EFFECT OF HILL SPACING AND NITROGEN FERTILIZATION LEVEL ON THE NEW PROMISING EGYPTIAN COTTON HYBRID GIZA 90 X AUSTRALIAN

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ABSTRACT

Two field experiments were carried out in Mallawy Agricultural Research Station, Minia Governorate, Middle Egypt, during 2010 and 2011 seasons to find out the effect off hill spacing and nitrogen fertilization level on the new promising Egyptian cotton hybrid Giza 90 x Australian (*Gossypium barbadense L.*,). The experimental design was a split plot block with four replications. The main plots were devoted to four hill spacings (20, 25, 30 and 35 cm) and the sub plots for four nitrogen fertilization levels (30, 45, 60 and 75kg N/fed.). The results indicated that hill spacing and nitrogen fertilization levels had significant effects on no. of sympodia/plant, earliness %, no. of open bolls/plant, boll weight and seed cotton yield/fed while, but not on plant height, first sympodial position, seed index and lint %. Increasing hill spacing to 35 cm between hills significantly increased no of sympodia/plant, no. of open bolls/plant, boll weight, seed cotton yield/fed, but decreased earliness %. Increasing N levels from 30 to 75 kg N/fed exhibited a significant increase in each of no. of sympodia/plants, no. of harvested plants/fed, earliness %, no. of open bolls/plant, boll weight and seed cotton yield/fed. The interaction between hill spacing and nitrogen level exerted significant effects on no. of sympodia/plant, earliness % and boll weight in both seasons, no. of open bolls/plant in the first season and seed cotton yield/fed in the second season. The combination between 35 cm hill spacing and 60 or 75 Kg N/fed. gave the highest averages of no. of sympodia/plant, boll weight, no. of open bolls/plant and seed cotton yield/fed. The effect of hill spacing and nitrogen fertilization level and their interactions did not exhibit any significant effect on all fiber properties under study. It could be concluded that 35 cm hill spacing and 60 Kg N/fed. could be recommended production of this new cotton hybrid Giza 90 x Australian under Middle Egypt location.

Key words: Cotton, Hybrid, Hill spacing, Nitrogen fertilization, Growth, Productivity and Fiber.

INTRODUCTION

Plant population is one of the most important management practices which require attention as far as yield is concerned in cotton production. Plant population in cotton could be adjusted by manipulating inter and intra-row hill spacing as well as no. of plants/hill. The proper plant density/fed. results into higher yield, earlier maturity and reduces cost of insect and weed control. The proper plant spacing is one of the management practices that affect canopy light interception, maturity and dry matter of the cotton plant.

(**Eweida *et al,* 1981)** found that the no. of nodes and fruiting branches/plant were significantly affected by hill spacing where the no. of

open bolls/plant was increased with wider spacing while boll weight, fibre length, strength and fineness were not affected by plant density. **(Abd El-Malik** and **El-Shahawy, 1999)** found that low density stands increased plant height, no. of fruiting branchs, earliness %, no. of open bolls/ plant, boll weight and seed cotton yield/fed.. (**El-Sayed** and **El-Menshawi, 2005)** found that wider hill spacing increased earliness %, no. of open bolls/plant, boll weight and seed cotton yield. **(Dong *et al,* 2005)** found that seed cotton yield and lint percentage did not significantly differ among three plant densities. **(Obasi** and **Msaakpa, 2005)** indicated that wider hill spacing increased no. of sympodia, open bolls, boll weight and seed cotton yield while, it decreased plant height and earliness %. (**Hamed, 2006)** indicated that increasing plant population i.e. 64.600, 51.700 and 43.100 plants/fed. produced the best averages of the first fruiting branch node, no. of plants/fed and seed cotton yield/fed while, decreasing population density led to a significant increase in no. of fruiting branches/plant, no. of open bolls/plant, boll weight and seed cotton yield/plant**. (El-Shahawy** and **Hamoda, 2011)** found that increasing hill spacing from 20 to 30 cm significantly increased no. of sympodia/plant, no. of open bolls/plant, boll weight and seed cotton yield /fed. while, plant height, first sympodial position and lint % decreased.

Nitrogen is one of the most important nutrient elements in cotton production. Adequate levels of nitrogen fertilization may produce a higher yield and quality, but higher levels may result in excessive vegetative growth with a lower yield and quality. In this respect, several studies were done to evaluate the response of cotton plants to different nitrogen levels.

(**El-Ganaini *et al,* 2005)** found that number of open bolls/plant, boll weight and seed cotton yield/fed., were increased with increasing levels of nitrogen. (**Khan *et al,* 2005)** found that seed cotton yield, number of bolls per plant and boll weight increased with increasing rates of N. (**Hamed, 2006)** indicated that the plant height, no. of fruiting branches/plant, no. of open bolls/plant and seed cotton yield/plant were significantly increased by increasing nitrogen levels up to (45, 60 and 75) Kg N/fed.. **(Sawan *et al,* 2006)** showed that no. of open bolls/plant, boll weight, seed index and seed cotton yield/plant were increased with the higher N rate. Nitrogen effects on fibre properties were small and inconsistent. (**Srinivasulu *et al,* 2006)** found that the seed cotton yield obtained with the 120 kg N/ha rate was significantly higher than the seed cotton yield observed with the 90 kg N/ha rate. Nitrogen level did not affect the quality of the fibre. **(Ahmed** and **Kassem, 2008)** found that increasing nitrogen level to 90 kg N/fed significantly increased plant height and no. of fruiting branches/plant but, it failed to exert any significant effects on yield or yield components. (**Ibrahim, 2008)** found that plant height, no. of fruiting branches/plant, no. of open bolls/plant, boll weight, no. of plants/fed., seed index, lint %, seed cotton yield/plant, seed cotton yield/fed., fiber length, fiber strength, micronaire values and fiber elongation were significantly increased by increased NPK fertilizations levels at 80 kg N + 30 kg P_2O_5 + 48 kg K_2O/fed. (**Hamoda, 2010)** found that the increase of N level to 60kg N/fed. exhibited a significant increase in each of plant height, no. of fruiting branches/plant, no. of open bolls/plant, boll weight, seed index, seed cotton yield/fed. and gave the best fiber quality**. (El-Shahawy** and **Hamoda, 2011)** found that plant height, no. of sympodia/plant, first sympodial position, no. of open bolls /plant, boll weight, seed index and seed cotton yield/fed.

were increased by increasing nitrogen levels but did not exhibit any significant effect on all fiber properties under study.

The main purpose of this study was to investigate the effect of hill spacing and nitrogen fertilization level on growth and productivity of the new promising cotton hybrid Giza 90 x Australian under Middle Egypt conditions.

MATERIALS AND METHODS

Two field experiments were carried out in Mallawy Agricultural Research Station, Minia Governorate, Middle Egypt, during 2010 and 2011 seasons to study the effect of hill spacing and nitrogen fertilization level on growth, earliness, yield and fiber quality of the new promising cotton hybrid Giza 90 x Australian (*Gossypium barbadense*, L.). Characters this cotton hybrid are shown in Table (1).

Table 1. Main characters the new promising cotton hybrid Giza 90 x Australian.

Hybrid name	New promising cotton hybrid Giza 90 x Australian.
Species	Barbadense.
Category	Long staple
Pedigree	Crossing between Giza 90 x Australian
Characteristics	Long staple characterized by high yielding, early maturity, high lint %, resistance to fuzariam and tolerance to relatively high temperature (Middle Egypt).
Botanical distinguishing characters	The stem has a medium length also has pale purple color. The leaf is of medium size and intermediate (1/2- 3/4) in lobe depth. The node of the first fruiting branch ranged from 6-7. The flower petal has tubular shape. The boll is of conical shape: non–tapering shape (Tity). Seed is of medium size and semi racked to 1/4 from fuzz covers. Fuzz color is gray. Lint color is creamy
Hybrid bred by	Breeding Res. Section, Cotton Res., Agric. Res. Center, Giza, Egypt.

The experimental design was a split plot block with four replications. Main plots were devoted to four hill spacings (20, 25, 30 and 35 cm) and the sub plots were devoted for four nitrogen fertilization levels (30, 45, 60 and 75kg N/fed.). The experimental unit included 8 ridges (5 m long and 65 cm apart) occupying an area of 26 m². Cotton seeds were planted on 25 March in the two seasons. Hills were and seedlings were thinned at 2 plants/hill after 25 days from planting. Phosphorus fertilizer as ordinary superphosphate (15.5% P_2O_5) at the level of 22.5 kg P_2O_5/fed. was incorporated during seed bed preparation. Nitrogen fertilization was applied in the form of ammonium nitrate (33.5% N) at the tested level in two equal doses i.e. immediately before the first and the second irrigations (29 and 45 days after planting). Potassium fertilization was applied in the form of potassium sulfate (48% K_2O) at the level of 24 kg K_2O/fed. in a single dose before the second irrigation. Standard agricultural practices were followed throughout the growing seasons. Soil analysis of the experimental site in the two growing seasons was shown in Table (2).

Table 2. Soil analysis of the experimental sites in the two seasons.

Seasons	Soil properties							
	Soil Texture	pH	Organic matter (%)	EC m mhos/cm	Ca CO_3 %	Available element (ppm)		
						N	P	K
2010	**Clay loam**	7.9	1.16	0.36	3.22	23	9.5	333
2011	**Clay loam**	8.1	1.09	0.35	2.30	22	13	288

Plants of five representative hills were taken at random from each plot to study the following traits: plant height (cm), no. of sympodia/plant**,** first sympodial position, boll weight (gm), number of open bolls/plant, lint % and seed index (gm). The seed cotton yield (ken./fed.) was estimated as the weight of seed cotton yield (kilogram) picked twice from the six central rows of each plot, then converted to yield per fedden in kentar (Kentar = 157.5 kg.). Earliness index was determined as percent of seed cotton yield at first pick to total seed cotton yield/plot. Also, number of plants/fed. at harvest (1000 plants/fed.) was determined. All fiber tests were performed at the laboratories of the Cotton Technology Research Division, Cotton Research Institute, Agricultural Research Center, Giza, Egypt, at a constant relative humidity 65% ±2 and temperature 21˚C ±2. Fiber properties (upper half mean length (UHM) in mm, uniformity index, fiber strength in g/tex., fiber elongation % and micronaire reading were measured using High Volume Instrument (HVI) fiber test system according to (**A.S.T.M. 1986)**. Data were subjected to statistical analysis as proposed by (**Gomez** and **Gomez, 1984**) and means were compared by LSD at 5% level of probability.

RESULTS AND DISCUSSION

The effect of hill spacing, nitrogen level and their interactions on growth, earliness, yield and its components and fiber properties for the new promising cotton hybrid Giza 90 x Australian are shown in Tables (3) to (8).

1- Effect of hill spacing:

Data in Table (3) showed that no. of sympodia/plant and earliness % were significantly affected by hill spacing which did not exhibit any significant effect on plant height at harvest and first sympodial position in both seasons. Wider spacing of 35 cm gave the highest values of no of sympodia/plant and earliness traits compared with the other hill spacings under study. Similar results were obtained by (**Abd El-Malik** and **El-Shahawy, 1999**).

Table 3. Effect of hill spacing and nitrogen fertilization levels on growth and earliness traits of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		Growth parameters				Earliness traits			
		Plant height at harvest (cm)		No. of sympodia/plant		First sympodial position		Earliness (%)	
		2010	2011	2010	2011	2010	2011	2010	2011
Hill spacing	20 cm/hills	109.83	124.00	12.33	12.44	8.2	7.0	74.86	73.61
	25 cm/hills	112.21	123.88	13.30	12.90	8.1	7.0	75.64	74.55
	30 cm/hills	109.83	117.96	13.60	14.62	8.0	7.1	77.53	74.31
	35 cm/hills	114.67	123.63	13.93	15.50	7.9	7.1	78.08	74.80
LSD		N.S	N.S	0.19	0.37	N.S	N.S	0.73	0.48
N fertilization levels	30 kg N/fed.	109.04	116.79	12.16	13.00	8.0	7.1	77.06	76.71
	45 kg N/fed.	110.50	121.88	13.18	13.47	8.0	7.1	77.08	75.11
	60 kg N/fed.	112.75	124.58	13.83	14.24	8.0	7.1	76.67	73.67
	75 kg N/fed.	114.25	126.21	14.00	14.75	8.1	7.1	75.29	71.78
LSD		N.S	N.S	0.17	0.24	N.S	N.S	0.53	0.34

Results presented in Table (5) indicated that hill spacings significantly affected on no. of open bolls/plant, boll weight and no. of plants/fed. in both seasons and seed cotton yield/fed. in the second season only. Increasing hill spacing to 35 cm significantly increased no. of open bolls/plant, boll weight, seed cotton yield/fed. Hill spacing did not exhibit any significant effect on seed index and lint %. The no. of harvested plants/fed. was significantly increased as a result of decreasing distance between hills in both seasons. With using the suitable wide hill spacing might have had increased light intensity within the plant canopy which, increased seed cotton yield, due to a higher production of bolls per plant and increase in boll weight. These results are in harmony with those obtained by (**El-Sayed** and **El-Menshawi, 2005)**.

Data in Table (7) showed that hill spacing treatments did not exhibit any significant effect on all fiber properties under study in both seasons. Similar results were obtained by **(Eweida *et al,* 1981).**

2- Effect of nitrogen fertilization level:

Data in Table (3) showed that nitrogen fertilization level had a significant effect on no of sympodia/plant and earliness % but did not exhibit any significant effect on plant height at harvest and first sympodial position in both seasons. Increasing N level from 30 to 75 kg N/fed exhibited a significant increase in no of sympodia/plant where cotton plants under 75 kg N had more no. of fruiting branches than those received 30, 45 or 60 Kg N/fed. without any significant differences with the level of 60 Kg N/fed. These results may be due to the well known roles of N in building up the plant tissues and stimulating its growth. It is well established that cotton plant, owing to its indeterminate growth habit, responds favorably to increasing N rate where its growth is linearly correlated with N supply **(Silvertooth *et al,* 2007).** Increasing N level from 30 to 75 kg N/fed. decreased earliness %. Both levels of 60 kg N /fed. and 75 kg N/fed gave the best values of no. of sympodia/plant without any differences between them. Similar results were obtained by **(Hamed, 2006)** and **(Hamoda, 2010)**.

It is clear from Tables (5) that increasing N fertilization level from 30 to 75 kg N /fed exhibited a significant increase in no. of open bolls/plant, boll weight and seed cotton yield/fed in both seasons, while lint %, no. of harvest plants/fed. and seed index were insignificantly affected by N levels. In this respect (**El-Shahawy** and **Hamoda, 2011)** found that no. of open bolls/plant, boll weight, seed index and seed cotton yield/fed. were increased by increasing nitrogen levels. These results are in harmony with those of (**Ahmed** and **Kassem, 2008)** and **(Sawan *et al,* 2006).**

Data also in Table (7) cleared that N levels did not exhibit any significant effect on all fiber properties under study in both seasons. In this respect (**El-Shahawy** and **Hamoda, 2011)** found that hill spacings and nitrogen fertilizer levels and the interaction between them did not exhibit any significant effect on all fiber properties.

3- Effect of the interaction between hill spacing and nitrogen fertilization level:

Data in Table (4) showed that the interaction between hill spacing and nitrogen fertilization levels exerted a significant effect on no. of sympodia/plant and earliness % but did not exhibit any significant effect on plant height at harvest and first sympodial position in both seasons. The combination between 35 cm between hills and the level of 75 Kg N/fed. gave the highest averages of no. of sympodia/plant without any significant differences with 60 Kg N/fed. These results are in harmony with those of (**El-Shahawy** and **Hamoda, 2011)**.

The interaction between hill spacing and nitrogen fertilization levels had a significant effect in no. of open bolls/plant in the first season only, boll weight in both seasons and seed cotton yield/fed in the second season but did not exhibit any significant effect on lint %, no. of harvest plants/fed. and seed index (Table 6). The combination between 35 cm between hills and the level 75 Kg N/fed. gave the highest averages of this traits without any difference with 60 Kg N/fed. These results are in harmony with those of (**El-Shahawy** and **Hamoda, 2011).** From these results in general the interaction between 35 hill spacing and 60 Kg N/fed. were increased yield and yield components.

The interaction between hill spacing and nitrogen fertilization levels did not exhibit any significant effect on all fiber properties in both seasons (Table 8). This may be attributed to the realization that these characteristics are heritable and hence are less affected by the environmental factors. The obtained results are in close agreement with those reported by (**Srinivasulu *et al,* 2006).**

Table 4. Effect of the interaction between hill spacing and nitrogen fertilization levels on growth and earliness traits of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		Growth parameters				Earliness traits			
		Plant height at harvest (cm)		No. of sympodia/plant		First sympodial position		Earliness (%)	
Hill spacing	N fertilization levels	2010	2011	2010	2011	2010	2011	2010	2011
20 cm/hills	30 kg N/fed.	107.67	111.83	11.10	11.50	8.2	7.0	76.33	76.20
	45 kg N/fed.	109.33	128.17	11.87	12.30	8.2	7.0	75.33	73.47
	60 kg N/fed.	110.83	127.33	13.13	12.73	8.2	7.1	74.87	73.43
	75 kg N/fed.	111.50	128.67	13.23	13.23	8.1	7.0	72.90	71.33
25 cm/hills	30 kg N/fed.	106.67	121.00	12.17	11.73	8.0	7.0	74.70	76.80
	45 kg N/fed.	112.33	122.50	13.37	12.57	7.9	7.0	76.60	74.40
	60 kg N/fed.	113.17	125.50	13.80	13.20	8.2	7.1	76.00	73.90
	75 kg N/fed.	116.67	126.50	13.87	14.10	8.1	7.0	75.27	73.10
30 cm/hills	30 kg N/fed.	109.50	114.50	12.50	14.03	8.0	7.1	78.20	75.97
	45 kg N/fed.	107.33	115.83	13.57	14.20	7.9	7.1	78.13	75.40
	60 kg N/fed.	111.00	117.83	14.00	14.93	7.8	7.1	78.00	73.90
	75 kg N/fed.	111.50	123.67	14.33	15.30	8.2	7.1	75.77	71.97
35 cm/hills	30 kg N/fed.	112.33	119.83	12.87	14.73	7.9	7.0	79.00	77.87
	45 kg N/fed.	113.00	121.00	13.90	14.80	7.9	7.0	78.27	77.17
	60 kg N/fed.	116.00	127.67	14.40	16.10	7.8	7.1	77.80	73.43
	75 kg N/fed.	117.33	126.00	14.57	16.37	8.0	7.1	77.23	70.73
LSD		N.S	N.S	0.35	0.49	N.S	N.S	1.05	0.69

Table 5. Effect of hill spacing and nitrogen fertilization levels on yield and yield components of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		No. of open bolls/plant		Boll weight (g)		No. of plants (plants/fed.)		Lint (%)		Seed index (g)		Seed cotton yield (Kent./fed.)	
		2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
Hill spacing	20 cm/hills	15.18	16.85	2.15	2.15	49.63	47.47	41.7	40.5	8.77	8.83	10.90	11.29
	25 cm/hills	17.67	18.48	2.16	2.17	46.51	46.50	41.8	40.4	8.87	8.89	11.22	11.48
	30 cm/hills	19.33	18.99	2.26	2.23	41.38	39.75	41.7	40.8	8.88	8.85	11.08	11.18
	35 cm/hills	21.76	22.94	2.31	2.24	35.60	35.57	41.8	40.8	8.92	8.90	11.13	11.43
LSD		**0.26**	**0.43**	**0.03**	**0.01**	**0.64**	**0.83**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**0.16**
N fertilization levels	30 kg N/fed.	17.15	18.14	2.19	2.21	42.79	42.34	41.6	40.8	8.84	8.69	10.55	10.85
	45 kg N/fed.	17.93	19.17	2.23	2.19	43.16	42.18	41.7	40.7	8.85	8.90	10.75	11.01
	60 kg N/fed.	19.29	19.85	2.23	2.19	44.95	42.34	41.8	40.6	8.81	8.94	11.45	11.74
	75 kg N/fed.	19.56	20.11	2.23	2.20	44.21	42.43	41.9	40.5	8.93	8.94	11.58	11.79
LSD		**0.25**	**0.44**	**0.02**	**0.01**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**0.53**	**0.13**

Table 6. Effect of the interaction between hill spacing and nitrogen fertilization levels on yield and yield components of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		No. of open bolls/plant		Boll weight (g)		No. of plants (plants/fed.)		Lint (%)		Seed index (g)		Seed cotton yield (Kent./fed.)	
Hill spacing	Nitrogen fertilization levels	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
20 cm/hills	30 kg N/fed.	14.63	15.93	2.14	2.15	49.04	47.67	41.6	40.3	8.76	8.55	10.71	10.27
	45 kg N/fed.	14.70	16.57	2.14	2.13	50.11	47.13	41.8	40.2	8.74	8.94	10.63	11.16
	60 kg N/fed.	15.34	17.33	2.15	2.15	49.82	47.29	41.7	41.1	8.70	8.80	10.81	11.50
	75 kg N/fed.	16.03	17.57	2.16	2.15	49.57	47.78	41.8	40.2	8.88	9.01	11.46	12.26
25 cm/hills	30 kg N/fed.	15.50	17.53	2.14	2.20	46.17	46.32	41.5	40.8	8.87	8.74	10.58	11.30
	45 kg N/fed.	16.07	18.07	2.16	2.16	46.78	46.54	41.9	40.7	8.85	8.83	10.53	11.12
	60 kg N/fed.	19.47	19.13	2.18	2.14	46.33	46.48	41.8	40.1	8.82	8.97	12.15	11.98
	75 kg N/fed.	19.63	19.20	2.16	2.20	46.76	46.65	42.0	40.0	8.93	9.03	11.63	11.54
30 cm/hills	30 kg N/fed.	17.80	17.97	2.23	2.23	40.50	39.81	41.5	41.2	8.86	8.41	10.14	11.09
	45 kg N/fed.	19.50	18.77	2.31	2.22	40.23	39.59	41.4	40.8	8.89	8.97	11.02	10.95
	60 kg N/fed.	19.90	19.47	2.26	2.24	40.03	39.92	41.9	40.7	8.80	8.95	11.14	11.05
	75 kg N/fed.	20.10	19.77	2.26	2.24	40.74	39.70	42.0	40.7	8.95	9.09	12.02	11.64
35 cm/hills	30 kg N/fed.	20.67	21.13	2.25	2.27	35.46	35.55	41.9	41.0	8.88	9.08	10.79	10.74
	45 kg N/fed.	21.47	23.27	2.32	2.25	35.52	35.45	41.8	40.9	8.93	8.87	10.81	10.85
	60 kg N/fed.	22.43	23.47	2.33	2.23	35.62	35.67	41.9	40.3	8.92	9.04	11.71	12.43
	75 kg N/fed.	22.47	23.90	2.35	2.22	35.78	35.61	41.6	41.2	8.96	8.62	11.22	11.71
LSD		0.49	N.S	0.04	0.2	N.S	N.S	N.S	N.S	N.S	N.S	N.S	0.25

Table 7. Effect of hill spacing and nitrogen fertilization levels on fiber properties of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		Fiber length parameters				Fiber bundle tinsel				Mic. reading	
		Upper half mean (mm)		Uniformity index		Strength (g/tex)		Elongation (%)			
		2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
Hill spacing	20 cm/hills	30.2	31.1	85.7	84.3	37.2	38.8	7.65	7.65	4.16	4.78
	25 cm/hills	30.4	30.9	85.4	84.1	37.3	37.9	7.89	7.66	4.21	4.80
	30 cm/hills	30.5	31.1	85.5	84.2	37.5	38.7	7.72	7.77	4.16	4.79
	35 cm/hills	30.2	31.2	85.3	84.1	37.0	38.9	7.58	7.85	4.24	4.74
LSD		N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S
N fertilization levels	30 kg N/fed.	30.5	30.9	85.6	83.9	37.4	38.4	7.78	7.59	4.23	4.73
	45 kg N/fed.	30.2	31.1	85.5	84.4	37.3	38.9	7.66	7.75	4.22	4.76
	60 kg N/fed.	30.3	31.3	85.4	84.5	37.0	38.7	7.60	7.74	4.15	4.80
	75 kg N/fed.	30.4	30.9	85.6	84.0	37.2	38.4	7.80	7.84	4.17	4.82
LSD		N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

Table 8. Effect of the interaction between hill spacing and nitrogen fertilization levels on fiber properties of the new promising cotton hybrid Giza 90 x Australian during 2010 and 2011 seasons.

Treatments		Fiber Length parameters				Fiber bundle tinsel				Mic. reading	
		Upper half mean (mm)		Uniformity index		Strength (g/tex)		Elongation (%)			
Hill spacing	N fertilization levels	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
20 cm/hills	30 kg N/fed.	30.4	30.8	85.6	84.2	37.8	38.9	7.50	7.67	4.23	4.73
	45 kg N/fed.	30.0	30.9	85.8	84.4	39.6	39.4	7.60	7.73	4.27	4.77
	60 kg N/fed.	30.1	31.2	85.9	83.7	37.1	39.3	7.73	7.57	4.10	4.80
	75 kg N/fed.	30.4	31.4	85.6	84.8	37.0	37.7	7.77	7.63	4.03	4.80
25 cm/hills	30 kg N/fed.	30.6	31.0	85.3	84.0	36.8	37.8	7.23	7.60	4.20	4.77
	45 kg N/fed.	30.5	31.3	85.5	84.3	37.7	38.2	8.10	7.50	4.17	4.80
	60 kg N/fed.	30..5	30.8	84.9	84.5	38.0	38.2	7.47	7.83	4.20	4.80
	75 kg N/fed.	30.1	30.4	86.01	83.6	36.8	37.5	7.77	7.70	4.27	4.83
30 cm/hills	30 kg N/fed.	30.6	30.9	86.1	83.8	37.8	39.0	7.80	7.80	4.10	4.80
	45 kg N/fed.	30.0	30.8	85.4	84.4	38.4	39.0	7.47	7.70	4.10	4.77
	60 kg N/fed.	30.6	31.9	84.9	85.3	36.6	38.1	7.73	7.53	4.27	4.83
	75 kg N/fed.	30.6	30.7	85.6	83.3	37.2	38.9	7.87	8.03	4.17	4.77
35 cm/hills	30 kg N/fed.	30.3	31.1	85.3	83.4	37.4	38.0	7.60	7.30	4.37	4.63
	45 kg N/fed.	30.2	31.3	85.2	84.4	36.4	39.1	7.47	8.07	4.36	4.70
	60 kg N/fed.	30.1	31.1	85.7	84.3	36.2	39.1	7.47	8.03	4.03	4.77
	75 kg N/fed.	30.2	31.4	85.1	84.4	37.9	39.3	7.80	8.00	4.20	4.87
LSD		N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

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تأثير المسافة بين الجور ومستوي التسميد النتروجيني علي هجين القطن المبشر الجديد جيزة ٩٠ × استرالى

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أجريت التجارب الحقلية بمحطة البحوث الزراعية بملوى التابعة لمركز البحوث الزراعية بمحافظة المنيا خلال موسمي ٢٠١٠ و٢٠١١ لدراسة تأثير المسافة بين الجور ومستويات التسميد النتروجينى على النمو، التبكير، المحصول ومكوناته وصفات التيلة لهجين القطن المبشر جيزة ٩٠ × استرالى وهو من طبقة الاقطان طويلة التيلة للوجه القبلى والذي فى مرحلة اعداد التوصيات الفنية وذلك الهجين إنُتج بواسطة قسم بحوث تربية القطن بمعهد بحوث القطن بمواصفات عالية الجودة عن الاصناف التجارية المنزرعة.

زرعت التجارب في تصميم القطع المنشقة مرة واحدة في أربعة مكررات حيث وضعت المسافة بين الجور (٢٠، ٢٥، ٣٠ و٣٥ سم بين الجور) فى القطع الرئيسية ووضعت معدلات التسميد الازوتى (٣٠، ٤٥، ٦٠ و ٧٥ كجم أزوت/فدان) فى القطع المنشقة ويمكن إيجاز أهم النتائج المتحصل عليها كما يلى:

١. أثرت العوامل الرئيسية (مسافات الجور و مستويات التسميد النتروجينى) تأثيراً معنوياً على عدد الافرع الثمرية، نسبة التبكير، عدد اللوز المتفتح/النبات، وزن اللوزة ومحصول القطن الزهر/فدان بينما لم يتاثر طول النبات، أرتفاع أول فرع ثمرى، معدل البذرة وتصافى الحليج بهذة العوامل.
٢. أدت زيادة المسافة بين الجور من ٢٠ الى ٣٥سم لزيادة معنوية فى عدد الافرع الثمرية/النبات، عدد اللوز/النبات، وزن اللوزة، محصول القطن الزهر ونسبة التبكير وأعطت المسافة ٣٥ بين الجور أفضل القيم.
٣. بزيادة معدلات التسميد حتى ٧٥ كجم أزوت/فدان زاد عدد الافرع الثمرية، عدد اللوز/النبات، وزن اللوزة ومحصول القطن الزهر بينما إنخفضت نسبة التبكير.
٤. أعطى كل من مستويين التسميد ٦٠ و ٧٠ كجم ازوت/فدان أفضل القيم لصفات محصول القطن الزهر ومكوناته (عدد اللوز ووزن اللوزة) وكانت الزيادة بينهما غير معنوية.
٥. أثر التفاعل بين مسافات الجور ومستويات التسميد الازوتى معنوياً على عدد الافرع الثمرية، نسبة التبكير، وزن اللوزة فى كلا الموسمين وعدد اللوز/النبات فى الموسم الاول فقط ومحصول القطن الزهر فى الموسم الثانى، بينما لم يؤثر على طول النبات، أرتفاع أول فرع ثمرى، معدل البذرة وتصافى الحليج.
٦. تشير نتائج التفاعل بين مسافات الجور والتسميد النتروجينى الى إن مسافة الزراعة ٣٥ سم بين الجور مع ٦٠ كجم وحدة ازوت/فدان أعطت زيادة معنوية فى عدد الافرع الثمرية ومحصول القطن الزهر/الفدان ومكوناته (عدد اللوز ووزن اللوزة).
٧. لم يكن لمسافات الجور ومستويات التسميد النتروجينى والتفاعل بينهما إى تأثير معنوى على صفات جودة التيلة فى كلا الموسمين.

التوصية: مما سبق يمكن التوصية بزراعة هجين القطن المبشر الجديد جيزة ٩٠ × استرالى تحت مسافة ٣٥ سم بين الجور والخف علي نباتين بالجورة مع التسميد الازوتي بمعدل ٦٠ كجم وحدة أزوت/فدان تحت ظروف منطقة ملوى بمصر العليا.