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The Competitiveness of Wheat (*Triticum Aestivum* L.) Against Weeds at Different Seeding Rates

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Abstract
An experiment was carried out in the 2017-2018 agricultural season to assess the growth and production of the wheat crop under the conditions of different weeds numbers at different plant densities of the crop. The study included two factors: the first factor was the number of weed seeds in the soil, which are (0, 14, 28, 56, 112) weed plants / m 2 and the second factor was the difference in seeding rate of the yield, which is (80, 100, 120) kg / ha. The results showed: that the increase in the seed rate was accompanied by a gradual significant increase in the plant height of the wheat yield, the number of Tillers of the crop and the grain yield, and it was also accompanied by a gradual significant decrease in the number of grains per spike and the dry weight of the weeds, and that the increase in the number of weeds per unit area was accompanied by a gradual significant decrease in the height of the plants The yield of wheat, the number of grains in the spike and the grain yield, as for the interaction between the two factors, the interaction between the seed rate of 80 kg / ha and the absence of weeds with the highest height of wheat plants and the highest number of grains in the spike, thus significantly exceeding the rest of the interaction in these two characteristics, the highest number of The crop yield and the highest yield was achieved when the interaction between the seed rate of 120 kg / ha and the absence of weeds, while the interaction between the seed rate of 80 kg / ha with the presence of 112 weed plants achieved the highest dry weight of the weed and thus it was significantly superior to the rest of the interactions in this characteristic.
Key word: Wheat, Different weeds, seeding rates

Introduction

Prepare (*Triticum aestivum* L.) is an important and staple cereal crop in most countries of the world. Its importance is due to its protein content, which ranges between 12-17% (Wali, 2010). And the low productivity of this crop comes from not following the correct scientific methods in cultivating this crop and accompanying the weeds to it, which depletes the soil moisture, making it one of the main problems facing dry agriculture (Al-Aqidi, 2010), and thus the decrease in the yield, which is in varying proportions ranging from (30) - 50%) according to the prevailing density and quality of the weeds, according to the ecological site, the amount of stocking weed seed in the soil and its relationship with the cultivation systems in the field. In the wheat fields there are many types of associated weeds (Khan et al., 2007). Wild oats,

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(*Avena fatua* L.), is one of the most important and most widespread annual grassy weeds in the fields of winter grain crops, especially the wheat crop. Poor quality of the crop, as the presence of 20 plants / m2 for wild oat bush in wheat fields causes a loss of yield by 10% (Cousens, 2003) and in dry areas, agricultural methods, including seeding rates, are among the important methods in controlling the jungles associated with field crops. From researches, the higher the density of the weed per unit area, the lower the yield accordingly, due to the high competition between plants and the weed for different growth factors (Sloane et al., 2004). Therefore, this research was conducted in order to find out the effect of different numbers of weed seeds in the soil on a number of growth and yield characteristics in the wheat yield, in addition to the weed characteristics at different seed rates of the crop.

Materials and Methods

The experiment was carried out on 26 /11/2017 in the wire canopy of the Field Crops Department / College of Agriculture and Forestry / University of Mosul during the 2017-2018 agricultural season. The experiment included the following factors: - The first factor: the difference in numbers of wild weed oat seeds in the soil, which is (zero, 1, 2, 4, 8) weed seed / pot, which is equivalent to (0, 14, 28, 56, 112) weed plants / m^2. The second factor is the difference in the seed rate of the wheat yield of the (Sham 6 variety), which is (80, 100, 120) kg / ha**,** which is equivalent to (16, 21, 26) of wheat seed / pot. used in the experiment plastic pots with a diameter of 30 cm and a depth of 30 cm and filled with mixing soil. The plants were watered as needed, and at the end of the agricultural season the following characteristics were studied: Yield characteristics: plant height, number of wheat Tillers, number of spike grains, grain yield, dry weight of the weeds. This experiment was carried out using the global experiments method, the CRD design, with three iterations (Al-Rawi and Khalaf Allah, 2000).The data obtained from the experiment were analyzed using the computer according to the (SAS) program, and the multi-range Duncan test (Duncan, 1955) was used to compare the averages, so that the averages differed from each other significantly at a probability level of 5% in different alphabets.

Results and Discussion

Wheat plant height (cm):

The data in the table indicate that there was a significant increase in plant height at the seed rate of 120 kg / ha compared to the rates (80 and 100) kg / ha, and the increase rate reached (5.56 and 4.24)% for the rates respectively. The reason for this may be attributed to the fact that Increasing the seeding rate means increasing the number of plants per unit area, and this means that there is intense competition between them, which pushes the plants to elongate their stems to obtain adequate light, as well as increasing the deception between plants leads to a decrease in the ratio of red light to the ratio of Far Red light and this is responsible for increasing The height of the plant to encourage it to produce gibberellin, which works to elongate cells (Attia and Jaddoa, 1999) Also, the data in the same table indicate a gradual significant decrease in the height of wheat crops when increasing the number of weeds / m^2, as

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the height reached (55 cm) at the presence of 112 weed / m^2.(Sloane et al., 2004), and the data also indicate the significant interaction between the seed rate and the number of weed plants, as we note that there is a gradual significant decrease in this characteristic when increasing the number of weed plants and for each rate of seeding, and agricultural research urges farmers to plant with high plant densities and consider it a Important methods or means in weed control (Olsen et al., 2006).

Tillers number of wheat/pot:

The results in the table indicate that there was a significant increase in the number of Tillers for the wheat yield when the seeding rate increased, as the seeding rate of 120 kg / ha achieved the highest number of Tillers, with an increase of (32.3 and 10.1)% compared to the rates (80 and 100) kg / ha. Respectively , The reason for this is due to the increase in the number of plants per unit area when the seeding rate increases, and this result is in agreement with many studies that indicate an increase in the number of Tillers by increasing the seeding rate (Habiullah et al., 2007). The results also indicate a significant increase in this characteristic when the number of weed plants per unit area decreases, and the reason for this may be due to the lack of competition or that competition is in favor of the crop plants when the density of the weed is low, and this result coincides with the findings of (Sloane and others, 2004). As for the results of the interaction between the seed rate and the number of weed plants, it indicates that the highest number of Tillers was achieved at the seed rate of 120 kg / ha in the absence of the weed, as the number of Tillers reached 24 Tiller compared to 13 Tillers at the seed rate of 80 kg / ha with 112 weed / m^2.

Number of grains / spike:

The data in the table indicate that a significant gradual decrease in the number of grains / spike when the seeding rate increased. The reason for this may be due to the high competition between plants for different growth factors, which led to a lack of seed locations on the spike or failure to hold some florets, especially at the basal spikes. And peripheral when the seeding rate increases This result has been confirmed by many research in the world, especially in areas of limited rain or in medium rainy areas, that their decrease when the spikes appear or during the flowering stage lead to the failure to fertilize a large number of spikelets and thus the number of grains decreases with the spike, while farmers who have supplementary irrigation, especially at that stage. The number of grains increases because the crop plants do not suffer from water stress (Khan, 2007). The same table also indicated that there was a gradual significant decrease in this characteristic when the number of weeds per unit area increased the reason for this may be attributed to the phenomenon of competition, and this result coincided with his findings (Hayawi, 2015). As for the interaction between factors, the seeding rate of 80 kg / ha was achieved when there was no weeds, the highest number of spike seeds was 30 seed thus it was significantly superior to all treatments, while the lowest number of spike seeds was at the seed rate of 120 kg / ha with 112 weed/ m^2, reaching 18, 68 grain / spike.

Grains Yield (g / pot):

The results in the table indicate that the grain yield increased significantly and gradually with the increase in the seeding rate, and that this increase in productivity

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appeared as a result of the increase in the number of plants per unit area, as many researches in rainy regions of the world indicated on increasing the yield of wheat yield when the seeding rates increased. It is commensurate with the environmental conditions and the variety of each region, which are the result of increasing the yield components (Hayawi, 2015). The results also indicate a significant increase in the yield, in a gradual manner also, with a decrease in the number of weed plants per unit area, As for the interaction between the seed rate and the number of weed plants per unit area, there was a significant increase in this characteristic by increasing the seed rate for each level of weed densities, and the highest yield of pot reached 11.06 g / pot when the interaction between the seed rate of 120 kg / ha in The absence of weeds compared to the rest of the treatments (equivalent to 1.580 kg / ha), while the lowest yield was achieved at the seed rate of 80 kg / ha with the presence of 112 weed / m^2, reaching 6.32 g / pot (equivalent to 900 kg / ha), and the increase rate reached Between the two transactions, it reached 42.85%.

Dry Weight of weed/ pot:

The data in the table indicate that there was a significant decrease in the dry weight of the weed / pot, as the reduction percentage reached (37.66 and 55.82%) for the seed rates (100 and 120) kg / ha compared to the seed rate of 80 kg / ha for the wheat crop. The reason for this is the decrease in the number of Tillers for bush plants / pot when seeding rates increase, and this result is consistent with what was found (Olsen et al., 2006). The data in the same table also show that there is a significant increase in this characteristic when the number of weed plants per unit area increased, as the dry weight of the weed reached (8,34 g) when there were 112 weed plants /m^2 and the reason for this was the increase in the number of weed plants per unit area upon this treatment, this result coincided with what he found (Hayawi, 2015). The results of the interaction between the two factors show that the highest dry weight of the weed was achieved at the seed rate of 80 kg / ha with the presence of (112) weed plants per unit area, as the dry weight reached (8,34 g) compared to the rest of the treatments. As for the lowest dry weight, it was achieved at seeding rate (120 kg / ha), with (14) weed plants per unit area, as it reached (0.28g) .

The table shows the effect of seed rate, weed density and the interactio between them on the studied characteristics.

Treatments Seeding rate Kg/ha	Wheat plant height (cm)	Tillers number of wheat/pot	Number of grains / spike	Grains Yield (g / pot)	Dry Weight of weed/ pot
80	**57,8 b**	**13,4 c**	**25,0 a**	**8,28 c**	**4,46 a**
100	**58,6 b**	**17,8 b**	**23,3 b**	**9,00 b**	**2,78 b**
120	**61,2 a**	**19,8 a**	**22,2 c**	**9,25 a**	**1,97 c**
Weeds number					

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0		**62,78 a**	**18,00 a**	**28,23 a**	**10.57 a**	**0.00 e**
14		**61,89 ab**	**18,34 a**	**24,48 b**	**10.14 b**	**1.42 d**
28		**60,34 b**	**15,67 c**	**23,57 b**	**9.44 c**	**2.34 c**
56		**56,12 c**	**16,66 bc**	**21,67 c**	**7.40 d**	**3.26 b**
112		**55,00 c**	**16,34 b**	**19,76 d**	**6.66 e**	**8.34 a**
Weeds number X seeding rate						
80	**0**	**64,34 a**	**14,00 gh**	**30.0 a**	**10.15 bc**	**0.00 g**
	14	**63,34 ab**	**15,00 fg**	**26.0 b-d**	**9.62 d**	**2.80 e**
	28	**63,67 ab**	**13,00 hi**	**25.0 c - e**	**8.32 e**	**3.13 e**
	56	**49,67 f**	**13,00 hi**	**23.0 e-h**	**7.02 g**	**4.20 d**
	112	**48,67 f**	**12,00 i**	**21.0 g-i**	**6.32 h**	**12.20 a**
100	**0**	**61,34 a-c**	**16,00 ef**	**28.0 ab**	**10.50 b**	**0.00 g**
	14	**60,67 a-d**	**21,00 b**	**24.30 d-f**	**10.31 bc**	**1.20 g**
	28	**57,00 de**	**17,00 de**	**23.40 e-g**	**9.91 cd**	**2.70 e**
	56	**57,67 ce**	**16,00 ef**	**21.50 g-j**	**7.52 f**	**2.80 e**
	112	**56,34 e**	**19,00 c**	**19.60 jk**	**6.77 gh**	**7.20 b**
120	**0**	**62,67 a**	**24,00 a**	**26.23 bc**	**11.06 a**	**0.00 g**
	14	**61,67 ab**	**19,00 c**	**23.16e-h**	**10.51 b**	**0.28 g**
	28	**60,33 b-d**	**17,00 de**	**22.31 f-j**	**10.11 bc**	**1.20 f**
	56	**61,34 a-c**	**21,00 b**	**20.50 j**	**7.67 f**	**2.80 e**
	112	**60,00 b-d**	**18,00 cd**	**18.68 k**	**6.90 g**	**5.60 c**

The values followed by the same letter do not differ significantly from each other at the level of probability of 5% for each of the study factors And for each overlap.

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