CHOOSING PRODUCTIVE AND BARROW-RESISTANT BARLEY VARIETIES FOR IRRIGATED LANDS

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Abstract. *Today, barley has not lost its importance among the main food crops. It is natural that the need for this plant will also increase against the background of the progressive increase in the population of the earth. To meet this need, creating a variety of barley resistant to various resistances is considered an urgent problem today. This article reflects the current situation and the research conducted by the author on the topic of selection of productive and lodging-resistant barley varieties for irrigated lands.*

Keywords: *barley, soil, food, variety, early morning, selection.*

ВЫБОР ПРОДУКТИВНЫХ И УСТОЙЧИВЫХ К КУРГАНАМ СОРТОВ ЯЧМЕНЯ ДЛЯ ОРОШАЕМЫХ ЗЕМЕЛЬ

Аннотация. *Сегодня ячмень не утратил своего значения среди основных продовольственных культур. Естественно, что потребность в этом растении будет возрастать и на фоне прогрессивного увеличения населения земли. Для удовлетворения этой потребности создание сортов ячменя, устойчивых к различным резистентностям, на сегодняшний день считается актуальной задачей. В данной статье отражено современное состояние и проведенные автором исследования по теме селекции продуктивных и устойчивых к полеганию сортов ячменя для орошаемых земель.*

Ключевые слова: *ячмень, почва, питание, сорт, раннее утро, селекция.*

INTRODUCTION

Enter. It ranks fourth in the world by area of barley. In 2019, an area of 58.4 million hectares was planted, and the total yield was 154.8 million tons, the average yield was 2.82 tons. The main cultivated areas of barley correspond to the Commonwealth of Independent States and account for one third of the world's barley area.

Today, in the world, great importance is attached to obtaining a high-quality and abundant harvest due to the use of resource-saving technologies in the cultivation of barley. One of the main problems today is to create varieties of barley that are suitable for the soil and climate conditions in the irrigated lands of our country, resistant to disease and lodging, and have a stable grain yield.

MATERIALS AND METHODS

Despite the fact that the varieties of barley grown in the irrigated lands are adapted to the local soil and climate conditions, they are not sufficiently resistant to winter, various diseases and dormancy. In irrigated lands, the tendency of the plant to become dormant is increasing due to its height and high productivity.

One of the urgent tasks of today is to select and create varieties of barley resistant to dormancy to ensure high productivity.

One of the urgent problems facing barley breeding in irrigated lands is the creation and introduction of early varieties of barley that are resistant to diseases and dormancy and provide two harvests in one year.

Varieties of barley grown in the irrigated fields of our republic mainly belong to the group of mid-ripening and late-ripening varieties imported from Europe. The main tasks of our scientific research are to study and crossbreed samples of varieties with early characteristics, as well as to create early, resistant and productive varieties by hybridizing the genetic characteristics of several parental forms.

Among the characteristics of barley, important signs in the direction of selection are resistance to dormancy, plasticity, that is, the ability to produce stable crops in different weather years in different regions, resistance to highly harmful diseases, black mold, powdery mildew, helminthosporiosis, root rot, and small rust diseases.

Barley is a feed used in livestock and poultry farming. Malt extract obtained from barley grain has important economic value and is used in pharmaceutical, textile, tanning, printing and other industries. Barley flour has healing and body-energizing properties. Barley water is useful for chest diseases, it is a cooling and moisturizing agent for fevers. Barley also serves as a dietary supplement in modern medicine.

In the national economy of our country, barley is used for various purposes. In this respect, barley is the first valuable grain crop. Barley is the most nutritious cereal crop, which contains a large amount of protein, as well as vitamins such as V1, V2, C, E, which are necessary for cattle.

Barley has a unique property. Barley is the leader in the presence of irreplaceable amino acids. These substances are not completely synthesized in the animal body or are not accumulated in sufficient quantities (lysine, methionine, tryptophan, etc.). According to this indicator, it is the leading grain crop among all grain crops, and it is also given as concentrate feed for pig breeding.

One of the main problems today is to create barley varieties that are suitable for the soil and climate conditions of the dry lands of our republic, resistant to drought, heat, disease, pests, and with a stable grain yield.

Despite the fact that the varieties of barley cultivated in dry lands are adapted to the local soil and climate conditions, they are not sufficiently resistant to winter, drought and heat, as well as to various diseases. In plains and hilly regions of low-lying lands, strong heat and high temperature during barley grain filling cause a sharp drop in productivity.

The reason for the sharp drop in productivity in some years is the occurrence of drought and heat, and the widespread spread of epiphytotia of various diseases. Therefore, creating barley varieties that are resistant to diseases, heat and drought is one of the urgent tasks of today, in order to ensure the uniformity of grain yield in dry lands.

The semi-arid regions of Jizzakh, Kashkadarya, Samarkand, Surkhandarya and Tashkent regions of our republic are the main regions where barley is grown.

RESULTS

Today, one of the urgent problems facing barley breeding is the creation and introduction of barley varieties that are resistant to early, heat, winter, heat, cloudiness and diseases, and provide two harvests in a year.

Soils of the experimental region and field. A characteristic feature of the Zarafshan Valley soil layer is the widespread distribution of gray soils. There are also meadow-swamp soil samples of gray soils. Formerly irrigated lands have a typical gray soil cover.

The mechanical composition of the soil is medium, heavy sand. Light-colored typical gray soils are found in the plains, grasslands and marshy soils are located on the banks of rivers and are used in irrigated agriculture. Sizot waters are 1-4 meters deep in the central part of the valley due to the influence of the Zarafshan River, and are less mineralized. In the mountain and sub-mountain region, seepage water reaches a depth of 10-20 meters, in some places it reaches 30-40 meters.

Table 1

Agrochemical characterization of experimental field soil

Layer, cm	*Hummus, %*	*General, %*			P_2O_5, mg/kg	*K_2O*	*pH water suction*	*Sum of absorbed bases, mg.eq / 100 g of soil*			*Absorption capacity for Ca^+, Mg^+, K^+, mg.eq/ 100 g of soil*
		N	*P*	*K*				*Ca^+*	Mg^+	*K^+*	
0 - 3 0	*1,20*	*0,14*	*0,27*	*2,27*	*4,6*	*209*	*7,1*	*9,40*	*3,2*	*0,80*	*13,40*
3 0 - 6 0	*0,79*	*0,06*	*0,17*	*2,16*	*17,6*	*187*	*7,4*	*9,69*	*3,3*	*0,65*	*13,64*

In 2020-2021, research on the topic under study was carried out in the experimental field of the "Farboma Select" scientific seed farm, located in the territory of Zarafshon MMTP, Jomboy district, Samarkand region. The soil of the experimental field is irrigated soil, the depth of seepage water is 2-2.5 meters, the meadow is gray soil, and the mechanical composition is medium sand.

70-80% of absorbed cations correspond to Sa2+, 14-17% to Mg2+ ion. 9-10% of the absorption capacity of grassland soils corresponds to K+ and Na+ ions. K+ ion is more abundant than Na+ ion.

For agrochemical characterization of the soils of the experimental field, soil samples were taken and analyzed from the plow layer (0-30 cm) and sub-plot layer (30-60 cm). The amount of humus in soil layers is 1.20; 0.79; total nitrogen 0.12; 0.06; total phosphorus 0.24; 0.17; total potassium 2.27; 2.16 percent, mobile phosphorus 4.6; 17.6; exchangeable potassium was 209-187 mg/kg, and decreasing cases of this amount were observed as it went down along the soil profile.

The environment of soil water absorption is almost neutral rN = 7.1 - 7.4. Soil absorption capacity is 13.4 - 13.6 mg. eq / 100 g of soil. 70.1% of absorbed cations corresponded to Sa2+, 23.9% to Mg2+, 6.0% to K+ cation. It was noted that the amount of absorbed bases increases as the soil subsoil deepens (Table 1).

Soil samples taken from 0-10, 10-20 cm layers were used in the analysis of the mechanical composition of the soils of the experimental field. The data in Table 1 showed that the soils of the experimental field were medium loam in terms of mechanical composition.

Mechanical composition of experimental field soils. The amount of physical fine particles in the upper 0-10 cm layer (<0.01 mm) was 40.9 percent on average, and 37.0 percent in the 10-20 cm layer. These indicators indicate that the mechanical composition of the soil is average sand. In addition, the large amount of turbidity in the soil in the 10-20 cm layer indicates that the soil contains a lot of humus, nitrogen and other elements.

The duration of the growing season in varieties and samples of winter barley. The growth period of the autumn apra plant is the most important biological characteristic of the species and variety in selection and it depends on the plant's response to various stresses, its ability to adapt to them, its genetic potential, and the duration of its development phases.

The study of varieties and collection samples shows that the duration of the plant growth period is an important indicator. Taking into account the soil and climate conditions of our research, the samples of the variety were divided into 3 groups: early, mid-season and late season.

The demand for early-yielding, disease- and pest-resistant barley varieties is increasing day by day in order to obtain two harvests in a year from agricultural crops. Therefore, the creation and introduction into production of tezpishar varieties of autumn bee with valuable economic biological properties for irrigated lands remains the main direction.

Creation of fast winter barley varieties is one of the most important problems of selection. The development of varieties with a short growing season can solve many problems in agriculture, including increasing productivity, increasing the efficiency of agriculture due to repeated cropping on the land that is empty of barley crops.

Productivity of quick-cooking varieties depends on their rapid development, rapid accumulation of dry matter, and efficient operation of the assimilation apparatus. One of the important areas of selection is the selection focused on the duration of the growing season. It is important to create quick-ripening winter barley varieties suitable for irrigated lands of Uzbekistan.

Table 2

Growing season of winter barley varieties and samples, (2020-2021 years)

T/r	The name of the species, origin	Growing period, day		
		2020 M±m	2021 M±m	Average M±m
1	Ixtiyor (St)	210,5	212,8	210,4
2	INBYT-HI-13	212,1	211,9	211,7
3	491stGSBSN-7	198,3	198.9	199
4	IBON-HI-1	200	199,4	199.1
5	IBON-W-11	200,5	199,3	199.2
6	3rdGSBYT-4	198,2	198.6	197.9
7	Kondrat	199,2	199,0	198.6
8	Temur	200,1	199	199.4
9	Mirzachol	200,5	201	200.7
10	Bolgali	203,2	202,5	202,4
11	Xonakoh	200,9	203,6	202.5
12	Ixtiyor	202,1	201,7	201,4
13	HM-55	200,1	199,8	199.4
14	HM-79	202,2	201,4	201,4
15	Novosadsky 520	203,5	202,6	202,8
16	Kizilkurgon	200.3	199,5	200,5
17	Mezon	201,2	200,2	200,7

18	HM-53	200,4	200,7	200,8
19	Mavlono	200,6	200,2	200,6
20	1stGSBSN-17	200,4	200,0	199,8
21	IBON-W-15	200,1	199,7	199,5
22	IBON- W-21	202,1	201,3	201,3
23	INBYT-HI-15	203,5	202,9	202,9
24	3rdGSBYT-2	202,9	202,6	202,3
25	K-561063	205,1	204,5	204,3
26	K-22845	205,4	204,2	204,5
27	K-92320	204,3	203,7	203,6
28	K-19985	205,5	204,2	204,4
29	INBYT-HI-35	202,9	202,6	202,3
30	491stGSBSN-10	180	182	183.3
31	491stGSBSN-11	200	199,4	199.1
32	491stGSBSN-12	200,5	199,3	199.2
33	IBON-HI-6	200.3	199,5	200,5
34	IBON-HI-23	201,2	200,2	200,7
34	IBON-HI-24	200,4	200,7	200,8
35	IBON-HI-25	200,6	200,2	200,6
36	3rdGSBYT-6	200,4	200,0	199,8
37	HM-93	200,1	199,7	199,5
38	1stGSBSN-20	202,1	201,3	201,3
39	1stGSBSN-28	203,5	202,9	202,9
40	1stGSBSN-36	202,9	202,6	202,3
41	1stGSBSN-44	205,1	204,5	204,3
42	INBYT-HI-49	212,1	211,9	211,7
43	3rdGSBYT-127	200,5	199,3	199.2
44	3rdGSBYT-32	198,2	198.6	197.9
45	3rdGSBYT-27	199,2	199,0	198.6
46	K-566244	200,1	199	199.4
EKF, day		3,4		

As a result of the research: - the gradation of early ripening of barley variety samples was as follows. Samples with early indications: INBYT-HI-13, 15, 35, 491stGSBSN-7, 10, 11, 12; IBON-HI-1, 6, 23, 24; IBON-W-11, 15, 21; Designated 3rdGSBYT-4, 6. (Table 2).

Many studies have shown that late maturing varieties have the potential to produce the highest yields.

In recent years, the reason for the increase in the level of disease damage to grain crops in our republic is the introduction of many different varieties from abroad into the irrigated areas of the republic, the expansion of the population of fungi that spread rust disease, the emergence of new diseases, and the lack of varieties resistant to rust disease. First degree diseases of barley: dark-brown spotting (helmintosporiasis), rhynchosporiosis, powdery mildew, striped spotting, net spotting disease in the fields irrigated with 10-50% atrophy of variety samples was noted.

Kondrat, Temur, Mirzachol, Bolgali, Khanaqokh, Ikhtiyor, NM-55, NM-79 were selected from among the samples.

Plant growth and lodging tolerance. The expansion of grain areas in irrigated lands remains an important task in modern selection, creation and production of barley varieties that are resistant to dormancy.

New varieties of barley created for irrigated areas of Uzbekistan are expected to be resistant to lodging. One of the main problems facing breeders of the world now is to create varieties resistant to dormancy. At present, it is of great importance to cross geographically distant forms with biologically diverse qualities of intervarietal hybridization in order to create new, high-yielding, high-quality barley varieties.

As a result of cross-breeding of geographically distant forms, productive genes formed in different places in plant genetics create a basis for the appearance of hybrid organisms. It is known that the interaction between genes changes under the influence of the conditions in which the plant is grown. In order to create high-yielding varieties, it is appropriate to involve forms with complex characteristics in crossbreeding.

DISCUSSION

Fall barley dormancy can often occur before milk ripening or even earlier. In this case, the plant will shade each other. As a result of dormancy, the slowing down of photosynthesis causes the grain to become stunted or small. Dormancy of winter barley during ripening period makes harvesting of grain much more difficult.

Lying down can also be caused by strong winds when it is raining. Strengthening the root system also plays a big role in increasing lodging resistance.

When lying down, the stem of the plant bends or breaks. Together with the loss of grain, the quality of the grain decreases and the development of various diseases. In the seeds of plants that lie down until the grain is fully ripe, a full grain does not form, the grain remains crushed. It becomes difficult to mow dormant plants. Lying plants create conditions for better development of diseases. Diseases and insects usually damage the dead stems. Even the grain may be very small or not at all.

Dormancy can be prevented by changing the structure of the stem and roots of the plant and making them stronger. The following can be taken into account when increasing resistance to lodging: - short, strong stem; - strong root system and good placement in the soil; - the stem is flexible and does not break when bent; - the resistance of the stem or root system to diseases and pests.

In selection, there is a negative correlation between stem height and lodging resistance.

During the conducted research, the studied variety samples were evaluated with average (51-70%), very high (over 90%) indicators of winter resistance in irrigated fields. The following Kondrat, Novosadsky 520, Kyzilkurgan, with a degree of hardiness (71-90%) and close to it (±10%), which is very winter-hardy,

Mezon, Mirzachol, Ikhtiyor, NM-53, NM-93, Mavlano samples were determined.

According to the plant height, the samples are classified as short (71-80 cm), medium (81-95 cm), medium high (96-110 cm), tall (111-125 cm) and very tall (126-140 cm). according to the list, it was rated with high (7 points) and very high (9 points) endurance with the characteristic of resistance to lying down. 1stGSBSN-17, 20, 28, 36, 44; IBON-W-11, 15, 21; IBON-HI-1, 6, 23, 24, 25; INBYT-HI-13, 15, 35, 49; 3rd GSBYT-2, 4, 6, 27, 32, 127 variety

samples were observed to be resistant to lodging and the selected variety samples are recommended to breeders as initial material for use in the future selection process (Table 3).

Table 3

Samples of winter barley varieties resistant to lodging, (2020-2021 years)

T/r	Name of specimens of the variety	Plant height, cm			Resistance to lying down, (points)
		2020M ±m	2021M ±m	Average M±m	
1	1stGSBSN-17	95,4	94,6	94,6	7
2	1stGSBSN- 20	85,2	84,7	84,5	9
3	1stGSBSN- 28	86,3	85,6	85,9	9
4	1stGSBSN- 36	88,1	87,6	87,5	8
5	1stGSBSN- 44	90,0	89,7	89,6	7
6	IBON-W-11	89,3	89,1	89,0	7
7	IBON-W- 15	91,2	90,8	90,5	7
8	IBON-W-21	94,3	93,7	93,5	7
9	IBON-HI-1	86,5	85,7	85,7	9
10	IBON-HI-6	90,2	89,5	89,5	7
11	IBON-HI-23	88,7	88,1	88,0	8
12	IBON-HI-24	90,2	91,3	90,1	7
13	IBON-HI-25	82,3	81,7	81,6	9
14	INBYT-HI-13	90,6	89,8	89,5	8
15	INBYT-HI-15	82,8	81,5	81,5	9
16	INBYT-HI-35	88,3	87,9	87,7	8
17	INBYT-HI-49	91,1	90,4	90,2	7
18	3rdGSBYT-2	94,5	93,7	93,7	7
19	3rdGSBYT-4	90,1	89,5	89,4	8
20	3rdGSBYT- 6	92,3	91,6	91,5	7
21	3rdGSBYT- 27	92,8	92,0	92,0	7
22	3rdGSBYT-32	94,6	93,7	93,6	7
23	3rdGSBYT-.127	84,8	83,6	83,8	8
EKF, cm		2,2			

Mirzachol, Khanaqokh, NM-55, NM-79 variety samples were distinguished by their high height and resistance to lodging. With the increase in the height of the plant, it was observed that the lodging of the plants increased in the samples of the variety. A decrease in yield was observed in all samples of the dormant variety.

During the study of samples of the Jaxon collection, 23 samples of varieties resistant to lodging were separated. When breeders create lodging-resistant, short-stemmed, intensive-type soft wheat varieties, the recorded varieties can be the initial material for selection.

Productivity indicators. The number of grains per ear is important in selection for productivity and is the main factor for high yield. K-561063, Mirzachol, K-22845, Temur, K-92320 variety samples according to the number of grains in the ear, grain weight in the ear K-561063, Mirzachol, K-22845, K-92320 variety samples, 1000 grain weight has a high indicator

the following samples K-22845, Ikhtiyor, K-19985 are valuable starting material. In the studied samples, the mass of grain obtained from 1m2 area was from 478 to 633 grams.

High grain mass was observed in the samples of the following varieties. Mirzachol (610 gr), K-22845 (618 gr), K-19985 (625 gr), Temur (614 gr), K-566244 (633 gr) samples yielded up to 155 grams higher than the standard and were selected, short-stemmed barley cultivars were observed to be more productive and moderately productive, but also resistant to lodging.

CONCLUSIONS

1. Selection achievements are determined by the creation of a new variety or hybrid. As a result of the introduction of new varieties in the cultivation of agricultural crops, economic efficiency indicators are improved. In the introduction of a new variety or hybrid, the additional yield obtained compared to the standard variety that was previously planted indicates the efficiency of the variety or hybrid. The results of many researches confirm that the productivity increased by 20-25% as a result of the use of new varieties and hybrids.
2. Creation of Tezpishar varieties of autumn barley is one of the most important problems of selection. Samples with early indications: INBYT-HI-13, 15, 35, 491stGSBSN-7, 10, 11, 12; IBON-HI-1, 6, 23, 24; IBONW-11, 15, 21; 3rdGSBYT-4, 6 varieties were selected.
3. 1st GSBSN-17, 20, 28, 36, 44 among the variety samples studied during the conducted research; IBON-W-11, 15, 21; IBON-HI-1, 6, 23, 24, 25; INBYT-HI-13, 15, 35, 49; 3rdGSBYT-2, 4, 6, 27, 32.127 variety samples were observed to be resistant to lodging and the selected variety samples are recommended to breeders as initial material for use in the future selection process.
4. High grain mass was observed in the samples of the following varieties. Mirzachol (610 gr), K-22845 (618 gr), K-19985 (625 gr), Temur (614 gr), K-566244 (633 gr) samples yielded up to 155 grams higher than the standard and were selected, short-stemmed barley cultivars were observed to be more productive and moderately productive, but also resistant to lodging.
5. In conclusion, as a result of the research, during the study of the collection variety samples, compared to the standard Ikhtiyor variety, the above isolated variety samples were selected as a starting source for selection in the creation of productive barley varieties and recommended to be used as starting material for scientific institutions engaged in barley selection.

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