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Research Article

The effects of wild oat weed in characteristics of bread wheat cultivars

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ABSTRACT

A research on examination of wild oat weed role in characteristics of bread wheat cultivars has been conducted in agricultural year of 2012- 2013 in research farm of agriculture faculty from Islamic Azad University of Arak Unit. In this test 8 cultivars of agricultural cultivars are cultivated by factorial experiment in frame of randomized complete block design with 3 replications and in its desirable density with and without weed. Density of wild oat was 80 bushes per square meter. The results show that the weight of one thousand different cultivars decreases in treatment with weed and also the same number in Virgo shows the same result so that backcross cultivars ofRoshan and Shahriar cultivars show the minimum decrement in Virgo. It is seemed that the further effect is in the number of spikelet in Virgo in competing with Rye on weed on Oroum cultivar.

Keywords: wheat, oat, the weight of one thousand seed of wheat, harvest index.

INTRODUCTION

Cereals are a group of agricultural plants belonged to Poaceae (Gramineae) and have a lot important in human feed and livestock. This group of agricultural plants included wheat, Rye, barley, oat, sorghum, millet and rice. Normal wheat has two spring and autumn forms and can be recognized in the form of virgo, with awn and without awn, awncolor, گلوم and downy, density or compaction of virgo and …. (Noormohammadi et al., 2008). Nowadays, weeds are the major barriers in accessing to real performace of agricultural plants (Sadeqi at al., 2003; Diant et al., 2009). According to the estimations existence of weeds in cereals causes to 30% increment in production expenses (Wenz, 2000). The last results show that in the world because of using from cultivars with less competitive power and high consumption of fertilizers and plant growth regulators, weeds averagely caused to 13.1% decrement in performance of wheat (Kaffi, 2005). The relationship among different members of plant species is common. Usually when such relationship is established between agricultural plants and weed species, agricultural products will be decreased. There are many studies in weeds science which examine this negative aspect of plant relation (losses on the performance of agricultural product). Interference is a general word that is applied for stating the relationship between species or populations and it is the means of an effect that one plant has on another one. Density of weeds is also one of effective factors on competition (Phaster et al., 2000; Norouzi et al., 2003; Baqestani and Zand, 2004; Menanand Zandestra, 2005;Eslami et al, 2006). Also, the performance of agricultural plants usually depend on the amount, size and neighborhood of existence weed after greening agricultural plant (Zand et al., 2010) and weeds losses in different plants depend on density and cultivar of product in addition to environmental conditions, soil fertility, agricultural species, time of greening, time of

weeds controlling. Moreover, there are difference between ecological characteristics of old cultivars and new modified ones of agricultural plants (Kolman and Gilla, 2003).

Weeds are the most important factors in decreasing the performance of cereals especially wheat (Lotus et al., 1990), that despite different ways of battling and controlling are still accounted as a serious problem for farms and farmers (Mode and Pandai, 1990). Existence of weeds in cereals caused to 30% increment in production expenses (Montazeri et al., 2004). Wild oat comes from millet family and is the most effective weeds of winter wheat farms (EbrahimpoorNoorabadi, 2006) that because of compatibly with different biological and ecological conditions are found as weed in most provinces of Iran and is one of most common species of weeds in wheat farms which caused major losses annually (Montazeri et al., 2005) and because of high height and better distribution of leaves and decrement in light penetration in wheat canopy has high ability in decrement of wheat performance (Rony, 1991). Wild oat called with other names such as oat, absurd oat and straw wheat are among important weeds which has wide transmittal in Iran and in is shown in various types of agricultural products, wastelands and gardens. Wild oat plants can be differentiated via refresh, watery and soft leaves from other plants. Their lamina is more small, outspread and non-condensing and downy which by increasing the numbers of dawns its softness is added and microscope or magnifier should be used for seeing them. These leaves don’t have similar sample in Eurycle rule or ear ligule but Ligule of leaves is big, white and ahrp (Rashedmohassel et al., 2009). The losses of oat in wheat farms depend on different factors such as density of oat, relative time of sprouting and growth stage of weed and agricultural plant. Sooner growth of wild oat caused to increase pure assimilation of weed and finally quicker doing of growth stage. Quicker development of rooted system of oat makes limit water and food providing for wheat (EmbrahimpoorNoorabadi et al., 2006). In this line, Sorkhi et al. (2007) announced through a test that complete interference and rooted interference on wheat and wild oat are more than interference ofAsteragalusMorinusBoiss Aerial Parts. The interference of interference of AsteragalusMorinusBoiss Aerial Parts in wheat caused to significant decrement of leaves in bush but does not have significant effect on the rate of Chlorophyll and the level of flowers' flag, but complete and rooted interference caused to a significant decrement in all considered attributes.Saneei and Dehkordi (2000) study show that regarding to this fact that further competitiveness of oat is usually because of further competitiveness of its root comparing to the root of wheat, so, the performance of wheat has affected in competitiveness with oat. Salehian et al. (2003) in their experiments for examining losses of weeds and determining the most suitable index for assessing decrement of wheat performance in agricultural conditions report that weeds biomass than their number give a better assessment from the decrement of wheat performance. Two types of fenugreek and wild oat assigned itself the most share in decrement of wheat performance; however germander and Artemisia species enjoy from least effect in decreasing wheat. Since weeds caused to decrement in performance and other problems in forms; so, identifying and controlling weeds can have basic role in increasing performance and economic productivity. Nowadays, farmers use mainly from herbicides for decreasing losses resulted from this weed (Ghorbani et al., 2012). So, applying chemic compositions in addition to high expense and environmental pollution is caused to resistant biotypes of weeds against these compositions. So that increasing resistance ofweeds against herbicides and essential environmental factors make us force to use from non- chemic methods among competition foor managing weeds (Menan and Zandestra, 2005). Many Zareer methods are used for managing weeds.

Among them, cultivating cultivars with high competitive power (Yang, 2004; Menan and Zendestra, 2005; Safhani et al., 2007) is from basic and effective ways for reaching to this purpose. Lamiral et al. (2001) did a study on genetic and Zareei developments which caused to increase competitive power of wheat cultivars against weeds and believe that by identifying the most important effective characteristics in increasing competitive power of wheat with weeds and use from these characteristics in Behnejadi programs at future we can consider to cultivars with high competitive as one of combined management programs part of weeds. BeheshtianMesgaran et al. (2006) did a research to evaluate some cultivars of wheat (Omid, Bezostaya, Azadi, Ghods, Alamot and Alvand) in competing and without competing with wild oat. Obtained result was ascendant procedure of wheat at a rate about 2.2 and 3.8 percent in a year was respectively in terms of presence and no presence of weed. Incremental procedure was quicker than without competitiveness status in treatment with weed representing improvement of competitiveness. Harvest and biomass index were increased in new cultivars than previous ones. There is not significant difference between cultivars in terms of efficiency of light consumption and light extinction (K), but presence of weed decrease significantly efficacy of light consumption.

Zand et al. (2001) for examining competition power of free bread wheat against wild oat weed in Arak shows that incremental procedure of 2% and 8% wheat at the rate of 2% was quicker than without competitiveness status in treatment with weed representing improvement of competitiveness. Harvest and biomass index were increased in new cultivars than previous ones. 74% of performance increment by harvest index was justified and the remainder 24% of performance increment is attributed to biomass production. Leaf surface index was the only attribute that has over time a decedent procedure. Attarian and RashedMohassel (2002) showed in an experiment that the rate and method of wild oat competition with wheat depends on the density of weed. Armin et al. (2005) reported that by increasing density of wild oat in two cultivars of wheat (Niknejad and Roshan) the performance of seed, biologic performance, the number of tiller per plant and the number of vigor per square meter decreased linearity and significantly.

MATERIALS AND METHODS

This experiment in agricultural year of 2012- 2013 was conducted for studying cultivars of bread wheat against wild oat weed in research farm of Islamic Azad University of Arak located at 5 km east- south of Arak.

The experimented case plowed moldboard plows on 13 Oct. 2012 and cleared and zoned during 2 disking stages as perpendicular to the ground and then farrowing operation was done.

In the last day cultivating Ammonium Phosphate fertilizer in amount of 250 kg per one Hectare and urea fertilizer in amount of 300 kg per Hectare during 3 stages included fertilization of one third of it before cultivating and the remainder of fertilizing done on experimented sector excessively in two equal parts in two tillering and stemming stages. The next day, wheat seeds which are weighted before (cultivation density of 450) cultivated in distance of 1 cm wide and length and 5 cm depth.

8 cultivars of wheat including Oroum, BakrasRoshan, Pishgam, Rijab, Shahryar, Karim, Zare and C7814 that were done as each 2 treatments with and without weed (witness treatment) in 4 replications. And 1 Crete planting was considered for separating each treatment. The measure of each treatment is in the length of 4 in 4 Crete and each Crete including 3 cultivation lines. Then watering was done as rainy watering. Watering was done 1 time per week. Experimented treatment inspection was weekly. Eliminating margin effect of 3 middle rows from 4 rows cultivation harvested as 3 rows as experimented sample and two rows of each side titled margin effect was considered. Also, 0.5

meter from the beginning and ending point of plots was not used in sampling.

The method for measuring the characteristics

Weigh of one thousand seed: it is counted by 1000- seed counting device, and then it is weighted.

The number of seed in Virgo: the number of existing seeds in o: the number of existing seeds in the number of existing seeds in 10 bushes per Crete.

The amount of fertile tiller: the numbers of 10 fertile tillers have been picked what all bushed enter to other bushes and the average of fertile tillers was computed.

Measuring leaf surface: leaf surface measurement was measured by leaf surface measured device.

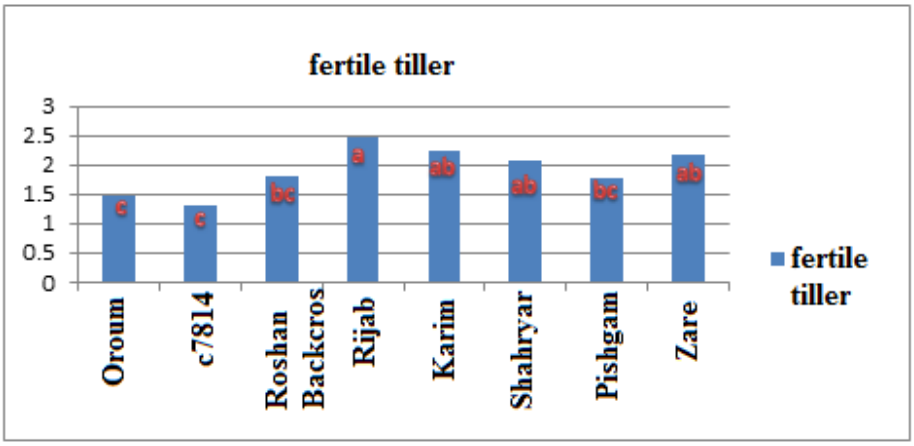
Measuring dry materials of leaf surface (in 2 stages): after measuring leaf surface,the bushes were put into pocket and it shouldbe put equally into oven device with 72 degreefor 48 years and then weighted average of bushes has obtained.

Statistical computations: in this trial, there are only 4 blocks including 17 Cretes and each Crete including 4 and 6 cultivation lines. Distance of cultivation lines from together is 50 cm and the seeds were cultivated on 3 rows in any cultivation line. Obtained data were analyzed by using from SAS software and it provides by tables and graphs by using from Word and excels software.

Results and Discussions

Fertile Tiller

According to the results of variance analyzing table, the number of tillers of cultivar's simple effects was statistically significant in 1% and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically. Based on the result of comparing the average of simple effects was maximum number of fertile tiller related to Rijab cultivar with an average of 2.47 and the minimum number was related to c7814 cultivar with an average of 1.3188.



Distance of flag leaf

According to the results of variance analyzing table, seedling appearance of cultivar's simple effects and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.

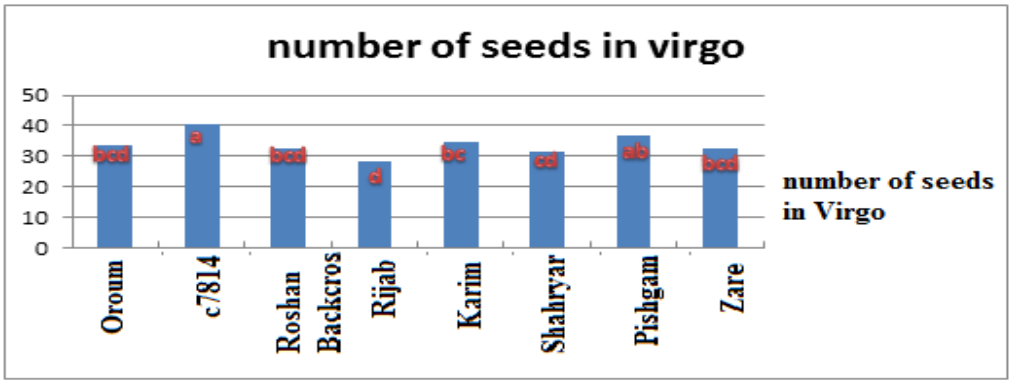
The number of spikelet in Virgo

According to the results of variance analyzing table, seedling appearance of cultivar's simple effects and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.

The number of seeds in Virgo

According to the results of variance analyzing table, the number of seeds in virgo of cultivar's simple effects was statistically significant in 1% and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically. Based on the table of comparing the average of simple effects of treatment the maximum number of seeds related to c7814 cultivar with an average of 40.634 numbers and the minimum number of seed in

Virgo was related to Rijab cultivar with an average of 28.46.

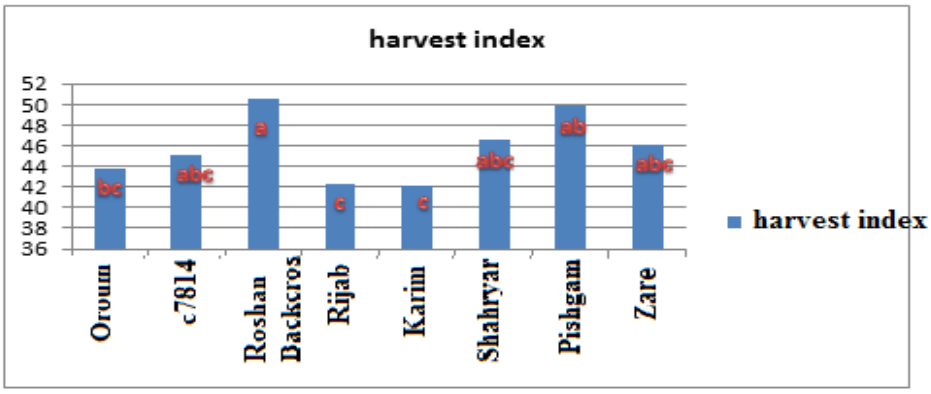


The weight of 1000 seeds

According to the results of variance analyzing table, the weight of 1000 seeds of cultivar's simple effects and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.

Harvest index

According to the results of variance analyzing table, harvest index of cultivar's simple effects was statistically significant in 1% and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.



Flag leaf surface in pollination stage

According to the results of variance analyzing table, flag's leaf surface of cultivar's simple effects was statistically significant in 1% and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically (table 4-4). Based on the table of comparing the average of maximum flag's leaf surface related to Shahriar cultivar with an average of 563.38 numbers and the minimum flag's leaf surface was related to Rijab cultivar with an average of 324.25 (table 4-5).

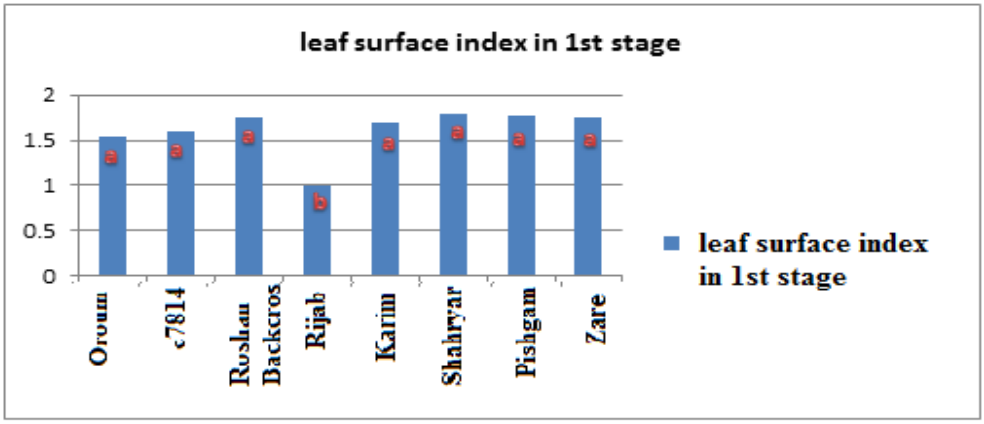
Flag's leaf surface in milking stage

According to the results of variance analyzing table, 2nd flag's leaf surface of cultivar's simple effects and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.

4 indices of 1st leaf surface

According to the results of variance analyzing table, 1st leaf surface index of cultivar's simple effects was statistically significant in 1% and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically. Based on the table of comparing the average of maximum 1st leaf surface index related to Shahriar cultivar with an average of 1.7868 numbers and the minimum flag's leaf surface was related to Rijab cultivar with an average of 0.9961 (table 4-5).

Regarding to the results obtained from competition index, leaf surface may not interfere in competition.



2nd stage leaf surface

According to the results of variance analyzing table, 2nd leaf surface of cultivar's simple effects and simple effect of weed and counter effect of cultivar with weed does not show significant different statistically.

Conclusion

Regarding to the resulted findings, examined attributes can be effective in competition; also, high level of bush and maximum length of peduncle and maximum level of flag's leaf surface and high performance of dry material cause to increase the competitive power.

The cultivars that have further competition in performance decrease their leaves surface as milking of seed. The weight of 1000 seeds of different cultivars is decreased in treatments with weed and also the number of seed in virgo show similar result in virgo such that backcross cultivars of Roshan and Shahriar represent the minimum decrement in the number of seed in virgo.

It is seemed that maximum effect on the number of spikelet in virgo was in competition with rye on weeds on Oroum cultivar. C7814 cultivar in competition show minimum decrement considering to the length of virgo. Zare cultivar increased the number of its tillers (total tillers) and decreased severly in its seed performance. But biological performance was high. But the Rijabcultivar against Zarecultive increases its fertile tiller than total tiller so that its biological performance was low and seeds' performance was better.

Peduncle length in Karim and Rijab cultivar show the maximum decrement in competition. In competition maximum effect of bush height was on c7814 cultivar. In effect of competition, different cultivars of wheat went to cluster sooner and Pishgam cultivar went to cluster sooner than others. By examining peduncle length and height of bush it seems that Karim and Rijab cultivar expend their maximum power for decreasing height and longitude growth for compensating the effect of weeds. Also it is seemed that the cultivars with high level of competitive power went to cluster sooner than other cultivars.

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