SOWING METHODS INFLUENCE ON GRAIN YIELD AND ITS COMPONENTS OF SOME WHEAT CULTIVERS UNDER DIFFERENT FERTILIZER LEVES

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ABSTRACT: Two field experiments were conducted at the Farm of Kuotor - EL- Gharbia Governorate during 2016/17 and 2017/18 growing seasons to study the effect of three sowing methods [Broadcasting on beds method, Drilling on beds method and Hills on beds method] and three seeding rates (45, 52,5 and 60 kg seeds/fad.) on growth and yield of three bread wheat cultivars (*Triticum aestivum* L.). Regarding hills sowing method was better for growing wheat plants and gradually increased grain yield/fad than drilling and broadcasting methods. Giza 171 variety gave the highest values No. of spikes/m^2, No. of grains/spike, 1000-grain weight, biological yield, grain yield and straw yield compared with the other varieties in the first and second seasons. planting by hills on bed method increased significantly No. of spikes/m^2, No. of grains/spike, 1000- grain weight/spike, biological yield, grain yield and straw yield compared with the other sowing methods in the first and second seasons. The highest values of no. of grains/spike, 1000-grain weight and grain yield were found with seed rate (45 kg/fad.), in both seasons. No. of spikes/m^2, biological yield, grain yield and straw yield were affected by the interaction between wheat varieties and planting methods with seeding rates in the first and second seasons except harvest index in the first season.

Key words: wheat cultivars, sowing methods, grain yield and its components and seeding rates.

INTRODUCTION

Wheat is considered the most important productive cereal crop in the World **(Coventry *et al*., 2011)**. Therefore, it has a strategic position with competition for many other crops produced in the world. This importance comes from its use principally in human food in many world countries especially Egypt, where it is used in bread production and also several food industries.

Wheat **(*Triticum aestivum*, L.)** has been considered the first strategic food crop for more than 7000 years in Egypt. It has maintained its position during that time as the basic staple food in urban areas and mixed with maize in rural areas for bread making. In addition, wheat straw is an important fodder **(Gomaa, 1999).**

Raising wheat production through increasing productivity and increasing the cultivated area is an important national target to minimize the gap between the Egyptian production and consumption. The total production of wheat reached at least 9 million tons annually **(FAO, 2016)**; while, the annual consumption of wheat grains in Egypt is about 15 million tons. Increasing wheat yield per unit area can be achieved by breeding high yielding varieties or improving the cultural treatments of the crop. New wheat varieties were developed to maximize grain yield under favorable environmental conditions (high input conditions especially planting methods to save water supply and seeding rate).

Egypt imports above 5.5 million tons of wheat grains. Unless domestic wheat production increases, the deficit will increase due to the increased birth rate (about 2%) and present the high per-capita consumption which is estimated by 180 kg /year*. More than 3 million faddans are cultivated annually with wheat. The average productivity is about 2.7 ton/fad; where the recent high yielding wheat varieties have been cultivated.

Several investigators showed that wheat cultivars differed in yield and its components as well as chemical properties **(Hassan, 2008, Ashmawy *et al,* 2010, Mehasen *et al,* 2015). Also (Zenhom *et al,* 2018)** reported that wheat cultivars were varied significantly in plant height, No. spikes/m, seed index and grain yield/fed.

Optimum seeding rate may be of treatments main to increase wheat yield by improving yield components of wheat plants and applying the scientific recommendations in that respect.

MATERIALS AND METHODS

Two field experiments were carried out in the Middle of Nile Delta (the Private Farm of Kuotor - EL- Gharbia Governorate) during the

two successive seasons of 2016/17 and 2017/18 to study the effect of three sowing methods and three seeding rates on growth, yield and yield components of three bread wheat cultivars (*Triticum aestivum* L.).

The experimental design was a split-split-plot design with three replications in both seasons. The main plot treatments were occupied by the three wheat cultivars, while the three sowing methods were assigned in the sub- plots and the three seeding rates in the sub- subplots. Sowing dates were 15_{th} November in the first season and 20_{th} November in the second one. The harvest area was 7.2 m^2, (2.4 width and 3m in length).

Soil chemical analysis

The soil of the experimental site of Kuotor is clay in texture and fairly uniform without distinct changes in texture. Soil samples were taken before sowing during the two seasons at soil depth of 0-30 cm and 30-60 cm. Some soil physical and chemical characteristics of the experimental site were determined and presented in Table (1).

The following data was recorded during the growing seasons at and after harvest as follows:

A. Growth characteristics:

A.1. Date of expulsion: Number of days from sowing to the date when 50% of spikes complete emergence from flag leaf of the plot.
A.2. Flag leaf area, FLA $(cm)^2$*:* Mean areas of flag leaves of ten random leaves within each plot were separated and their green area were measured using a LI-3100 (LI-COR, Lincoln, Nebraska, USA) leaf area meter, according to **Watson *et al.*(1963)**.
FLA= (leaf length x maximum width of flag leaf x 0.75) at 125 days.
A.3.Date of maturity: Number of days from sowing to date when 50% of spikes and top of the peduncles turned yellow of the plot.
A.4. Plant height (cm.): Plant length from the soil surface to the tip of the spikes, excluding awns.

B-Yield and its components:

At harvest, ten wheat plants were chosen at random from each plot to study the following characters:
B.1. Spike length (cm.): Ten main spikes were chosen; their average was calculated to express spike length in cm.
B.2. Number of spikes/m^2: Number of fertile tillers/m² was calculated by counting all spikes per square meter.
B.3. Number of kernels/spike: It was counted as an average number of grains collected per spike.
B.4. 1000-grain weight (g): A random sample of 1000-grains was taken from each plot, hand counted and weighted.
B.5. Grain weight /spike (g): Average number of grains of ten randomly chosen spikes and weighted.
B.6. Grain yield (ardab/fad): Recorded for the harvested area after threshing and then converted to ardab/fad (One ardab = 150 kg on the basic of 14.5% moisture content and one faddan = 4200 m^2.
B.7. Straw yield (ton/fad.): Determined as the difference between biological and grain yield of sub plot in terms of kg/plot and converted to ton/fad.
B.8. Biological yield (ton/fad.): It was recorded for the harvested area and converted to ton/fad.
B.9. Harvest index (HI): It was recorded as a ratio of grain yield to the total biological yield.
HI= (Grain yield / Biological yield) × 100

Statistical analysis:

Data were subjected to the proper statistical analysis as the technique of analysis of variance (ANOVA) of split- split plot design as mentioned by **Gomez and Gomez (1984).** Treatment means were compared using the Least Significant Difference (LSD) test as outlined by **Waller and Duncan (1969).**

RESULTS AND DISCUSSION

A- wheat cultivars:

Results in Tables (2) and (3) showed that Giza 171 gave the highest number of spikes/m^2, number of grains/spike, 1000-grain weight, grain yield, biological yield and straw yield, while, the wheat cultivar Shandaweel 1 recorded the lowest values in both seasons. This result due to it's a genetic character specific to the cultivar and the differences may be due to variability among the wheat cultivars under study which considered adequate for further biometrical assessment. These results are in harmony with those obtained by **Rahman *et al.*, (2010), El- Hag (2012), Qamar *et al.*, (2013), El- Hag (2015), El-Seidy *et al.*, (2016) and Al-Hilfy and Wahid (2017).**

B- Sowing methods:

Sowing methods had significantly effect on number of spikes/m^2, number of grains/spike, 1000-grain weight, grain yield, biological yield, straw yield and harvest index in both seasons, as shown as in Tables (2) and (3).

The hills on bed sowing method recorded the highest on number of spikes/m^2, number of grains/spike, 1000-grain weight, grain yield, biological yield and straw yield, while, the broadcasting on bed method recorded the lowest values in both seasons. These results are in harmony with those obtained by **Wang *et al.*, (2011), Amen (2012), Singh *et al.*, (2012), Genedy (2014), El-Hag (2015), Abdul Razaq *et al.*, (2016), and El-Seidy *et al.*, (2016).**

C- Seeding rates:

Regarding the effect seeding rates on number of spikes/m^2, number of grains/spike, 1000-grain weight, grain yield, biological yield, straw yield and harvest index was highly significant in both seasons, as shown as in Tables (2) and (3).
The highest values of number of spikes /m^2 and straw yield were found with seed rates 60 kg/fad in both seasons, while, the lowest values were recorded from using 45 kg/fad in both seasons. On another hand added 45 kg seed/fad. recorded the highest number of grains/spike, 1000-grain weight, grain yield and biological yield in both seasons. These results are in agreement with **Younis (2007), Laghari *et al.*, (2011), Javaid Iqbal *et al.*, (2012), May *et al.*, (2014), Said *et al.*, (2012), Banisaeidi *et al.*, (2014), Naveed *et al.*, (2014) and Al-Hilfy and Wahid (2017).**

D- Interaction:

Results indicated that sowing methods and seeding rates significantly affected in all the studied characters, as shown as in Tables (2) and (3).

The interactions between cultivars and sowing methods (C x M) was highly significant concerning with grain yield, biological yield, straw yield and harvest index in both seasons as shown as in Tables (2) and (3). While the interaction between cultivars and sowing methods on number of spikes/m^2 and 1000-grain weight (g.) was highly significant in the second season, number of grains/spike was highly significant in both the first season. These results are in full agreement with those of **Kiliç (2010).**

The interaction between cultivars and seeding rates (C x S) on grain yield, biological yield, straw yield and harvest index was highly significant in both seasons, as shown as in Tables (2) and (3). While the interaction between cultivars and seeding rates on 1000-grain weight (g.) was highly significant in the first season, number of spikes/m^2 was significant in the second season, number of grains /spike was not significant in both seasons. as shown as in Tables (2) and (3). These results are in full agreement with those of **Soomro *et al.*, (2009), Hossain et al., (2009 b) EL Hag (2016) and Al-Hilfy and Wahid (2017).**

The interaction between sowing methods and seeding rates (M x S) on grain yield, biological yield, straw yield and harvest index was highly significant in both seasons, as shown as in Tables (2) and (3). Effect interaction between sowing methods and seeding rates on number of spikes/m^2 was highly significant in second season only, while number of grains/spike and 1000-grain weight was not significant in both seasons, as shown in Table (2). These results are in a good accordance with those obtained by **Balkaran (2011), El-Lattief (2011) and Tadesse *et al.*, (2017).**

The interaction between cultivars, sowing methods and seeding rates (C x M x S) on number of spikes/m^2, grain yield, biological yield and straw yield was highly significant in both seasons, harvest index was highly significant in the first season, as shown as in Tables (2) and (3), while, number of grains /spike and 1000-grain weight (g.) was not significant in both seasons. These results in accordance with those obtained by **Balkaran (2011) and El-Lattief (2011).**

Table (1): Physical and some chemical properties of the experimental soil during 2016/17 and 2017/18 season.

Properties	2016/17	2017/18
Mechanical analysis :		
Sand %	**22.73**	**21.95**
Silt %	**31.50**	**31.85**
Clay %	**45.80**	**46.17**
Soil texture	**Clay**	**Clay**
Chemical analysis :		
pH	**8.30**	**8.05**
Ec dS / m	**2.30**	**2.34**
O.M %	**1.80**	**1.85**
Available N (mg/kg)	**31.80**	**30.79**
Available P (mg/kg)	**7.01**	**6.01**
Available K (mg/kg)	**119.00**	**121.02**
Available Zn (mg/kg)	**0.21**	**0.27**
Cation (meq / L) :		
Ca^{++}	**12.85**	**13.04**
Mg^{++}	**10.23**	**11.85**
Na^{+}	**42.08**	**41.22**
K^{+}	**51.37**	**53.07**
Anion (meq / L) :		
CO^{-}_{3}	**0.02**	**0.05**
HCO^{-}_{3}	**2.87**	**2.93**
CI^{-}	**62.57**	**63.45**
SO^{-}_{4}	**49.88**	**51.07**

Table (2): Effect of cultivars, sowing methods and seeding rates as well as their interactions on number of spikes/m^2, number of grains/spike, 1000-grain weight (g.) and grain yield (ardab/fad.) at harvest in 2016/17 and 2017/18 seasons.

Characters / Treatments	Number of spikes/m^2		Number of grains/spike		1000-grain weight (g.)		Grain yield (ardab/fad.)	
	Season 2016/17	Season 2017/18	Season 2016/17	Season 2017/18	Season 2016/17	Season 2017/18	Season 2016/17	Season 2017/18
A: Cultivars (C)								
Shandaweel 1	295.44	283.74	60.89	57.37	50.33	48.63	19.70	17.13
Gemmeiza 11	306.11	300.11	64.44	62.22	55.00	52.52	21.66	18.32
Giza 171	317.22	318.26	70.33	67.26	61.44	58.00	22.41	19.15
F-test	**	**	**	**	**	**	**	**
LSD at 0.01	3.57	2.85	3.87	6.62	3.36	2.23	0.19	0.23
B: Sowing methods (M)								
Hills	353.74	347.11	73.78	70.82	63.56	60.56	22.41	19.76
Drilling	307.07	300.00	65.67	63.22	54.56	51.96	21.66	18.39
Broadcasting	257.96	255.00	56.22	52.82	48.67	46.63	19.70	16.44
F-test	**	**	**	**	**	**	**	**
LSD at 0.01	2.60	2.48	0.95	1.80	1.42	0.80	0.12	0.12
C: Seeding rates (S)								
45 Kg/fad.	289.67	283.26	69.22	65.67	59.78	56.52	21.68	18.58
52.5 Kg/fad.	307.30	301.26	65.33	62.48	55.44	52.93	21.10	18.11
60 Kg/fad.	321.82	317.59	61.11	58.70	51.56	49.70	20.99	17.90
F-test	**	**	**	**	**	**	**	**
LSD at 0.01	2.17	2.56	1.00	1.26	1.23	0.59	0.11	0.12
D- Interaction effects								
C x M	NS	**	**	NS	NS	**	**	**
C x S	NS	*	NS	NS	**	NS	**	**
M x S	NS	**	NS	NS	NS	NS	**	**
C x M x S	**	**	NS	NS	NS	NS	**	**

*and ** Significant at 0.05 and 0.01 levels of Probability, respectively, while NS means non-Significant.

Table (3): Effect of Cultivars, sowing methods, seeding rates their interactions on straw yield (ton/fad.), biological yield (ton/fad.) and harvest index at harvest in 2016/17 and 2017/18 seasons.

Characters / Treatments	Straw yield (ton/fad.)		Biological yield (ton/fad.)		Harvest index	
	Season 2016/17	Season 2017/18	Season 2016/17	Season 2017/18	Season 2016/17	Season 2017/18
A: Cultivars (C)						
Shandaweel 1	2.53	2.35	5.48	4.92	53.94	52.25
Gemmeiza 11	2.61	2.50	5.86	5.25	55.51	52.37
Giza 171	2.77	2.69	6.13	5.56	54.85	51.63
F-test	**	**	**	**	**	**
LSD at 0.01	0.02	0.02	0.04	0.04	0.25	0.40
B: Sowing methods (M)						
Hills	2.93	2.79	6.29	5.76	53.41	51.52
Drilling	2.59	2.47	5.83	5.23	55.67	52.82
Broadcasting	2.39	2.29	5.35	4.76	55.23	51.90
F-test	**	**	**	**	**	**
LSD at 0.01	0.02	0.02	0.03	0.02	0.23	0.28
C: Seeding rates (S)						
45 Kg/fad.	2.48	2.36	5.88	5.30	55.29	52.66
52.5 Kg/fad.	2.63	2.51	5.65	5.08	55.98	53.45
60 Kg/fad.	2.80	2.68	5.95	5.36	53.03	50.13
F-test	**	**	**	**	**	**
LSD at 0.01	0.02	0.01	0.02	0.02	0.23	0.25
D- Interaction effects						
C x M	**	*	**	**	**	**
C x S	**	*	**	**	**	**
M x S	**	**	**	**	**	**
C x M x S	**	**	**	**	**	NS

*and ** Significant at 0.05 and 0.01 levels of Probability, respectively, while NS means non-Significant.

REFERENCES:

[1] Abdul Razaq, M. J. K.; T. Sarwar and M. J. Khan (2016). Effect of deficit irrigation, sowing methods and mulching on wheat yield and nitrogen uptake, Pakistan J. Agric. Res. 29(3): 222-228.

[2] Al-Hilfy, H. H. Intsar and S. A. Wahid (2017) Seeding rates influence on growth and straw yield of some bread wheat cultivars and their relationship with accumulated heat units. American-Eurasian Journal of Sustainable Agriculture. 11(5): 49-58.

[3] Ashmawy, F.; M. S. El-Habal; H. S. Saoudy and Iman Kh. Abbas (2010). The relative contribution of yield components to grain yield of some wheat cultivars grown under different nitrogen fertilizer levels. Egypt. J. Agric. Res., 88(1):225-239.

[4] Balkaran Singh; R. S. Uppal (2011). Interaction effect of sowing time, planting method and seed rate on performance of wheat variety PBW 550. Environment and Ecology, 29(3):1087-1090.

[5] Banisaeidi, A. K.; E. Zand; A. Modhj; S. Lak and M. A. Baghestani (2014). Effect of seeding rate and variety on wild oat (Avena ludoviciana L.) suppression and yield of spring wheat (Triticum aestivum L.).International Journal of Biosciences (IJB), 5(12):166-172.

[6] Coventry, D.R.; R.K. Gupta ; A. Yadav ; R.S. Poswal ; R.S. Chhokar and Cummins, J.A.(2011). Wheat quality and productivity as affected by varieties and sowing time in Haryana. India F. Cr. Res., 123(3): 214-225.

[7] El- Hag, Dalia, A. A. (2012). Effect of planting date and nitrogen level on yield and quality of bread and durum wheat. Ph D. Thesis, Fac. of Agric., Kafr El-Sheikh Univ., Egypt.

[8] EL Hag, D. A. A. (2016). Effect of seeding rates on yield and yield components of two bread wheat cultivars. J. Agric. Res. Kafr El-Sheikh Univ. 42(1) 71-81.

[9] El-Hag, Walaa, A.A. (2015). Morphological studies on bread wheatunder different regimes and planting methods. PhD.Thesis, Fac.of Agric., Kafr El-Sheikh Univ., Egypt.

[10] El-Lattief, E. A. A. (2011).Bread wheat (Triticum aestivum L.) productivity and profitability as affected by method of sowing and seeding rate under Qena environment. Asian Journal of Crop Science, 3(4):188-196. 35 ref.

[11] El-Seidy E. H., A. M. Moussa, U .A. Abd El-Razek and M. O. Al-Farouk (2016). Effect of irrigation deficit and sowing methods on growth characters and water requirements of some wheat cultivars. Wheat Research Dept., Field Crops Research Inst., ARC.

[12] F. A. O (2016). Food outlook biannual report on global food markets. Food and Agriculture Organization of the United Nations.

[13] Fakkar, A.A.O. and E.A. Amen (2012). Integration between sowing methods and mechanical weed control and their effect on wheat productivity. Australian J. of Basic and Applied Sci., 6(13): 519-529.

[14] Genedy, M. S. A. (2014). Effect of some planting methods, nitrogen fertilization rates and irrigation on wheat grain yield. Ph D. Thesis, Fac. of Agric., Mansoura Univ., Egypt.

[15] Gomaa, A.S.A (1999). Wheat improvement in Egypt: History and future prospects. Egypt. J. Plant Breeding, 3(1): 1-14.

[16] Gomez, K. A and A. A. Gomez (1984). Chi-square test. Pages 458-477 in Statistical Procedures for Agricultural Research. John Wiely and Sons. Toronto.

[17] Hassan, Manal A. (2008). Effect of seeding rate and row spacing on productivity and resistance to powdery mildew of two bread wheat cultivars. Egypt. J. Appl. Sci., 23(10): 169-182.

[18] Hossain, M. B.; Abdul Hannan; Hossain, M. D.; Najrul Islam; Izaz Ahmed (2009 b).Effect of nitrogen level, seed rate and planting method on the yield performance of wheat (*Triticum aestivum L.*). International Journal of Sustainable Agricultural Technology; 5(4):24-30.

[19] Javaid Iqbal; Khizer Hayat; Safdar Hussain; Anser Ali; Bakhsh, M. A. A. H. A. (2012).Effect of seeding rates and nitrogen levels on yield and yield components of wheat (Triticum aestivum L.).Pakistan Journal of Nutrition; 2012. 11(7):531-536. 33.

[20] Kiliç, H. (2010). The effect of planting methods on yield and yield components of irrigated spring durum wheat varieties. Scientific Research and Essays. 5 (20), pp. 3063-3069.

[21] Laghari, G. M.; Oad, F. C.; Shamasuddin Tunio; Qamaruddin Chachar; Gandahi, A. W.; Siddiqui, M. H.; Syed Waseem-ul-Hassan; Abid Ali (2011). Growth and yield attributes of wheat at different seed rates. Sarhad Journal of Agriculture; 2011. 27(2):177-183. 33.

[22] May, W. E.; M.R. Fernandez; F. Selles and G.P. Lafond (2014). Agronomic practices to reduce leaf spotting and fusarium kernel infections in durum wheat on the Canadian Prairies. Canadian Journal of Plant Science, 94(1):141-152.

[23] Mehasen, S.A.S.; Shimaa A. Badawy and S. Sh. Abdullah (2015). Influence of bio and mineral nitrogen fertilizers on productivity of some bread wheat varieties. J. of Food, Agriculture & Environment, 13 (2): 162-167.

[24] Naveed, K.; M.A. Khan; M.S. Baloch; K. Ali; M.A. Nadim; E.A. Khan; S. Shah and M. Arif (2014). Effect of different seeding rates on yield attributes of dual-purpose wheat. Sarhad Journal of Agriculture, 30(1):83-91.

[25] Qamar, R.; E. Abdul Rehman; G. Mustafa and A. Ghaffar (2013). Effect of irrigation scheduling on the yield and yield components of two wheat (Triticum aestivum L.) genotypes Crop& Environment, 4(1): 1-5.

[26] Rahman, M. A.; S. J. Hossain; M. B. Hossain; M. R. Amin and K. K. Sarkar (2010). Effect of variety and cultural method on the yield and yield attributes of wheat. Int. J. Sustain. Crop Prod. 5(3):17-21.

[27] Said, A.; H. Gul; B. Saeed; B. Haleema; N. L. Badshah and L. Parveen (2012). Response of wheat to different planting dates and seeding rates for yield and yield components. Journal of Agricultural and Biological Science; 7(2):138-140.

[28] Soomro, U. A.; M. Ur Rahman; E. A. Odhano; S. Gul and A.Tareen (2009).Effects of sowing method and seed rate on growth and yield of wheat (Triticum aestivum L.). World J. Agric. Sci. 5 (2):159-162.

[29] Tadesse, A.; T. Yoseph and M. Mitiku (2017). Effect of sowing methods and seed rate on yield of bread wheat (Triticum aestivum, L.) at South Ari District, South Omo Zone, Snnpr, Ethiopia. International J. of Research-Granthaalayah, 5(6):175-180.

[30] Waller, R.A. and D.B. Duncan (1969). A bays rule for the symmetric multiple comparison problem. Am. Stat. Assoc. J., 1485-1504.

[31] Wang, F.; L. Kong; K. Sayre; S. Li; J. Si1; B. Feng and B. Zhang (2011). Morphological and yield responses of winter wheat (Triticum aestivum, L.) to raised bed planting in Northern China. African J. of Agri. Res., 6(13): 2991-2997.

[32] Watson, D.J.; G.N. Thorne and S.A.W. French (1963). Analysis of growth and yield of winter and spring wheats. Ann. Bot. N. S. 27(1):1-22

[33] Younis, M. A. A. (2007). Responses of durum wheat and associated weeds to some weed management under various seeding rates. M.Sc. Thesis, Fac. Agric, Minia Univ., Egypt.

[34] Zenhom, M. F. T; G. Y. Hammam and S. A. S. Mehasen (2018). Wheat lodging and yield in response to cultivars and foliar application of paclobutrazol. 4th International Conference on Biotechnology Applications in Agriculture (icbaa), 4-7 Hurghada, Egypt Invited Papers, 639-644.

" تأثير طرق الزراعية على محصول الحبوب ومكوناته لبعض أصناف القمح تحت مستويات سمادية مختلفة "

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أجريت هذه التجربه خلال موسمى ٢٠١٦ / ٢٠١٧ ، ٢٠١٧ / ٢٠١٨ بمركز قطور محافظة الغربيه لدراسة تأثير بعض الطرق الزراعيه المختلفه (الزراعة البدار على المصاطب، التسطير على المصاطب، النقر على المصاطب) وثلاث أصناف من القمح (جيزة ١٧١، جميزة ١١، شندويل ١) وثلاث معدلات تقاوى (٤٥ ، ٥٢,٥ و ٦٠ كجم / فدان) على المحصول ومكوناته. وقد استخدم تصميم القطع المنشقه مرتين فى ثلاث مكررات حيث إحتوت القطع الرئيسيه على الأصناف والقطع الشقيه الأولى على طرق الزراعه والقطع الشقيه الثانيه على معدلات التقاوى.

ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلى :-

١- أظهرت النتائج أن تأثير الأصناف كانت عالية المعنويه على كل من عدد السنابل/م^{٢}، عدد الحبوب فى السنبله، وزن الأف حبه، محصول الحبوب، محصول القش، المحصول البيولوجى ودليل الحصاد. سجل الصنف جيزة ١٧١ أعلى القيم لكل من عدد السنابل/م^{٢}، عدد الحبوب فى السنبله، وزن الأف حبه، محصول الحبوب، محصول القش والمحصول البيولوجى فى كل من الموسمين.

٢- أشارت النتائج الى أن تأثير طرق الزراعه كانت عالية المعنويه على كل من عدد السنابل/م^{٢}، عدد الحبوب فى السنبله، وزن الأف حبه، محصول الحبوب، محصول القش، المحصول البيولوجى ودليل الحصاد. طريقة الزراعه بالنقر على المصاطب سجلت أعلى القيم لكل من عدد السنابل/م^{٢}، عدد الحبوب فى السنبله، وزن الأف حبه، محصول الحبوب، محصول القش والمحصول البيولوجى فى كل من الموسمين.

٣- أوضحت النتائج أن تأثير معدلات التقاوى كانت عالية المعنويه على كل من عدد السنابل/م^{٢}، عدد الحبوب فى السنبله، وزن الأف حبه، محصول الحبوب، محصول القش، المحصول البيولوجى ودليل الحصاد. اضافة معدل التقاوى ٦٠ كجم/فدان سجل أعلى القيم من عدد السنابل/م^{٢}، محصول القش والمحصول البيولوجى فى كل من الموسمين. بينما سجل معدل التقاوى ٤٥ كجم/فدان أعلى القيم من عدد الحبوب فى السنبله، وزن الأف حبه ومحصول الحبوب فى كل من الموسمين.

٤- أظهرت النتائج أن تأثير التفاعل بين الأصناف، طرق الزراعه ومعدلات التقاوى كان عالى المعنويه على كل من عدد السنابل/م^{٢}، محصول الحبوب، محصول القش والمحصول البيولوجى فى كل من الموسمين وكان التأثير عالى المعنويه على دليل الحصاد فى الموسم الاول فقط. بينما كان التفاعل غير معنوى على كل من عدد الحبوب فى السنبله، وزن الأف حبه فى كل من الموسمين. حيث أعطى التفاعل بين الصنف جيزة ١٧١ وطريقة الزراعه بالنقر على المصاطب مع معدل التقاوى ٤٥ كجم/فدان أعلى القيم من محصول الحبوب فى كل من الموسمين.