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Selection of Productive Resources in Wheat Breeding

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Abstract: In the article, productivity indicators of varieties and samples of winter soft wheat and barley regionalized in regional conditions and brought from abroad through international scientific centers: the number of clusters, weight of 1000 grains, length and number of the first joint from the ground level, resistance to lodging and rust diseases, and the study of high productivity indicators the results of the research carried out for the purpose of selecting available sources and involving them in selection studies are presented.

Keywords: wheat, barley, variety samples, lodging resistance, productivity, weight of 1000 grains, yellow rust, brown rust, selection, tillering, productivity, ridge, selection.

Introduction

Agricultural products make up 100% of food products and 40% of industrial raw materials in our republic. Therefore, the main task before scientists is to create promising varieties of agricultural crops that are resistant to environmental stresses, early, fruitful, resistant to diseases and harmful insects, and have high productivity characteristics for different regions.

In wheat selection, the elements that make up the productivity of varieties and lines are divided into several parts, the main ones are the productive cluster, ear length, the number of ears in one ear, the number of grains in one ear, grain weight and 1000 grain weight.

The tillering phase of wheat is an important developmental period of the plant leading to the appearance of the ear, and the tillering phase begins with the appearance of the 4th leaf.

In hot climates, it is possible to prevent the reduction of the yield due to the lack of grain by increasing the number of productive stands.

According to scientists emphasized that the number of productive stems in the cultivation of crops is strongly influenced by the conditions under which the plant is grown.

Productive tillering is 1.5-2.0 times less than total tillering, and soft wheat lines are more tillering under short day than long day. Clumping is the main indicator in determining productivity. A number of scientists have mentioned in their data that there is a positive connection between productive population and productivity.

However, according to the research results of other scientists, it is believed that when the wheat plant has a high yield, the yield may decrease, that is, the developed vegetative mass leads to thinning of the grain in the ear and starvation of the grain.

Materials and Methods

Experimental placement, calculations and analyzes according to the method of VIR (Former All-Union Plant Science Institute) (1984), biometric analyzes and phenological observations of agricultural crops according to the method adopted by the State Variety Testing Commission (1985, 1989), evaluation of resistance to rust diseases in field conditions Modified Cobb using the scale, the degree of morbidity was determined based on Peterson's assessment from 0-100 percent (1948), and the hypersensitivity of varieties was determined according to the method of Roelfs (1992).

Results and discussion

According to the results of the analysis carried out during the experiments, for the irrigated fields provided on the basis of the "International Winter Wheat Improvement" (IWWIP) program, the resistance to dormancy, 1000 grain weight and productivity indicators of 26 varieties and samples studied in the control nursery were studied. According to the results of the study, the level of lodging resistance was 7 points in the template variety "Chillaki", the selected samples had the same indicator as the template variety, i.e. 7 points, only GREER/KANMARK, KS031009K-4/KS060142-K-4 samples had 9 points.

When analyzing the weight of 1000 grains, which is of great importance in determining productivity, the standard "Chillaki" variety was 39.1 grams. When the samples were analyzed according to this indicator, the change in the weight of 1000 grains in the samples was 39.1-43.1 grams. 13 samples were selected according to the indicator of 1000 grain weight in relation to the sample variety. The highest result was 43.1 grams in sample PATWIN YR15/L 4224 K 121. This sample was observed to be up to 4.0 grams higher than the standard variety.

Table 1Productivity indicators of varieties and samples

№	Name of variety and samples	Stemming, date	Get laid, score	Yield, ts/ha	Weight of 1000 grains, gr
1	**Chillaki (control)**	05.03.2022	7	49,0	39,1
2	PASTOR/MILAN/7/ZCL/3/PGFN//CNO67/SN64/4/SERI/5/UA.2837/6/ATTILA/3*BC1	06.03.2022	7	58,3	42,1
3	NIKIFOR//KROSHKA	06.03.2022	7	58,0	41,8
4	PATWIN YR15/L 4224 K 123	06.03.2022	7	68,2	42,6
5	PFAU/SERI.1B//AMAD/3/KRONSTAD F20094/SHARK-6/5/SHARK-6	06.03.2022	7	66,4	42,2
6	GREER/KANMARK	06.03.2022	9	48,6	42,7
7	KS031009K-4/KS060142-K-4	06.03.2022	9	62,0	42,2
8	PATWIN YR15/L 4224 K 121	06.03.2022	7	58,0	43,1
9	PASTOR/MILAN/7/ZCL/3/PGFN//CNO67/SN64/4/SERI/5/UA.2837/6/ATTILA/3*BC2	06.03.2022	7	69,0	42,1
10	OBRII/DNESTREANCA25//ILICIOVCA/OD.CRASNOCOLOS/3/UN-49	06.03.2022	7	66,0	42,7
11	ZNAKHIDKA/EKIZ	06.03.2022	7	63,0	43,0
12	SY SUNRISE	06.03.2022	7	67,0	42,4
13	PATWIN YR15/L 4224 K 122	06.03.2022	7	65,0	42,6
14	Uk-335/2018-22	06.03.2022	7	68,6	42,5

When the yield index of the studied varieties and samples was analyzed, the yield of the Chillaki variety, which was taken as a model variety, was 49.0 tons/ha.

A total of 13 samples were selected, which were superior to the model variety in terms of yield, and it was observed that the yield index varied from 49.0 to 96.0 grams. The highest yield was 69.0 ts/ha in sample PASTOR/MILAN/7/ZCL/3/PGFN//CNO67/SN64/4/SERI/5/UA.2837/6/ATTILA/3*BC2.

Samples selected on the basis of productivity were selected for use as parental forms in the creation of new varieties with high productivity in selection processes.

Table 2 Assessment of productivity indicators in varieties

№	Name of varieties	Origin	Yellow rust, %	Brown rust, %	Get laid, score	Yield, ts/ha	Weight of 1000 grains, gr
1	**Vassa (control)**	Uzbekistan	50S	R	7	52,8	40,1
2	Yonlgonchuk	Russia	60S	R	7	57,6	40,2
3	Gazgon	Uzbekistan	50S	20MR	7	59,5	40,0
4	Bymba	Russia	20MS	10MR	9	67,6	43,0
5	Vekha	Russia	40S	R	9	62,8	41,2
6	Stil-18	Russia	10S	10MR	9	50,3	38,4
7	Aleksevich	Russia	10S	10MR	7	68,0	39,8
8	Odare	Russia	20S	R	7	66,6	41,6
9	Grom	Russia	50S	10MS	9	57,7	39,0
10	Chillaki	Russia	60S	30S	7	41,1	38,5
11	Temiryazevka-150	Russia	20S	20MS	9	64,0	39,7
12	Step	Russia	20S	R	7	63,0	37,8
13	Soberbosh	Russia	20S	R	7	51,4	38,6
14	UK-335/2018-22	Turkey	R	R	7	68,2	45,0
15	Obad	Uzbekistan	R	R	7	68,0	52,0
16	Barqaror	Uzbekistan	R	R	7	68,6	42,1
17	Nurafshon	Uzbekistan	R	R	7	64,4	40,2
18	O'ITI-1	Uzbekistan	10MS	R	7	71,8	42,4
19	Borjona	Turkey	20S	R	7	64,3	44,4
20	Zamin-1	Uzbekistan	20MR	10MR	7	67,7	41,5
21	Aral	Uzbekistan	50S	R	7	54,6	41,8
22	New Life	France	R	R	9	67,6	40,2
23	Cesarlo	France	R	10MR	9	42,2	39,8
24	Chimboy	Uzbekistan	40S	R	9	50,3	38,4

Of course, these varieties and lines studied during the selection process were transferred to the next stages of selection as starting sources for selecting parental forms with high productivity indicators and creating new varieties.

During the research, resistance to rust diseases and dormancy, yield and weight of 1000 grains of 11 varieties of soft and hard winter wheat, 2 varieties of French selection, 2 varieties of Turkish selection and 9 varieties of soft wheat created in local conditions from Krasnodar Agricultural Scientific Research Institute of Russia were studied. symptoms were assessed.

According to the results of the experiment, the flowering period of the varieties was observed on March 7-9. When the varieties were analyzed for resistance to yellow rust disease, the incidence of the model Vassa variety was 50 percent, and if the varieties Obad, UK-335/2018-22, Barqaror, Nurafshon, New Life, Cesarlo were selected as highly resistant varieties to yellow rust disease, the incidence was 20 percent. Bymba, Stil-18, Aleksevich, O'ITI-1, Zamin-1, Borjona, Temiryazevka-150, Step, Soberbosh varieties, which did not exceed a percentage, were selected. When assessing the level of resistance to brown rust in varieties, if the model Vassa variety was evaluated as a resistant variety, the same indicator as the model variety is as follows: Elonchuk, Vekha, Odare, Step, Soberbosh, UK-335/2018-22, Obad, Barqaror, Nurafshon, O'ITI-1, Borjona, Aral, New Life, Chimboy varieties were observed. In the course of the research, the resistance of the varieties to lodging was analyzed, according to the results, 8 varieties were identified whose resistance to lodging was rated 9 points, while all other varieties were rated 7 points. Also, the weight of 1000 pieces of grain and yield indicators were evaluated in the varieties. According to the results of the research, the weight of 1000 grains of the model Vassa variety was 40.1 grams, and the yield was 52.8 tons/ha. The change in the weight of 1000 pieces of grains was observed to be 37.8-52.0 grams

in the varieties, while the highest result was observed in the Obad variety and was 52.0 grams. According to the results of the analysis, the change of the productivity index in varieties was 41.1-71.8 ts/ha. The highest yield was 71.8 tons/ha in OITI-1 variety.

Also, productivity indicators of 13 varieties of imported soft and hard wheat and 3 varieties of barley were analyzed based on the results. The Vassa variety, currently cultivated in large areas in our region, was used as a model variety.

According to the results of the research, the number of clusters in the model Vassa variety was 7 units, while this indicator was 6-10 units in the varieties, the highest clustering index was observed in the Zolotie rupo variety of winter durum wheat, up to 10 units. When studying the index of the number of joints in the varieties, the number of joints in Govan, Liner, Nadiyny varieties of durum wheat was 3 units, and the number of joints in all other varieties was 4 units. Varieties prone to stem lodging have longer internodal intervals, tall plants, and stem and joint thickness are small or thin, while resistant varieties are short and short internodal intervals.

Table 3 Assessment of productivity indicators of varieties.

№	Name of varieties	Number of branches	The number of joints in the plant, pcs	The length of 1 joint from the ground level, cm	Endurance to lie down, score	Weight of 1000 grains, gr	Yield, ts/ha
1	**Vassa (control)**	7,4±0,1	4,1±0,2	7	7	39,6	50,0
2	Dostnoyniy	7,5±0,2	4,5±0,2	10	7	40,2	35,7
3	Skarb polmira	7,1±0,1	4,6±0,4	12	7	37,2	28,5
4	Vakula	6,0±0,13	4,5±0,1	6	7	43,7	57,1
5	Peremoga	7,6±0,4	4,1±0,2	5	9	35,1	21,4
6	Mudrist	6,4±0,1	4,5±0,3	5	9	42,4	71,4
7	Monera	6,1±0,2	4,6±0,1	4	9	40,1	42,8
8	Garantia	6,6±0,2	4,3±0,5	10	9	42,1	57,1
9	Fortetsya	7,1±0,3	4,5±0,2	3	9	40,4	42,8
10	Obryad	7,5±0,4	4,6±0,1	7	9	39,2	50
11	Gurt	7,6±0,1	4,7±0,2	3	9	40,1	42,8
12	Krugozir	6,5±0,2	4,2±0,3	9	9	41,7	50
13	Zolotie rupo	10,0±0,1	4,8±0,1	6	9	39,2	50
14	Govan	9,2±0,2	3,6±0,2	5	9	40,4	42,8
15	Liner	6,3±0,4	3,7±0,1	5	7	42,3	42,8
16	Nadiyny	8,6±0,2	3,8±0,2	4	7	43,5	57,1

According to the results, when the length of 1 joint above the ground level of the varieties was analyzed based on the results, the model was 7 cm in the Vassa variety, and the variation of this indicator was observed in the varieties up to 4-12 cm. If the following varieties, Monera, Fortetsya, Govan, Liner, Nadiyny, with 1 joint length shorter than the ground level, were selected, it was observed that these varieties have a shorter distance of the first joint from the ground level to 2-4 cm compared to the model variety.

In the course of research, the level of resistance to lodging in the varieties was evaluated, according to the results, the standard was 7 points for the Vassa variety, 10 of the studied varieties were rated with 9 points, and 5 varieties were rated with 7 points.

When the weight of 1000 grains was analyzed as one of the main indicators of productivity, the weight of 1000 grains was 39.6 g in the model Vassa variety, while the following Vakula (43.7 g), Mudrist (42.4 g), Garantia (42.1 g) had a higher index compared to the model variety, Krugozir (41.7 gr), Liner (42.3 gr), Nadiyny (43.5 gr) varieties were selected. The lowest indicator was observed in the Peremoga variety and the weight of 1000 grains was 35.1 grams. The variation of this sign in varieties was 35.1-43.7 gr.

The yield indicators of the varieties were also evaluated. According to the results, the productivity of the model Vassa variety was 50.0 tons/ha. The pattern was found in the following varieties, Vakula (57.1 ts/ha), Mudrist (71.4 ts/ha), and Garantia (57.1 ts/ha), which have higher productivity compared to the variety. It was found that these varieties have an additional yield of 7.1-21.4 tons/ha compared to the standard variety. the lowest yield was 21.4 ts/ha in the Peremo variety.

Conclusion

In conclusion, we can emphasize that varieties and samples with high productivity were widely involved in selection research, and were involved in research to be used as starting sources for creating new varieties and lines with high productivity and resistance to rust diseases.

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