

RESISTANCE AND PRODUCTIVITY INDICATORS OF CEREAL CROPS TO EXTERNAL FACTORS IN MEDIUM SALINITY SOIL - CLIMATE CONDITIONS

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Abstract. *This article is based on the data obtained in the field experiments conducted in order to determine the resistance to abiotic and biotic factors and productivity elements of barley and triticale varieties planted in the demonstration field of Syrdarya region. In the experiment carried out in field conditions, when the plants were harvested and the biological yield was determined, the triticale "Boyovut" variety - 88.3 t/ha, the "Tuyatish" variety - 83.1 t/ha, the barley "Mashuldar" variety - 67.6 ts/ha, in "Sayhun" variety - 69.0 ts/ha and in "Syrdarya" variety - 65.8 ts/ha. It was observed that the indicators of resistance to external factors were higher in barley varieties, and based on the biological capabilities of the plant, productivity elements were higher in triticale varieties compared to barley varieties.*

Keywords: *triticale, barley, variety, seed, protein, vitamin, variety test, planting time, development phases, stem, ear, grain, yield.*

Usage. Triticale is a valuable cereal, contains a lot of protein and essential amino acids (lysine, tryptophan). On average, there is 1.0-1.5% more protein than wheat, and 3–4% more than rye. Gluten is the same as wheat, but the quality is lower. Grain is used in bread baking, the confectionery industry, and for animal feed. Straw is used for animal feed and for bedding for livestock. Feed triticale varieties are sown for green fodder, silage, and grass meal. Feed from triticale is well eaten by animals.

Triticale is cultivated where wheat and rye are sown. It is widespread in Russia, in the Caucasus. There is interest in such hybrids in several European countries. The grain yield is 5–7 t / ha, and the biomass is 40–55 t / ha.

In Uzbekistan, this crop is studied in a number of research institutes. It is cultivated in intermediate crops of forage crops.

Systematics. Triticale is a hybrid of bread wheat and winter rye. The best properties of the two crops combined in one plant. The name Triticale comes from the first part Triticum (wheat) of the second part Secale (rye). Triticale has spring and winter forms.

Barley is a valuable cereal used in the food industry and as a valuable feed for animals. Barley grains are obtained from barley grain – barley, and barley differing in nutritional value and good digestibility.

The value of a crop is estimated by its valuable biological qualities, like early maturity, which makes it possible to cultivate it in northern areas. The crop is tolerant to drought and salt, which makes it possible to use the crop in harsh environmental conditions.

Content of "crude protein" in grain fluctuates from 7 to 25%. The embryo contains 26–36% of protein, 8–14% – in the endosperm, and 7–10% – in the shells, and in the biomass in the phase of earing – 1.8 - 3.5%. The protein fraction is heterogeneous: albumin – 7.5 - 28.8%, globulins – 7 - 21.9%, hordeins – 15.6 - 46.4%, glutelin – 18 - 47.5%, non-protein nitrogenous substances – 7.5 - 16.9%. The average content of amino acids in the total protein of barley grain is: lysine – 3.35%, histidine – 2.09, arginine – 4.37, aspartic acid – 27.35, proline – 12.32, cystine – 1.17, glycine – 3.81, alanine – 4.10, valine – 4.97, methionine – 2.57, isoleucine – 3.61, leucine – 6.53, tyrosine – 2.52, phenylalanine – 5.24 [32]. The biological value of barley protein is low – 51.2%, compared with oat – 83.4% and wheat – 59.9% [38]. The carbohydrate content is 44 - 56%, the main part is starch. This contributes to the quality of the beer. In addition to starch, there are hemicellulose, cellulose, dextrans and pectin substances. The content of oil (lipids) is 2.70 - 3.30%. The grain also contains enzymes, vitamins – thiamine, riboflavin, nicotinic acid, carotene, tocopherol [39].

The quality of the grain depends on the degree of flaking of the grain. Since barley has a filmy grain, it first separates the flower florets and partially the outer shells and germ, which leads to a decrease in the quality of the grain.

In order to ensure the stability of grain independence of our country - to carry out ecological testing of new varieties of grain crops in the soil-climate, water and air conditions of the Syrdarya region, to study their morphological economic characteristics, as well as to produce acceptable fertilizing and watering regimes, to distinguish their promising ones, to start initial seed production laying works is one of the urgent tasks.

Experimental methodology. In 2013, field and laboratory experiments on grain cultivation were carried out in the medium salinity area of the "Selection and seed breeding" experimental branch farm in the United region of Saykhunabad district, Syrdarya region. During the experiment, phenological observations, calculations and analyzes were carried out according to the method of the Institute of Plant Science of Uzbekistan (1984), and biometric analyzes were carried out according to the method issued by the State Commission for Variety Testing of Agricultural Crops (1985; 1989).

Statistical analysis of the data obtained in the experiment B.A. It was conducted based on the method developed by Dospikhov (1985).

The disease resistance of the cultivars and lines studied in the experiment was evaluated in percentage (%) according to the scale developed at the international ICARDA (International Center for Agricultural Research in Dry Areas) Center (1996).

Based on the results of the analysis of weather conditions in 2013, it was observed that the autumn (October) month for grain was warm compared to the average for many years, and January and February were also quite warm, so it was observed that the grain entered the village in the fall with full piles.

Table 1

General and mobile in soil composition amount of nutrients

Soil layer, cm	Gross, %			Active, mg/kg	
	Rotted	N	P	N-NO ₃	P ₂ O ₅
At the beginning of the validity period, 23.04.2013					
0-30	0.761	0.070	0.117	2.69	10.3
30-50	0.686	0.061	0.098	1.77	7.4

Analysis of experimental results

In the demonstration field, the grain varieties cultivated in our Republic were tested in all respects by planting them in the medium salinity soil of the region.

Table 2

Indicators of resistance to abiotic and biotic factors and productivity elements of barley and triticale varieties planted in the demonstration field.

№	Varieties and lines	Resistance to lodging down, score	Heat resistance, %	Salt resistance, %	Stem height, cm	The number of grains in one ear, piece	1000 pcs grain weight, Gr	Received harvest, ts/ha
1	name	7	70	76	140	48	40.0	88.3
2	Boyovut	9	68	73	120	48	40.7	83.1
3	Appetite	9	88	88	110	40	41.8	67.6
4	Productive	7	84	81	102	42	42.4	69.0
5	Saihun	9	88	82	102	39	42.2	65.8

The analysis of the data obtained on the resistance to biotic and abiotic factors and yield of barley and triticale varieties planted in the moderately saline areas of the Syrdarya region shows that the main stem height indicators of the triticale "Boyovut" variety are 140 cm, the "Tuyatish" variety is 120 cm, and the barley "Mashuldor" variety is 110 cm, it was found that it was 102 cm in "Sayhun" and "Syrdarya" varieties.

It can be seen that in the average saline soil-climate conditions of Syrdarya region, triticale varieties had 20-40 cm higher stem height indicators than barley varieties.

In the formation of the crop elements of spiked grain crops, it is important that the stem is lying upright or under the influence of adverse factors. When the resistance to lodging was determined in barley and triticale varieties planted in the field of variety testing, it was equal to 7-9 points.

Determining the degree of drought and heat resistance of the varieties of grain crops studied in the experimental field N. Kojushka and A.M. According to the Volkova method, compared to triticale varieties (68-70%), it was observed that heat resistance of barley varieties was higher (84-88%).

It was noted that this pattern was also found in the indicators of salt resistance, and salt resistance in triticale varieties was 73-76%, and in barley varieties - 81-88%.

Triticale "Boyovut" and "Tuyatish" varieties studied in the field of variety testing have an average of 48 grains per ear and barley varieties "Mahsuldor", "Saykhun", "Sirdaryo" 40; 42; It was found that 39 grains were formed when the ear was analyzed in laboratory conditions.

It is noted in scientific sources that the formation of a large or small number of grains per ear is directly related to the indicators of the weight of 1000 grains. The same law was observed in our scientific research work and the average weight of 1000 grains of triticale "Boyovut" and "Tuyatish" is 40 - 40.7 grams and barley "Mahsuldor", "Saykhun", "Sirdaryo" is 41.8; 42.4; It was 42.2 grams.

In the experiment, when the plants on the calculated area were collected and the biological productivity was determined, triticale "Boyovut" variety - 88.3 t/ha, "Tuyatish" variety - 83.1 t/ha,

barley "Mashuldar" variety - 67.6 t/ha, " It was 69.0 t/ha in Sayhun variety and 65.8 t/ha in "Syrdarya" variety.

Summary. In conclusion, according to the results of scientific research carried out in field conditions, it was observed that the indicators of resistance to abiotic and biotic factors were high in barley varieties, and based on the biological capabilities of the plant, the productivity elements of triticale varieties were higher than barley varieties.

When determining the grain yield of the researched varieties of triticale and barley, the "Boyovut" variety of triticale has 88.3 centners per hectare, the "Tuyatish" variety - 83.1 t/ha, the "Mashuldar" variety of barley - 67.6 t/ha, the "Sayhun" variety - 69.0 t/ha and "Syrdarya" variety - 65.8 t/ha grain yield was obtained and it is recommended to plant these varieties.

REFERENCES

1. Atabaeva X.N., Xudayqulov J.B. O‘simlikshunoslik. “Fan va texnologiya” nashriyoti, Toshkent- 2018 y. Darslik. 25.5 b.t. 407-b.
2. Atabaeva Kh.N., Khudaykulov J.B., Nurbekov A.I., Kassam A. Plant Science. “Fan ziyosi” nashriyoti, ISBN 978 9943 6594 9 0. Toshkent-2021 y. Darslik (Ingliz tilida). 25 b.t. 398-b.
3. Тўрақулов, А. Қурбонбоев, Р. Сиддиқов “Сифатли экиш ва тўлиқ ниҳол олиш мўл ғалла ҳосили гаровидир”//Ўзбекистон қишлоқ хўжалиги журнали, №10.2013 йил, 5-6 бетлар.
4. Янкелевич Р.К. Реакция сортов озимой тритикале на приемы возделывания // Янкелевич Р.К.// Автореф. канд. дисс. - Жодино, 1997, -17 с.
5. Ҳайдаров Г. Истиқболли донли экинлар имконияти. Республика илмий-амалий конференцияси, Тошкент 2015 йил. -127 бет.
6. Jorg L. Crean and fodder crops. Conferens material. Kaleforniya 2013.
7. www. Google//Triticale growing technology, 2015.