GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 13, Issue 8 August (2025)

CREATION OF THE DROUGHT-RESISTANT WINTER WHEAT VARIETY "NURAFSHON" WITH HIGH YIELD AND GRAIN QUALITY

Nurbekov U. A.
Researcher, Institute of Plant Genetic Resources

ABSTRACT

The article highlights the growing demand for grain products under the conditions of the republic, as well as the impact of climatic and soil characteristics on wheat productivity and grain quality. In particular, it analyzes the negative changes observed in the yield and quality indicators of soft wheat under high temperatures and moisture deficiency. Based on the research results, the necessity of developing wheat varieties that are resistant to rust diseases, tolerant to heat and drought, and characterized by high yield and quality has been emphasized. In addition, the article presents the biological and agrobiological description, economic traits, productivity indicators, and fertilization requirements of the "Nurafshon" variety created by the Institute of Plant Genetic Resources. The conclusion substantiates the drought, heat, and rust resistance of the "Nurafshon" variety, as well as its recommendation for cultivation in various regions of the republic.

Keywords: Soft wheat, Nurafshon variety, rust diseases, yield, grain quality, drought, heat tolerance, breeding, agrobiological characteristics.

INTRODUCTION

The growing demand of the population of the republic for grain products has led to an increase in the area of cereal crops on irrigated and fallow lands to about 1.3 million hectares. The soil and climatic conditions of the republic's regions, with their hot and dry climate, sharply differ from those of other countries, and a significant increase in average air temperatures in the middle of the spring months and low rainfall have a negative impact on grain yield and grain quality indicators.

The formation and development of soft wheat grain (flowering, milk, wax ripening phases) in local conditions coincide with a period of increased air temperature and decreased humidity. Such conditions have a negative impact on the yield of grain crops and grain quality. Pollination and fertilization processes are slowed down under the influence of high air temperatures. Grain quality indicators include; The protein content and gluten viscosity decrease and negatively affect the breading properties. In conditions of high air temperature and low soil moisture, it is effective to use early maturing, high-yielding and heat-resistant varieties of soft wheat. In addition, although the volume of grain production has increased today, the damage caused by fungal diseases to the cultivated crop is also increasing. In this regard, due to the fact that in the years when epiphytotia of yellow and brown rust diseases are widespread, up to 30 percent of the yield is lost, and a large amount of money is spent on fungicides used in chemical control, it is urgent to create wheat varieties that are resistant to fungal diseases.

RESEARCH RESULTS

In the world, breeding scientists are intensively conducting selection research to create varieties resistant to rust diseases and heat, first of all, paying great attention to the selection of initial sources and creating varieties based on them. Based on these initial sources, varieties with complex characteristics, adapted to climatic conditions, resistant to rust diseases, heat and high grain quality are being created and introduced into production. However, the rapid change of new aggressive strains of rust diseases and global climate change, in particular due to the warming of air temperatures, require further intensification of selection research in this area. This, in turn, will lead to a decrease in the number of new virulent strains of yellow rust in natural conditions.

The "Nurafshon" variety was created by the Research Institute of Plant Genetic Resources and has been included in the State Register of Promising Varieties for Autumn Sowing in the Irrigated Lands of the Andijan, Fergana and Tashkent Regions of the Republic since 2024.

Origin: Created by single selection from a hybrid combination of Mannon (America) x Umanka (Russia).

Biological characteristics of the variety. Erythrospermum (Erythrospermum) belongs to the genus Erythrospermum, the biological life cycle is dioecious, the spike is pyramidal, red in color, the spike length is 10-11 cm, the number of spikelets per spike is 18-20, the spikelets are located in an average density, the number of grains per spike is 52-54, the axil is branched, red in color.

The ear shell is hairless, ovoid, 12-15 mm long, 4-5 mm wide, the shoulder is straight and slightly raised, the ear tip is slightly curved. The grain is red, oblong, medium-sized, shiny, does not fall apart, 1000-grain weight 42.8-43.6 g, grain bulk density 809-817 g/l. The grain contains 14.2-14.7% protein, 32.0% gluten, 81.3% gloss, good baking quality.

Valuable economic characteristics and properties of the Nurafshon variety

Indicators	Unit of measurement	Khisorak			Average	Krasnodar-99			Average
		2015	2016	2017		2015	2016	2017	
Yield at standard moisture %)	s/ga	73,2	73.8	74,3	73.7	64,8	63.7	65.4	64.6
Agroecological variety test	s/ga	73.6	73.6	75.2	74.1	65.2	67.6	64.9	65.9
Grain nature	g/l	810	809	817	812	802	804	807	804
1000 grain weight	g	43.6	43,1	42,8	43.1	40.1	40.5	39,7	40.1
Grain luster	%	82	80	82	81.3	77.2	78.4	76.8	77.4
Gluten	%	31.6	32.4	32.1	32.0	29.8	28.7	29.6	29.3
Protein	%	14.7	14.2	14.3	14.4	13.4	13.5	12.7	13.2
Ripe date	Kun	224	226	225	225	230	232	231	231
Plant height	sm	99.2	97.9	98.1	98.4	92,1	90.5	89.4	90.6
Collection coefficient	Dona	4.4	4.6	4.8	4.6	4.6	4.2	3.9	4.2
Number of grains per ear	Dona	55	53	54	54	47	45	46	46

Agrobiological characteristics. Plant height 97.9-99.2 cm, strong, resistant to lodging, leaves of medium length, light green, hairless. Good bunching, straight stem. Mid-ripening, ripens 3-4 days earlier than the Krasnodar-99 variety. Resistant to drought, spring frosts, resistant to yellow and brown rust diseases. Yield 72-74 t / ha. In the Fergana region, 68-71 t / ha were harvested, in the Kashkadarya region 65-67 t / ha. Sowing rate. Determined at the rate of 4.0-4.5 million. germinating seeds per hectare. The sowing period is the first ten days of October. Feeding is carried out before plowing with 90 kg of pure phosphorus and 60 kg of potassium fertilizers per hectare, in early spring (March) during the first feeding period, 90 kg, the second time during the tillering period - 100 kg, and during heading - 50 kg of nitrogen fertilizers.

Conclusion. In the hybrid combinations involving the varieties "Mannon" and "Krasnodar-99", only dominance was observed in terms of traits, and it was concluded that the use of the "Mannon" variety and the "Krasnodar-99" variety in crossbreeding with other geographically distant forms is more effective than other varieties. Based on the study of valuable biological and economic characteristics and properties, the Nurafshon variety of soft winter wheat was created, resistant to drought, heat, rust diseases, and with high productivity traits. Growing the Nurafshon variety of soft wheat in irrigated areas allows for an additional yield of 10-13 t/ha and a profitability of 30-35 percent. The Nurafshon variety, which is resistant to drought, heat, and rust diseases, is recommended for planting in the southern regions of Kashkadarya and Surkhandarya regions, as well as in the Samarkand, Syrdarya, Jizzakh, Tashkent, and Fergana regions, where rust diseases can develop.

REFERENCES

1. Dilmurodov Sh.D., Boysunov N.B. O‘zbekistonning janubiy hududlarida boshaqli don ekinlari seleksiyasi, urug‘chiligi va yetishtirish agrotexnologiyalarining holati va rivojlantirish istiqbollari. Xalqaro ilmiy-amaliy konferinsiya. Qarshi, 14-15 may 2018 yil. B 47-48.
2. Alenin, P.G. Produksionnыy potensial zernovыx, zernobobovыx, kormovыx i lekarstvennыx kultur i sovershenstvovanie texnologii ix vozdelыvaniya v lesostepi Srednego Povoljya: monografiya / P.G. Alenin, A.N. Kshnikatkina. – Penza, 2012. – S. 265.
3. Baboev S.K., Turakulov X.S., Xasanov B.A. Genы ustoychivosti pshenisы k jeltoy rjavchine i rol epifitotiy v poyavlenii novыx ras// Genetika, 2014. Tom 50. № 3. –C. 1-7.