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SEEDING AND NITROGEN RATES REQUIRED TO MAXIMIZE YIELD OF GEMMEIZA 9 WHEAT CULTIVAR IN EASTERN DELTA REGION

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ABSTRACT

Two field experiments were carried out at Bany-Amer, Zagazig District, Sharkia Governorate, Egypt during 2006/2007 and 2007/2008 seasons to study the effect of four seeding rates (45, 55, 65 and 75 kg/fad) and five levels of nitrogen fertilizer (30, 45, 60, 75 and 90 kg N/fad) on yield and its components as well as yield analysis of Gemmeiza 9 wheat cultivar in Eastern Delta Region.

The increase in seeding rates from 45 to 75 kg/fad significantly decreased number of grains/ spike and 1000-grain weight. Grain and biological yields/ fad significantly increased by increasing seeding rates from 45 to 55 or 65 kg/fad, while number of spikes/m^2 and straw yield/fad responded to the increase in seeding rates up to 75 kg/fad. However, the differences in grain weight/spike and both harvest and crop indices due to seeding rates were not significant. Each of 1000-grain weight, straw and grain yields/fad responded to N application up to 60 kgN/fad, while number of spikes/m^2, number of grains/spike and grain weight/spike responded to N application up to 90 kg N/fad. However, the response of biological yield/fad to N fertilization was up to 75 kg N/fad.

Grain yield/fad was positively and significantly correlated with each of number of spikes/m^2, number of grains/spike, grain weight /spike, 1000-grain weight, straw yield/fad and biological yield/ fad. The main sources of grain0yield variation according to their relative importance were number of spikes/m^2 (61.18%), number of grains/spike (18.1s%) and 1000-grain weight (4.65%). The direct and indirect effects of these characters amounted to 95.96% of whuat grain$yield variation. Vegression analysis revealed that grain yield of wheat could be increased by split|ing the suétable nitvogen(amount in order to be active in increasing 1000-grakn weight.

From this study it can be recommended by using 65 kg seeds / fad and 60 kg N/fad to maximizewheat productivity of Gemmeiza 9 in Eastern Delta Region.

INTRODUCTION

In Egypt, wheat (*Triticum aestivum*, L.) is considered the first leading cereal crop and the increase in wheat production is became a national aim. Seeding rate plays an important role in wheat productivity and it is a factor of particular importance in wheat production system because it can be controlled and this was reported in severál studies, El-Karamity (1998) showed that number of spikes/m^2 as well as grein and straw yields/fad were significantly increased with increasing seeding rates from 45 to 85 kg seeds/fad while, number of grains/spike and 1000-grain weight were decreased. In this respect, El-Kholy (2000), Abo-Shataia *et al.* (2001) and Abd-Alla (2002) noticed that increasing seeding rates from 50 to 70 or 80 kg seeds/ fad significantly increased number of spikes/m^2 and grain and straw yields/fad, but, significantly decreased number of grains/spike. Similar results were recorded by El-Bana (2000), Toaima *et al.* (2000), Staggenborg *et al.*

(2003), Ali *et al.* (2004) and Jaime *et al.* (2004). However, Masgrou and Maich (2008) as well as Carraro and Maich (2008) observed insignificant effect of wheat seeding rates on grain yield and its components and the higher number of spikes/m^2 at the higher seeding rate was compensated for by a higher number of seeds/spike and higher number of spikes/plant at the lower seeding rates.

Nitrogen is the most important plant nutrient needed to obtain high yield of wheat. Several workers reported a beneficial effect for nitrogen application to wheat fields. Patil *et al.* (2000) indicated that grain yield per unit area was increased by increasing nitrogen level up to 90 kg N/fad. Mowafy (2002) and Ali *et al.* (2004) reported that application of N-fertilizer up to 120 kg N/fad caused a significant increase in number of spikes/m^2, number of grains/ spike, grain weight/spike, 1000-grain weight, grain, straw, and biological yields/fad. under sandy soil conditions. Similar results were reported by Toaima *et al.* (2000), Abd El-Hameed (2002), Abd El-Maksoud (2002), Staggenborg *et al.* (2003), Hussain *et al.* (2006) and Mowafy (2008). However, Carraro and Maich (2008) found that adding N-fertilizer up to 80 kg N/ha insignificantly affected wheat grain yield.

Thus, the aim of this investigation was to study the effect of seeding rates and nitrogen fertilizer levels on wheat grain yield and its components as well as yield analysis under Eastern Delta Region conditions (Zagazig District).

MATERIALS AND METHODS

Two field experiments were carried out at Bany-Amer, Zagazig District, Sharkia Governorate, Egypt during the two successive seasons, 2006/2007 and 2007/2008 to study the effect of seeding rates and N fertilizer levels on yield and its components as well as yield analysis of Gemmeiza 9 wheat cultivar.

The soil of the experimental field is clay in texture, had a particle size distribution percentage of 12.96, 29.91, 57.13 and 1.15 for sand, silt, clay and organic matter, respectively. The soil contained 37.5, 11.1 and 384 ppm available N, P and K, respectively and had average pH of 8.6. Each experiment included 20 combination treatments of the following factors:

a- Seeding rates: 45, 55, 65 and 75 kg seeds / fad.

b- Nitrogen fertilizer levels: 30, 45, 60, 75 and 90 kg N/fad.

Phosphorus and potassium fertilizer levels were applied in one dose at sowing in the rate of 150 kg calcium super phosphate (15.5% P_2O_5) and 50 kg potassium sulphate (48% K_2O). The tried nitrogen fertilizer levels in form of ammonium sulphate (20.5% N) were applied in three equal doses at sowing, tillering and just before heading. Wheat grains of the tested densities were handly drilled in rows 20 cm apart on 22nd of November in the two growing seasons.

A split-plot design with three replicates was used. Main plots were assigned for seeding rates, while the sub-plots were occupied by nitrogen fertilizer levels. Each sub-plot area was 9 m^2 (3x3 m) and included 15 rows.

At harvest, sample of ten guarded plants were taken from each plot to determine number of grains/spike, grain weight/ spike and 1000-grain weight. Also, 1.2m^2 (the two middle rows) from each plot was harvested to calculate number of spikes/m^2, straw, grain and biological yields/ fad. then, harvest and crop indices were calculated.

Data of both seasons were statistically analyzed according to Snedecor and Cochran (1980). For comparison between means, Duncan's multiple range test was used (Duncan, 1955). The combined data of yield components and yield were subjected to simple correlation, simple regression and path coefficients calculated according to Svàb (1973).

RESULTS AND DISCUSSION

Data presented in Tables (1), (2) and (3) show the effect of seeding rates and nitrogen levels on wheat grain yield and yield components in the two growing seasons and their combined.

a. Effect of seeding rates:

Combined analysis revealed that seeding rates had significant influences on number of grains/ spike, 1000-grain weight, straw, grain and biological yields/fad. Number of grains/spike and 1000- grain weight significantly decreased with increasing seeding rates from 45 to 75 kg seeds/ fad. Raising seeding rates from 45 to 55 and then to 65 kg seeds/fad. increased significantly both grain and biological yields/fad. Straw yield/ fad. and number of spikes / m^2 were significantly increased in dense sowing (75 kg seeds/fad). However, the differences grain weight/ spike and both harvest and crop indices due to increasing seeding rates did not reach the 5% level of significance, except both harvest and crop indices in the second season, whereas these two traits were increased by increasing seeding rate from 45 to 65 kg/ fad with insignificant differences between 65 and 75 kg seeds/fad. Similar results were found by Masgrou and Maich (2008) and Corraro and Maich (2008).

Grain yield of wheat (ton/fad) obtained with 65 and 75 kg seeds/fad outyielded that of 45 and 55 kg seeds/ fad. This was true in both growing seasons and the combined. The relative increases in grain yield/fad due to raising seeding rate from 45 to 75 kg seeds / fad were 22.80, 22.69 and 22.75% in the first, second seasons and their combined analysis, respectively. The increase in grain yield due to dense sowing may be attributed to the increase in number of spikes/m^2. These results are in agreement with those of El-Bana (2000), Abo-Shataia *et al.* (2001), Abd-Alla (2002), Staggengorg *et al.* (2003), Ali *et al.* (2004) and Jaime *et al.* (2004).

b- Effect of nitrogen fertilizer levels:

The effect of nitrogen fertilizer levels on wheat grain yield and its components in the two growing seasons as well as their combined are shown in Tables (1), (2) and (3).

Combined data revealed that all studied characters except, both harvest and crop indices were markedly affected by nitrogen fertilizer levels.

Table (1) : Number of spikes/m^2, number of grains/spike and grain weight/spike (gm) as influenced by seeding rates and nitrogen fertilizer levels in 2006/2007 and 2007/2008 seasons and their combined.

Main effects and nteraction	Number of spikes /m^2			Number of grains/spike			Grain weight/spike (gm)		
	1st season	2nd season	Combined	1st season	2nd season	Combined	1st season	2nd season	Combined
Seeding rates (S) :									
45 kg seeds/fad	310.50c	297.25c	303.88c	59.90a	53.20a	56.55a	2.34	2.31	2.33
55 kg seeds/fad	317.25b	297.50c	307.38a	59.50a	51.90b	55.70a	2.34	2.30	2.32
65 kg seeds/fad	317.50b	311.30b	314.40b	58.70ab	50.35b	54.53a	2.33	2.29	2.31
75 kg seeds/fad	322.25a	320.25a	321.25a	56.95b	47.25c	52.10b	2.29	2.25	2.27
F. test	*	**	**	*	**	**	N.S	N.S	N.S
Nitrogen levels (N) :									
30 kg N/fad.	260.31e	254.38e	257.35e	54.56d	45.81e	50.19e	1.99e	1.97e	1.98e
45 kg N/fad.	289.38d	283.75d	286.57d	57.37c	48.56d	52.94d	2.23d	2.16d	2.20d
60 kg N/fad.	320.63c	309.06c	314.84c	59.00b	50.94c	54.97c	2.35c	2.29c	2.32c
75 kg N/fad.	344.38b	332.18b	338.28b	60.56b	52.81b	56.69b	2.47b	2.45b	2.46b
90 kg N/fad.	367.19a	352.88a	360.04a	62.38a	55.25a	58.81a	2.58a	2.56a	2.57a
F. test	**	**	**	**	**	**	**	**	**
Interaction :									
S X N	N.S	N.S	N.S	*	N.S	N.S	N.S	N.S	N.S

Table (2) : 1000 - grain weight (gm), straw yield (ton/fad) and grain yield (ton/fad) as influenced by seeding rates and nitrogen fertilizer levels in 2006/2007 and 2007/2008 seasons and their combined.

Main effects and interaction	1000-grain weight (gm)			Straw yield (ton/fad)			Grain yield (ton/fad)		
	1st season	2nd season	Combined	1st season	2nd season	Combined	1st season	2nd season	Combined
Seeding rates (S) :									
45 kg seeds/fad	57.33a	46.30a	51.82a	5.61d	6.31c	5.96d	2.50c	2.60c	2.55c
55 kg seeds/fad	55.89a	45.91a	50.90a	5.96c	6.78b	6.37c	2.65bc	2.92b	2.78b
65 kg seeds/fad	55.65a	45.16a	50.41ab	6.52b	6.98b	6.75b	2.86ab	3.17a	3.01a
75 kg seeds/fad	55.60b	45.33b	49.47ab	6.76a	7.32a	7.04a	3.07a	3.19a	3.13a
F. test	*	*	*	**	**	**	**	**	**
Nitrogen levels (N) :									
30 kg N/fad.	54.22e	44.08b	49.51e	5.71d	6.53b	6.12c	2.46d	2.79c	2.63c
45 kg N/fad.	55.11d	44.58b	49.85b	5.94c	6.88a	6.41b	2.64c	2.94b	2.79b
60 kg N/fad.	56.20c	44.49b	50.34ab	6.36b	6.91a	6.64a	2.83b	3.07a	2.95a
75 kg N/fad.	56.99b	45.48ab	51.23ab	6.52a	7.10a	6.81a	2.94a	3.10a	3.02a
90 kg N/fad.	58.06a	46.53a	52.31a	6.52a	6.82a	6.67a	2.95a	2.96a	2.96a
F. test	**	**	**	**	**	**	**	**	**
Interaction :									
S X N	N.S	N.S	N.S	N.S	*	N.S	N.S	N.S	N.S

Table (3) : Biological yield (ton/fad), harvest index and crop index as influenced by seeding rates and nitrogen fertilizer levels in 2006/2007 and 2007/2008 seasons and their combined.

Main effects and interaction	Biological yield (ton/fad)			Harvest index			Crop index		
	1st season	2nd season	Combined	1st season	2nd season	Combined	1st season	2nd season	Combined
Seeding rates (S) :									
45 kg seeds/fad	8.11d	8.91c	8.51c	0.308	0.292	0.300	0.446	0.412c	0.429
55 kg seeds/fad	8.61c	9.70b	9.16b	0.307	0.301b	0.304	0.445	0.431b	0.438
65 kg seeds/fad	9.38b	10.15b	9.77a	0.305	0.312a	0.308	0.439	0.454a	0.446
75 kg seeds/fad	9.83a	10.51a	10.17a	0.312	0.304b	0.308	0.454	0.436b	0.445
F. test	**	**	**	N.S	**	N.S	N.S	**	N.S
Nitrogen levels (N) :									
30 kg N/fad.	8.17d	9.32d	8.75d	0.301	0.299	0.300	0.431	0.427	0.429
45 kg N/fad.	8.58c	9.82c	9.20c	0.308	0.299	0.303	0.444	**0.427**	0.435
60 kg N/fad.	9.19b	9.98bc	9.59b	0.307	0.308	0.307	0.445	0.444	0.445
75 kg N/fad.	9.46a	10.20ab	9.83a	0.311	0.304	0.308	0.451	0.437	0.444
90 kg N/fad.	9.47a	9.73c	9.63b	0.312	0.303	0.307	0.452	0.434	0.443
F. test	**	**	**	N.S	N.S	N.S	N.S	N.S	N.S
Interaction :									
S X N	N.S	N.S	N.S	N.S	*	N.S	N.S	N.S	N.S

Increasing nitrogen fertilizer levels from 30 to 90 kg N/fad significantly increased number of spikes/m^2, number of grains and grains weight/spike (with significant response up to 90 kg N/fad), 1000-grain weight, straw yield/fad and grain yield/fad (with significant response up to 60 kg N/fad) and biological yield/fad (with significant response up to 75 kg N/ fad). Nitrogen fertilizer levels had no significant effect neither on harvest nor crop indices. Grain yield was increased by 6.08 and 12.17% due to increasing nitrogen levels from 30 to 45 and from 30 to 60 Kg N/fad, respectively. Also, straw yield/fad had the same trend. Such results could be attributed to the promotion effect of nitrogen on metabolic processes and in turn increased most of all studied yield components. The positive response of grain yield of wheat to N application was observed by several workers in literature, included El-Bana (2000), Patil *et al.* (2000), Abd El-Hameed (2002), Mowafy (2002), Ali *et al.* (2004), Hussain *et al.* (2006), Corraro and Maich (2008) and Mowafy (2008).

c-Yield analysis:

1-Correlation studies:

Data presented in Table (4) clearly indicated that grain yield/fad appeared to be positively and significantly correlated with number of spikes/m^2, number of grains/spike, grain weight / spike, 1000-grain weight, straw yield/fad and biological yield/fad, while it was insignificantly correlated with both harvest and crop indices. Number of spikes/m^2 showed positive and significant correlation coefficients with all studied characters except, both harvest and crop indices, whereas the correlation coefficient between number of spikes/m^2 and each of them was negative and insignificant. Number of grains/spike appeared significantly correlated with each of weight of grains/spike, straw and biological yields/fad. However, that correlation with 1000-grain weight was positive and insignificant and with harvest and crop indices was negative and insignificant. Positive and significant correlations were detected between grain weight/spike and each of 1000- grain weight, straw and biological yields/fad, but that correlation with either harvest or crop indices was positive and insignificant.

Table (4): Simple correlation coefficient between grain yield (ton/fad) and its components of wheat (combined).

Character	1	2	3	4	5	6	7	8
Grain yield (ton/fad)	0.883**	0.835**	0.488**	0.618**	0.708**	0.866**	0.363	0.359
1- No. of spikes/m^2		0.545*	0.724**	0.556*	0.515*	0.553*	-0.007	-0.011
2- No. of grains/spike			0.519*	0.371	0.583*	0.552*	-0.283	-0.287
3- Grain weight/spike (gm)				0.522**	0.459*	0.503*	0.020	0.019
4- 1000- grains weight					0.284	0.276	0.122	0.129
5- Straw yield (ton/fad)						0.966**	-0.397	-0.398
6- Biological yield (ton/fad)							0.150	0.152
7- Harvest index								0.998**
8- Crop index								-

The correlation coefficients between 1000-grain weight and each of straw and biological yields/ fad, harvest index and crop index were positive and insignificant. Positive and high significant correlation coefficient was detected between straw yield biological yield /field, while straw yield was negatively and insignificantly correlated with both harvest and crop indices. Negative and insignificant correlation coefficients were found between biological yield/fad and both harvest and crop indices.

Harvest index was positively and highly significantly correlated with crop index.

2-Path analysis:

The method of path coefficient included the yield components i.e. number of spikes/m^2, number of grains/spike and 1000-grain weigh. Path analysis was practiced in order to find out the relative importance of these characters in contributing wheat grain yield.

The effect of direct and indirect path coefficients of number of spikes/m^2. number of grains/spike and 1000-grain weight on wheat grain yield are shown in Table (5).

These effects were computed by partitioning the total correlation coefficient into its components- Number of spikes/m^2 proved to have a high direct effects on yield compared with that of number of grains/spike or 1000-grain weight. Again, as mentioned before (Table 4), total correlation coefficient was most pronounced in number of spikes/m^2 (r=0.883) than in number of grains/spike (r = 0.835) or in 1000-grain weight (r = 0.618).

The relative importance in contributing wheat grain yield as recorded in percentage of variation for number of spikes/m^2, number of grains/spike, 1000-grain weight and their interactions is presented in Table (6). The path analysis revealed that the direct effect for number of spikes/m^2 was 61.18% being higher than that of number of grains/spike and 1000-grain weight which was 18.13 and 4.65% of the grain yield variation, respectively. The joint effect of number of spikes/m^2 with number of grains/spike and with 1000-grain weight; number of grains/spike with 1000-grain weight as 7.23, 2.41 and 2.36% of the grain yield variation, respectively.

Table (5): Partitioning of simple correlation coefficient between wheat grain yield and its components (combined).

Source	Value
Number of spikes/m^2:	
Direct effect	0.5319
Indirect effect via number of grains/spike	0.7206
Indirect effect via 1000-grain weight	-0.3695
Total (ry_1)	0.8830
Number of grains/spike :	
Direct effect	0.9151
Indirect effect via number of spikes/m^2	0.1490
Indirect effect via 1000-grain weight	-0.2291
Total (ry_2)	0.8350
Thousand-grain weight :	
Direct effect	0.4578
Indirect effect via number of spikes/ m^2	0.1213
Indirect effect via number of grains/spike	0.0389
Total (ry_3)	0.6180

Table (6) : Direct and joint effects of yield components as percentage of grain yield variation of wheat.

Variable	C.D.	%
Number of spikes / m^2	0.6118	61.18
Number of grains/spike	0.1813	18.13
Thousand grain weight	0.0465	4.65
Number of spikes/m^2x number of grains/spike	0.0723	7.23
Number of spikes/m^2x 1000- grain weight	0.0241	2.41
Number of grains/spike x 1000- grain weight	0.0236	2.36
R^2	0.9596	95.96
Residual	0.0404	4.04
Total	1.000	100.00

C.D = Coefficient of determination   % = percentage contributed

Here, it is worthy to note that those characters i.e. number of spikes/m^2, number of grains/spike and 1000-grain weight could contributed much in wheat grain yield, since R^2 was 95.96% of the total variation in yield. Also, it is interesting to observe that the residual effects contributing to grain yield in this study was low in magnitude being 4.04%. Similar wheat yield analysis results were obtained by Darwich (1994), El-Bana and Basha (1994), Moselhy (1995), El-Bana (2000), Mowafy (2002) and Nadia El-Wakil and Maha Abd- Alla (2004).

3- Regression study :

Parameters of regression analysis between N fertilization and grain yield as well as yield components for wheat are represented in Table (7). Data clearly show that the response of 1000-grain weight is similar to that of grain yield and each is of linear relationship with nitrogen fertilization, while the response of number of spikes/m^2 and number of grains/spike to nitrogen fertilization had quadratic relationship. Here, it is worthy to note that grain yield of wheat could be increased by splitting the suitable nitrogen amount in order to be active in increasing 1000-grain weight.

Table (7) : Parameters of regression analysis between N fertilizer levels and grain yield as well as yield components of the combined.

Parameter	Number of spikes/m^2	Number of grains/spike	1000-grain weight	Grain yield/fad
a	241.65	42.63	40.53	2.35
b	84.36	0.33	0.28	0.37
c	- 1.91	- 0.03	0.35	0.02
R^2	0.9843	0.9718	0.9865	0.9985
Max. X	70.38	69.15	-	-
Max. Y	361.59	59.50	-	-

Conclusion:

From the aforementioned results of this study, it could be concluded that the highest grain yield/fad of Gemmeiza 9 wheat cultivar could be attained by using 65 kg/fad and 60 kgN/fad seeding and nitrogen rates, respectively under Eastern Delta Region conditions.

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معدلات التقاوى والنيتروجين اللازمة لمعظمة محصول القمح صنف جميزة ٩ بمنطقة شرق الدلتا

عبد الغنى عبد المعطى منصور و أمين هاشم بسيونى
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أقيمت تجربتان حقليتان بقرية بنى عامر، مركز الزقازيق، محافظة الشرقية خلال موسمى ٢٠٠٦/٢٠٠٧ ، ٢٠٠٧/٢٠٠٨ بهدف دراسة تأثير أربعة معدلات للتقاوى (٤٥ ، ٥٥ ، ٦٥ ، ٧٥ كجم بذور/فدان) وخمسة معدلات من التسميد النيتروجينى (٣٠ ، ٤٥ ، ٦٠ ، ٧٥ ، ٩٠ كجم ن/فدان) على المحصول ومكوناته وتحليل المحصول أيضا لصنف القمح جميزة ٩ تحت ظروف الأراضى الطينية وذلك للوقوف على أنسب هذه المعدلات لأقصى إنتاجية لهذا الصنف. استخدم تصميم القطع المنشقة فى ٣ مكررات حيث وزعت معدلات التقاوى عشوائيا على القطع الرئيسية بينما احتلت معدلات النيتروجين القطع المنشقة. ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلى :

أدت زيادة معدلات التقاوى حتى ٧٥ كجم بذور/فدان إلى نقص معنوى فى كل من عدد الحبوب/السنبلة ووزن ١٠٠٠ حبة. زاد محصول البذور وكذلك المحصول البيولوجى/فدان معنوياً بزيادة معدلات التقاوى حتى ٦٥ كجم بذور/فدان ، بينما زاد عدد السنابل /م٢ محصول القش/فدان معنوياً بزيادة معدلات التقاوى حتى ٧٥ كجم بذور/فدان ، لم يكن لمعدلات التقاوى تأثير معنوى على وزن الحبوب/السنبلة وكل من معاملى الحصاد والمحصول.

زاد وزن ١٠٠٠ حبة ومحصول القش وكذلك محصول البذور/فدان معنوياً بزيادة معدلات التسميد النيتروجينى حتى ٦٠ كجم ن/فدان. أدت الزيادة فى معدلات النيتروجين حتى ٩٠ كجم ن/فدان إلى زيادة معنوية فى عدد السنابل/م٢ ، عدد الحبوب/السنبلة ووزن الحبوب/السنبلة ، بينما أدت الزيادة فى معدلات النيتروجين حتى ٧٥ كجم ن/فدان إلى زيادة المحصول البيولوجى. لم يتأثر معامل الحصاد أو معامل المحصول معنوياً بالتسميد النيتروجينى.

ارتبط محصول الحبوب/فدان بعدد السنابل/م٢ ، عدد الحبوب السنبلة ، وزن الحبوب /السنبلة، وزن ١٠٠٠ حبة ، محصول القش/فدان ، المحصول البيولوجى/فدان وكان هذا الارتباط موجباً ومعنوياً ، كان معامل الارتباط بين محصول الحبوب/فدان وباقى الصفات المدروسة موجباً وغير معنوياً. كانت أهم مصادر الاختلاف فى محصول حبوب القمح/فدان تبعاً لأهميتها النسبية هى عدد السنابل/م٢ (٦١,١٨%) ، عدد الحبوب/السنبلة (١٨,١٣%) ووزن ١٠٠٠ حبة (٤,٦٥%) وكانت التأثيرات المباشرة وغير المباشرة لهذه الصفات منفردة ومع بعضها البعض قد بلغت (٩٥,٩٦%) من قيمة الاختلاف فى محصول الحبوب ولم يتعدى التأثير المتبقى ٤,٠٤%. أشار تحليل الانحدار الى امكانية زيادة محصول الحبوب/فدان لصنف القمح جميزة ٩ عن طريق تقسيم كمية السماد النيتروجينى لكى تكون اكثر فعالية فى زيادة وزن الألف حبة.

توصى الدراسة من خلال النتائج المتحصل عليها بزراعة صنف القمح جميزة ٩ باستخدام معدل تقاوى ٦٥ كجم بذور/فدان وأن يضاف السماد النيتروجينى بمعدل ٦٠ كجم ن/فدان وذلك بمنطقة شرق الدلتا (مركز الزقازيق) بمحافظة الشرقية.