The Specificity of Reaction of some Winter Wheat Genotypes in Environmental Conditions of Transylvanian Plane

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ABSTRACT

A genotype is a genetic entity, governed by internal links between different quantitative or qualitative characters. The capacity of genotype to fight against to unfavorable conditions differ according to stability of that characters and is specific to genotype. The goal of this paper is to monitor and reveal the behavior of 15 varieties of winter wheat regarding the main components of grain yield in specific conditions of Transylvanian Plain (Turda) and different levels of fertilizations. The behavior of main components of grain yield (number of grain per spike, weight of grain per spike and thousand kernel weight) was different especially in the first experimental year when the climatic conditions were unfavorable to winter wheat crop mainly in the second part of plant vegetation. The different environment conditions and agro-technical measures used have determined some significant or very significant variation.

Keywords: *environment, specificity reaction, Transylvania Plain, wheat genotypes.*

INTRODUCTION

number of grain per spike, weight of grain per spike, thousand kernel weight (TKW) and plant density are the main components of the yield. These characters can be influenced more or less by the climatic conditions, especially water regime and temperature. The main components of yield, and finally the total grain yield, can be affected by environmental conditions (Wheeler and all., 1996b). The influence of climatic conditions under plants is even greater as it is manifested in the most important growing and development phases (grain formation, grain filling period, ripening, etc.) (Herbek and Lee, 1995). As a shape to prevent the influence of environmental conditions each genotype of winter wheat have a specific adaptability to this unfavorable conditions.

AIMS

the aim of this study is to highlight the capacity of winter wheat plant to react by certain stability

given by good reaction to favorable periods from growing wheat season.

MATERIALS AND METHODS

The experiments were conducted over three years, 2011-2013 at Agricultural Research and Development Station Turda, which are characterized with a high rainfall and temperatures favorable for winter wheat crop. The biologic material used in our study is quite varied, consisting of 15 winter wheat varieties of local and foreign origin. The following traits was studied: number of grain per spike, weight of grain per spike, thousand kernel weight and grain yield. The processing data will be performed using the usual statistic models.

RESULTS AND DISCUSSION

The influence of additional fertilization was very significant in cause of weight of grain per spike and grain yield. Though the character

Tab 1. The average values and some statistics parameters of grain yield and main yield components of 15 winter wheat genotypes studied in ARDS Turda, in period 2011-2013

Nr. crt.	Genotype Add. fertil.	No. grain/spike		Weight of grain/spike (g)		Thousand kernel weight (g)		Grain yield (t ha ⁻¹)		
		Basic fertil.	Add. fertil.	Basic fertil.	Add. fertil.	Basic fertil.	Add. fertil.	Basic fertil.		
1.	Apullum	34.3	29.2	1.18	0,75	41,5	38,9	5,82	4,57	
2.	Arieșan	27.2	27.8	1.00	1,05	42,8	41,8	5,95	4,59	
3.	Boema	31.7	30.9	1.06	0,98	40,5	40,5	5,68	4,58	
4.	Delabrad	31.5	30.9	1.05	0,97	41,3	40,5	5,43	4,49	
5.	Dropia	30.8	29.8	0.94	0,96	41,4	38,4	5,68	4,19	
6.	Dumbrava	33.8	31.5	1.18	1,04	43,8	43,8	6,32	5,18	
7.	Lovrin 34	32.5	31.1	1.07	0,93	46,1	43,6	5,69	4,73	
8.	GK Othalom	30.6	28.4	1.27	1,13	44,0	44,0	5,43	4,62	
9.	GK Kalasz	29.1	28.4	1.14	1,05	42,7	42,4	5,33	4,16	
10.	Serina	31.0	28.9	1.21	1,01	44,9	43,9	5,76	4,57	
11.	Renan	30.0	27.3	1.16	0,84	44,9	43,8	6,22	4,89	
12.	Josef	32.7	30.3	1.25	0,96	42,6	41,7	5,65	4,41	
13.	MV Palotas	30.9	28.8	1.14	0,92	42,8	42,7	5,45	4,21	
14.	Andrada	31.1	30.7	1.06	0,92	42,7	41,6	6,15	4,92	
15.	Bezostaia	27.8	26.2	1.06	1,05	42,6	42,9	5,01	4,19	
Average		31,0	29.3	1.41	1.31	45,3	44,4	5,70	4,55	
St. deviation		1,96	1.55	0.079	0.083	1,99	2,05	0,36	0,30	
C.V. (%)		6,33	5.29	5.64	6.32	4,39	4,62	6,23	6,54	
Range	min	27.2	26.2	1.286	1,172	43,1	41,6	5,01	4,16	
		34.3	31.5	1.610	1,497	49,8	48,6	6,32	5,17	
LSD 0.05		2,28		0.05		0.78		0.20		
LSD 0.01		3,01		0.06		1.02		0.27		
LSD 0.001		3.88		0.08		1.32		0.35		

thousand kernel weight have more than other a genetic conditioning, this character has the largest variation (43,1- 49,8 at additional fertilization and between 41,6- 48,6 by basic fertilization) but this range was not caused by environmental conditions or other factors but due variability of character between the group of studied genotypes. The value of coefficient of variability (C.V.) was small value in all cases. For weight of grain per spike, thousand kernel weight and grain yield the application of additional fertilization determine a smaller coefficient of variability compared with basic fertilization.

CONCLUSIONS

The variation of environmental conditions (especially absence of precipitation) influenced negative the main yield components particularly if this coincide with the second plant vegetation

period. Generally the additional fertilization is a good action to increase and to help the development of the main components of yield, and also determine a better stability of those characters.

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