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ORIGINAL ARTICLES

The Evaluation of Rapeseed Morphological Traits in Different Conditions of Irrigation (*Brassica napus L.*)

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ABSTRACT

Drought and opportune water use is too important for water saving and high yield product, In order to evaluation of rapeseed morphological traits in different conditions of irrigation experiment was carried out in 2005-2006 crop season. Using two treatments and three replicates, in which irrigation remained as the main factor in seven levels and the two secondary factors consisting of Zarfam & Opera varieties. Variance on the results of this experience was the variety of traits such as grain yield, grain oil contect ($P<0.01$) and 1000-seed weight ($P<0.05$) were significantly. The results showed that In mean comparison of varieties has maximum of grain yield of Zarfam variety In the normal water conditions (4800 kg\ha).

Key words: *Rapeseed, Varieties ,Yield and yield component, Drought stress.*

Introduction

It is apparent that water stress has no considerable effect on grain quality but in flowering time cause for decrease in grain oil contents (Wilcox and frankenberyer, 1987). One third of the world lands are classified as Arid and Semiarid Region and the remains are faced with water seasonal or local fluctuations (Beweley and Krochko, 1982). Aridity is the most common environmental stress and approximately include 25% of the world lands (Christianse, 1982). Among the most important criteria for genotypes assessment to environmental conditions is study of respective effect of genotype and resistant study of grain operation through non-considerable changes in different environmental conditions. The fact that water stress effects on growth and yield are genotype-dependent is well known (Bannayan *et al*., 2008). Identification of the critical irrigation timing and scheduling of irrigation, based on a time and accuracy to the crop, is the key for conserving water and improving irrigation performance and sustainability of irrigated agriculture (Igbadun *et al*., 2006, Ngouajio *et al*., 2007). In arid and semi-arid environments, both efficient use of available water and a higher yield and quality of safflower are in demand (Lovelli *et al*., 2007, Dordas & Sioulas, 2008, Koutroubas *et al*., 2008). Major part of Canola production in the world are under dry farming conditions and as a result, plant reaction to stress is an important topic (Mayers *et al*., 1997). Canola may treated by dry farming in those regions which have autumn and spring raining. The plant has no need extra water, but in germination stage, Rosset period, stem elongation, flowering, seed formation and its growth; there is sense of water requirements (Singh *et al*., 1977). Canola is sensitive to drought in time of germination and pod grow. The case being most important when sufficient water is available for commencement of germination and new planted seedling faced with in -sufficiency water. Of course, in Canola cultivation water irrigation may not be used (Mayers., 1997). Irrigation performance after 50 mm evaporation of Class A in Canola is produce the most grain operation and with increase irrigation period to 100 and 150 mm evaporation of class A, grain operation show meaningful decrease (Shirani-e-Rad., 2002). After Irrigation with 50 mm evaporation in control Class A in Canola, the most production of grain operation is attain and with increase of irrigation to 80 mm evaporation of Class A, grain operation is not receive meaningful decrease but in irrigation of 110 mm of class A; shown meaningful decrease of grain operation regarding control sample (Shirani-e-Rad, 2005). Whereas most part of consumable oil of the company are import from foreign countries, also due to limitations of water resources, the necessity of planting oil seeds have an important features. The aims of this research were to study the effects of late season drought stress on seed and oil yields and their components, and to evaluate their relationships among Autumn Rapeseed Cultivars.

Materials And Methods

For finding of resistance to drought stress two varieties of autumnal rapeseed and survey of component of their function in conditions of treatment for examination drought stress and regular irrigation (control group),

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examination in case of split plot in form of complete basis design block in three repetitions that which the irrigation was the main factor in seven levels: consist of regular irrigation (control group), cutting irrigation in stage of jointing, cutting irrigation in stage of flowering, cutting irrigation in stage of forming pods, cutting irrigation in stage of jointing and flowering, cutting irrigation in stage of jointing and forming pods, and cutting irrigation in stage of flowering and Forming pods and also the accessory factor in two levels consist of Zarfam & Opera varieties. The experiment was carried out at the Karaj, Iran. during 2005-06. In this survey all the stages of plant's phonology and various attributes such as length of the bush, number of the secondary branches in the bush, the sickness of the stem, the length of pod's main stem, secondary branch, the length of the pod, the number of the pod in the main stem and the secondary stem, number of the pod in the bush, the number of seed in the pod in main stem and secondary stem, the number of the seed in the pod, the weight of the thousand of seeds, function of the seed, biologic function of harvest's coefficient and the percentage of oil of the seed and the function of the seed's oil were measured. The experiment was organized in a randomized complete block design, with split plot arrangement, employing three replications. Data matching statistical models split plot design in randomized complete block design was simple variance analysis and comparison of means using multiple range Duncan test 5% level was performed.

Results and Discussion

Variance on the results of this experience was the variety of traits such as grain yield, grain oil contect ($P<0.01$) and 1000-seed weight ($P<0.05$) were significantly (Table 1). The interaction between irrigation and cultivars on the adjective has a significant effect on the number of seeds per pod. The results of this study showed that, is significant due to a variety ($P<0.01$) of grain yield. Interaction between irrigation and cultivars were determined in comparison with the highest grain yield In the normal water conditions Zarfam Variety, the average is 4800 kg \ha. And the lowest grain yield in the water phase (7) Water stress has been and about 2100 kg \ha compared with an average of Opera have been tested in field conditions. Adverse effect of water stress can affect the performance of canola, but these effects depend on genotype, stage of plant development and adaptation to drought (if previously exposed land is located) (Azizi *et al*., 2000). Khoshnazar and *et al* (2000), Reddy and Rudy (1998) were observed between the different Variety of *Brassica* significant difference in grain yield. Puma (1999) stated, one advantage among canola ability to absorb water from the depths of the earth and need to be rain in dry areas (Poma *et al*., 1999). Simple interaction effects of irrigation and irrigation and variety was not significant on 1000-seed weight. While was significant ($P<0.05$) the simple effects of variety. Interaction between irrigation and cultivars was in mean in condition of drought stress, the highest 1000-seed weight as for Zarfam Variety (4gr) has been by cutting at the water in stage of flowering and jointing and the lowest value of this attribute to the Variety opera has been in condition stress in stage flowering and jointing(Table 1).Sadaghat (2003), In the physiological study of drought tolerance in canola, said, under drought conditions, is not significant differences in 1000- seed weight (Sadaghat *et al*., 2003). In mean comparison of effect between Variety and irrigation in condition common Irrigation was the highest oil content for Zarfam Variety by 40.5% and in condition drought stress ,obtained most of the oil percent Zarfam Variety (42.5 %) in condition Water cutting in stage flowering and jointing (Table 1). Jensen (1996), Showed that drought stress in canola, only one of the experiments the soil was sandy, Cause 3.3 % reduction in the amount of oil seeds and significant effects other tests showed (Jensen *et al*., 1996). The results of this experiment with the results of researchers such as (Sadaqat *et al*., 2003, Poma *et al*., 1999, Pritchard, 1999, Jensen *et al*., 1996, Das, 1998).

Table 1: Mean comparison the interaction of irrigation and variety effect on some traits of rapeseed.

Treatment	Grain yield	1000- seed weight	Oil Content
Irrigation(A)			
I_1= regular irrigation	4769a	3.8a	40.03a
I_2= cutting irrigation in stage of jointing	3365b	3.79a	40.07a
I_3= cutting irrigation in stage of flowering	3138b	3.72a	40.90a
I_4= cutting irrigation in stage of Forming pods	3521b	3.74a	40.20a
I_5= Cut. Ir. in stage of jointing and flowering	3051b	3.72a	41.10a
I_6= Cut. Ir. in stage of jointing and Forming pods	3131b	3.79a	39.60a
I_7= Cut. Ir. in stage of flowering and Forming pods	2852b	3.88a	41.40a
Variety(B)			
V_1=Opera	3448.8a	3.6a	39.4a
V_2=Zarfam	4192.2b	3.8b	41.4b
Irrigation* variety (AB)			
I_1V_1 (Irrigation* variety)	3996abcd	3.82ab	39.49cd
I_2V_1 (Irrigation* variety)	2971bcde	3.77abc	39.6bcd
I_3V_1 (Irrigation* variety)	2167e	3.61bc	40.5bcd
I_4V_1 (Irrigation* variety)	2438cde	3.69abc	39.19d
I_5V_1 (Irrigation* variety)	2321abc	3.45c	39.85bcd
I_6V_1 (Irrigation* variety)	2805abcde	3.66abc	38.75bcd

I_7V_1 (Irrigation* variety)	2100abcd	3.84ab	40.32bcd
I_1V_2 (Irrigation* variety)	4800a	3.77abc	40.57bcd
I_2V_2 (Irrigation* variety)	3758abcd	3.8abc	40.5bcd
I_3V_2 (Irrigation* variety)	3108abc	3.84ab	41.49ab
I_4V_2 (Irrigation* variety)	3204abcd	3.78abc	41.26abc
I_5V_2 (Irrigation* variety)	2850a	4.00a	42.52a
I_6V_2 (Irrigation* variety)	2625de	3.83ab	41.23abc
I_7V_2 (Irrigation* variety)	2452ab	3.92ab	42.56a
Significant (M.S)			
Irrigation(A)	ns	ns	ns
variety(B)	**	*	**
Irrigation* variety(A*B)	ns	ns	ns
CV%	16.37	4.82	2.36

Means with similar letter were not significant at the 5% probability level.
Levels of significant:* =P< 0.05, **= P<0.01 and NS = not significant

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