Middle East Journal of Agriculture Research
Volume: 10 | Issue: 04| Oct. – Dec.| 2021

EISSN: 2706-7955 ISSN: 2077-4605
DOI: 10.36632/mejar/2021.10.4.84
Journal homepage: www.curresweb.com
Pages: 1266-1272

Effect of Nitrogen and Organic Fertilizer on Growth of Some Wheat Cultivars

Nabila M. Zaki, Amal G. Ahmed and Hassanein M. S.

Field Crops Research Department, National Research Centre, 33 El-Bohouth St., Dokki, Giza, Egypt. Postal Code: 12622.

Received: 25 Oct. 2021 **Accepted:** 20 Nov. 2021 **Published:** 30 Nov. 2021

ABSTRACT

Two field experiments were conducted at Wadi El- Rayan Fayoum Governorate, Egypt in 2017/2018 and 2018/2019 seasons, to study the effect of nitrogen fertilizer (ammonia gas 82%) and organic fertilizer on growth characters of two wheat cultivars. The main results could be summarized as follows: Misr-1 cultivar surpassed Sids-1 cultivar in all growth characters under study significantly. Addition of 75kg N/feddan (ammonia gas 82%) resulted in a significant increment in growth characters. Increasing nitrogen fertilizer from control to 75kg N/feddan increased growth characters significantly. The application of organic fertilizer at the rate of 15 ton/ feddan significantly increased growth characters under study comparison with other treatments (5 ton/ feddan and 10 ton/ feddan). With respect to the interaction between wheat cultivars x nitrogen fertilizer x organic fertilizer affected significantly growth characters. The best treatments for growth characters were Misr-1 cultivar +75 kg N / fed., + 15 ton / fed., organic fertilizer, while was Sids-1 cultivar +75 kg N / fed., + 15 ton / fed., organic fertilizer for number of tillers/ m^2 at 110 days from sowing.

Keywords: Wheat, cultivars, nitrogen, ammonia gas, organic, fertilizer, growth characters.

1. Introduction

Wheat (*Triticum aestivum* L.) is an important cereal crop in Egypt and over the world used in human food and animal feed as well as, with regard to cultivated area and total production, as well as nutritive value. It provides 37% of the total calories for the people and 40% of the protein in the Egyptian diet (El- Habbasha *et al.,* 2015 and Dahshouri *et al.,* 2017). Recently, a great attention of several investigations has been directed to increase the productivity of wheat to minimize the gap between the Egyptian production and consumption by increasing the cultivated area and wheat yield per unit area.

The total biomass is a result of the integration of metabolic reaction in the plants. Consequently any factor influencing the metabolic activity of the plant at any period of its growth can affect the yield. Metabolic processes in wheat plants are greatly governed by both internal i.e. genetic makeup of the plant and external conditions which namely climatic and edaphically environmental factors. Thus, increasing wheat production per unit area can be achieved by breeding and cultivating the promising wheat cultivars and applying the optimum cultural practices such as suitable fertilizer. Zaki *et al.,* (2016), Dahshouri *et al.,* (2017) and Ahmed *et al.,* (2019) reported that there were significant differences in all growth characters under study. There were a significant differences among cultivars (Ahmed *et al.,* 2006; Zaki *et al.,* 2007; Gomaa *et al.,* 2011; Hassanein *et al.,* 2013; Zaki *et al.,* 2016 and Ahmed *et al.,* 2018). Nutrition is essential for plant life and yield therefore; mineral fertilization (nitrogen) is a common agronomic practice that leads to improve productivity. But with the steadily increasing prices of chemical fertilizers especially nitrogen and the pollution problems of soil and water. Gomaa *et al.,* (2011); Ahmed *et al.,* (2018) and Ahmed *et al.,* (2019) told that nitrogen fertilization significantly increased growth characters under study.

Corresponding Author: Hassanein M. S., Field Crops Research Department, National Research Centre, 33 El-Bohouth St., Dokki, Giza, Egypt. Postal Code: 12622.

Organic fertilization reduce pollution and sustain soil fertility through their effect on the physical, chemical and biological properties. Organic fertilizer increased growth characters in wheat plants, Hosam El-Din (2007) and Gomaa *et al.,* (2011).

The aim of this study was designed to study the effect of nitrogen and organic fertilizers on growth characters in two wheat cultivars.

2. Materials and Methods

Two field experiments were conducted at new land at Wadi El-Rayan, El- Fayoum Governorate, Egypt during 2017/2018 and 2018/2019 seasons. The experiments were carried out to study the combined effect of mineral nitrogen fertilizer i.e. (ammonia gas 82%) and organic fertilizer on growth characters of two wheat cultivars (*Triticum aestivum* L.). The physical and chemical characters of soil (30 cm depth) in the experimental site were as follows; sand 72.59%, silt 23.47%, clay 3.45%, PH 8.00, organic matter 0.84%, soluble N 84.00 ppm, soluble P 13.50 ppm, and soluble K 132.00 ppm., according to as described by Chapman and Pratt (1961).

The experimental design was split-split plot design with four replications. Wheat cultivars were allocated randomly in the main plots (Sids-1 and Misr-1), nitrogen fertilizer were randomly allocated in sub- plots (Control, 50 kg N/ fed., and 75 kg N/ fed.). Organic fertilizer were randomly allocated in sub-sub plot (5 ton/ fed., 10 ton/ fed., and 15 ton/ fed., chicken manure). The size of each plot was 10.5m^2 (1/400 feddan) 3.5 m long and 3 m wide. Each experiment included 18 treatments which were the combination among two cultivars, three nitrogen level and three organic fertilizer level. Nitrogen fertilizer added at the first irrigation and 25 days after the first irrigation in form of ammonia gas. Super phosphate fertilizer (15.5%P_2O_5) was applied before sowing at the rate of 150 kg/ fed., also organic fertilizer form chicken manure was added and mixed with the soil two weeks before sowing raked it lightly at a depth of 10 -15cm. Potassium fertilizer was applied before sowing at a rate of 50 kg/ fed., in the form of potassium sulphate (48% K_2O). Sowing date were November 15th and November 20th in both seasons, respectively, while, seeding rate was 70 kg/ fed. The normal agronomic practices of wheat were followed until harvest as recommended by Wheat Research Dep., Agric. Research Centre.

At 90 and 110 days from sowing samples of one square meter were taken from each plot to determine 1- plant height (cm) 2- number of tillers (m^2)3-number of leaves (m^2) 4- number of spikes (m^2) 5- spikes dry weight (g/ m^2) 6- total dry weight (g/ m^2) 7- L.A (dm^2) 8- L.A.I

Data obtained were exposed to the proper method of statistical analysis of variance differentiate among means of different treatments as described by Gomez and Gomez (1984). The treatments means were compared using the least significant differences (L.S.D.) test at 5% level of probability. Combined analysis was made from the two growing seasons hence the results of two seasons followed similar trend.

3. Results and Discussion

3.1. Varietal differences

Data in Table (1) showed that there were significant differences between the two wheat cultivars under study in all growth characters at 90 and 110 days from sowing. It is clear that Misr-1 cultivar significantly surpassed Sids-1 cultivar in values of plant height (cm), number of leaves (m^2), number of spikes (m^2), spikes dry weight (g/ m^2), total dry weight (g/ m^2), L.A (dm^2) and L.A.I at 90 and 110 days, on the other hand number of tillers (m^2) at 90 days from sowing only. It could be concluded that varietal differences between wheat cultivars may be due to genetically differences between cultivars and differences between genotype concerning partition of dry matters, where wheat cultivars differed in carbon equivalent, yield energy per plant (Ahmed *et al.,* 2009).

These results could be supported by those obtained by Zaki *et al.,* (2004);Ahmed *et al.,* (2006); Zaki *et al.,* (2007); Ahmed *et al.,* (2009); Gomaa *et al.,* (2011); Hassanein *et al.,* (2013) and Zaki *et al.,* (2016).

3.2. Effect of nitrogen fertilizer

It is clear from Table (1) that adding nitrogen fertilizer (ammonia gas) increased significantly all growth characters under study at 90 and 110 days from sowing compared with control. Data revealed that increasing nitrogen level increased significantly all character under study. These increase with increasing nitrogen level may be attributed to the role of nitrogen in promoting the vegetative growth and meristimic activity during growth. These finding are in agreement with those obtained by Sabah (2006), Gomaa *et al.,* (2011) and Ahmed *et al.,* (2018). The increase in plant height may be occurred due to the stimulation of cell division and internodes elongation resulted from nitrogen application. In general, application of nitrogen fertilizer (ammonia gas) at rate of 75kg N / fed., gave the highest values of growth characters compared to 50 kg N / fed., and to control.

These results are in harmony with those reported by Hassanein *et al.,* (2013), Ahmed *et al.,* (2018) and Ahmed *et al.,* (2019).

3.3. Effect of organic fertilizer

Data in Table (1) showed that adding organic fertilizer at rate of 15 ton / fed., gave the highest values of all growth characters followed by 10 ton / feddan under study. The differences between organic fertilizer levels were significant for all characters under study in both seasons. The superiority of 15 ton / fed., organic fertilizer may be due to the stimulate effect of it through vegetative growth (Mowafy, 2002; Abdel-Ati *et al.,* 2006; Gomaa *et al.,* 2011 and Hassanein *et al.,* 2013).

Table 1: Effect of cultivars, nitrogen fertilizer and organic fertilizer on growth characters of wheat (Average of 2017/2018 and 2018/2019 seasons).

Characters	Plant height (cm)		No. of tillers (m^2)		No. of leaves (m^2)		No. of spikes (m^2)	
Treatments	**90**	**110**	**90**	**110**	**90**	**110**	**90**	**110**
Cultivars								
Sids 1	113.23	115.88	512.26	563.33	484.56	456.93	493.74	535.89
Misr 1	119.79	123.46	527.59	562.19	495.89	470.30	505.11	544.15
L.S.D. at 5%	0.50	0.30	0.96	0.89	0.55	0.80	1.66	0.97
Nitrogen fertilizer(Ammonia Gas)								
Control	113.91	117.12	496.72	541.00	481.17	448.89	487.83	521.72
50 kg N/ fed.	116.54	119.60	517.89	559.44	490.89	465.00	493.11	543.06
75 kg N/ fed.	119.07	122.28	545.17	587.39	498.61	476.94	517.33	555.28
L.S.D. at 5%	0.34	0.35	1.20	0.65	0.90	0.47	0.84	0.55
Organic fertilizer								
5 ton/ fed.	113.53	117.06	507.78	552.11	481.44	450.33	484.50	530.67
10 ton/ fed.	116.36	119.39	517.50	563.61	490.89	463.94	502.39	539.94
15 ton/ fed.	119.63	122.56	534.50	572.56	498.33	476.56	511.39	549.44
L.S.D. at 5%	0.35	0.27	0.90	0.77	1.04	0.41	0.63	0.74

Table 1: Cont.

Characters	Spikes dry weight (g/m^2)		Total dry weight (g/m^2)		LA (dm^2)		LAI	
Treatments	**90**	**110**	**90**	**110**	**90**	**110**	**90**	**110**
Cultivars								
Sids 1	786.22	826.89	1257.52	1361.04	56.91	54.74	5.152	5.122
Misr 1	807.22	848.11	1284.56	1394.48	59.59	57.00	5.362	5.154
L.S.D. at 5%	0.73	7.26	4.47	10.22	0.84	0.07	0.164	0.003
Nitrogen fertilizer(Ammonia Gas)								
Control	789.39	821.44	1258.28	1363.44	55.66	53.70	4.979	4.816
50 kg N/ fed.	785.94	830.44	1270.61	1378.11	58.33	56.21	5.289	5.082
75 kg N/ fed.	814.83	843.83	1284.22	1391.72	60.74	57.71	5.503	5.216
L.S.D. at 5%	0.78	3.39	0.95	6.75	0.30	0.15	0.110	0.016
5 ton/ fed.	792.67	819.61	1256.17	1361.00	56.08	53.87	5.076	4.873
Organic fertilizer								
10 ton/ fed.	802.17	831.50	1272.61	1380.28	58.12	55.93	5.227	5.033
15 ton/ fed.	795.33	844.61	1284.33	1392.00	60.54	57.81	5.468	5.208
L.S.D. at 5%	0.98	3.44	0.94	5.47	0.23	0.28	0.094	0.015

3.4. Effect of interaction

The effect of interaction between wheat cultivars and nitrogen fertilizer (ammonia gas) on all growth characters under study in 90 and 110 days from sowing were significant except spikes dry weight (g/ m^2) and total dry weight (g /m^2) at 110 days from sowing, and L.A.I at 90 days from sowing. Data in Table (2) indicated that the highest value of all characters under study was Misr-1 cultivar + 75kg N/ feddan.

Table 2: Effect of interaction between cultivars x nitrogen fertilizer on growth characters of wheat (Average of 2017/2018 and 2018/2019 seasons).

Characters		Plant height (cm)		No. of tillers (m^2)		No. of leaves (m^2)		No. of spikes (m^2)	
Treatments		90	110	90	110	90	110	90	110
Cultivars x Nitrogen fertilizer(Ammonia Gas)									
	Control	110.23	113.14	492.89	534.67	474.44	441.11	486.00	511.78
Sids 1	50 kg N/ fed.	113.78	116.32	508.22	561.56	485.89	459.44	482.22	543.11
	75 kg N/ fed.	115.67	118.18	535.67	593.78	493.33	470.22	513.00	552.78
	Control	117.58	121.10	500.56	548.22	487.89	456.67	489.67	531.67
Misr 1	50 kg N/ fed.	119.30	122.88	527.56	557.33	495.89	470.56	504.00	543.00
	75 kg N/ fed.	122.48	126.39	554.67	581.00	503.89	483.67	521.67	557.78
L.S.D. at 5%		0.49	0.50	1.69	0.92	1.27	0.66	1.18	0.78

Table 2: Cont.

Characters		Spikes dry weight (g/m^2)		Total dry weight (g/m^2)		LA (dm^2)		LAI	
Treatments		90	110	90	110	90	110	90	110
Cultivars x Nitrogen fertilizer(Ammonia Gas)									
	Control	784.67	816.56	1244.56	1344.22	54.69	52.82	4.956	4.704
Sids 1	50 kg N/ fed.	761.11	824.56	1255.00	1365.22	56.66	54.71	5.139	4.939
	75 kg N/ fed.	812.89	839.56	1273.00	1373.67	59.38	56.68	5.361	5.122
	Control	794.11	826.33	1272.00	1382.67	56.63	54.58	5.002	4.928
Misr 1	50 kg N/ fed.	810.78	836.33	1286.22	1391.00	60.01	57.70	5.439	5.224
	75 kg N/ fed.	816.78	848.11	1295.44	1409.78	62.11	58.73	5.644	5.310
L.S.D. at 5%		1.10	n.s	1.35	n.s	0.43	0.21	n.s	0.022

Data in Table (3) revealed that the interaction between wheat cultivars and organic fertilizer was significantly at 90 and 110 days from sowing in both seasons except number of leaves (m^2) and L.A.I at 90 days from sowing, while total dry weight (g/ m^2) at 110 days from sowing. On the other hand the interaction between nitrogen fertilizer x organic fertilizer was significant at all characters in this study except plant height and L.A.I at 90 and110 days after sowing, while spikes dry weight (g/ m^2) and total dry weight (g /m^2) at 110 days after sowing. Data in (Table 4) showed that the best treatment was 75 kg N/ feddan + 15 ton / feddan organic fertilizer.

Table 3: Effect of interaction between cultivars x organic fertilizer on growth characters of wheat (Average of 2017/2018 and 2018/2019 seasons).

Characters		Plant height (cm)		No. of tillers (m^2)		No. of leaves (m^2)		No. of spikes (m^2)	
Treatments		90	110	90	110	90	110	90	110
Cultivars x Organic fertilizer									
	5 ton/ fed.	109.62	112.79	502.00	555.89	475.89	446.11	475.00	526.00
Sids 1	10 ton/ fed.	113.37	115.57	510.00	562.67	485.56	457.33	499.44	536.44
	15 ton/ fed.	116.69	119.29	524.78	571.44	492.22	467.33	506.78	545.22
	5 ton/ fed.	117.44	121.33	513.56	548.33	487.00	454.56	494.00	535.33
Misr 1	10 ton/ fed.	119.34	123.21	525.00	564.56	496.22	470.56	505.33	543.44
	15 ton/ fed.	122.57	125.82	544.22	573.67	504.44	485.78	516.00	553.67
L.S.D. at 5%		0.49	0.39	1.27	1.09	n.s	0.58	0.90	1.05

Table 3: Cont.

Characters		Spikes dry weight (g/m^2)		Total dry weight (g/m^2)		LA(dm^2)		LAI	
Treatments		90	110	90	110	90	110	90	110
		Cultivars x Organic fertilizer							
	5 ton/ fed.	788.22	816.00	1244.33	1344.44	55.03	52.77	4.983	4.766
Sids 1	10 ton/ fed.	797.56	823.56	1258.11	1361.67	56.76	54.58	5.151	4.919
	15 ton/ fed.	772.89	841.11	1270.11	1377.00	58.93	56.87	5.321	5.081
	5 ton/ fed.	797.11	823.22	1268.00	1377.56	57.13	54.98	5.168	4,980
Misr 1	10 ton/ fed.	806.78	839.44	1287.11	1398.89	59.48	57.28	5.303	5.148
	15 ton/ fed.	817.78	848.11	1298.56	1407.00	62.14	58.76	5.614	5.334
L.S.D. at 5%		0.44	4.87	1.33	n.s	0.33	0.39	n.s	0.021

Table 4: Effect of interaction between nitrogen fertilizer x organic fertilizer on growth characters of wheat (Average of 2017/2018 and 2018/2019 seasons).

Characters		Plant height (cm)		No. of tillers ($m^{2)}$		No. of leaves (m^2)		No. of spikes (m^2)	
Treatments		90	110	90	110	90	110	90	110
		Nitrogen fertilizer(Ammonia Gas) x Organic fertilizer							
	5 ton/ fed.	111.15	114.32	489.00	531.17	470.50	436.17	483.33	512.67
Control	10 ton/ fed.	113.63	116.93	495.33	542.33	483.17	449.33	488.67	521.00
	15 ton/ fed.	116.93	120.12	505.83	550.83	489.83	461.17	491.50	531.50
	5 ton/ fed.	113.73	117.23	505.00	548.67	482.83	451.50	468.00	535.00
50 kg N/ fed.	10 ton/ fed.	116.42	119.32	514.50	559.33	491.17	462.33	500.83	543.50
	15 ton/ fed.	119.47	122.25	534.17	570.33	498.67	481.17	510.50	550.67
	5 ton/ fed.	115.72	119.63	529.33	576.50	491.00	463.33	502.17	544.33
75 kg N/ fed.	10 ton/ fed.	119.02	121.92	542.67	589.17	498.33	480.17	517.67	555.33
	15 ton/ fed.	122.48	125.30	563.50	596.50	506.50	487.33	532.17	566.17
L.S.D. at 5%		n.s	n.s	1.56	1.33	1.80	0.71	1.10	1.28

Table 4: cont.

Characters		Spikes dry weight (g/m^2)		Total dry weight (g/m^2)		LA(dm^2)		LAI	
Treatments		90	110	90	110	90	110	90	110
		Nitrogen fertilizer(Ammonia Gas) x Organic fertilizer							
	5 ton/ fed.	782.33	808.00	1243.00	1342.50	53.52	51.65	4.832	4.655
Control	10 ton/ fed.	790.17	821.00	1259.67	1369.50	55.43	53.27	4.875	4.803
	15 ton/ fed.	795.67	835.33	1272.17	1378.33	58.03	56.18	5.230	4.990
	5 ton/ fed.	794.67	819.33	1256.83	1366.00	56.12	54.05	5.087	4.927
50 kg N/ fed.	10 ton/ fed.	801.33	831.00	1272.83	1378.83	58.05	56.65	5.280	5.070
	15 ton/ fed.	761.83	841.00	1282.17	1389.50	60.83	57.92	5.500	5.248
	5 ton/ fed.	801.00	831.50	1268.67	1374.50	58.62	55.92	5.308	5.037
75 kg N/ fed.	10 ton/ fed.	815.00	842.50	1285.33	1392.50	60.87	57.87	5.527	5.227
	15 ton/ fed.	828.50	857.50	1298.67	1408.17	62.75	59.33	5.673	5.385
L.S.D. at 5%		1.71	n.s	1.63	n.s	0.40	0.48	n.s	n.s

With respect of the three way interaction between wheat cultivars x nitrogen fertilizer x organic fertilizer data in Table (5) showed that the effective treatments for plant height (cm), number of leaves (m^2), spikes dry weight (g/ m^2) and L.A (dm^2) at 90 and 110 days after sowing were Misr-1 cultivar + 75 kg N/feddan +15 ton/feddan organic fertilizer. Meanwhile there were insignificant interaction in number of spikes (m^2) and total dry weight (g/ m^2) at110 days after sowing, besides L.A.I at 90 days from sowing. The effective treatment for number of tillers (m^2) at 90 days from sowing was Misr -1 cultivar + 75kg N/ feddan + 15 ton/feddan organic fertilizer while at 110 days after sowing was Sids-1 cultivar + 75kg N/ feddan + 15 ton/feddan organic fertilizer.

Table 5: Effect of interaction between cultivars x nitrogen fertilizer x organic fertilizer on growth characters of wheat (Average of 2017/2018 and 2018/2019 seasons).

Characters			Plant height (cm)		No. of tillers (m^2)		No. of leaves (m^2)		No. of spikes (m^2)	
Treatments			90	110	90	110	90	110	90	110
Sids 1	Control	5 ton/ fed.	106.83	109.87	487.00	524.67	462.67	431.00	480.67	502.33
		10 ton/ fed.	109.80	112.47	492.00	535.33	477.33	441.33	487.00	512.00
		15 ton/ fed.	114.07	117.10	499.67	544.00	483.33	451.00	490.33	521.00
	50 kg N/ fed.	5 ton/ fed.	110.43	113.37	496.67	554.00	477.00	449.67	441.33	535.00
		10 ton/ fed.	114.10	116.10	506.00	559.67	486.33	457.67	498.33	544.00
		15 ton/ fed.	116.80	119,50	522.00	571.00	494.33	471.00	507.00	550.33
	75 kg N/ fed.	5 ton/ fed.	111.60	115.13	522.33	589.00	488.00	457.67	503.00	540.67
		10 ton/ fed.	116.20	118.13	532.00	593.00	493.00	473.00	513.00	553.33
		15 ton/ fed.	119.20	121.27	552.67	599.33	499.00	480.00	523.00	564.33
Misr 1	Control	5 ton/ fed.	115.47	118.77	491.00	537.67	478.33	441.33	486.00	523.00
		10 ton/ fed.	117.47	121.40	498.67	549.33	489.00	457.33	490.33	530.00
		15 ton/ fed.	119.80	123.13	512.00	557.67	496.33	471.33	492.67	542.00
	50 kg N/ fed.	5 ton/ fed.	117.03	121.10	513.33	543.33	488.67	453.33	494.67	535.00
		10 ton/ fed.	118.73	122.53	523.00	559.00	496.00	467.00	503.33	543.00
		15 ton/ fed.	122.13	125.00	546.33	569.67	503.00	491.33	514.00	551.00
	75 kg N/ fed.	5 ton/ fed.	119.83	124.13	536.33	564.00	494.00	469.00	501.33	548.00
		10 ton/ fed.	121.83	125.70	553.33	585.33	503.67	487.33	522.33	557.33
		15 ton/ fed.	125.77	129.33	574.33	593.67	514.00	494.67	541.33	568.00
L.S.D. at 5%			0.85	0.67	2.21	1.88	2.54	1.00	1.56	n.s

Table 5: Cont.

Characters			Spikes dry weight (g/m^2)		Total dry weight (g/m^2)		LA (dm^2)		LAI	
Treatments			90	110	90	110	90	110	90	110
Cultivars x Nitrogen fertilizer(Ammonia Gas) x Organic fertilizer										
Sids 1	Control	5 ton/ fed.	776.67	804.00	1233.33	1321.67	52.57	50.57	4.787	4.577
		10 ton/ fed.	787.33	813.00	1244.33	1349.00	54.57	51.97	4.947	4.677
		15 ton/ fed.	790.00	832.67	1256.00	1362.00	56.93	55.93	5.133	4.860
	50 kg N/ fed.	5 ton/ fed.	789.33	818.00	1246.33	1355.67	54.67	52.73	4.950	4.770
		10 ton/ fed.	791.33	824.67	1256.00	1364.00	56.43	55.17	5.140	4.947
		15 ton/ fed.	702.67	831.00	1262.67	1376.00	58.87	56.23	5.327	5.100
	75 kg N/ fed.	5 ton/ fed.	798.67	826.00	1253.33	1356.00	57.87	55.00	5.213	4.950
		10 ton/ fed.	814.00	833.00	1274.00	1372.00	59.27	56.60	5.367	5.133
		15 ton/ fed.	826.00	859.67	1291.67	1393.00	61.00	58.43	5.503	5.283
Misr 1	Control	5 ton/ fed.	788.00	812.00	1252.67	1363.33	54.47	52.73	4.877	4.733
		10 ton/ fed.	793.00	829.00	1275.00	1390.00	56.30	54.57	4.803	4.930
		15 ton/ fed.	801.33	838.00	1288.33	1394.67	59.13	56.43	5.327	5.120
	50 kg N/ fed.	5 ton/ fed.	800.00	820.67	1267.33	1376.00	57.57	55.37	5.223	5.083
		10 ton/ fed.	811.33	837.33	1289.67	1393.67	59.67	58.13	5.420	5.193
		15 ton/ fed.	821.00	851.00	1301.67	1403.00	62.80	59.60	5.673	5.397
	75 kg N/ fed.	5 ton/ fed.	803.33	837.00	1284.00	1393.00	59.37	56.83	5.403	5.123
		10 ton/ fed.	816.00	852.00	1296.67	1413.00	62.47	59.13	5.687	5.320
		15 ton/ fed.	831.00	855.33	1305.67	1423.33	64.50	60.23	5.843	5.487
L.S.D. at 5%			2.42	8.43	2.31	n.s	0.57	0.68	n.s	0.036

References

Abdel-Ati, A.A. and K.I. Zaki, 2006. Productivity of some wheat cultivars in calcareous soils under organic farming and rainfed conditions with special references to plant disease. J. Agric. Sci. Mansoura Univ., 31(4): 1875-1889.

Ahmed, A.G., M.S. Hassanein, M.A. Ahmed and Nabila M. Zaki, 2009. Response of two wheat cultivars grown in newly cultivated lands to potassium and slow release N fertilizer. Modern J. of Appl. Biol. Sci., Crop Sci., 3(2):51-61.

Ahmed, A.G., M.S. Hassanein and M.M. El-Gazzar, 2006. Growth and Yield Response of Two Wheat Cultivars to Complete Foliar Fertilizer Compound "Dogoplus". J. of Applied Sci. Res., 2(1): 20-26.

Ahmed, A.G., M.S. Hassanein and Nabila M. Zaki, 2019. Performance of two barley cultivars as affected by nitrogen and bio-fertilizer under newly reclaimed lands. Middle East J. of Agric. Res., 8(2): 684-691.

Ahmed, A.G., Nabila M. Zaki and M.S. Hassanein, 2018. Effect of nitrogen fertilizer and bio-fertilizer on growth characters of two wheat cultivars under sandy soil. Middle East J. of Agric. Res., 7(1): 10-116.

Chapman, H.D. and P.F. Pratt, 1961. Methods of Analysis for Soils, Plants and Water. Univ. of California, Berkeley, CA, USA.

El-Dahshouri. M.F., M.M. El-Fouly, R.Kh.M. Khalifa and H.M. Abd El-Ghany, 2017. Effect of zinc foliar application at different physiological growth stages on yield and quality of wheat under sandy soil conditions. Agric. Eng. Int.: CIGR J., Special issue: 193–200.

El-Habbasha, E.S., E.A. Badr, and E.A. Latef, 2015. Effect of zinc foliar application on growth characteristics and Grain Yield of some wheat arieties under Zn deficient sandy soil condition. Inter.J. Chemtech Res., 8(6): 452–458.

Gomaa, M.A., N.M. Zaki, F.I. Radwan, M.S. Hassanein, A.M. Gomaa and A.M. Wali, 2011. The Combined Effect of Mineral, Organic and Bio-Fertilizers on Growth of Some Wheat Cultivars. J. of Applied Sci. Res., 7(11): 1591-1608.

Gomez, A.K. and A.A. Gomez, 1984. Statistical procedure for agricultural Research.2nd edition John Wiley and Sons, Inc., New York.

Hassanein, M.S., Amal G. Ahmed, Nabila M. Zaki, H.I. El-Aila and M.M. Tawfic, 2013. Response of two wheat cultivars grown in newly cultivated lands to iron and slow release N fertilizers. Aust. J. of Basic and Appl. Sci., 7(1): 498-505.

Hosam El-Din, A.T.S., 2007. Productivity of some wheat varieties by using bio and organic fertilization in the New Valley. M. Sc. Thesis, Fac. Of Agric. Ain Shams Univ., Egypt.

Mowafy, S.A.E., 2002. Effect of organic manure and splitting of different levels of nitrogen on wheat under sprinkler irrigation in sandy soils. Zagazig J. Agric. Res., 29(1): 51-72.

Sabah, H. Abo-El-Ela, 2006. Influence of mineral and bio-nitrogen fertilization on three new bread wheat genotypes. Egypt. J. Agric. Res., 84(6): 1833-1841.

Zaki, N.M., M.A., Ahmed and M.S., Hassanein, 2004. Growth and yield of some wheat cultivars irrigated with saline water in newly cultivated land as affected by nitrogen fertilization. Ann. Of Agric. Sci., Moshtohor, 42(2): 515-525.

Zaki, N. M., M. S. Hassanein and K.M. Gamal El-Din, 2007. Growth and yield of some wheat cultivars irrigated with saline water in newly cultivated land as affected by biofertilization. J. of Applied Sci. Res., 3(10): 1121-1126.

Zaki, N.M., M.S. Hassanein, Amal G. Ahmed, M.A. Ahmed and M.M. Tawifk, 2016. Response of two wheat cultivars to different nitrogen sources in newly cultivated land. Res. J. of Pharmaceutical, Biolog. and Chem. Sci., 7(6): 410-416.