DROUGHT-HEAT RESISTANCE OF TRITIKALE IN DRAIN-fED CONDITIONS OF UZBEKISTAN

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ABSTRACT

The article presents data on the study of triticale varieties in rainfed conditions. 4 triticale varieties with high drought-heat resistance and 5 varieties based on the accumulation of total biomass were selected.

Keywords: variety, triticale, rainfed, drought resistance, heat resistance, total water, biomass.

INTRODUCTION

Triticale is a crop that successfully combines the high ecological plasticity of rye with the yield and quality of wheat (Veverine E.K., 2012).

Drought resistance of triticale is higher than that of wheat, but lower than that of rye. The heat resistance of triticale is +37 °C. During grain filling, triticale tolerates drought and high temperatures well. This is facilitated by a waxy coating on the shoots, a developed root system and the high water-holding capacity of the crop (Kozmina N.P., 1976).

During dry periods, a positive correlation was revealed between yield and water-holding capacity of leaves and ears of plants. Accordingly, the selection of highly productive and drought-resistant breeding numbers using the water-holding capacity indicator can be effective (Krotova L.A., Triputin V.M., 2017).

Since 2005, breeding research on triticale has been carried out at the Scientific Research Institute of Rainfed Agriculture; the triticale varieties Sardor (2016), Dustlik-4 (2021) have been created.

MATERIALS AND RESEARCH METHODS

The material for the research was the dry-fed KSI triticale varieties of the Gallyaaral Scientific Research Institute of Rainfed Agriculture.

The study of drought and heat resistance of triticale was carried out using the methods of VIR a. Determination of triticale biomass accumulation was carried out according to V.A. Kumakov. (1985).

The purpose of this study was to study triticale varieties for drought-heat resistance and biomass accumulation, with subsequent selection of varieties with high resistance to abiotic stress.

RESEARCH RESULTS

In the nursery of a competitive triticale variety trial over three years of study, the varieties Sardor, Plot22VAR35, Plot31VAR49, Plot61VAR49 with high indicators of drought and heat resistance were selected (Table 1).

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N⁰	Variety	Plant height, cm	Length of the upper internode,	Coagulation temperature of water-soluble	Total water content in			
			cm	proteins, °C	leaves, 70			
1	Farkhod, st	99,4	32,6	60,0	73,35			
2	Zarbdor	97,2	32,8	60,0	73,71			
3	Sardor	90,2	32,4	61,0	73,80			
4	Dustlik-4	96,4	35,4	60,5	71,91			
5	Plot22VAR35	97,4	35,6	61,5	72,98			
6	Plot91VAR15	96,2	38,8	60,5	73,23			
7	Plot31VAR49	90,2	31,4	62,0	73,37			
8	Plot61VAR49	99,4	34,2	62,0	73,11			
9	Plot19VAR34	91,6	30,0	61,0	73,54			
10	Plot1VAR15	81,6	24,8	61,0	69,54			
11	Plot13VAR17	96,4	31,2	61,0	69,45			
12	Sergey	66,6	14,6	61,0	72,74			
13	Tikhon	91,8	33,6	61,5	70,98			
14	Matchmaker	84,8	21,2	61,0	72,25			

Table 1. Morphophysiological parameters of drought-heat resistance of KSI triticale varieties on rainfed soil (Gallyaaral 2023).

The table data shows that the height of triticale plants ranged from 66.6 cm (Sergey) to 99.4 cm (Plot61VAR49) over the years, the standard was 99.4 cm (Farkhod), the coagulation temperature of water-soluble leaf proteins was from 60.0 °C (Plot14VAR34) up to 62.0 °C (Plot31VAR49, Plot61VAR49), for the standard 60.0 °C (Farkhod). During three years of studying the accumulation of total biomass, triticale varieties Plot14VAR34 (216.17 g), Sardor (196.08 g), Dustlik-4 (205.42 g), Plot22VAR35 (191.04 g), Plot13VAR17 (196.06 g) (Table 2.).

Table 2. Variability of the accumulation of total biomass of KSI triticale varieties depending on the variety and year in the heading phase on rainfed soil (Gallaaral, 2021 – 2023)

N⁰	Variatu	Total biomass, g				
	variety	2021 g.	2022 g.	2023 g.	Х	
1	Farkhod, st	124,46	313,92	198,20	212,19	
2	Zarbdor	141,06	285,20	$222,\!26$	216,17	
3	Sardor	110,42	$274,\!60$	203,24	196,08	
4	Dustlik-4	119,44	302,30	$194,\!52$	205,42	
5	Plot22VAR35	150,92	194,66	227,56	191,04	
6	Plot91VAR15	111,80	200,34	228,78	180,30	
7	Plot31VAR49	88,90	252,22	153,72	164,94	
8	Plot61VAR49	156,82	169,56	203,96	176,78	
9	Plot19VAR34	151,54	199,14	195,46	182,04	
10	Plot1VAR15	126,28	161,44	208,28	165,33	
11	Plot13VAR17	147,48	241,12	199,60	196,06	
12	Sergey	122,38	217,34	163, 12	167,61	
13	Tikhon	93,12	210,10	193,76	165,66	
14	Matchmaker	91,66	170,62	143,48	165,25	

Tabular data show that the accumulation of total biomass on average over three years ranged from 164.94 g (Plot31 VAR49) to 216.17 g (Plot14 VAR34) for varieties, and 212.19 g for the standard (Farkhod).

Variability in the percentage of triticale spikes depended on the variety and year conditions. Thus, in 2021, the share of triticale ears varied from 27.30% (Tikhon) to 48.68% (Sardor), for the standard 49.34% (Farkhod); in 2022 - from 13.26% (Zarbdor) to 18.05% (Plot 91VAR15), for the standard 17.05% (Farkhod); in 2023 - from 15.18% (Dustlik-4) to 20.18% (Plot 1AR15), the standard has 18.56% (Farkhod).

CONCLUSIONS

In a competitive triticale variety trial, the varieties Sardor, Plot22VAR35, Plot31VAR49, Plot61VAR49 were selected for drought and heat resistance components. The varieties Plot14VAR34, Sardor, Dustlik-4, Plot22VAR35, Plot13VAR17 were selected based on the accumulation of triticale plant biomass.

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