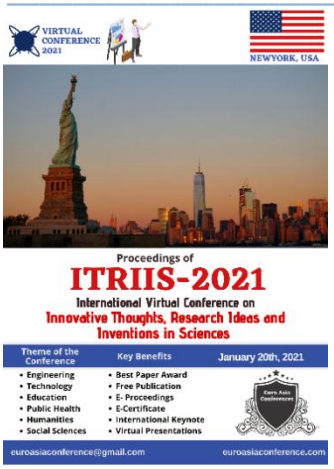

ANALYSIS OF YIELD AND GRAIN QUALITY TRIATS IN THEADVANCED YIELD TRIAL OF WINTER BREAD WHEAT

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Abstract:

In recent years, a number of scientific and practical work is being carried out in the country to create new varieties of cereals, especially soft wheat. The grain fields of our country are enriched with new varieties of soft wheat created by local and world breeders. The main part of wheat grown in our region is winter soft wheat (ordinary) varieties belonging to the genus T. Aestivum L.

In the last decade, grain yield loss due to epithelium of yellow rust disease has increased by more than 30 percent. In addition, weather factors (drought, high temperature, cold, in some years the arrival of excessive rainfall in the spring months) are repeated seasonally. In this regard, the creation of varieties resistant to major pathogens and adaptable to abiotic stresses remains very important and relevant.

Key words:

Bread wheat, grain yield, grain quality, protein, gluten, variety, lines.

Introduction.

Wheat (Triticum aestivum L.) is one of the most important cereal crops in world agriculture. The world produces 764 million tons of grain annually. Bread wheat occupies 17% of the total crop area.

In order to grow high-yielding and high-quality grain in different regions, it is important to create and place scientifically based varieties of grain crops that are scientifically based, consistent with the conditions of the region, give stable yields, grain quality indicators do not change [1, 6, 9].

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 [2, 5, 7, 8]. For example, in baking you need 14-15% protein, in the preparation of pasta you need grain with 17-18% protein. The greatest value has high-quality strong, valuable and durum wheat varieties. The basis for the classification of soft wheat according to the strength of flour (strong, medium and weak) lies in the quality of protein, gluten and gluten in the grain [3, 4, 11].

Strong wheat includes only varieties of soft wheat with 14% protein and 28% gluten in the first group. Gluten should be able to give high-quality bread (large in size and crispy) not only in pure form, but also when adding weak grains to the bali [10, 12].

When creating the best varieties of bread wheat on irrigated lands, the early maturing properties of the variety, the composition of the grain and its quality indicators, the external environment and agronomic measures have a strong influence. It is important to study the valuable properties of the variety in relation to the characteristics of early maturity in various soil and climatic conditions, grain yield. Early maturing varieties should be used in grain growing to increase yields and grain quality [1, 2, 13, 14].

The main goal of the study of common wheat lines in the control nursery is the selection of early maturing, productive, high-quality lines adapted to irrigated areas, as part of the creation of new varieties of common wheat and transfer to agroecological variety testing, competitive variety testing.

Material and methods.

As part of the creation of new varieties of bread wheat resistant to biotic and abiotic factors, high yield and grain quality, a competitive test variety of bread wheat was established in the central experimental area Kashkadarya branch of the Grain and Legume Research Institute.

For the experiment, 4 standard varieties and 26 new homozygous fertile lines were selected. Grom, Gozgan, Bunyodkor and Hisorak varieties, which are grown on a large area in the irrigated areas of the country, were taken as standard varieties. The experiment was performed by randomization in 3 rounds, the crop area was placed as 30 m2. In the experiment, the Alpha lattice design of the international program GenStat-13 was used to develop a scheme of random placement of genotypes.

Planting of field experiments was carried out on a special selection tractor.

Phenological monitoring was carried out during the growing season. The obtained results were summarized, statistical analysis and sampling were carried out [1].

Phenological observations have shown that the onset of each phase occurred in 10% of plants and 75% of all plants. Determination of the height of each cultivar and bed plant was measured from 10 full plant heights before harvest. To determine the yield, each plot was harvested on a selection harvester and the yield was determined.

One of the main requirements when introducing high-quality and high-yielding varieties into production is the correct selection of varieties and their distribution by regions.

Results.

Currently, the average yield of wheat varieties grown on irrigated lands exceeds 55 c/ha. The most important indicator of valuable properties in field experiments is productivity.

Productivity is a combination of a number of characteristics, which can vary under the influence of external factors.

In the experiment, the yield of varieties and lines was determined using a special selection combine. According to the results, the yield of varieties and lines ranged from 8.2 to 68.5 c/ha. The reason for the low productivity of some optional types of lines was the decrease in productivity due to the snowfall on April 8 and the cold snap of the generative organs of the lines, which entered the sprouting phase during this period.

Table 1

Grain yield and productivity indicators of varieties and lines (Karshi, 2020).

№	Name	Grain yield, c/ha	The difference from the check Grom variety			1000 kernel weight, g	Test weight, g/l
			c/ha	%	Group		
1	Gozgon (check)	68.5	10.8	18.7	I	39.9	783.0
2	Grom (check)	57.7	0.0	-0.1	II	37.1	797.6
3	Bunyodkor (check)	58.8	1.1	1.9	II	52.2	793.6
4	Hisorak (check)	65.9	8.2	14.2	I	33.4	763.0
5	KR17-FWWPYT-1597	35.3	-22.4	-38.8	III	44.9	776.2
6	KRBW17-6	59.9	2.2	3.8	II	47.2	803.1
7	**KRBW17-15**	**66.8**	**9.1**	**15.7**	**I**	**41.2**	**815.4**
8	KRBW18-9	30.9	-26.8	-46.5	III	41.4	814.2
9	KR17-F6-BWYT-P-166	42.4	-15.3	-26.5	III	40.0	811.0
10	KR17-F6-BWYT-P-171	30.3	-27.4	-47.5	III	44.9	817.2
11	KRBW17-10	65.5	7.8	13.6	I	47.3	812.8
12	KRBW18-4	58.2	0.5	0.9	II	46.7	812.0

13	KR19-IWY-9812	59.7	2.0	3.4	II	41.5	807.9
14	KR19-IWY-9816	38.7	-19.0	-32.9	III	45.0	806.5
15	KR19-IWY-9822	55.4	-2.3	-3.9	II	50.2	806.7
16	KRBW18-18	36.2	-21.5	-37.3	III	37.1	805.2
17	KRBW18-19	42.3	-15.4	-26.7	III	50.8	793.9
18	KRBW18-21	45.7	-12.0	-20.8	III	54.5	799.0
19	KRBW18-29	59.2	1.5	2.7	II	48.8	809.8
20	KR18FWIR57	60.4	2.7	4.6	I	47.1	817.2
21	KR18FWIR123	36.5	-21.2	-36.7	III	51.7	772.4
22	KR18FWIR158	41.4	-16.3	-28.3	III	48.6	788.6
23	KRBW19-047	55.1	-2.6	-4.4	III	43.5	802.4
24	KRBW19-132	53.2	-4.5	-7.8	III	48.1	795.4
25	KRBW19-142	65.9	8.2	14.3	I	43.1	797.4
26	**KRBW19-174**	**59.8**	**2.1**	**3.6**	**II**	**50.2**	**810.2**
27	KRBW19-212	59.0	1.3	2.3	II	51.6	807.4
28	KRBW19-213	41.1	-16.6	-28.8	III	49.3	809.4
29	KR15-NAZORAT-77-44	28.9	-28.8	-49.9	III	54.1	780.4
30	KR15-NAZORAT-77-67	8.2	-49.5	-85.8	III	50.7	791.3
	Minimum	**7.3**				**32.8**	**761.2**
	Mean	**49.6**				**46.1**	**800.0**
	Maximum	**70.3**				**55.3**	**824.3**
	LSD_{05}	**2.32**				**1.08**	**7.39**
	LSD_{05} %	**4.69**				**2.34**	**0.92**
	CV %	**3.1**				**1.4**	**0.6**

Productivity is a combination of a number of characteristics, which can vary under the influence of external factors.

In the experiment, the yield of varieties and lines was determined using a special selection combine. According to the results, the yield of varieties and lines ranged from 8.2 to 68.5 c/ha. The reason for the low productivity of some optional types of lines was the decrease in productivity due to the snowfall on April 8 and the cold snap of the generative organs of the lines, which entered the sprouting phase during this period.

Analyzing the yield of varieties and lines, the check Grom variety yielded 57.7 c/ha, and according to statistical analysis, Gozgan and Hisorak varieties showed high yields of 8.2 - 10.8 c/ha. Although Bunyodkor variety yielded 1.9 c/ha higher, the results of statistical analysis showed that the yield did not differ from Grom variety. Of the 26 studied lines, 4 were higher than the check variety, 7 were equal, and 15 were less productive. High yields were found in the KRBW17-15 line at 66.8 c/ha, the KRBW19-142 line at 65.9 c/ha, and the KRBW17-10 line at 65.5 c/ha.

One of the most important features in a high grain yield is the 1000 grain weight index, which is positively correlated. According to the results, the weight of 1000 grains of varieties and lines was 33.4 - 54.5 g. The check weight of 1000 grains was 39.9 g in Gozgan, 37.1 g in Grom, 52.2 g in Bunyodkor and 33.4 g in Hisorak. From the lines studied in the experiment, it was found that there were 8 lines weighing more than 50 g per 1000 grains, 17 lines weighing 40-50 g and 1 line weighing less than 40 g. The weight of 1000 grains was 54.5 g on the KRBW18-21 line, 54.1 g on the KR15-NAZORAT-77-44 line, 51.7 g on the KR18FWIR123 line, and 51.6 g on the KRBW19-212 line.

When determining the grain yield of varieties and lines, it was 772.4 - 817.2 g / l. The grain yield was 797.6 g / l in the Grom variety, which had the highest grain yield. It was found that there were 17 lines with a grain size above 800 g / l.

Table 1

Grain quality triats of varieties and lines (Karshi, 2020).

№	Name	Protein content, %	Moisture, %	Gluten content, %	IDK	Vitreousity, %
1	Gozgon (check)	18.2	7.0	29.5	90.7	49.7
2	Grom (check)	17.5	7.5	28.0	86.5	57.2
3	Bunyodkor (check)	18.3	7.1	29.4	95.4	74.2
4	Hisorak (check)	17.8	7.5	29.5	81.5	44.5
5	KR17-FWWPYT-1597	17.6	7.1	30.1	83.9	68.7
6	KRBW17-6	18.1	7.2	29.7	92.7	62.3
7	**KRBW17-15**	**17.8**	**7.2**	**28.3**	**92.3**	**65.5**
8	KRBW18-9	17.5	7.0	28.5	92.3	51.7
9	KR17-F6-BWYT-P-166	18.1	7.2	30.1	82.1	62.0
10	KR17-F6-BWYT-P-171	17.1	7.3	29.4	88.8	62.8
11	KRBW17-10	18.1	6.9	29.6	92.6	47.7
12	KRBW18-4	17.6	7.0	30.2	88.7	51.3
13	KR19-IWY-9812	17.8	6.9	29.1	94.0	83.0
14	KR19-IWY-9816	17.3	7.3	30.2	93.0	74.3
15	KR19-IWY-9822	16.0	6.8	32.0	82.3	66.2
16	KRBW18-18	18.2	7.5	28.7	83.5	61.3
17	KRBW18-19	17.7	7.0	28.5	91.5	83.8
18	KRBW18-21	17.5	7.1	27.8	81.2	73.3
19	KRBW18-29	18.0	7.1	29.6	91.5	77.0
20	KR18FWIR57	17.2	7.3	29.1	87.9	72.3
21	KR18FWIR123	18.7	7.2	27.5	79.7	83.3
22	KR18FWIR158	17.4	7.3	27.8	92.2	85.0
23	KRBW19-047	18.1	7.1	30.9	77.5	59.8
24	KRBW19-132	18.0	6.9	29.4	79.2	54.2
25	KRBW19-142	17.8	7.4	30.1	92.1	55.3
26	**KRBW19-174**	**16.9**	**7.5**	**28.2**	**82.0**	**79.5**
27	KRBW19-212	18.3	7.3	28.4	83.1	73.5
28	KRBW19-213	17.9	7.0	28.3	93.8	63.0
29	KR15-NAZORAT-77-44	17.5	7.4	29.5	81.6	68.7
30	KR15-NAZORAT-77-67	18.0	6.9	27.8	103.1	60.5
	Minimum	**16.0**	**6.8**	**27.5**	**77.5**	**44.5**
	Mean	**17.7**	**7.2**	**29.2**	**87.9**	**65.7**
	Maximum	**18.7**	**7.5**	**32.0**	**103.1**	**85.0**
	LSD_{05}	**0.5**	**0.3**	**0.7**	**4.3**	**2.8**
	LSD_{05} %	**2.9**	**4.3**	**2.3**	**4.9**	**4.2**
	CV %	**1.8**	**2.6**	**1.4**	**3.0**	**2.6**

At present, the creation of new varieties of soft wheat is aimed at creating new varieties with high grain quality and fully meeting the requirements of strong wheat. The purpose of this study was to identify high-quality grain lines and to involve them in selection work.

Grain quality indicators of varieties and lines were carried out in the laboratory of the Branch "Assessment of technological quality indicators of grain", which assessed such indicators as protein content, grain moisture, gluten content, IDK and grain vitreousness.

The protein content of the grain is required to be 14 percent or higher to fully meet the requirements of strong wheat. According to the results of the analysis, the protein content of grains of varieties and lines

ranged from 116.0 to 18.7%. The Bunyodkor variety, which has the highest lysine content, was found to contain 18.3% protein, while 10 varieties with 18% lyceum content and above were found to have.

According to the results, the grain moisture content was 6.8-7.5%. It is known that the allowable grain moisture during storage should not exceed 14 percent. In the experiment conducted, it was observed that the grain and lines have much lower grain moisture, which is due to the high temperature in summer and the relative humidity of the air at low levels.

When determining the amount of gluten in the grain, it was observed that it ranged from 27.5 to 32.0 percent. The grain gluten content in the check Gozgan and Hisorak varieties was 29.5%. It was found that there were 7 lines with a gluten content of 30-32% and 15 lines with 28-29.7%.

The IDK index of gluten quality of varieties and lines ranged from 77.5 to 103.1 in the analysis. All cultivars and lines were found to correspond to group 2 gluten.

When assessing the glassiness of the grain, it was found that it ranged from 44.5 to 85.0 percent. The sample was 49.7% in Gozgan, 57.2% in Grom, 74.2% in Bunyodkor and 44.5% in Hisorak. It was found that there are 20 lines with a grain glass content of 60% and above, and 7 lines with a check Bunyodkor variety.

In conclusion,

Comparing all the valuable features of varieties and lines, the yield of KRBW17-15 line is 66.8 c/ha, grain weight 41.2 g per 1000 grains, test weight 815.4 g/l, protein content 17.8 %, gluten content 28.3 %, KRBW19-174 line yield 59.8 c/ha, grain weight 50.2 g per 1000 grains, test weight 810.2 g/l, protein content 16.9 %, gluten content 28.2 %. Given the high performance of check varieties, it was recommended to submit agricultural varieties to the testing center and use them as donor varieties in selection work.

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