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DEVELOPING OF ULTRA EARLY MATURITY SPRING VARIETIES OF BREAD WHEAT FOR SOWING IN THE PLAIN AND STEPPE ZONES OF RAINFED LANDS OF UZBEKISTAN

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Abstract:

The article presents the results of scientific research on determining the duration of the vegetation period of Bread wheat varieties in the climatic conditions of Plain and Steppe-hill zones of the Rainfed areas. The studies evaluated early spring, spring varieties and variety samples, new lines of Bread wheat. Also, recommendations are given on the use of these varieties and lines as a source for developing new varieties and lines of wheat resistant to early maturity, drought and heat.

Keywords: Rainfed lands, ultra-early maturity, Bread wheat, variety, lines, early maturity, vegetation period, drought and heat resistance, germination-maturity, heading, weather conditions.

INTRODUCTION. Bread wheat varieties planted in the arable regions of Uzbekistan have been severely affected by extreme drought and heat caused by global climate change in recent years, and low grain yields are observed.

This is especially true in the plains and steppe regions of arable lands, where low rainfall (average annual rainfall is 200-250 mm) is the cause of drought. Therefore, it is necessary to create ultra-early maturity spring varieties of bread wheat that intensively use natural soil moisture and productivity in a short period of time for planting (in the spring months when there is sufficient soil moisture).

Global climate change, rising air temperatures, drought, and extreme soil-climatic conditions in arable lands require scientific research to create ultra-early maturing spring bread wheat varieties that are resistant to biotic and abiotic stresses, with high grain quality and yield.

The duration of vegetation of plants in arable lands in the spring-summer season under drought and heat conditions determines the formation of valuable economic traits and characteristics [6, 4, 5]. The duration of the sowing-germination period in arable lands of Uzbekistan depends on the amount of moisture in the soil and the temperature regime. The length of the growing season for wheat sown in the fall depends on whether germination occurs in the fall, winter, or spring.

High air temperatures and low relative humidity lead to simultaneous ripening of all varieties. However, when the weather conditions are hot and dry, and drought occurs, it is possible to accurately characterize varieties by the length of the growing season, depending on the wheat heading phase [2].

In Uzbekistan, bread wheat varieties under drought conditions may experience severe drought conditions during the heading-ripening period. This will determine how high the variety is in terms of drought tolerance. According to many researchers [3, 7], drought-tolerant varieties have a shorter heading-ripening period than drought-intolerant varieties. Bread wheat varieties differ from each other in the length of the growing season under drought conditions [1].

MATERIAL AND METHODS. As a result of scientific research conducted in 2024, samples and lines of soft wheat varieties were studied according to the duration of the growing season, and ultra-ripening and early-ripening varieties and lines were evaluated and selected.

In 2024, a total of 1455 varieties and varietal samples and lists, including 275 local and hybrids selected from the collection nursery, were brought from the international organization ICARDA 2I WWIP- 2022-2023 90 from the 30th FAWWON-SA nursery, 300 from the 3rd HT&DTSBWON nursery, 115 from the 31st FAWWON-SA nursery and 30 from the 25th IWWYT-SA nursery - a total of 810 soft wheat variety samples and 33 perennial wheat variety samples, 105 G1-G6 hybrid lists in the Hybrids nursery, 50 from the 2nd year selection (SP-2) nursery and 225 local ones - a total of 275 varieties and lines, 60 and 95 local varieties in the 24th IWWYT-SA nursery - a total of 155 varieties and lines, 41 new varieties in the Initial Variety Testing (IVT) nursery, 36 regionalized and new varieties in the Competitive Variety Testing (CVT) nursery were planted and studied.

The duration of the growing season of new bread wheat varieties intended for planting in the fallow areas in the experimental plots was studied and evaluated for early maturity. In the competitive variety testing field, the duration of the growing season of new bread wheat varieties and lines was analyzed, and ultra-early and early-maturing varieties and lines were selected.

RESULTS AND ANALYSIS. During the research, the germination of the variety samples and lines occurred on December 22, 2023, and the tillering phase occurred on February 15, 2024. It was determined that the growing season

for varieties and lines was 168-178 days. The varieties and lines were studied in comparison with the Tezpishar variety (standard), and early-maturing lines were isolated. Accordingly, the growing season (germination-maturation) of the Tezpishar variety was 168 days.

Bread wheat varieties are divided into winter, durum and spring varieties according to their biological life cycle. Although winter varieties have a long growing season and high winter and cold resistance, they are prone to damage by heat and drought, but their grain yield is low. Also, it was found that winter and facultative varieties are severely damaged by adverse factors of the external environment, i.e., heat, severe drought conditions, and various fungal diseases, including yellow rust.

Research has proven that biological spring wheat varieties, when planted in early spring, use soil fertility and moisture at a high level, and give a high-quality and high yield due to the ability to fully form vegetative and generative organs during a short growth period.

When the biological lifestyle of the studied varieties and lines was studied during the research, it became known that the main varieties and samples belong to the biological spring wheat group.

Field experiments for the study were sown in the third decade of October 2023, and full germination was determined on December 22. It was found that the germination-ripening period in new varieties and rows planted in the competitive variety testing area was 160-178 days. The Tezpishar variety, which was taken as a standard for the early maturity variety samples, had an heading date of 01.05. The germination-ripening period was 168 days, and the germination-ripening period of the varieties Istiklol-6, Noshkent, Kyzildon, and Grekum-2023, which are currently planted in large areas, was 171-176 days, and it was found that they ripen 7-8 days later than the standard variety. In studies, mid-ripening and late-ripening varieties in terms of the duration of the growing season, such as Grekum-2023, Otb.-21/2022-SP-1-835/2021, and SP-1/602/2021, had a growing season of up to 177 days.

In addition, it was found that in the new lines studied in the RNS, such as SP-2/65/2023SP-1/382/2021earlyripe, KP-76/2023SP-1/447/2021, the heading phase was observed 3-4 days earlier than the Tezpishar variety, but the germination-ripening period was the same as the standard, i.e. 168 days. Also, during the studies, the new variety Erythrospermum-2021 (SP-2/21/2023) had a heading phase 14 days earlier than the Tezpishar variety, and the germination-ripening period was 8-10 days shorter than the standard (160 days). This new variety is spring in terms of its biological life cycle and was selected as a variety with ultra-early ripening properties of bread wheat on rainfed lands (table).

As a result of scientific research, it was found that in rainfed lands, ultra-early and early-maturing varieties and lines of soft wheat passed the grain filling-ripening period, taking advantage of favorable climatic conditions, without being damaged by drought and heat.

In the years of research, it was proven that the moderate weather conditions in the spring months, followed by a sudden strong warming of the weather during the heading-ripening period, led to the grain filling period in early-maturing varieties passing earlier than in late-maturing varieties, and this had a positive effect on grain yield.

As a result of research, ultra-early and early-maturing and mid-maturing new varieties and lines were selected as the initial source for creating early-maturing varieties for rainfed lands.

Assessment of the growth period and early maturity of Bread wheat varieties and lines at the Competitive Variety Testing nursery (GallaAral, 2024).

№	**Varieties and lines**	Biological lifestyle	Vegetation period			
			Emergence day	Heading day	Maturity day	Emergence-maturity, days
1.	Tezpishar (st.)	winter	22.12.23.	01.05.24.	08.06.24.	168
2.	Istiklol-6	winter	22.12.23	07.05.24.	15.06.24.	175
3.	Noshkent	spring	22.12.23	07.05.24.	11.06.24	171
4.	Kizildon	winter	22.12.23	06.05.24.	11.06.24.	171
5.	Grekum-2023	winter	22.12.23	14.05.24.	16.06.24.	176
6.	SP-1/744/2021	facultative	22.12.23	02.05.24.	10.06.24.	170
7.	SP-1/602/2021	spring	22.12.23	02.05.24.	17.06.24.	177
8.	KSI-10/2023PSI-2020/6	spring	22.12.23	12.05.24.	17.06.24.	177
9.	KSI-16/2023KP-26/2020	facultative	22.12.23	13.05.24.	17.06.24.	177
10.	Otb.-21/2022-SP-1-835/2021	spring	22.12.23	15.05.24.	18.06.24.	178
11.	КП2021/82(Semurg x Ok bygday)	spring	22.12.23	02.05.24.	15.06.24.	175
12.	KP-70/2023kp-2020/98good till	spring	22.12.23	14.05.24.	14.06.24.	174
13.	Kp-76/2023SP-1/447/2021	spring	22.12.23	29.04.24.	08.06.24.	168
14.	KP-88/2023SP-1/872/2021	spring	22.12.23	29.04.24.	12.06.24.	172
15.	Eritrospermum-2021 (SP-2/21/2023)	spring	22.12.23	**17.04.24.**	**01.06.24.**	160

16.	SP-2/56/2023SP-1/907/2021soogood	spring	22.12.23	15.05.24.	16.06.24.	176
17.	SP-2/62/2023SP-1/288/2021	spring	22.12.23	10.05.24.	12.06.24.	172
18.	SP-2/65/2023SP-1/382/2021earlyripe	spring	22.12.23	29.04.24.	08.06.24.	168

CONCLUSION. As a result of the research, it was found that the new varieties and lines studied at the Competitive Variety Testing nursery had early ripening characteristics in lines with biological spring.

The results of this study indicate the effectiveness of using biological spring bread wheat variety samples and lines as initial sources in creating ultra-early ripening, heat and drought-resistant, high-grain and technological quality varieties of spring bread wheat for planting in Central Asia, including the rainfed regions of Uzbekistan.

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