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ORIGINAL ARTICLE

Evaluation of Agronomic traits of Five Triticale Varieties under Drought Stress

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ABSTRACT

In order to investigate the effect of water stress on yield traits of triticale trial was conducted in Zone Rey Split plot in a randomized complete block design with three replications at the research farm of the Islamic Azad University, Shahr-e Rey in crop year 2012-2013. Irrigation as the main factor in three levels: optimal irrigation irrigation in the stage of gestation (Boating stage), water cut-pollination stage (Anthesis) and consists of two lines of triticale genotypes ET86 and ET85 joalino and Sanabad and wheat Sirvan (control) of 5 was considered as a minor factor. Traits measured by the number of grains per spike, grain weight, grain yield, biological yield, harvest index. Analysis of variance showed that the number of grains per spike, grain weight, grain yield, biological yield, harvest index, the simple effect of stress was significant at the one percent. These results indicate that different levels of applied stress causes a dramatic decrease in the yield of grain per spike, grain weight, grain yield, biological yield, harvest index. The effects of genotype × drought stress in all measured traits were not significant.

Keywords: *drought stress, triticale varieties, seed yield, biological yield*

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INTRODUCTION

Triticale is a plant derived Crosses between tetraploid wheat and rye, and are close to the wheat and rye. Studies show that it can successfully triticale forage and grain used to feed livestock and poultry. Triticale as a pasture plant, green forage, silage and dry hay and straw are used on wheat and barley is preferred. The ability of plants to grow and produce poorer and less prone soils that
are not suitable for crop production and land contains sandy and sandy-volume production of acid only cereal that is a good product [1].

A reaction of different crops and different varieties of plants to drought stress is different. Various explanations have been offered for the land. Stress, physical drought stress, such as the most important factor limiting crop growth and production is known in many parts of Iran and the world [2].

Blum and Associates have stated that the land is a multidimensional stress affecting the plant at different organizational levels [3]. Water shortage is one of the most important factors limiting crop yield in arid and semiarid regions [4].Environmental stress by limiting the supply of assimilates for grain filling, grain number per plant and the yield is affected India.

Jahanbin and associates reported on a study of drought stress during barley grain yield, biological yield and grain weights significantly reduced [5].

Khazaei stated that the trial was conducted in Mashhad stress caused a significant reduction in harvest index were all cultivars [6].

The results of the experiments done by Heydari., *et al* [7] so as to evaluate the different genetic variation in 157 line double haploids of the bread wheat, showed that the lines under the study , from the last internode length of view, the number of fertile spikes in the area unit of measurement , the height of the bush, number of the seeds, functionality of the seed in the main spike had more variant genetic with regard to the other attributes such as the seed test weight, the days remaining to become mature , and the days to heading and pollination.

In an experiment on 39 winter blooming wheat, 10 quantitative attribute have been studied and by means of solving them to the factors, they got the capability to decrease the diversification of the data to the 5 main factors: The first was the height of bush, second was the number of seeds in the main spike [6].

MATERIALS AND METHODS

To study the effect of water stress on yield traits of triticale area Rey, split-plot experimental design (split-plot) in 3 replications in a randomized complete block design to be implemented, The research in crop year 2012-2013 at the Research Station University Rey was during one growing season. Field elevation of 1000 meters above sea level and in terms of geographical location, the farm is located at latitude 35 degrees 51 minutes and longitude 51 degrees 29 minutes. Where irrigation as a major factor in three levels including optimum irrigation irrigation in the stage of pregnancy, the water cut of the stage of pollination and genotypes of triticale includes jovalino, Sanabad, wheat Sirvan cultivar (control) and two lines ET86 and ET85 and 5 level was considered as a minor factor. Of seed per spike, grain weight, grain yield, biological yield, harvest index were measured. For statistical analysis was used program Minitab and SAS, Excel.

RESULTS AND DISCUSSION

Number of grains per spike

Results Table Analysis of variance showed that the simple effect was significant at 1% level of drought stress and other effects and interaction were not significant (Table 1).

These results indicate that drought stress reduced the number of grains per spike and thus reduce the yield (Table 2).

Thousand grain weight

Results Table Analysis of variance revealed that the simple effect of stress on a percentage of triticale genotypes were significant at the five percent level (Table 1).

These results indicate that applying different levels of drought stress caused a significant reduction in Thousand grain weight also among the different genotypes of triticale Thousand grain weight difference was high (Table 2).

Grain yield

Results Table Analysis of variance revealed that the simple effect of water stress at 1% and triticale genotypes were significant at the 1% level (Table 1).

These results indicate that a different level of applied stress causes a dramatic reduction in grain yield. In addition, genotypes revealed that genotypes of triticale grain yield there is a significant difference (Table 2).

Biological yield

Results Table Analysis of variance revealed that the simple effect of stress on a percentage of triticale genotypes were significant at the five percent level (Table 1).

Results showed that the effect of simply applying different levels of drought stress was reduced Biological yield also triticale genotypes and between genotypes showed that there are different levels of Biological yield (Table 2).

Harvest index

Results Table Analysis of variance revealed that the simple effect of stress on a percentage of triticale genotypes were significant at the five percent level (Table 1).

These results indicate that the differences between the different levels of water stress and drought stress on Harvest index has a direct impact in addition, the triticale genotypes show differences between genotypes of triticale Harvest index (Table 2).

Table 1 Analysis of variance on the effects of irrigation and triticale genotypes of grain per Spike, number of spikes per square meter, grain yield, Biological yield and harvest index

S.O.V	DF	Number of seeds Per spike	thousand grain weights	Grain yield	Biological yield	Harvest index
Repeat	2	704/125	91/81118	460/4785	35663/84	218/2627267
Irrigation	2	25/210*	523/906**	317531/6072**	1370144/163**	355/5392067**
Error A	4	401/78	14/39536	2341/6014	6982/813	38/9084433
Genotype	4	196/69ns	40/940*	2031/2325**	40786/407*	69/3102967*
Irrigation × genotype	8	3/749ns	1/534824 ns	18370/2346 ns	12184/618 ns	10/8788067 ns
Error B	24	291/005	10/220883	2464/7436	12418/91	20/205477

Ns, * and **: Not significant, significant at 5% and 1% probability levels, respectively.

Table 2 Effect of drought stress simple and triticale genotypes of seed per Spike, spike number, grain yield, biological yield, and Harvest index

		Number of seeds Per spike	Number spike (m2)	Grain yield (kg.ha-1)	Biological yield (kg.ha-1)	Harvest index (percent)
Simple effects of drought stress	Gestational	35/08 c	536/43 c	1087/1c	3454c	32/755c
	Spike	51/59 b	628/89 b	2864/9b	7545/1b	37/955b
	Normal	58/04 a	683/41 a	3971a	9353/2a	42/484a
Simple effects of triticale genotypes	Sanabad	53/8 a	669/89 a	3255/7 a	7631/7 a	41/468 a
	joanilo	52/28 a	636/01 b	2807 ab	7055/4 ab	38/068 ab
	ET86	46/67 a	612/2 bc	2596 ab	6857/8 ab	37/927 ab
	ET85	45/82 a	605/63 c	25361 b	6577/8 b	37/544 ab
	Sirvan	42/62 a	557/5 d	2010/1 c	5797/8 c	33/65 b

REFERENCES

1. Iran-Nejad, H.. And n. Shahbazian. In 2005. Cereals. The first volume of wheat. Tehran Press Association.
2. Alizadeh, A.. In 1992. Soil and plant water relations (translation), publications, Ferdowsi University of Mashhad.
3. Blum , A. 1996. Crop responses to drought and the interpretation of adaptation. Plant Growth Regul., 20,135-148.
4. Pereyra MA, Zalazar CA, Barassi CA. 2006. Root phospholipids in Azospirillum-inoculated wheat seedlings exposed to water stress. Plant Physiology and Biochemistry. 44.873-879.
5. Jahanbin,sh., Tahmasebi Sarvestani j., Modares Sanavi.a, Karimzadeh, gh.2003. "The effect of drought stress on grain yield, yield components and resistance indices of barley genotypes," Journal of Agricultural Sciences and Natural Resources tenth year, No. 4, pages 34 to 25.
6. Khazaei H. R .2002. "The effect of drought stress on physiological characteristics of wheat varieties resistant to drought resistance and introduce appropriate measures," Ph.D. dissertation, Department of Agriculture, Ferdowsi University of Mashhad, 225 pages.
7. Heydari, B., B. C. Saidi., B. Sayed Tabatabaei and K. Svynaga. 2006. Genetic variability and heritability estimates of some quantitative traits in doubled haploid lines of wheat. Journal of Agricultural Science, Volume 1-37.
8. Farshadfar, E. 2004.Multivariate principles and procedures of statistics. Taghbostan publication.(In Persian).

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