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Comparative analysis of agrobiological traits of durum (*T. durum* Desf.) and bread wheat (*T. aestivum* L.) varieties in the Karabakh region

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Agrobiological features of new perspective durum wheat varieties "Maya", "Alliance" and bread wheat varieties "Leyla", "Start", "Janub", "Khamsa", "Almaz", "Oguz", "Vilash" created as a result of many years of research (2005-2020) of the Genetic Resources Institute (GRI) of ANAS and the Scientific Research Institute of Crop Husbandry (RICH) in the Karabakh region were compared. The varieties were characterized by high adaptability and potential productivity. Among them "Start" (patent № 00246), "Janub" (patent № 00274), "Leyla" (patent № 00305) and "Almaz" (patent № 00312) varieties of bread wheat, "Maya" (patent № 00250) and "Alliance" (patent № 00316) varieties of durum wheat were patented by the Agrarian Services Agency and regionalized. The studied varieties were analyzed for height, productivity and structural elements, resistance to rust diseases and adaptability in the competitive variety testing nursery. In the year of epiphytosis (2020), durum wheat varieties and "Almaz" and "Khamsa" bread wheat varieties were resistant to yellow rust. Significant differences were also observed in terms of productivity and structural elements. In addition, the new durum and bread wheat varieties were characterized by morphobiological and agronomic features and characteristics. Optimal cultivation technology of regionalized varieties, predecessors, fertilizer norms and sowing period were also given. It is recommended to cultivate new varieties in the irrigated plains and moisture-supplied foothills of the Karabakh region.

Keywords: *Durum wheat, bread wheat, yellow rust, brown rust, variety, productivity, resistance*

INTRODUCTION

To ensure the efficient use of arable land in the liberated areas, it is extremely important to create productive and resistant plant varieties to unfavorable environmental factors and to organize the seed production of varieties created in previous years. After the Second Karabakh War, one of the main tasks of biological and agrarian sciences was to create new, high-yielding intensive varieties suitable for local conditions and ensure their distribution among farmers through the efficient use of existing genetic resources.

Bread wheat (*T. aestivum* L.) and durum wheat (*T. durum* Desf.) are of special strategic importance in ensuring the economic security of the country. Since ancient times, durum wheat varieties have been cultivated in the plains and foothills of Azerbaijan, and bread wheat in mountainous areas, mainly in winter sowings (Mustafayev, 1973; Aliyev, 2006; Rustamov et al., 2020).

The main fund, production and other buildings of the Karabakh Scientific Research Base (SRB) of the Genetic Resources Institute were completely destroyed as a result of the Armenian aggression. Karabakh SRB, located in the former Aghdara region (Shikharkh settlement of Tartar region), functioned from 1950 to July 1989 as a world-renowned exemplary research base. The main activities of the base were the collection, study, efficient use of genetic resources of cereals, legumes, fodder, technical, fruit, berries, grapes,

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etc. plants, as well as agricultural animals in breeding, creation of new plant varieties and animal breeds, organization and dissemination of their initial breeding.

The territory of the liberated Karabakh region is divided into plains, foothills and mountainous parts, and the soil and climatic conditions are different. Therefore, it is very important to create varieties suitable for a wide range of soil and climatic conditions of the region (temperature, humidity, precipitation evaporation ratio, soil type, amount of humus, etc.), to select and distribute varieties that successfully pass production tests.

Taking into account the need of Azerbaijan for wheat and the urgency of restoring wheat fields in the liberated territories, new bread and durum wheat varieties with high adaptability to the soil and climatic conditions of the Karabakh and East Zangazur economic regions were created by scientists of the Genetic Resources Institute during 2005-2020. Their valuable economic indicators were compared and the initial seed production of selected varieties was organized. The initiated research and activities will be continued in the coming years at a faster pace and using all the opportunities of modern breeding.

MATERIALS AND METHODS

The researches were carried out in 2005-2020 in Buruj village, Tartar region, near the Karabakh Scientific Research Base of GEI, on a farm, under irrigation conditions. The experimental area is located in the northeastern foothills of the Lesser Caucasus - in the irrigated Karabakh plain, at an altitude of 190.0 m above sea level. The climate of the region is moderately warm, winters are mild and summers are dry and hot. In recent years, the climatic indicators of the region have differed sharply (Rustamov, 2019; Rustamov et al., 2020). Different generations of hybrid materials, regionalized and promising durum and bread wheat varieties were taken as research material. Experiments, phenological observations, assessment of productivity and structural elements, disease resistance were carried out following the relevant methodologies (Musayev et al., 2008; Duveiller et al., 2014). In hybrid and breeding nurseries, sowing was carried out by hand, and in control and competitive variety nurseries, sowing was carried out with a grain spreader in 2-4 repetitions with a sowing area of 50 m^2. The experiments were carried out in accordance with the stages of plant development; irrigation and feeding with mineral fertilizers in spring were fulfilled. All nurseries were assessed for leaf disease and pest infestation at the beginning of wax ripeness.

RESULTS AND DISCUSSION

The most effective way to increase grain production and meet the population's demand for food products through domestic production is to increase the complex resistance to biotic (disease, pests, plant density, etc.) and abiotic (salt, drought, frost, cold, etc.) factors, high productivity and creation of high-quality varieties, optimization of their elite and reproductive seed production. For this purpose, in recent decades the gene pool of durum and bread wheat has been enriched at the Genetic Resources Institute of ANAS through hybridization, expeditions and exchange. The genetic diversity of wheat in different soil-climatic conditions was evaluated for resistance to biotic and abiotic factors, productivity and grain quality in laboratory and field conditions, and initial breeding materials were created by conducting selection work.

As a result of the research, in recent years at the Genetic Resources Institute of ANAS new bread wheat varieties "Leyla", "Start", "Janub", "Khamsa", "Almaz", "Oguz", "Vilash" and durum wheat varieties "Maya" and "Alliance" which are distinguished by high potential, adaptive productivity and quality of grain were created. Among them “Start” (Certificate of Authorship № 00246), “Janub” (№ 00274), “Leyla” (№ 00305) and “Almaz” (№ 00312) varieties of bread wheat, “Maya” (№ 00250) and “Alliance” (№ 00316) varieties of durum wheat was regionalized by the Agrarian Services Agency with a patent certificate.

The studied regionalized and perspective varieties were evaluated for diseases resistance, dormancy, their productivity was determined and structural analyzes were carried out in the competitive variety testing (CVT) nursery (Table 1).

Table 1. Agrobiological indicators of the varieties studied in the competitive variety testing nursery (Karabakh SRB Tartar, 2020).

S/s, 2020	Catalog	Plant height, cm	Productive tillering	Spike			Productivity, c/ha	Standard deviation, ±c/ha
				length, cm	Number of seeds	Seed weight, g.		
1	Aran (St.)	112.7	6.1	10.2	49.5	2.01	64.0	0.0
2	Almaz	107.3	6.1	11.1	57.1	2.9	66.0	+2.0
3	Start	110.1	5.7	13.7	58.8	2.7	70.0	+6.0
5	Janub	108.7	6.0	9.3	61.7	2.8	70.0	+6.0
6	Leyla	94.4	5.6	10.5	55.7	2.45	54.0	-10.0
7	Khamsa	90.9	6.3	13.3	69.8	3.21	70.0	+6.0
8	v. *ferrugineum*	107.0	6.6	9.1	56.9	2.8	66.0	+2.0
9	TT 09214/3-7-2-1	114.0	6.0	11.2	62.1	3.04	68.0	+4.0
10	TT 09214/3-7-2-1 0815/2-2	116.3	5.0	11.6	61.7	2.9	74.0	+10.0
11	v. *lutescens x* v. *graecum*	83.8	6.0	9.8	55.0	2.0	56.0	-8.0
12	v. *lutescens x* v. *graecum*	82.6	5.9	10.2	61.1	2.3	64.0	0.0
13	Barakatli 95 (St.)	104.7	7.1	9.7	70.0	3.9	54.0	0.0
14	Maya	98.5	7.4	10.7	69.8	3.8	74.0	+20.0
15	Allians	104.9	8.4	11.3	78.4	4.9	60.0	+6.0

As can be seen from the table, the height indicators varied between 82.6-116.3 cm, "Khamsa" and fixed hybrid lines differed in short height. Significant differences were also observed in terms of productivity and its structural elements.

Infectious diseases (yellow and brown rust) of the studied varieties were studied in the competitive variety testing nursery. It should be noted that epiphytosis of yellow rust has been observed in the last year, and most of the varieties studied have been infected with this disease at one or another level. Only durum wheat varieties and bread wheat Almaz and Khamsa showed full resistance to yellow rust (Fig. 1).

30.8-69.0% of the studied varieties showed resistance to yellow and brown rust, 46.2-16.0% were fully sensitive (Fig. 1). According to the 3-years average productivity of the varieties studied in the competitive variety testing nursery, it can be said that the studied bread wheat varieties showed 1.2-17.4 c/ha higher results than the standard Aran variety. The productivity of Maya and Alliance durum wheat varieties was 6.3-8.6 c/ha higher than Barakatli 95 (Table 2).

As can be seen from Table 2, the productivity of new regionalized and promising (TT 09704/2-4-1-2, Start, Khamsa and var. *ferrugineum*) bread wheat varieties is much higher than the standard Aran variety.

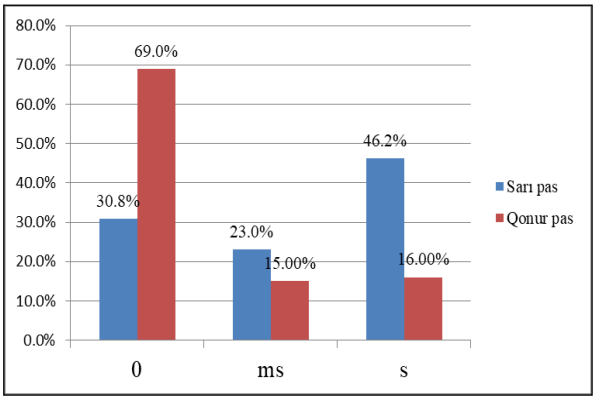

Fig. 1. Yellow and brown rust infection of cultivars studied at the CVT (Tartar, 2021)

The standard deviation indicates that the productivity of Almaz, TT 09704 / 2-4-1-2, Start, and Janub varieties are relatively stable. The average perennial productivity of "Maya" and "Alliance" (69.5±7.37 - 67.2±8.13) durum wheat varieties do not lag behind the new bread wheat varieties, except for Khamsa (74.7±8.2). Productivity stability in new durum wheat varieties is lower than in bread wheat varieties.

Table 2. 3-year productivity indicators of varieties studied in the competitive variety testing nursery in Karabakh SRB, Tartar, 2018-2020.

Variety, accession	Productivity, c/ha				Standard deviation, c/ha
	2018	2019	2020	Average, c/h	
Aran (Standard)	61.5	56.5	64.0	60.7±3.82	0.0
Almaz	68.5	66.5	66.0	67.0±1.0	+6.3
TT 09704/2-4-1-2	68.5	71.0	54.5	68.5±1.80	+7.8
Start	66.5	69.0	70.0	68.5±1.80	+7.8
Janub	64.5	66.0	70.0	66.8±2.84	+6.1
Leyla	62.0	59.5	54.0	58.5±4.09	-2.2
Khamsa	75.5	78.5	70.0	74.7±8.2	+14.0
v. ferrugineum	69.5	75.5	66.0	67.5±4.31	+6.8
Barakatli 95 (Standard)	62.6	66.0	54.0	60.9±6.19	0.0
Maya	61.0	73.5	74.0	69.5±7.37	+8.6
Allians	65.5	76.0	60.0	67.2±8.13	+6.3

Fig. 2. New durum and bread wheat varieties

The morphobiological and agronomic traits and characteristics of regionalized and promising bread and durum wheat varieties are given below:

"Start" bread wheat variety

Authors: Abdullayev A.M., Akparov Z.I., Talai J.M., Abbasov M.A., Shikhlinski H.M.

"Start" bread wheat variety was created by repeated individual selection in Karabakh SRB from a complex hybrid combination (TB 0815/2-2 [(TB Akhatsikhis Tsiteli Doli x 45319 Panonia) x 45319 Panonia] x AB 01090- (Sharbat sonora x Dwarf). The variety presented in the State Variety Testing in 2016, regionalized in 2019. Patent № 00246.

"Start" variety is of medium height (101-124.8 cm), has a high branching coefficient (3.2-3.6 pieces). It is resistant to lodging and medium ripening (224.3 days) in a high agronomic background. The leaves and spikelets are hairless, green, covered with a layer of wax. Spikes are thorn-shaped, white, seeds are dark red, the variety belongs to var. *lutescens*. Spike is long (11.6-12.6 cm) with medium dense (21.0-23.0 pieces). The spikelets are sparsely arranged on the spike axis. The number of grains per spike is 52.0-76.5, and the three-year average is 52.0. The 1000 seed weight is 43.8-45.5 g, the net weight is 792 g. The vitreousness of the grain is high (93.0%). The amount of protein in the grain is 12.2-15.0%, and the amount of gluten is up to 29.6%. The potential productivity of the Start variety is high - 76.5 c/ha. The three-year average yield in the competitive variety testing nursery was 66.2 c/ha, which is 5.2 c/ha more than the standard Aran variety (61.0 c/ha). The variety is medium resistant to yellow and brown rust.

"Janub" bread wheat variety

Authors: Abdullayev A.M., Akparov Z.İ., Talai C.M., Rustamov Kh.N., Abbasov M.A., Shikhlinski H.M., Morgunov A.İ., Sadigov H.B.

The "Janub" variety of bread wheat was created in the Karabakh SRB by repeated individual

selection from a complex hybrid [(Ulugbey x Mexican yarovaya line) x Sanzor 6] selected from international nurseries. It was submitted to the State Variety Testing in 2016 and regionalized in 2020. Patent № 00274.

"Janub" variety is of medium height (92.6-116.5 cm) with high branching. Resistant to lodging, semi-winter with medium maturity (210-218 days). The spike is cylindrical, long (9.4-14.0 cm) with medium density (19.0-23.0 pieces), white, seeds are dark red, belongs to var. *erythrospermum*. The number of grains per spike is 41.2-60.2, the three-year average is 52.2. The 1000 seed weight is 34.6-44.6 g, the net weight is 792 grams. The amount of protein in the grain is 13.6-14.2%, the amount of gluten is up to 34.0%. The potential productivity of the "Janub" variety is high - 67.2 c/ha. The three-year average yield in the competitive variety testing nursery was 63.2 c/ha, 4.0 c/ha more than Aran (59.2 c/ha).

"Leyla" bread wheat variety

Authors: Akparov Z.İ., Abbasov M.A., Sheykhzamanova F.A., Rzayeva S.P., Rustamov Kh.N., Sadigov H.B.

"Leyla" bread wheat variety was created at the Genetic Resources Institute of ANAS in 2009 by repeated individual selection from the genotype obtained from hybridization of bread wheat accessions (var. *ferrugineum* x var. *velutinum*) selected for complex economic valuable features. It was submitted to the State Variety Testing in 2015 and regionalized in 2021. Patent № 00305.

"Leyla" variety is of medium height (110-120 cm), semi-intensive type, with strong stem; highly resistant to lodging. Productive branches are high (5.0 pcs.), lifestyle is semi-winter, belongs to var. *lutescens*. The spike is straight, of medium length (9.5 cm), white-colored. In the spike, the spikelets are located in the middle density (D = 19-21 pieces). It is awnless. The seed is of medium length, large, hairy, and white. The potential productivity of the "Leyla" variety is high - 100-110 c/ha. In the competitive variety testing, the 3-year average yield was 105.3 c/ha, 28.7 c/ha higher than the Aran variety. In ecological tests conducted in Tartar and Gobustan conditions, more than 2.0-3.7 t/ha of products were obtained from regionalized varieties. The number of grains per spike is 62.7, the 1000 seed weight is 53.4 g, the net weight is 810.0 g. The amount of protein in the grain is 13.8%, and gluten content is 26.6-32%. Moderately resistant to rust and powdery mildew.

"Almaz" bread wheat variety

Authors: Abdullayev A.M., Akparov Z.İ., Rustamov Kh.N., Abbasov M.A., Rafiyev E.B., Mehdiyev H.M., Gurbanov F.J.

The "Almaz" variety was created by repeated individual selection from a complex hybrid combination (Akhaltsikis Tsiteli Doli, Panonia, Sharbat Sonora and Dwarf varieties) in Karabakh SRB. The variety was submitted to the State Variety Testing in 2018, regionalized in 2021. Patent № 00312.

"Almaz" variety is of medium height (92.8-116.5 cm), resistant to lodging, has a high coefficient of branching (3.4-4.7 pieces), late maturing. In the branching phase, the leaves are hairless, green, free of wax. The spike is cylindrical, white, seed are dark red, belongs to the var. *lutescens*. The spike is long (10.0-12.0 cm), sparse (D = 19.0-23.0). The potential productivity of the "Almaz" variety was 66.5-68.5 c/ha. The average productivity in Nakhchivan SVTC was 37.0 c/ha, in Aghdam SVTC 45.0 c/ha, in Salyan SVTC 42.5 c/ha. The number of grains per spike is 48.7-57.0, the three-year average is 52.2. The 1000 seed weight is 41.8-49.0 g, the amount of protein in the grain can increase up to 15.2-17.3% and the amount of gluten can increase up to 45.0%. Resistant to yellow and brown rust, and powdery mildew.

"Khamsa" bread wheat variety

Authors: Akparov Z.İ., Abdullayev A.M., Rustamov Kh.N., Abbasov M.A., Shikhlinski H.M., Sadigov H.B.

"Khamsa" variety was established in Absheron SRB of the Genetic Resources Institute of ANAS by repeated individual selection from the genotype obtained as a result of the hybridization of bread wheat samples (var. *erythrospermum* x var. *albidum*) selected for complex economic valuable features and submitted to the State variety testing in 2019.

"Khamsa" variety is of medium height (95.0-110.0 cm), intensive type, has a strong stem, highly resistant to lodging. The branching is high, the lifestyle is semi-winter. Spike is straight, long (12.5-13.3), with white colour, has awns, belongs to var. *erythrospermum*. The seed is of medium length, large, red. The potential productivity of the "Khamsa" variety is high 80-90 c/ha. The number

of grains per spike is 48.7-57.0, the three-year average is 52.2. The 1000 seed weight is 41.8-49.0 g, the amount of protein in the grain can increase up to 15.2-17.3% and the amount of gluten can increase up to 45.0%. During the years of research, the variety showed high resistance to yellow, brown rust, and powdery mildew.

"Vilash" bread wheat variety

Authors: Akparov Z.İ., Abdullayev A.M. Abbasov M.A, Rustamov Kh.N., Mehdiyev H.M., Sadigov H.B.

"Vilash" variety was created in Karabakh SRB by repeated individual selection from a complex hybrid combination. In 2019, it was submitted to the State Variety Testing.

"Vilash" variety is of medium height (114.0-118.0 cm), resistant to lodging, has a high branching coefficient, and is late maturing. In the branching phase, the leaves are hairless, green, covered with a weak wax layer. The spikelets are of medium density on the spike axis. The spike of the "Vilesh" variety is cylindrical in shape, white, seeds are dark red, belongs to the var. *lutescens*. The spike is long (11.6-12.6 cm), sparse (D = 22.4-24.2). The number of grains per spike is 48.0-62.1, the three-year average is 56.0. The 1000 seed weight is 40.8-44.5 g. The vitreousness of the grain is high (71.0-100.0%). The amount of protein in the grain can rise up to 11.8-14.9%, gluten - up to 40.0%. The potential productivity of the "Vilash" variety was around 73.0 c/ha. According to the results of the competitive variety testing nursery, the three-year average yield was 64.2 c/ha (62.0; 57.7; 73.0 c/ha), which is 14.7 centners higher than the standard Aran variety (49.5 c/ha).

"Maya" durum wheat variety

Authors: Akparov Z.İ., Abbasov M.A., Sheykhzamanova F.A., Rzayeva S.P., Jafarova R.H., Rustamov Kh.N., Sadigov H.B.

Semi-winter durum wheat variety Maya was established in Absheron SRB in 2009 by re-selection from hybridization of promising durum wheat accessions (var. *melanopus* x var. *horeiforme*). It was submitted to the State Variety Testing in 2015 and regionalized in 2019. Patent № 00250.

Maya variety is a semi-intensive type, medium height (110.0-125.0 cm), highly resistant to lodging. Branches are high (5-6 pieces), semi-winter type, medium ripening. The seedlings are dark green, covered with short hairs. The spike is cylindrical, has awns, of medium length (9.0-10.0 cm), and is dense (D=20.0-22.0), belongs to var. *leucomelan*. Spikelets of medium length are lanceolate and white. The veins are well defined. The awns are 1.5 times longer than the spike, parallel to the spike, slightly scattered, toothless-smooth, black in color, shed when ripe. It is easy to beat. The grains are very large, elongated, white, the vitreousness is 60-98%. Potential productivity is high - 80-90 c/ha, 1000 seed weight is 64.8 g, the net weight is 830.0 g, the number of grains in the main spike is 50.0-51.0. The overall baking quality is low. The amount of protein in the grain is 12-14%, and the amount of gluten is between 24.0-30.0%. Due to the high productive branching (5-6 units), productivity is high when 3.5-4.0 million seeds are sown per hectare. The variety is middle tolerant to winter and drought, tolerant to high temperature, and highly resistant to rust diseases.

"Alliance" durum wheat variety

Authors: Akparov Z.İ., Abdullayev A.M., Rustamov Kh.N., Abbasov M.A., Shikhlinski H.M., Sadigov H.B.

The "Alliance" durum wheat variety was created by repeated individual selection from a complex hybrid combination introduced from CIMMYT. Submitted to the State Variety Testing in 2018, regionalized in 2021. Patent № 00316.

"Alliance" durum wheat variety is of medium height (103.7-109.6 cm), resistant to lodging, and has a high branching coefficient (3.5-4.2 units). In the branching phase, the leaves are light green, hairless, free of wax. Spike is white, cylindrical, has medium-length (9.0-10.0 cm) and density (D = 24.6-26.6 pieces), the seeds are white, belongs to the var. *leucomelan*.

The potential productivity of "Alliance" variety is 76.0 c/ha. Productivity was 36.9 c/ha in Nakhchivan SVTC and 36.0 c/ha in Ismayilli SVTC. The number of grains per spike was 61.4-66.4, the three-year average was 60.4, the 1000 seed weight was 42.0-53.6 g, the amount of protein in the grain was 11.0-15.0%, the amount of wet gluten was 24.2-31.0%. "Alliance" is highly resistant to yellow, brown, and stem rust, and to powdery mildew.

The new varieties are mainly semi-intensive and intensive types, requiring high agronomic background. Cotton and other inter-row crops are more effective predecessors under irrigation conditions.

To get a high and quality product, 90-100 kg/ha of nitrogen (at sowing time and as feeding), 60-90 kg/ha of phosphorus and 50-60 kg/ha of potassium fertilizers should be given. The optimal sowing period is the I-II decade of October. It is recommended to cultivate new varieties in irrigated lowlands and foothills provided with moisture.

CONCLUSIONS

In recent years, at the Karabakh SRB, the resistance to diseases and pests, morphobiological and agronomic traits and characteristics, productivity indicators of bread and durum wheat varieties were studied, and new durum and bread wheat varieties of semi-intensive and intensive type were created.

"Khamsa" and stable hybrid lines are fully suitable for cultivation in a modern, intensive type, high agronomic background. The cultivation of these varieties in artificial rainfall backgrounds with high fertilizer doses is more effective.

The average perennial productivity of the new regionalized “Maya” and “Alliance” durum wheat varieties does not lag behind the bread wheat varieties. The standard deviation indicates that the yield stability of new durum wheat varieties is lower than that of bread wheat varieties.

Seeds of 5 bread (Leyla, Start, Janub, Almaz, Khamsa), 2 durum wheat (Maya, Alliance) varieties submitted to the Agrarian Services Agency under the Ministry of Agriculture of the Republic of Azerbaijan, were multiplied. Seed production of “Maya” durum wheat, “Start” and “Janub” bread wheat varieties were organized.

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Bərk (*T.durum* Desf.) və yumşaq buğda (*T.aestivum* L.) sortlarının aqrobioloji göstəricilərinin Qarabağ bölgəsində müqayisəli təhlili

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Qarabağ bölgəsində AMEA Genetik Ehtiyatlar İnstitutu (GEİ) və Əkinçilik Elmi Tədqiqat İnstitutunda (ƏETİ) çoxillik tədqiqatlarla (2005-2020-ci illər) aparılan seleksiya işləri nəticəsində yaradılmış yeni perspektiv buğda sortlarının aqrobioloji xüsusiyyətləri müqayisəli tədqiq olunmuşdur. Yüksək adaptivliyə malik və potensial məhsuldarlığı ilə fərqlənən "Leyla", "Start", "Cənub", "Xəmsə", "Almaz", "Oğuz", "Viləş" yumşaq buğda və "Maya", "Alyans" bərk buğda sortları yaradılmışdır. Onlardan yumşaq buğdanın "Start" (patent № 00246), "Cənub" (patent № 00274), "Leyla" (patent № 00305) və "Almaz" (patent № 00312) sortları, bərk buğdanın "Maya" (patent № 00250) və "Alyans" (patent № 00316) sortlarına Aqrar Xidmətlər Agentliyi tərəfindən patent verilərək rayonlaşdırılmışdır. Müsabiqəli sort sınağı pitomnikində tədqiq olunan sortların boy göstəriciləri, məhsuldarlığı və onun struktur elementləri, pas xəstəliklərinə davamlılığı və adaptivliyi analiz edilmişdir. Epifitotiya ilində (2020-ci il) bərk buğda sortları və "Almaz" və "Xəmsə" yumşaq buğda sortları sarı pasa davamlı olmuşlar. Məhsuldarlığa və onun struktur elementlərinə görə də önəmli fərq müşahidə edilmişdir. Bundan başqa yeni bərk və yumşaq buğda sortları morfobioloji və aqronomik əlamət və xüsusiyyətlərinə görə səciyyələndirilmişdir. Rayonlaşdırılmış sortların optimal becərilmə texnologiyası, sələfləri, gübrə normaları və səpin müddəti verilmişdir. Yeni sortların Qarabağ bölgəsinin suvarılan düzən və nəmliklə təmin olunan dağətəyi bölgələrində becərilməsi tövsiyə olunur.

Açar sözlər: *Bərk buğda, yumşaq buğda, sarı pas, qonur pas, sort, məhsuldarlıq, davamlılıq*

Сравнительный анализ агробиологических показателей новых сортов твердой (*T. durum* Desf.) и мягкой (*T. aestivum* L.) пшеницы в Карабахском регионе

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В Карабахском регионе было проведено сравнительное изучение агробиологических показателей новых сортов твердой и мягкой пшеницы, созданных в результате многолетних (2005-2020 гг.) исследований в Институте генетических ресурсов НАНА и НИИ Земледелия. Были созданы отличающиеся потенциальной продуктивностью и высокой адаптивностью сорта мягкой пшеницы «Лейла», «Старт», «Джануб», «Хамса», «Алмаз», «Огуз» и «Вилаш», а также сорта твёрдой пшеницы «Майя» и «Альянс». Агентством аграрных услуг были выданы патенты и районизированы сорта мягкой пшеницы «Старт» (патент № 00246), «Джануб» (патент № 00274), «Лейла» (патент № 00305) и «Алмаз» (патент № 00312), а также сорта твердой пшеницы «Майя» (патент № 00250) и «Альянс» (патент № 00316). В питомнике конкурсного сортоиспытатания были проанализированы показатели

высоты растений, урожайность и ее структурные элементы, устойчивость к желтой и бурой ржавчине и адаптивность. В эпифитотийном 2020 году сорта твердой пшеницы, а также сорта мягкой пшеницы «Алмаз» и «Хамса» оказались устойчивыми к желтой ржавчине. Значительные различия наблюдались также по урожайности и ее структурным элементам. Кроме того, проанализированы морфо-биологические и агрономические признаки и свойства новых сортов твердой и мягкой пшеницы. Приведены оптимальные агротехнические приёмы выращивания, предшественники, нормы удобрений и сроки посева новых сортов. Новые сорта рекомендованы для выращивания на орошаемых равнинных и в обеспеченных влагой предгорных богарных условиях Карабахского региона.

Ключевые слова: *Пшеница твёрдая, пшеница мягкая, жёлтая ржавчина, бурая ржавчина, сорт, урожайность, устойчивость*