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EFFECT OF SOWING DATES AND NITROGEN LEVELS ON GROWTH, EARLINESS AND YIELD OF EGYPTIAN COTTON CULTIVAR GIZA 88

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Abstract

Two field experiments were carried out at Sakha Agricultural Researech Station on the Egyptian cotton cultivar Giza 88 during 1998 and 1999 seasons to study the effect of sowing dates (25 March, 10 and 25 April) and N-levels (40, 60 and 80 kg/fed.) on growth, earliness and yield of cotton. Split-plot design with four replications was used. Results obtained revealed that early sowing (25 March) had significantly increased number of internodes and sympodia on the main-stem, number of open bolls per plant, boll weight, seed index, lint percentage, number of days to the first flower appearance, days to crack the first boll and earliness percentage and seed cotton yield, per plant and feddan, while plant height, internode length, number of monopodial branches, number of true leaves at 80 days age, first sympodium position and stand of plant at harvest were decreased. On the other hand, increasing nitrogen levels up to 80 kg/fed. had significantly increased plant, length and number of internodes on the main stem, number of monopodia and sympodia per plant, number of true leaves at 80 days age, weight and number of open bolls/plant, seed index and seed cotton yield per plant and feddan. On the contrary, higher N. levels delayed the appearance of first flower, cracking the first boll, produced the 1st sympodium on higher mode and decreased earliness percentage. The interaction between sowing dates and N. levels had no significant effect on all traits in this study except the number of open bolls/plant in the first season. Best results were obtained when cotton plants were sown early (25 March) and fertilized with 80 kg N/fed. While in case of late sowing (25 April) the nitrogen level reduced to 40 kg/feddan. In general, it could be concluded that early sowing gave the proper yield per feddan than the late planting.

INTRODUCTION

It is well known that the reduction in cotton yield is mainly due to applying unproper cultural practices. The suitable sowing date and nitrogen fertilizer rate play a vital role in this field, while the first factor recognizes the requirement of necessary heat units overall the cotton plant life, the second one provides the cotton plants with one of the major feeding elements. In this respect, early sowing increased seed cotton yield (El-Shahawy *et al.*, 1994 and Makram *et al.* 1994) and earliness (Abd El-Malik 1998).

On the other hand, delaying sowing increased plant height and internode length but decreased number of sympodia per plant (Shalaby 1972). Abd El-Malik (1998) found that late sowing reduced number of sympodia, open bolls and boll weight, while early sowing increased earliness %. Abd El-Aal (1997) revealed that early planting increased number of open bolls, boll weight, earliness percentage, seed index and seed cotton yield. Nitrogen is considered the conventional nutritional element for monitoring cotton growth and development (Makram 1977, Abd El-Malik and Abd El-Aal 1998). Makram *et al.* (1982), found that increasing nitrogen rates increased number of open bolls. El-Shinnawy *et al.* (1984), showed that plant height, number of fruiting branches, seed cotton yield, boll weight and number of bolls per plant were increased by increasing nitrogen level. Abd El-Malik (1998) found that, final plant height, number and length of main stem internodes, monopodia, number of open bolls, boll weight, lint percentage, seed index and seed cotton yield were, increased by increasing N levels. He also added that the interaction between sowing dates and nitrogen levels attained insignificant effect on all traits except for final height, main stem internodal length, days to first flower, number of open bolls, lint %, seed index and seed cotton yield. Therefore, this investigation was carried out to study the effect of sowing date and N levels on growth, yield and earliness of the new cotton variety Giza 88.

MATERIALS AND METHODS

Two field experiments were conducted at Sakha Agricultural Research Station, Kafr El-Sheikh Governorate, during 1998 and 1999 seasons using the new Egyptian cotton cultivar Giza 88 (G. *barbadense* L.). The experimental design was split-plot with four replications. The main plots were allocated for the three sowing dates (25 March, 10 and 25 April), while the sub-plots were assigned for the three nitrogen levels (40, 60 and 80 kg/fed.) The subplot size was 18 m2 including 6 rows (5 m. long and 60 cm width). Cotton seeds were sown in hills spaced 25 cm apart leaving two vigorous seedlings per hill at thinning time without replanting. Nitrogen fertilizer was added in bands and divided in two equal portions, the first one was applied after thinning just before the second irrigation and the second part before the third irrigation. Other practices were done as recommended in cotton production that is involved a basic dose of 150 kg calcium superphosphate (15.5 % P_2O_5) at land preparation besides 50 kg potassium sulphate (48% K_2O) per feddan before the fourth irrigation for all subplots. The monthly air temperature (ºC) and relative humidity % for Sakha weather station were through the two growing seasons are given in Table (2). Soil samples were taken in the two seasons before planting cotton to estimate the soil characters using the standard methods as described by Chapman and Pereker (1981) The results are shown in Table (1). Ten guarded plants were chosen at random form each sub-plot to determine the

following characters:

A. Plant growth: final plant height in cm., length and number of inernodes on the main stem, number of monopodia sympodia per plant, number of true leaves at 80 days age.

B. Earliness measurements: Nodal position of the first sympodium, No. of days from planting to the appearance of the first flower, No. of days to the first cracking boll, number of flowers produced up to first cracking boll and earliness percentage.

C. Yield and yield components: Number of open bolls per plant, boll weight in gm, seed cotton yield per plant and seed index gm. Seed cotton yield was estimated from picking all plants of the four inner rows of each subplot and transformed in Kentars per feddan, the two outer rows of each subplot was picked separately to avoid any border effect. Statistical anaysis was performed according to Snedecor and Cochran (1981) and means were compared by L.S.D. at 5% level.

Table 1. Mechanical and chemical analysis of the experiment soil in 1998 and 1999 seasons.

Characters	1998	1999
Soil structure	Clay	Clay
pH	8.69	8.35
Orgnaic matter %	1.69	1.75
TSS %	0.65	0.62
Bicarbonate %	1.85	1.81
Chloride %	7.95	7.81
Sulfuric %	5.66	6.21
Ca^{++} %	1.32	1.46
Mg^{++} %	1.95	1.88
Na^{+} %	4.61	4.59
Available N ppm	12.2	11.95
Available P ppm	9.20	9.50
Available K ppm	690.3	685.2

Table 2. Monthly air temperature (°C) and relative humidity (%) during 1998 and 1999 seasons.

Month	1998 season				1999 season			
	Air temp. °C		R.H %		Air temp. °C		R.H %	
	Max.	Min.	7.30	13.30	Max.	Min.	7.30	13.30
March	19.3	7.0	68.2	43.5	20.5	10.3	66.0	43.0
April	22.7	8.2	67.1	42.0	25.5	9.3	73.5	46.0
May	27.2	11.0	70.1	44.3	28.5	15.0	68.0	40.0
June	30.5	17.2	70.2	42.3	31.0	18.0	73.0	42.0
July	31.6	18.3	72.3	48.0	30.5	20.0	80.0	55.0
Aug.	33.8	19.2	70.2	51.3	31.0	22.4	80.0	54.0
Sep.	32.7	18.5	81.1	48.2	32.0	19.0	81.0	44.0
Oct.	30.8	16.7	72.3	49.1	32.5	18.0	80.5	44.0

RESULTS AND DISCUSSION

Plant growth character:

The results in Table 3. cleared that late sowing date had significantly increased plant height, internode length on the main stem, number of monopodia and number of true leaves at 80 days age, while number of internodes on the main stem and number of sympodia per plant were decreased. The reverse was true for early sowing. These results may be due to that sowing cotton early 25 March fit cotton plants to full seasons in order to obtain complete heat unit requirements for good growth (Young *et al.*, 1980) which reflected in developing sympodia and lower position of first fruiting branch (Table 2). Similar results were obtained by Hussein *et al.*, 1983 for number of true leaves, Makram *et al.*, 1994 for plant height, and Abd El-All 1997 for length and number of internodes on the main stem and number of monopodia and sympodia per plant.

Regarding N. levels the data illustrated in Table 3 showed that increasing the rates from 40 to 80 kg N/fed. increased gradually and significantly plant height, length and number of internodes on the main stem, number of monopodia and sympodia, and number of true leaves at 80 days age. These results may be due to the lack of nitrogen in the experimental soil in the two seasons in addition to the importance of nitrogen for many basic physiological processes in cotton plants such as photosynthetic rate and accumulation of carbohydrates. Similar results were obtained by Makram 1977 for plant height, Abd El-Malik 1998 for number of true leaves at 80 days age, length and number of internodes on the main stem and number of monopodia per plant and Makram *et al.*, 1994 for number of sympodia per plant. The interaction between sowing dates and ni-

Table 3. Effect of sowing dates, nitrogen levels and their interaction (combined data of 1998 and 1999 seasons) on some growth characters of Giza 88 cotton cultivar.

Treatmeants	Season	Sowing dates (S)					Nitrogen levels kg/f (N)					S x N
Growth characters		Sig.	L.S.D	25 March	10 April	25 April	Sig.	L.S.D.	40	60	80	Interaction Sig.
Final plant height	1998	**	5.09	97.67	105.67	112.00	*	4.20	101.67	105.33	108.33	NS
(cm)	1999	**	4.11	90.22	96.70	105.30	*	3.80	92.30	97.50	102.42	NS
Comb.		**	4.22	93.95	101.19	108.65	*	4.51	96.99	101.42	105.38	
No. of main stem	1998	**	0.93	22.23	20.40	19.13	*	0.98	19.50	20.43	21.83	NS
internodes/plant	1999	*	0.85	20.80	18.30	17.50	*	0.81	18.20	19.55	18.85	NS
Comb.		*	0.81	21.51	19.35	18.32	*	0.85	18.85	19.99	20.34	
Main stem internodal	1998	**	0.24	4.40	5.27	5.80	**	0.15	4.97	5.17	5.33	NS
length (cm)/plant	1999	**	0.21	4.34	5.28	6.02	**	0.11	5.07	5.10	5.43	NS
Comb.		**	0.22	4.37	5.27	5.91	**	0.14	5.02	5.14	5.38	
No. of monopodial	1998	**	0.15	1.99	2.57	2.77	*	0.18	2.27	2.43	2.57	NS
branches/plant	1999	*	0.13	1.81	2.11	2.53	*	0.03	1.75	2.09	2.61	NS
Comb.		*	0.14	1.90	2.34	2.64	*	0.13	2.02	2.27	2.59	
No. of sympodial	1998	**	0.49	16.80	15.97	15.40	NS	-	15.87	16.00	16.30	NS
branches/plant	1999	**	0.32	15.20	14.81	14.20	NS	-	14.35	14.45	15.41	NS
Comb.		**	0.35	16.00	15.39	14.80	NS	-	15.11	15.22	15.86	
No. of true leaves at	1998	**	1.19	13.90	15.43	16.57	**	1.11	13.17	15.23	17.50	NS
80 days after sowing	1999	**	0.11	12.81	12.95	13.20	**	0.85	12.11	13.00	13.85	NS
Comb.		**	0.31	13.36	14.19	14.89	**	0.96	12.64	14.12	15.68	

*, ** and N.S. indicate P< 0.05, 0.01 and not significant, respectively.

trogen levels had no significant effects on any trait under study.

B. Earliness

Data given in Table 4 showed the effect of sowing dates, N levels and its interaction on some earliness measurements. The sowing dates had a significant effect on all earliness measurements studied, i.e., the position of the first sympodium, number of days to the first flower appearance, days to the first cracking boll, number of flowers up to first open boll per plant and percent of first pick to total yield. These results may be due to relatively high temperature of air and soil in case of late sowing which pushed the cotton plants to form excessive vegetative growth with few fruiting branches through short plant life, while in case of early sowing the heat units accumulation was slowly, that helped cotton plants to form more fruiting branches and more bolls per plant. At harvest (first pick) most bolls in case of early sowing reached maturity age, in the same time few bolls reached maturity in case of late planting which was reflected on earliness %. These results are in agreement with those obtained by Makram *et al.*, 1994. With regard to N levels, the results in Table 4. indicated that all earliness measurements were significantly affected by N rates. In general, increasing nitrogen application from 40 up to 80 kg N/fed. Raised nodal position of first sympodium, delayed the first flower appearance and first cracking boll, while number of flowers up to first open boll and earliness percentage were decreased as N level increased. These results could be explained on the basis that excess application of nitrogen fertilizer caused excessive vegetative growth which in turn increased the shedding of fruiting bodies on lower fruiting branches as a result of the shading of excessive vegetative growth and consequently resulted in delaying maturity. Similar finding were obtained by Kater *et al.*, 1991 and Abd El-Aal 1997.

C. Yield and its components:

Results presented in Table 5 cleared the effect of sowing dates, nitrogen levels and its interaction on yield and its components. The sowing dates had significant effect on seed cotton yield and its components. Cotton plants sown in early date (25 March) produced higher number of open bolls, boll weight, seed cotton yield per plant and feddan and seed index. In case of early sowing the increase of seed cotton yield per plant was compensated the decrease of stand of plants at harvest, while the reverse was true in case of late planting. These results could be explained on the basis that early sowing allows longer growing season and gave enough time to develop a heavy boll load with large seeds (Young *et al.*, 1980). Similar results were obtained by Makram *et*

Table 4. Effect of sowing dates, nitrogen levels and their interaction (combined data of 1998 and 1999 seasons) on some earliness measurements of Giza 88 cotton cultivar.

Treatmeants	Season	Sowing dates (S)					Nitrogen levels kg/f (N)					S x N
Earliness measurements		Sig.	L.S.D.	25 March	10 April	25 April	Sig.	L.S.D.	40	60	80	Interaction Sig.
Nodal position of the	1998	*	0.12	6.30	6.60	6.87	**	0.16	6.40	6.60	6.77	NS
first sympodium	1999	*	0.11	5.90	6.22	6.65	*	0.12	6.00	6.32	6.45	NS
Comb.				6.10	6.41	6.76			6.20	6.46	6.61	
Days of first	1998	*	2.48	95.10	91.65	90.20	*	1.89	91.22	92.23	93.50	NS
flower/plant	1999	*	1.20	92.35	90.11	89.36	*	0.95	90.53	93.00	88.29	NS
Comb.		*		93.72	90.88	89.78			90.88	92.61	90.89	
Days of first open	1998	**	0.63	145.83	144.53	143.70	*	0.22	144.36	144.70	145.00	NS
boll/plant	1999	**	1.31	145.70	143.30	142.00	*	2.21	141.50	143.93	145.57	NS
Comb.		**	0.97	145.76	143.91	142.85			142.93	144.30	145.29	
No. of flowers up to	1998	*	0.81	29.50	28.10	27.03	*	0.77	28.87	28.16	27.58	NS
first open boll/plant	1999	*	1.51	30.20	27.80	26.51	*	0.39	29.31	28.81	26.39	NS
Comb.				29.85	27.95	26.77			29.09	28.49	26.99	
Earliness percentage	1998	**	1.96	53.46	50.3	48.60	*	0.05	51.96	50.53	49.86	NS
	1999	**	1.80	54.36	51.0	47.80	*	2.20	55.00	50.22	47.94	NS
Comb.				53.91	50.65	48.20			53.48	50.38	48.90	

Means designated by the same letter are not significantly different at 0.05 level according to L.S.D. test.

*, ** and N.S. indicate P< 0.05, 0.01 and not significant, respectively.

Table 5. Effect of sowing dates, nitrogen levels and their interaction (combined data of 1998 and 1999 seasons) on seed cotton yield (kentar/fed.) and its components of Giza 88 cotton cultivar.

Treatmeants	Seasons	Sowing dates (S)					Nitrogen levels kg/f (N)					S x N
Seed cotton yield and its components		sig.	L.S.D.	25 March	10 April	25 April	Sig.	L.S.D.	40	60	80	Interaction Sig.
No. of open bolls/plant	1998	**	1.09	18.80	16.10	13.10	**	0.36	14.90	15.90	17.20	*
	1999	**	1.30	16.95	14.83	12.91	**	0.46	13.51	14.89	16.29	NS
Comb.		**	1.60	17.88	15.47	13.01	**	0.62	14.21	15.40	16.75	
Boll weight (g)	1998	**	0.08	2.40	2.00	1.90	NS	-	2.00	2.10	2.20	NS
	1999	**	0.02	2.21	1.90	1.81	*	0.21	1.62	2.10	2.20	NS
Comb.		**	0.03	2.30	1.95	1.86	*	0.02	1.81	2.10	2.20	
Seed cotton yield/plant	1998	**	5.21	45.00	32.1	24.90	**	2.81	29.78	33.40	38.82	NS
(gm)	1999	**	4.11	37.46	23.35	23.35	*	2.32	21.90	31.26	35.85	NS
Comb.		**	4.51	41.23	27.73	24.13	*	2.10	25.84	32.33	37.34	
Seed cotton yield	1998	*	0.62	11.40	10.63	9.67	*	1.33	9.54	10.53	11.63	NS
(kentar/fed.)	1999	*	0.71	10.70	9.85	8.73	*	1.26	8.22	9.28	11.78	NS
Comb.		*	0.53	11.05	10.20	9.20	*	1.10	8.88	9.91	11.71	
Stand No. of plants/fed.	1998	*	1020	46720	47080	49822	NS	-	47655	487.50	47217	NS
at the end of season	1999	*	975	47222	48951	50110	NS	-	47295	48355	50633	NS
Comb.		*	981	46971	48015	49966	NS	-	47475	48553	48925	
Lint percentage	1998	NS	-	40.38	40.30	40.23	NS	-	40.21	40.32	40.38	NS
	1999	NS	-	39.82	39.59	39.45	NS	-	39.26	39.71	39.89	NS
Comb.		NS	-	40.10	39.95	39.84	NS	-	39.74	40.02	40.14	
Seed index	1998	*	0.35	10.60	10.32	9.10	*	0.12	9.56	10.10	10.36	NS
(g/100 seed)	1999	*	0.05	10.31	10.21	10.00	*	0.01	10.35	10.61	10.56	NS
Comb.		*	0.04	10.46	10.27	9.55	*	0.08	9.95	10.35	10.46	

*, ** and N.S. indicate P< 0.05, 0.01 and not significant, respectively.

al. (1994) and Abd El-Malik (1998). Regarding the effect of nitrogen fertilization, the results showed that raising N levels had significantly increased weight and number of open boll/plant, seed index and seed cotton yield per plant and feddan. These results might be explained on the base that increasing nitrogen levels up to 80 kg/fed. gave cotton plants its requirements from nitrogen which provide the small formed bolls with its, resulting in more setting of bolls and decrease the shedding of fruiting organs per plant which reflected on seed cotton yield per plant and feddan. These results are in agreements with those obtained by El-Shahawy *et al.* (1994) and Abd El-Aal and Abd El-Malik (1998). The interaction between sowing date and N levels had insignificant effect on all traits studied in this investigation except number of open bolls per plant in 1998 season. Generally it is recommended to grow cotton early (25 March) and adding 80 kg nitrogen per feddan and adding 40 kg nitrogen in case of late sowing (25 April) for Giza 88 cotton cultivar under the condition of this study.

REFERENCES

1. Abd El-Aal, S.A.I. 1997. Effect of ridging rates in combination with hill spacing and nitrogen levels on growth, earliness, yield and yield components of Giza 86 cotton cultivar, J. Agric., Res. Tanta Univ., 23 (1): 9-17.

2. Abd El-Malik, R.R. 1998. Response of the new cotton cultivar Giza 89 to sowing dates under different nitrogen levels. J. Agric. Sci. Mansoura 23 (12): 5255-5267.

3. Abd El-Mmalik, R.R. and S.A.I. Abd El-Aal. 1998. Effect of thining dates and nitrogen levels under late sowing of Giza 89 cotton cultivar. J. Agric. Sci. Mansoura 23(1): 27-34.

4. Chapman, H.D. and F.P. Parker. 1981. Methods of analysis of soil, plants and water. Univ. California, August, 1981, Second Printing.

5. El-Shahawy, M.I., S.M. El-Gahel and E.A. Makram 1994. Effect of planting date, hill spacing and nitrogen levels on Giza 76 cotton cultivar. J. Agric. Res. Tanta Univ., 20(4): 631-642.

6. El-Shinnawy, A., F.M. Ghaly and A.A. Hosny 1984. Effect of hill spacing and nitrogen levels on Giza 80 cotton variety. Agric. Res. Rev. Cairo, 62(6): 101-111.

7. Hussein, M.A., M.H. El-Shaer, E.A. Makram and M.Kh. Abd El-Fattah. 1993. Effect of plant population density and sowing date on some Egyptian cotton cultivars. Proc. 1st Conf. Agron. Crop Sci., Cairo, Egypt, p. 709-717.

8. Kater, H., K. Cassman and W. Ebelhar. 1991. Cotton nutrition-N, P and K. Physiology today, Newsletter of the cotton physiology Education Program-National Cotton Council of America, 2(3): 2014.

9. Makram, E.A.O. 1977. Effect of plant density under different nitrogen rates on growth, yield and some fiber properties in cotton. Ph.D. Thesis, Fac. Agric. Al-Azhar Univ. Egypt.

10. Makram, E.A., A.A. Sallam and A.A. El-Gohary. 1992. Effect of hill spacing under different nitrogen rates on yield components, yield and some fiber properties of Egyptian cotton cultivar, Giza 75 Res., Bull., Fac. Agric., Ain Shams Univ., Cairo, Egypt, No. 1731, 19 pp.

11. Makram, E.A., M.I. El-Shahawy, S.F. El-Gahel and R.R. Abd El-Malik. 1994. Effect of hill spacing, soil fertilization and its interaction on growth, yield and earliness in Egyptian cotton cultivars 1-Giza 70 J. Agric. Sci. Mansoura Univ. 19(1): 1-13.

12. Shalaby, E.M. 1972. Physiological response of cotton plants to planting dates and population density. Ph.D. Thesis Fac. Agric. Ain Shams Univ., Cairo. Egypt pp. 323-340.

13. Snedecor, G.W. and W.G. Cochran. 1981. Statistical analysis methods. Seventh Edition, Iowa Sate. Univ., Ames. Iowa. U.S.A.

14. Young, E.F., R.M. Taylor J.Y. and H.D. Peterse. 1980. Days degree unit and time in relation to vegetative development and fruiting for three cultivars of cotton. Crop Sci., 20: 320-375.

تأثير مواعيد الزراعة ومستويات النيتروجين على النمو والتبكير والمحصول لصنف القطن جيزة ٨٨

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معهد بحوث القطن - مركز البحوث الزراعية - جيزة - مصر

أقيمت تجربتان حقليتان بمحطة البحوث الزراعية بسخا خلال موسمى ١٩٩٨، ١٩٩٩ لدراسة تأثير مواعيد الزراعة (٢٥ مارس، ١٠ إبريل، ٢٥ إبريل) وثلاثة معدلات من التسميد الأزوتى (٤٠، ٦٠، ٨٠ كجم/ف) على النمو والتبكير والمحصول ومكوناته لصنف القطن جيزة ٨٨ . وأستخدم تصميم القطع المنشقة مرة واحدة فى تنفيذ التجربة فى أربعة مكررات حيث وضعت مواعيد الزراعة فى القطع الرئيسية ومعاملات التسميد الأزوتى فى القطع المنشقة وفيما يلى أهم النتائج المتحصل عليها:

١- أدت الزراعة فى الميعاد المبكر (٢٥ مارس) إلى زيادة معنوية فى عدد سلاميات الساق الرئيسى وعدد الأفرع الثمرية وعدد اللوز المتفتح على النبات ووزن اللوزة ومعامل البذرة والنسبة المئوية للشعر وعدد الأيام لتفتح أول زهرة وعدد الأيام لتفتح أول لوزة والنسبة المئوية للتبكير ومحصول النبات ومحصول الفدان بالقنطار كما أدت الزراعة المبكرة إلى نقص فى إرتفاع النبات النهائى وطول السلامية وعدد الأفرع الخضرية وعدد الأوراق الحقيقية عند عمر ٨٠ يوم وانخفاض موقع أول فرع ثمرى وعدد النباتات عند الجنى.

٢- أدت زيادة معدل التسميد الأزوتى حتى ٨٠ كجم/ف إلى زيادة معنوية فى طول النبات النهائى وعدد سلاميات الساق الرئيسى وطول السلامية وعدد الأفرع الخضرية والثمرية وعدد الأوراق الحقيقية عند عمر ٨٠ يوم وعدد اللوز المتفتح على النبات ووزن اللوزة ومحصول النبات ومحصول الفدان بالقنطار ومعامل البذرة - فى حين أدت الزيادة فى معدل التسميد إلى تأخر النضج نتيجة إرتفاع عقدة أول فرع ثمرى وعدد الأيام حتى تفتح أول زهرة وأول لوزة ونقص النسبة المئوية للتبكير.

٣- لم يكن للتفاعل بين ميعاد الزراعة ومعدل التسميد الأزوتى تأثير معنوى على الصفات تحت الدراسة فيما عدا عدد اللوز المتفتح فى موسم ١٩٩٨م.

وتوضح الدراسة أن زراعة صنف القطن جيزة ٨٨ مبكراً فى (٢٥ مارس) مع التسميد النيتروجينى بمعدل ٨٠ كجم نيتروجين/للفدان تؤدى إلى تحقيق أعلى محصول تحت ظروف الدراسة. بينما أعطت الزراعة المتأخرة فى ٢٥ إبريل مع التسميد النتروجينى ٤٠ كجم نتروجين نقص فى المحصول مقداره ١٧,٦ ٪.