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**CREATION OF NEW VARIETIES OF WINTER BREAD WHEAT FOR  
RAINFED FIELDS EARLY, BIOMETRICAL INDICATORS HIGH AND  
LODGING RESISTANT**

Dilmurodov Sherzod Dilmurodovich,  
Senior Researcher

Boysunov Nurzod Bekmurodovich  
Junior researchers Southern Agricultural Research Institute, 180100, Karshi  
City, Kashkadarya Region, Uzbekistan

Kayumov Norboy Shakirjonovich  
Junior researchers Southern Agricultural Research Institute, 180100, Karshi  
City, Kashkadarya Region, Uzbekistan

Abdimajidov Jaloliddin Raxmatulla ugli  
Junior Researchers Southern Agricultural Research Institute, 180100, Karshi  
City, Kashkadarya Region, Uzbekistan

Shodiev Sherzod Shomiljon ugli  
Junior researchers Southern Agricultural Research Institute, 180100, Karshi  
City, Kashkadarya Region, Uzbekistan

Mavlonov Javokhir Sarvar ugli  
Junior Researchers Southern Agricultural Research Institute, 180100, Karshi  
City, Kashkadarya Region, Uzbekistan.

**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 26 lines and 4 local check varieties created by local hybridization. Vegetation period of bread wheat lines, early maturity, biometric indicators high and lodging resistant were selected for the next stages of selection work by selecting lines higher than the local check varieties.

**Keywords:** bread wheat, variety, line, early maturity, biometric indicators, lodging resistant.

**Introduction**

It is one of the most important cereal crops in the world, occupying 17% of the total rainfed areas used in agriculture, and produces about 750 million tons of grain annually. A total of 240.8 million hectares of wheat have been planted worldwide, and demand for wheat is expected to increase in the coming years.

The area under rainfed areas in our country is more than 750,000 hectares. In the dry lands of the country, bread wheat is sown in the winter after the first rains, in the

spring in late February and the first ten days of March. Therefore, it is desirable that the new varieties created for rainfed areas be drought-resistant, disease-resistant, productive, as well as varieties with high grain quality and high biomass in a short growing season.

One of the urgent tasks is to create and introduce new varieties of bread wheat, which are resistant to drought and rust, productive and high grain quality, due to the low rainfall in recent years in the dry lands, rising global temperatures as a result of global climate change.

As a result of the analysis of varieties and forms created by the world selection, it was observed that the height of the wheat stalk has decreased by 50-60 cm over the last 25 years [5, 8, 11, 19, 23, 29, 32, 38, 43, 47, 54, 55, 56].

High yields can be achieved not only by repeated watering or fertilizing, but also by choosing a variety that is suitable for the same climatic conditions. The productive accumulation of wheat, the number of grains in the ear, the weight of 1000 grains, the topography of the area where the crop is grown or in the field can also be affected [6, 9, 13, 16, 22, 26, 34, 36, 41, 48, 53, 57, 58, 59].

The correlation between plant height and lodging does not always occur. More reasons for lodging are the biological characteristics of the variety and primarily its anatomorphological structure. The lower joint spacing of stem-prone varieties is longer, the plant height is higher, the stem and joint thickness is smaller or thinner, the resistant varieties are shorter and the lower joint spacing is shorter [1, 4, 12, 17, 24, 27, 31, 37, 42, 46, 51, 60, 61, 62].

In some years, 25-40 percent of the wheat crop is lost as a result of plant dormancy. At the same time the quality of the grain decreases, and it is easily susceptible to fungal diseases [2, 7, 15, 20, 21, 28].

Under the influence of drought, a decrease in yield, cessation of growth points, a decrease in assimilation processes on the plant leaf surface. Drought weather has a negative impact on grain gloss, grain quality, various nitrogen compounds in the grain [33, 39, 44, 49, 63, 64, 65].

According to the author, the relative humidity in the conditions of Karshi district is the highest in the beginning of spring each year, and in the last months of the wheat growing season it was found to have fallen sharply. Based on the results obtained, it was found that the relative humidity of the air has a positive effect on wheat yield [45, 50, 52, 66, 67, 68].

In natural weather conditions, high temperatures lead to a sharp drop in relative humidity, which negatively affects productivity, resulting in damage to the reproductive organs of the plant, leading to incomplete fertilization during flowering. Yields fall sharply due to weight loss per 1,000 grains [3, 10, 14, 18, 25, 30, 35, 40].

### 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.

As part of the creation of new varieties of bread wheat for rainfed areas, a competitive variety nursery of bread wheat was established in the central rainfed area located in the Gallakor area of the Kamashi branch of the Southern Agricultural Research Institute. 4 standard varieties and 26 new lines were selected for the experiment. Kokbulak, Gallakor, Ravon and Oqsaroy varieties, which are grown on a large area in the rainfed areas of the republic, were taken as standard varieties.

The experiment was carried out in a randomized way in 3 rows, with a crop area of 30 m<sup>2</sup>. In the experiment, the Alpha lattice design of the international program GenStat-13 was used to develop a scheme of random placement of genotypes.

## Results

Planting of varieties and lines was carried out on 19 November. Germination of varieties and lines, depending on air temperature, occurred on December 18-19, 29-30 days after sowing.

Table-1 Results of phenological observation of varieties and lines, Kamashi, 2021.

№	Name	Germination, date	Tillering, date	Shooting, date	Heading, date	Days to heading date	Maturity date	Days to maturity date
1	Gallakor (check)	18 dec	10 march	30 march	28 apr	132	6 june	171
2	Ravon (check)	18 dec	13 march	2 apr	29 apr	133	6 june	171
3	Oksaroy (check)	19 dec	11 march	1 apr	1 may	135	6 june	170
4	Kukbulok (check)	18 dec	11 march	3 apr	7 may	141	9 june	174
5	KR16-18IWWYTS-9921	18 dec	10 march	3 apr	1 may	136	7 june	172
6	KR15-NAZORAT-77-67	19 dec	11 march	30 march	27 apr	131	5 june	170
7	KR15-NAZORAT-77-44	18 dec	10 march	31 march	28 apr	133	5 june	170
8	KR15-NAZORAT-77-55	18 dec	11 march	2 apr	28 apr	132	6 june	171
9	KR16-18IWWYTS-9912	18 dec	11 march	1 apr	3 may	137	10 june	175
10	KR16-18IWWYTS-9919	18 dec	10 march	2 apr	3 may	137	4 june	169
11	KR15-22FAWWON-SA-30	19 dec	10 march	1 apr	30 apr	134	5 june	170
12	KR15-22FAWWON-SA-53	18 dec	11 march	4 apr	1 may	135	9 june	174
13	KR15-22FAWWON-SA-50	18 dec	10 march	2 apr	4 may	138	9 june	174
14	KR19-21IWWYT-SA-9907	19 dec	11 march	4 apr	28 apr	132	6 june	170
15	KR19-21IWWYT-SA-9909	18 dec	10 march	3 apr	1 may	136	6 june	171
16	KR19-21IWWYT-SA-9915	18 dec	10 march	5 apr	1 may	135	6 june	171
17	KR19-21IWWYT-SA-9916	19 dec	12 march	17 apr	29 apr	133	5 june	169
18	KR19-21IWWYT-SA-9919	18 dec	11 march	1 apr	1 may	136	7 june	172
19	KR19-21IWWYT-SA-9920	18 dec	11 march	5 apr	6 may	140	7 june	172
20	KR19-21IWWYT-SA-9924	18 dec	11 march	4 apr	2 may	136	7 june	172
21	KR19-21IWWYT-SA-9927	19 dec	10 march	4 apr	3 may	136	7 june	171
22	KR19-21IWWYT-SA-9928	18 dec	13 march	2 apr	1 may	135	5 june	170
23	KR19-21IWWYT-SA-9930	18 dec	11 march	4 apr	6 may	140	5 june	170
24	KR19-21IWWYT-SA-9935	18 dec	10 march	2 apr	6 may	140	7 june	172
25	KR18BWF6-SA-P-9	18 dec	11 march	3 apr	29 apr	133	6 june	172
26	KR18BWF6-SA-P-99	18 dec	9 march	1 apr	30 apr	134	7 june	172
27	KR18BWF6-SA-P-113	18 dec	9 march	1 apr	30 apr	134	7 june	172
28	KR18BWF6-SA-P-163	18 dec	12 march	2 apr	29 apr	133	4 june	169
29	KR18BWF6-SA-P-198	18 dec	10 march	2 apr	1 may	135	6 june	171
30	KR18BWF6-SA-P-199	18 dec	9 march	3 apr	30 apr	135	4 june	170
	<b>Minimum</b>	<b>18 dec</b>	<b>9 march</b>	<b>30 march</b>	<b>27 apr</b>	<b>131</b>	<b>4 june</b>	<b>169</b>
	<b>Mean</b>	<b>18 dec</b>	<b>10 march</b>	<b>2 apr</b>	<b>1 may</b>	<b>135</b>	<b>6 june</b>	<b>171</b>
	<b>Maximum</b>	<b>19 dec</b>	<b>13 march</b>	<b>17 apr</b>	<b>7 may</b>	<b>141</b>	<b>10 june</b>	<b>175</b>
	<b>LSD<sub>05</sub></b>					<b>6.1</b>		<b>3.7</b>
	<b>LSD<sub>05</sub> %</b>					<b>4.5</b>		<b>2.2</b>
	<b>CV %</b>					<b>2.3</b>		<b>1.1</b>

It was observed that the transition of the cultivars and lines to the accumulation phase took place on March 9-13, while the germination phase lasted from March 30 to April 17. The reason why the period between the accumulation phase and the accumulation phase is short can be explained by the sharp rise in air temperature and the intensive growth of the ngavs.

The beginning of the sprouting phase is an important feature in the creation of new varieties of bread wheat, ensuring high and quality crop production. The flowering period of the variety and lines lasted from April 27 to May 7. While the early-maturing Gallakor variety entered the sprouting phase on April 28, it was found that there were 1 line from this standard variety that entered the early maturing phase and 3 lines that entered the sprouting phase at the same time. It was found that the Kokbulak variety, which has an winter character, entered the sprouting phase on May 7.

The pre-emergence period of varieties and lines was 131-140 days.

It was noted that the transition of the variety and lines to the full ripening phase took place from 4 to 10 June. While the standard Gallakor, Ravon, Oqsaroy varieties entered the full ripening phase on June 6, 9 lines were found to have entered the early ripening phase from the standard varieties. Rows KR18BWF6-SA-P-163, KR18BWF6-SA-P-199, KR16-18IWWYTSA-9919, which entered the early ripening phase, were selected.

The vegetation period of varieties and lines was found to be 169-175 days.

During the experiments, biometric parameters of cultivars and lines were also determined. In this case, the indicators of varieties and lines, such as plant height, final joint length, spike length, number of spikes were evaluated.

In dryland conditions, high plant height is one of the indicators of yield in drought years.

Pakana tall wheat varieties drastically reduce their yields during drought years. Therefore, when selecting plants according to plant height, special attention should be paid to relatively tall lines.

According to the results, the plant height of cultivars and lines was 87.5 - 109.5 cm. In the standard Ravon variety, the plant height was at least 87.5 cm, while in the Kokbulak variety, the figure was much higher at 105.0 cm. In 18 of the lines studied in the experiment, it was observed that the plant height was 100 cm and higher. It was observed that the plant height of the remaining 8 lines ranged from 95 to 100 cm.

Table-2 Results of biometric measurements and tolerance of varieties and lines, Kamashi, 2021.

No	Name	Plant height, cm	Peduncle length, cm	Spike length, cm	Spikelets per spike	Lodging resistance
1	Gallakor (check)	96.0	34.5	10.0	15.0	9
2	Ravon (check)	87.5	30.5	9.0	14.0	9
3	Oksaroy (check)	105.5	37.0	10.0	17.0	9
4	Kukbulok (check)	105.0	38.0	9.5	17.0	9
5	KR16-18IWWYTSA-9921	101.5	36.0	9.0	16.0	9
6	KR15-NAZORAT-77-67	103.5	33.0	9.5	17.5	9
7	KR15-NAZORAT-77-44	102.5	30.5	9.5	16.5	9
8	KR15-NAZORAT-77-55	99.5	31.5	8.5	14.0	9
9	KR16-18IWWYTSA-9912	102.0	32.0	9.5	15.5	9
10	KR16-18IWWYTSA-9919	102.5	32.5	8.5	17.5	9
11	KR15-22FAWWON-SA-30	97.0	34.0	8.5	18.5	9
12	KR15-22FAWWON-SA-53	97.5	30.0	9.5	18.5	9
13	KR15-22FAWWON-SA-50	109.5	33.0	9.5	16.0	9
14	KR19-21IWWYT-SA-9907	101.5	36.5	10.0	15.0	9
15	KR19-21IWWYT-SA-9909	99.0	35.0	8.0	17.5	9
16	KR19-21IWWYT-SA-9915	104.5	34.5	9.0	17.5	9
17	KR19-21IWWYT-SA-9916	99.0	35.5	9.0	19.0	9
18	KR19-21IWWYT-SA-9919	100.5	37.0	8.0	17.5	9
19	KR19-21IWWYT-SA-9920	103.5	33.5	9.0	17.0	9
20	KR19-21IWWYT-SA-9924	101.5	32.5	10.0	17.5	9
21	KR19-21IWWYT-SA-9927	101.5	34.5	8.5	17.0	9
22	KR19-21IWWYT-SA-9928	101.0	31.5	9.5	17.0	9
23	KR19-21IWWYT-SA-9930	106.0	36.0	8.5	16.5	9
24	KR19-21IWWYT-SA-9935	101.5	34.0	8.5	18.5	9
25	KR18BWF6-SA-P-9	100.5	33.0	9.5	16.0	9
26	KR18BWF6-SA-P-99	100.5	36.0	9.0	18.5	9
27	KR18BWF6-SA-P-113	100.5	36.5	10.0	16.5	9
28	KR18BWF6-SA-P-163	98.5	34.0	10.0	15.5	9
29	KR18BWF6-SA-P-198	96.0	34.0	9.0	18.0	9
30	KR18BWF6-SA-P-199	97.0	31.0	9.5	18.0	9
	<b>Minimum</b>	<b>87.5</b>	<b>30.0</b>	<b>8.0</b>	<b>14.0</b>	<b>9</b>
	<b>Mean</b>	<b>100.7</b>	<b>33.9</b>	<b>9.2</b>	<b>16.9</b>	<b>9</b>
	<b>Maximum</b>	<b>109.5</b>	<b>38.0</b>	<b>10.0</b>	<b>19.0</b>	<b>9</b>
	<b>LSD<sub>05</sub></b>	<b>6.5</b>				
	<b>LSD<sub>05</sub> %</b>	<b>6.5</b>				
	<b>CV %</b>	<b>3.3</b>				

The index of the length of the last joint indicates the drought tolerance of the variety and lines. In the experiment, it was found that the length of the last joint of the cultivar and lines ranged from 30.0 to 38.0 cm. The last joint length in Kokbulak variety, which is resistant to heat and drought, was 38 cm, while in the remaining 3 standard varieties, this figure was found to be slightly lower than in Kokbulak variety.

When measuring the spike lengths of the cultivars and lines, it was found that they ranged from 8.0 to 10.0 cm. In the Gallakor and Oqsaroy varieties, the maximum spike length was 10.0 cm, while in 4 more lines this figure was found to be equal to the standard varieties. In particular, the length of the spike was 10.0 cm in the lines KR19-21IWWYT-SA-9907, KR18BWF6-SA-P-113, KR18BWF6-SA-P-163, KR19-21IWWYT-SA-9924.

The number of spikes in one spike was 14 - 19. It was found that the number of spikes in Andoza Oqsaroy and Kokbulak varieties was 17, in Ravon variety - 14, in Gallakor variety - 15. When assessing the resistance of varieties and lines to deposition, all varieties were resistant to deposition and were rated 9 points.

### Conclusion

In assessing the early maturity characteristics of the 30 cultivars and lines studied, the duration of the development phases was studied and 8 lines that were earlier maturing than the standard cultivars were selected. In the analysis of biometric indicators, 6 lines with higher performance than standard varieties were selected and applied to selection work.

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