhari (check)	3 June	5.29	30.6	686.5
2	Gallakor (check)	4 June	4.79	30.6	686.7
3	Kukbulok (check)	4 June	4.47	30.3	677.8
4	KR20-20thDSBWYT-02	1 June	7.24	32.6	715.9
5	KR20-20thDSBWYT-04	2 June	6.81	34.2	709.0
6	KR20-20thDSBWYT-05	5 June	3.27	28.6	673.0
7	KR20-20thDSBWYT-08	5 June	3.60	29.6	677.0
8	KR20-20thDSBWYT-10	5 June	3.28	27.9	644.1
9	KR20-20thDSBWYT-12	1 June	6.30	34.7	721.3
10	KR20-20thDSBWYT-17	5 June	3.00	29.7	661.4
11	KR20-20thDSBWYT-22	5 June	2.01	27.9	659.3
12	KR20-20thDSBWYT-25	5 June	1.44	30.9	664.7
13	KR20-20thDSBWYT-26	5 June	2.88	26.7	672.8
14	KR20-20thDSBWYT-30	1 June	6.80	34.6	710.9
15	KR20-20thDSBWYT-32	5 June	3.65	31.5	665.0
16	KR20-20thDSBWYT-34	5 June	1.81	32.1	662.0
17	KR20-20thDSBWYT-35	5 June	2.44	33.7	658.8
18	KR20-20thDSBWYT-37	4 June	3.75	29.6	675.2
19	KR20-20thDSBWYT-38	5 June	4.42	28.6	668.1
20	KR20-20thDSBWYT-39	5 June	4.11	31.4	649.4
21	KR20-20thDSBWYT-41	5 June	3.09	33.7	649.6
22	KR20-20thDSBWYT-44	2 June	6.32	34.0	716.7
23	KR20-20thDSBWYT-45	5 June	3.09	28.6	658.6
24	KR20-20thDSBWYT-48	4 June	2.28	30.7	652.7
25	KR20-20thDSBWYT-49	5 June	4.11	32.7	676.1
X	**Mean**	**4 June**	**4.01**	**31.0**	**675.7**
X	**Maximum**	**5 June**	**7.24**	**34.7**	**721.3**
X	**Minimum**	**1 June**	**1.44**	**26.7**	**644.1**

Under the influence of various biotic and abiotic factors, the quality of the grain of the wheat varieties cultivated in dry areas is observed to be significantly lower. This problem can be achieved by selecting high grain quality, protein-rich gluten lines from among two-season wheat lines and lines, and creating and introducing new varieties based on them.

The grain size of Bread spring wheat, i.e., more than 40 grams per 1000 grain weight, indicates its drought tolerance.

Amanov O.A., Dilmurodov Sh.D. reported that large 1000-grain spring wheat cultivars increased yield in irrigated field.

In 13 of the studied lines, the weight of 1000 grains was higher than standard varieties (30.7-34.7 g), and they were selected for selection work next year.

Table 2

Grain quality indicators of varieties and lines, Kamashi-2022.

№	Name of variety	Protein content, %	Gluten content, %	IDK	Vitreousity, %
1	J.Gavhari (check)	14.2	26.0	86.6	35.5
2	Gallakor (check)	14.2	27.1	85.3	35.9
3	Kukbulok (check)	13.8	26.5	86.7	36.2
4	KR20-20thDSBWYT-02	15.8	28.1	80.5	57.7
5	KR20-20thDSBWYT-04	16.3	28.2	79.0	54.4
6	KR20-20thDSBWYT-05	12.3	23.4	96.1	35.2

7	KR20-20thDSBWYT-08	12.2	23.3	115.8	35.6
8	KR20-20thDSBWYT-10	11.5	22.4	104.5	36.4
9	KR20-20thDSBWYT-12	16.1	28.1	74.0	60.6
10	KR20-20thDSBWYT-17	12.4	23.4	113.8	38.8
11	KR20-20thDSBWYT-22	13.0	22.5	105.4	33.7
12	KR20-20thDSBWYT-25	13.8	24.1	115.3	31.3
13	KR20-20thDSBWYT-26	12.5	23.8	95.0	36.1
14	KR20-20thDSBWYT-30	16.0	28.6	85.1	59.1
15	KR20-20thDSBWYT-32	13.6	25.3	117.4	34.9
16	KR20-20thDSBWYT-34	13.0	23.1	110.7	33.7
17	KR20-20thDSBWYT-35	13.2	23.3	110.8	33.0
18	KR20-20thDSBWYT-37	12.2	23.8	95.3	35.4
19	KR20-20thDSBWYT-38	11.6	23.3	102.7	40.2
20	KR20-20thDSBWYT-39	13.5	23.2	108.5	38.2
21	KR20-20thDSBWYT-41	12.5	24.0	104.0	35.4
22	KR20-20thDSBWYT-44	15.4	27.4	80.7	56.5
23	KR20-20thDSBWYT-45	12.0	23.0	107.3	35.8
24	KR20-20thDSBWYT-48	12.3	22.9	95.6	32.4
25	KR20-20thDSBWYT-49	13.1	24.3	110.0	33.2
X	**Mean**	**13.5**	**24.8**	**98.6**	**39.8**
X	**Maximum**	**16.3**	**28.6**	**117.4**	**60.6**
X	**Minimum**	**11.5**	**22.4**	**74.0**	**31.3**

When analyzing the grain quality indicators of varieties and lines, the protein content of the lines is 11.5-16.5%, and this indicator is 14.2%, 14.2% and 13.8% in Andona Janub gavhari, Gallakor and Kokbuloq varieties. (Table 2).

Among the studied lines, KR20-20thDSBWYT-02 (15.8%), KR20-20thDSBWYT-04 (16.3%), KR20-20thDSBWYT-12 (16.1%), KR20-20thDSBWYT-30 (16%) have high protein content. KR20-20thDSBWYT-44 (15.4%) lines were selected for future selection work.

The amount of gluten in the lines was 22.4-28.6%, and 5 lines were selected from the Andona Janub Gavhari, Gallakor and Kokbuloq varieties.

In conclusion, it can be said that in the creation of two-season (double) spring Bread wheat varieties in the dry areas of the southern region of the republic, KR20-20thDSBWYT-02, KR20-20thDSBWYT-04, KR20-20thDSBWYT-12, KR20-20thDSBWYT-30 with high grain yield and quality indicators , it is appropriate to use KR20-20thDSBWYT-44 lines in selection work.

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