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THE INFLUENCE OF TEMPERATURE ON THE QUALITY OF DURUM WHEAT GRAIN

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Abstract:

Globally, in 2019-2020, the leading countries in the cultivation of durum wheat will be Italy, Spain, the USA, Russia, Greece, China and Kazakhstan. The yield of durum wheat affects the quality of grain due to the fact that in recent years, as a result of sharp climate changes, the air temperature on Earth has risen to 1-20C. It is also important to create new varieties in the world with high rates of ripening, yield and grain quality, adapted to different climatic conditions.

Keywords: Durum Wheat, Southern Region, Protein, Gluten, IDK, Glassiness, Air Temperature.

INTRODUCTION.

At present, along with the yield of varieties, the demand for grain quality is high for the cultivation of durum wheat in the irrigated areas of the country. New varieties must fully meet the demand for pasta and confectionery. This requires special attention to the grain quality of the sample and ridges studied in the selection work in the creation of new varieties of durum wheat [1].

According to the results of a study conducted for the 2020 harvest in Kashkadarya and Surkhandarya regions, which are the southern regions of the country, in 2019 in Kashkadarya region in the germination phase of varieties and ridges, the average temperature in October was 16.7 °C and in Surkhandarya region 18.1 °C was found to be ti. In the conditions of Kashkadarya region in January 2020, the average temperature was 4.7 °C in the 1st decade, -0.7 °C in the 2nd decade and 3.6 °C in the 3rd decade, with an average of 2.5°C. In the conditions of Surkhandarya region in January 2020 in the 1st decade was 5.7 °C, in the 2nd decade 2.4 °C and in the 3rd decade 5 °C and averaged 4.4 °C (Table 1).

The analysis of air temperature in the ripening phase of varieties and ridges in Surkhandarya region revealed that in the 1st decade of March it was 10 °C, in the 2nd decade 15.1 °C and in the 3rd decade 16.1 °C, with an average of 13.7 °C. In Kashkadarya region, the average temperature was 11.9 °C in the 1st decade of April, 15.9 °C in the 2nd decade and 21.6 °C in the 3rd decade, with an average of 16.5 °C.

Table 1
Air temperature in the 2019-2020 season, °C

	Kashkadaryo				**Surkhondaryo**			
	1-decade	2-decade	3-decade	Average monthly air temperature, ^{0}C	1-decade	2-decade	3-decade	Average monthly air temperature, ^{0}C
October	17,7	16,7	15,7	16,7	20,1	17,7	16,5	18,1
November	9	8,1	2,5	6,5	11,4	12,3	8,1	10,6
December	9,3	5,3	7,3	7,3	11,1	7,8	9,1	9,3
January	4,7	-0,7	3,6	2,5	5,7	2,4	5	4,4
February	10,2	4,5	9,6	8,1	9,1	6,8	11,9	9,3
March	9	15,3	14,2	12,8	10	15,1	16,1	13,7
April	11,9	15,9	21,6	16,5	14,3	17,4	23,5	18,4
May	21,4	20,5	28,4	23,4	23,8	22,3	28,5	24,9

Creation of high-yielding, high-quality, disease-resistant and pest-resistant cereal varieties suitable for local conditions in the changing and complex soil-climatic conditions of the Republic, one of the urgent tasks today is the development of seed production and the development and introduction into production of agricultural techniques for obtaining quality grain [2].

Experiments have shown that the technological quality of grain decreases with increasing temperature above + 35^{0}C during the grain filling period. Grain quality is an inherited trait of the variety that can be enhanced by properly selecting and mixing the parent forms.

Varieties and ridges studied in 2020 planted in the central experimental area of the Southern Agricultural Research Institute of the Institute when determining the protein content of grain in the laboratory "Technological quality indicators of grain" in the conditions of Kashkadarya region, the average return was 14.2-16.8%. In this case, the standard varieties are 15.8% in the varieties "Krupinka" and "Zilol", 15% in the variety "Nasaf" and 14.2% in the variety "Nafis". "KR17-F6-DW-29", "40th-IFWDON-Plot-45", "KR17-F6-DW-8", "KR18-F6-DW-9", "KR17-F6-DW-3", "KR18-F6-DW-12" 6 protein content was found to be between 16.3-16.8%.

The average grain yield of 20 varieties and ridges grown in Surkhandarya region was determined 13.4-15.6%, the standard varieties were 14.1% in the "Krupinka" variety, 14.2% in the "Nasaf" variety, 13.6% in the "Zilol" variety and 13.4% in the "Nafis" variety detected. According to the results of laboratory analysis, the protein content of the ridges with high protein content in the grain from the sample varieties ranged from 14.2 to 15.6% (Figure 1).

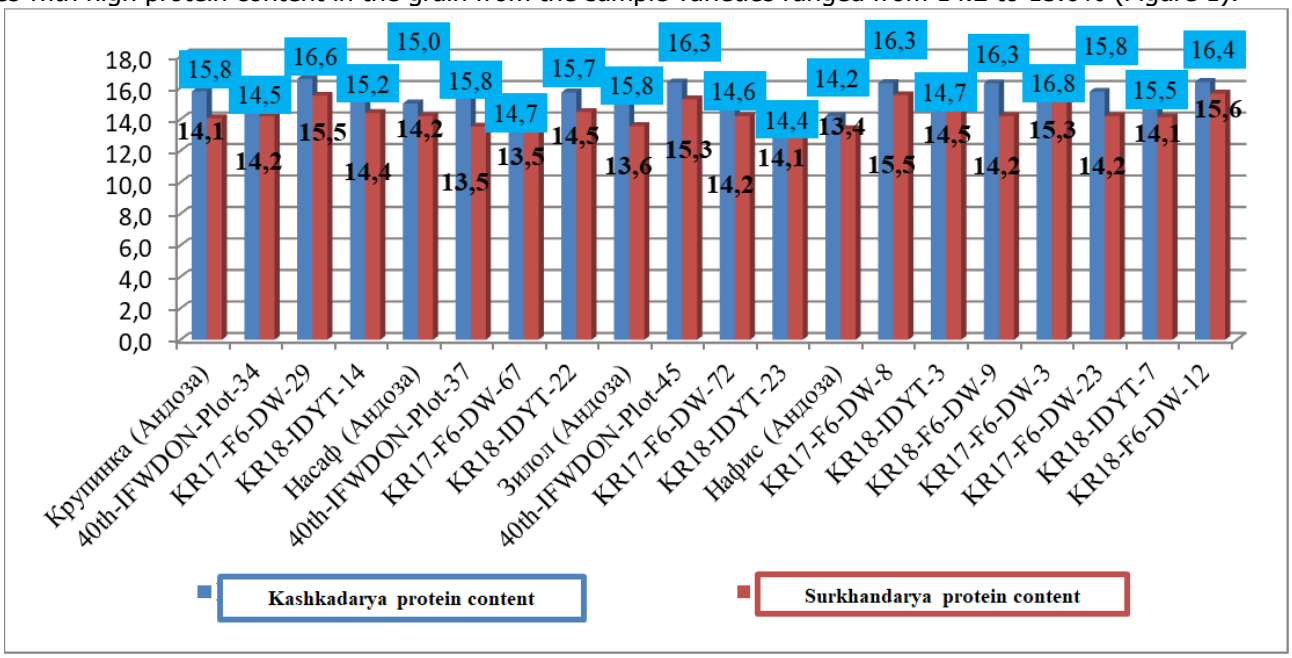

Figure 1: Protein content of durum wheat varieties and ridges (Kashkadarya, Surkhandarya 2019-2020)

It is expedient to cultivate 30,000 tons of durum wheat required in the country in the dry lands of Kashkadarya and Surkhandarya regions and the rest in the wetlands of these regions. Durum wheat varieties are resistant to drought, high temperatures and do not shed grains when ripe [3].

When analyzing the amount of gluten in the laboratory conditions of durum wheat varieties and ridges, the average yield in Kashkadarya region was 15.7-28.8%, the standard was 18.8% in "Krupinka" and "Nasaf" varieties and 20.7% in "Zilol" varieties 20,7 % and 21.5% in the "Nafis" variety. The study found that the number of high-gluten ridges from the sample varieties was 6, with a gluten content of 27.4-28.8%.

In the laboratory study of 20 varieties and ridges of durum wheat grown in Surkhandarya region, it was found that the average grain gluten content was 15.7-28.1% on 3 returns. At the same time, the gluten content in the standard varieties ranges from 18.3 to 20.4% and in the ridges with high gluten content from the standard varieties "KR17-F6-DW-29" and "40th-IFWDON-Plot-45", "KR18-F6-DW-9", "KR18-F6-DW-12" 28.1%, "KR17-F6-DW-8" 27.7%, "KR17-F6-DW-3" 27.9%. identified as a result of the study (Table 2).

Table 2
Gluten content of durum wheat varieties and ridges
(Kashkadarya, Surkhandarya 2019-2020)

Plots	Name	Kashqadaryo		Surkhondaryo	
		The amount of gluten, %	IDK	The amount of gluten, %	IDK
1	Krupinka (Template)	18,8	100,8	18,3	105,2
2	40th-IFWDON-Plot-34	23,8	115,3	21,4	114,4

3	KR17-F6-DW-29	27,4	83,3	28,1	86,6
4	KR18-IDYT-14	21,5	112,0	21,1	108,4
5	Nasaf	18,8	104,1	19,3	102,9
6	40th-IFWDON-Plot-37	17,6	101,2	18,5	105,3
7	KR17-F6-DW-67	15,7	105,5	18,6	428,6
8	KR18-IDYT-22	19,6	112,0	17,4	109,2
9	Zilol	20,7	109,1	19,5	110,4
10	40th-IFWDON-Plot-45	28,8	95,4	28,1	97,5
11	KR17-F6-DW-72	23,5	115,5	21,5	107,9
12	KR18-IDYT-23	24,0	115,3	15,1	112,4
13	Nafis	21,5	100,3	20,4	101,3
14	KR17-F6-DW-8	27,8	85,3	27,7	88,4
15	KR18-IDYT-3	24,2	115,3	21,4	115,8
16	KR18-F6-DW-9	27,6	88,2	28,1	89,9
17	KR17-F6-DW-3	27,5	94,4	27,9	97,4
18	KR17-F6-DW-23	19,4	100,9	18,3	102,4
19	KR18-IDYT-7	17,4	109,7	19,7	110,3
20	KR18-F6-DW-12	27,5	85,6	28,1	89,7
	Average performance	22,7	102,5	21,9	119,2
	The highest figure	28,8	115,5	28,1	428,6
	The lowest figure	15,7	83,3	15,1	86,6
	HCP_{05}	0,36	4,83	0,41	4,91
	HCP_{05} %	1,601	4,714	2,31	4,821
	Cv %	1	2,19	2,1	2,2

The constant change of weather in the southern regions, the natural hardships of some farming years, are testing the will of the grain growers. In arid conditions, the water regime of the wheat plant is gradually deteriorating. Usually, drought does not lead to plant death, but the metabolism is disrupted, resulting in a decrease in the number of spikes, the number of grains in the spike and the weight of 1000 grains.

In conclusion, the differences in the quality of grain of different varieties and ridges in different regions and soil climates can be attributed to the temperature observed in May at the time of grain filling, ie in Kashkadarya region the average temperature in May was 23.4^0C, we can observe that it is relatively high at 24.9^0 C.

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