J. Plant Production, Mansoura Univ., Vol. 2 (11): 1551 - 1561, 2011

THE PROPER AGRICULTURAL MANAGMENT PRACTICES FOR THE NEW PROMISING HYBRID COTTON (GIZA 77 x PIMA S^6)

El-Shahawy, M. I. and S. A. F. Hamoda
Agronomy Res. Dept., Cotton Res. Inst., Agric. Res. center, Giza, Egypt

ABSTRACT

The field experiments were conducted at Sakha Agricultural Research Station at Kafr El-Sheikh Governorate, Egypt, during the growing seasons of 2009 and 2010 to preparing the suitable agricultural managements practices (planting date, plant population (hill spacing) and nitrogen fertilizer level) for new promising hybrid cotton (Giza 77 x Pima S^6). The first experiment (detriment the suitable planting date) was grown under three planting dates 1st April, 15th April and 1st May. The randomized complete block design was used with four replications. The second experiment (detriment the suitable plant population (hill spacing) and nitrogen fertilizer level) were grown under split plot design. The main plots involved the three hill spacing (20, 25, and 30 cm between hills) and the sub plots included three nitrogen fertilizer levels (45, 60 and 75 kg N /fed.). The results indicated that early planting date in 1st April significantly increased seed cotton yield/fed. due to the increase of number of open bolls /plant and boll weight. Increasing hill spacing from 20 to 30 cm (decreasing plant population) significantly increased number of sympodia /plant, number of open bolls /plant, boll weight and seed cotton yield /fed. While plant height, first sympodial position, earliness % and lint % decreased. As for nitrogen levels, plant height, number of sympodia /plant, first sympodial position, number of open bolls /plant, boll weight, seed index and seed cotton yield/fed. increased by increasing nitrogen levels. The interaction between plant population (hill spacing) and nitrogen fertilizer levels gave significantly effect on all character studied except lint % and fiber properties. The interaction 30 cm between hills and 75 kg N /fed gave the highest number of sympodia plant, number of open bolls, boll weight, seed index and seed cotton yield /fed. The studied treatments did not exhibit any significant effect on all fiber properties. It could be concluded that the highest seed cotton yield/fed. was obtained from planting the new promising hybrid cotton Giza 77 x Pima S^6 early in 1st April under 30 cm hill spacing and 75 kg N/fed. under Sakha location.

Keywords: Cotton, Planting date, Plant population, Nitrogen fertilizer, Growth, Yield and yield components and Fiber quality.

INTRODUCTION

Planting cotton in a suitable time leads to forming the first fruiting branch at a lower node on the stem and only an optimum height, increasing number of flowers, bolls, lint %, yield, grade and quality of cotton fiber, escaping from leaf and boll-worms and aphids at the end of the season and picking early. Abd El-Karim (2003) found that early sowing significantly increased no. of open bolls/plant, boll weight, seed cotton yield/fed, lint %, seed index and fiber length as compared with late sowing. Boquet *et al.* (2003) showed that the excessive plant height at late planting date was partly responsible for lower yield as the crop used a larger portion of its energy budget for vegetative

growth and the excess plant height caused lodging. Lint % was highest at the earliest planting date. Seed cotton yield was significantly decreased when planting date was delayed. Emara, (2006) showed that early sowing gave shorter plants and significantly increased no. of open bolls/plant and seed cotton yield/fed. Hamoda (2006) found that late sown plants grew faster than early sown ones while, boll weight, number of open bolls/plant, seed index, seed cotton yield/fed., earliness % and fiber strength increased in early planting date, while fiber length and uniformity index tended to decrease by delay in planting date.

Plant population is one of the management practices which require attention as far as optimum yield is concerned in cotton production. Plant population in cotton is could be adjusted by manipulating inter and intra-row spacing as well as planting density. The proper spacing is one of the management practices that affect canopy light interception, maturity and vegetative dry matter of the cotton plant. The suitable plant population per feddan resulting into higher yield, earlier maturity and reduced cost of insect and weed control. Abd El- Malik and El- Shahawy (1999) found that low density stands increased final plant height, number of fruiting branch, earliness %, number of open bolls/ plant, boll weight and seed cotton yield. El- Sayed and El- Menshawi (2005) found that wider hill spacing increased earliness %, number of open bolls/ plant, boll weight and seed cotton yield.

Nitrogen is one of the most important elements in cotton plants. Moderate levels of nitrogen fertilization may produce a higher yield and quality, but higher levels may result in excessive of vegetative growth with a lower yield and quality. Through cotton agronomy programs, many traits are usually assigned to determine the optimum nitrogen levels must apply for every new promising hybrid cotton and commercial varieties. El-Ganaini *et al.* (2005) studied the response of Giza 70 cotton variety to nitrogen levels and found that yield parameters; number of open bolls /plant, boll weight and seed cotton yield/fed., increased with increasing rates of nitrogen. Khan *et al.* (2005) supplied cotton cv. DNH-25 plants with 0, 50, 100 and 150 kg N/ha in a field experiment. Seed cotton yield, number of bolls per plant and boll weight increased with increasing rates of N. 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. N levels did not affect the quality of the fibre. Singh and Rathore (2007) found that significant increase in seed cotton yield was observed at N level of 75 kg and 94 kg N/ha over 56 kg N/ha. Hamoda (2010) found that increase of N level to 60 kg N /fed exhibited a significant increase in plant height, no. of fruiting branches/plant, no. of open bolls /plant, boll weight, seed index, seed cotton yield/fed. and gave the good fiber quality.

The main purpose of this study was to investigate the suitable agricultural managements practices (planting date, plant population (hill spacing) and nitrogen fertilizer levels) to the new promising hybrid cotton Giza 77 x Pima S^6.

MATERIALS AND METHODS

The field experiments were carried out at Sakha Agricultural Research Station at Kafr El-Sheikh Governorate, Egypt, during 2009 and 2010 seasons to preparing the suitable agricultural managements practices (planting date, plant population and nitrogen fertilizer rate) to new promising hybrid cotton Giza 77 x Pima S^6. Characterized the new promising hybrid cotton Giza 77 x Pima S^6 showed in (Table 1)

The first experiment (detriment the suitable planting date) was grown under three planting dates 1April, 15 April and 1 May in two seasons. The randomized complete block design was used with four replications. The second experiment (detriment the suitable plant population (hill spacing) and nitrogen fertilizer levels) was grown under split plot design. The main plots involved the three hill spacings (20, 25 and 30 cm between hills) and the sub plots included three nitrogen fertilizer levels (45, 60 and 75kg N/fed.). The experimental unit included 7 ridges (6 m long and 70 cm apart) occupying an area of 29.4 m^2. Hills were spaced at 25 cm within rows and seedlings were thinned at 2 plants /hill in the first experiment. In the second experiment, hills were spaced at 20, 25 and 30 cm within rows as the tested hills and seedlings were thinned at 2 plants/hill. In all experiments the phosphorus fertilizer as ordinary superphosphate (15.5% P_2O_5) at the rate of 22.5 kg P_2O_5 /fed. was incorporated during seed bed preparation. Nitrogen fertilizer in the form of ammonium nitrate (33.5 % N) at the rate of 60 kg N/fed. in the first experiment and at 45, 60 and 75 kg N/fed. as a tested rates in the second experiment were applied in two equal doses, immediately before the first and the second irrigations. Potassium fertilizer in the form of potassium sulfate (48 % K_2O) at the rate of 24 kg K_2O/fed. was side-dressed 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).

All samples were taken at random in order to study the traits. At harvest, 6 guarded plants were randomly taken from the central row of each plot to determine plant height (P.H), number of sympodia/plant (N.S.P), first sympodial position (F.S.P), boll weight (B.W), number of open bolls /plant (N.O.B), lint % (L%) and seed index (S.I). Seed cotton yield (ken. /fed.)(S.C.Y.F) was estimated as the weight of seed cotton yield by kilogram picked from the five middle rows in sub plot collected from two picks, then converted to yield per fedden in kentar (Kentar = 157.5 kg.). Earliness % (E %) was determined as percent of seed cotton yield of first pick to total seed cotton yield. The studied fiber quality traits were upper half mean length (U.H.M|) (mm), uniformity index % (U.I %), fiber strength (F.S) g/tex., fiber elongation % (F.E%), micronaire reading (M.R), and fiber color (reflectance (Rd) and yellownes (+b)) which were measured by using High Volume Instrument (HVI) according to A.S.T.M. D-4605 (1986). All collected data were subjected to statistical analysis as proposed by Gomez and Gomez (1984) and means were compared by LSD at 5% level of probability

Table (1): Characterized the new promising hybrid cotton Giza 77 x Pima S^6

Variety name	**Promising hybrid cotton Giza 77 x Pima S^6**
Species	Barbadense
Category	Extra long staple and extra fine
Pedigree	Crossing between Giza 77 x Pima S^6
Characteristics	Extra long staple and extra fin variety characterized by high yielding, early maturity, resistance to Fuzariam, high lint %, consider the highest Egyptian cotton variety in strength value and quality until now and higher yarn strength (product the good yarns in the world) and fiber length more than 36 mm compared to all other Egyptian extra-long staple cotton varieties.
Botanical distinguishing characters	The stem has a medium length with polygon shape also has green color mixed by dim red with medium length internodes. The leaves have palmate shape with large size with no deep lobes and leather fell. The node of the first fruiting branch ranged from 6-8. A flower petal has shape like a tube. The boll size is large and pyramid shape with drawn summit. Seed is big-sized and the fuzz covers about fuzzless to 1/4 from the whole size and fuzz color is gray-greenish.
Varity bred by	Breeding Res. Section, Cotton Res. Institute. Address: 9 Gamma St., Giza, Egypt

Table (2): Soil analysis of the experimental site in the two growing seasons.

Seasons	Properties										
	Texture	pH	EC Mmhos/cm.	Ca CO_3 %	Available element (ppm)						
					N	P	K	Fe	Mn	Zn	Cu
2009	Clay loam	7.6	0.22	3.2	62	11	344	13.5	8.7	1.8	3.3
2010	Clay loam	7.5	0.36	2.8	69	14	400	14.1	19.2	1.9	3.8

RESULTS AND DISCUSSION

The first experiment (detriment the suitable planting date to the new promising hybrid cotton Giza 77 x Pima S^6)

The effect of planting dates on growth parameters, earliness traits, yield and yield components and fiber properties on new promising hybrid cotton Giza 77 x Pima S^6 were showed in Tables (3 to 5).

Data in Table (3) showed that growth parameters (plant height and number of sympodia/plant) and earliness traits (first sympodial position and earliness %) were significantly affected by planting dates in two seasons. The shortest plants produced by early planting, whereas the tallest plants were recorded by late planting date. The results indicated that late sown plants grew faster than early sown ones, which is evident that higher temperature provided by late sowing enhanced stem elongation of cotton plants. Cotton growth increases linearly as temperature increases. Similar results were obtained by Boquet *et al.* (2003) and Hamoda (2006)

Data also showed that first sympodial position was on lower node number in early planting date as compared to middle and late plantings while The earliness % decreased by delaying the date of planting in two seasons. The lowering of position of first node in favour of early sowing date mainly due to relatively low night temperature at the beginning of the season while late sown plants produced the first sympodia on higher node as a result of

increasing air temperature and increasing the vegetative growth. Similar results were obtained by Hamoda (2006)

Table (3): Effect of planting dates on growth parameters and earliness traits of new promising hybrid cotton Giza 77 x Pima S^{6} during 2009 and 2010 seasons

2009 season				
Planting dates	**Growth parameters**		**Earliness traits**	
	P.H	**N.S.P**	**F.S.P**	**E I%**
1st April	140.74	15.77	5.56	82.78
15th April	144.09	14.21	6.44	79.03
1st May.	159.73	12.14	7.56	61.53
LSD at 0.05	**1.97**	**0.53**	**0.51**	**2.45**
2010 season				
Planting dates	**Growth parameters**		**Earliness traits**	
	P.H	**N.S.P**	**F.S.P**	**E I%**
1st April	146.67	15.93	5.67	80.87
15th April	157.67	14.66	6.76	78.72
1st May.	163.33	12.77	7.30	71.71
LSD at 0.05	**2.72**	**0.97**	**0.69**	**1.11**

Also, data in Table (4) showed that boll weight, number of bolls /plant, seed index, seed cotton yield /fed. were significantly affected by planting dates. Delayed planting date decreased the boll weight, number of bolls / plant, seed index and seed cotton yield /fed. Early planting date increased seed cotton yield/fed. due to the increase of number of open bolls /plant rather than the effect of boll weight. Similar results were obtained by Emara (2006). However, previous results cleared that planting cotton early as local climatic conditions are favorable gave good yield due to fitting the cultivar to full season in order to obtain complete thermal units, beside the exposure of cotton plants at early stages of growth to relatively lower night temperature which promotes flowering early and bring the crop to harvest in suitable time.

Table (4): Effect of planting dates on yield and yield components of new promising hybrid cotton Giza 77 x Pima S^{6} during 2009 and 2010 seasons

2009 season					
Planting dates	**B.W**	**N.O.B**	**S.I**	**L %**	**S.C.Y.F**
1st April	2.58	16.33	10.19	35.42	10.30
15th April	2.44	15.30	10.03	35.50	9.21
1st May.	2.32	13.13	9.80	35.60	7.74
LSD at 0.05	**0.08**	**1.02**	**0.10**	**N.S**	**0.32**
2010 season					
Planting dates	**B.W**	**N.O.B**	**S.I**	**L %**	**S.C.Y.F**
1st April	2.64	17.00	10.48	35.52	11.05
15th April	2.49	16.90	10.31	35.63	10.83
1st May.	2.45	14.80	9.99	35.79	8.89
LSD at 0.05	**0.04**	**0.60**	**0.35**	**N.S**	**0.26**

The results in Table (5) show all fiber studied were not affected by planting dates but the trend of these fiber properties were good in early planting.

Table (5): Effect of planting dates on fiber properties of new promising hybrid cotton Giza 77 x Pima S^6 during 2009 and 2010 seasons

2009 season							
Planting dates	**U.H.M**	**U.I %**	**F .S**	**F.E%**	**M.R**	**RD %**	**+ b**
1st April	36.70	88.57	50.30	7.57	3.33	68.93	11.30
15th April	36.60	88.13	49.37	7.50	3.27	68.33	11.47
1st May.	36.50	87.30	49.10	7.63	3.17	67.57	11.53
LSD at 0.05	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**
2010 season							
Planting dates	**U.H.M**	**U.I %**	**F .S**	**F.E%**	**M.R**	**RD %**	**+ b**
1st April	36.77	88.63	48.87	6.53	3.30	68.87	11.50
15th April	36.73	88.47	47.67	6.57	3.23	66.80	11.57
1st May.	35.89	88.23	45.83	6.80	3.20	66.40	11.78
LSD at 0.05	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**

From this data we can recommended planting early in first of April for the new promising hybrid cotton Giza 77 x Pima S^6 to obtain good yield and fiber quality

The second experiment (detriment the suitable plant population (hill spacing) and nitrogen fertilizer level to the new promising hybrid cotton Giza 77 x Pima S^6)

The effect of plant population (hill spacing), nitrogen fertilizer levels and the interaction between them on growth, earliness, yield and fiber to new promising hybrid cotton Giza 77 x Pima S^6 were showed in Tables (6 to 8).

Effect of plant population

Data in Table (6) were showed that growth parameters (plant height and number of sympodia/plant) and earliness traits (first sympodial position and earliness %) were significantly affected by plant population. Plant population (30 cm / hill) had significantly increased no. of sympodia/plant, earliness % in two seasons. While, significantly decreased the plant height at harvest and first sympodial position in the two seasons compared to the other plant population. Similar results were obtained by Abd El- Malik and El- Shahawy (1999)

Results presented in Table (7) indicate that plant populations were significantly effect on yield and yield components traits. Decreasing plant population to 30 cm between hills significantly increased no. of open bolls /plant, boll weight, seed index and seed cotton yield/fed.. With using the suitable plant population increasing the availability of light intensity % into the canopy to the variety which, increase seed cotton yield, due to a higher production of bolls per plant and increase in boll weight this results are in harmony with those obtained by El- Sayed and El- Menshawi (2005)

The plant population treatments did not exhibit any significant effect on all fiber properties in both seasons Table (8).

Effect of nitrogen fertilizer levels

Data in Table (6) showed that nitrogen fertilizer levels had a significant effect on plant height, no. of sympodia /plant, first sympodial position and earliness %. Increasing N level exhibited a significant increase in plant height, no. of sympodia /plant, cotton plants under 75kg N were taller with more

sympodia than those received 45 or 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 and its growth is linearly correlated with N supply (Silvertooth *et al*, 2007).

Table (6): Effect of plant population (hill spacing), nitrogen fertilizer levels and the interaction between them on growth parameters and earliness traits of new promising hybrid cotton Giza 77 x Pima S^{6} during 2009 and 2010 seasons

2009 season					
Treatments		Growth parameters		Earliness traits	
Plant Population (A)	Nitrogen Levels (B)	P.H	N.S.P	F.S.P	E l%
20 cm/ hills	45 kg N/ fed.	148.23	12.13	6.20	69.15
	60 kg N/ fed.	152.00	12.25	6.37	65.00
	75 kg N/ fed.	155.20	12.43	6.53	64.75
Mean		151.81	12.27	6.37	66.30
25 cm/ hills	45 kg N/ fed.	142.57	12.37	5.57	73.00
	60 kg N/ fed.	143.03	12.53	5.87	70.00
	75 kg N/ fed.	145.10	12.80	6.13	68.33
Mean		143.57	12.57	5.86	70.44
30 cm/ hills	45 kg N/ fed.	135.00	13.73	5.13	77.11
	60 kg N/ fed.	135.48	14.30	5.27	75.30
	75 kg N/ fed.	138.23	15.53	5.47	74.90
Mean		136.23	14.52	5.29	75.77
General mean of (B)	45 kg N/ fed.	141.93	12.74	5.63	73.09
	60 kg N/ fed.	143.50	13.03	5.83	70.10
	75 kg N/ fed.	146.18	13.58	6.04	69.33
LSD at 0.05 for	A	**0.40**	**0.07**	**0.06**	**0.26**
	B	**0.82**	**0.14**	**0.05**	**0.35**
	A x B	**1.41**	**0.24**	**0.09**	**0.60**
2010 season					
Treatments		Growth parameters		Earliness traits	
Plant Population (A)	Nitrogen Levels (B)	P.H	N.S.P	F.S.P	E l%
20 cm/ hills	45 kg N/ fed.	156.67	12.92	6.93	76.94
	60 kg N/ fed.	156.67	15.07	7.00	77.55
	75 kg N/ fed.	158.33	14.00	7.13	75.59
Mean		157.22	14.00	7.02	76.70
25 cm/ hills	45 kg N/ fed.	151.67	13.68	6.20	79.23
	60 kg N/ fed.	153.33	13.93	6.33	78.10
	75 kg N/ fed.	154.67	14.24	6.73	74.51
Mean		153.22	13.95	6.42	77.28
30 cm/ hills	45 kg N/ fed.	140.00	14.31	5.80	82.67
	60 kg N/ fed.	145.00	14.70	5.87	80.10
	75 kg N/ fed.	148.00	16.14	6.00	78.04
Mean		144.33	15..05	5.89	80.27
General mean of (B)	45 kg N/ fed.	149.44	13.63	6.31	79.68
	60 kg N/ fed.	151.67	14.57	6.40	78.59
	75 kg N/ fed.	153.67	14.79	6.62	76.05
LSD at 0.05 for	A	**0.42**	**0.30**	**0.03**	**0.44**
	B	**1.23**	**0.51**	**0.07**	**0.39**
	A x B	**2.13**	**0.90**	**0.13**	**0.67**

Table (7): Effect of plant population (hill spacing), nitrogen fertilizer levels and the interaction between them on yield and yield components of new promising hybrid cotton Giza 77 x Pima S^6 during 2009 and 2010 seasons

2009 season						
Treatments		B.W	N.O.B	S.I	L %	S.C.Y.F
Plant population (A)	Nitrogen levels (B)					
20 cm/ hills	45 kg N/ fed.	2.32	11.00	9.68	36.15	7.95
	60 kg N/ fed.	2..35	12.14	9.79	36.06	8.87
	75 kg N/ fed.	2.43	12.62	9.84	35.95	9.32
Mean		2.37	11.92	9.77	36.05	8.71
25 cm/ hills	45 kg N/ fed.	2.48	15.30	10.14	35.87	9.53
	60 kg N/ fed.	2.53	15.79	10.18	35.61	10.00
	75 kg N/ fed.	2.58	16.36	10.22	35.43	10.51
Mean		2.53	15.82	10.18	35.64	10.01
30 cm/ hills	45 kg N/ fed.	2.65	19.00	10.37	34.56	10.74
	60 kg N/ fed.	2.73	19.76	10.45	34.35	11.33
	75 kg N/ fed.	2.78	20.83	10.67	3423	12.01
Mean		2.72	19.86	10.50	34.38	11.36
General mean of (B)	45 kg N/ fed.	2.49	15.10	10.06	35.53	9.40
	60 kg N/ fed.	2.54	15.90	10.14	35.34	10.07
	75 kg N/ fed.	2.60	16.60	10.24	35.20	10.61
LSD at 0.05 for	A	**0.01**	**0.21**	**0.02**	**0.10**	**0.04**
	B	**0.01**	**0.19**	**0.04**	**0.11**	**0.06**
	A x B	**0.02**	**0.33**	**0.07**	**N.S**	**0.10**
2010 season						
Treatments		B.W	N.O.B	S.I	L %	S.C.Y.F
Plant population (A)	Nitrogen levels (B)					
20 cm/ hills	45 kg N/ fed.	2.38	11.28	10.13	36.26	8.25
	60 kg N/ fed.	2.41	12.01	10.23	36.17	8.94
	75 kg N/ fed.	2.43	12.31	10.25	36.09	9.57
Mean		2.41	11.87	10.20	36.17	8.92
25 cm/ hills	45 kg N/ fed.	2.52	15.64	10.35	35.88	9.93
	60 kg N/ fed.	2.59	16.55	10.39	35.81	10.65
	75 kg N/ fed.	2.62	17.30	10..41	35.62	11.30
Mean		2.58	16.50	10.38	35.77	10.63
30 cm/ hills	45 kg N/ fed.	2.75	20.49	10.45	34.83	12.00
	60 kg N/ fed.	2.77	21.01	10.55	34.77	12.13
	75 kg N/ fed.	2.82	22.12	11.00	34.76	12.51
Mean		2.78	21.21	10.67	34.79	12.21
General mean of (B)	45 kg N/ fed.	2.55	15.80	10.31	35.66	10.06
	60 kg N/ fed.	2.59	16.52	10.39	35.58	10.57
	75 kg N/ fed.	2.62	17.24	10.55	35.49	11.13
LSD at 0.05 for	A	**0.01**	**0.10**	**0.02**	**0.11**	**0.08**
	B	**0.01**	**0.08**	**0.03**	**0.13**	**0.11**
	A x B	**0.03**	**0.14**	**0.06**	**N.S**	**0.18**

Table (8): Effect of plant population (hill spacing), nitrogen fertilizer levels and the interaction between them on fiber properties of new promising hybrid cotton Giza 77 x Pima S^{6} during 2009 and 2010 seasons

2009 season								
Treatments		U.H.M	U.I	F .S	F.E%	M.R	RD %	+ b
Plant Population(A)	Nitrogen Levels (B)							
20 cm/ hills	45 kg N/ fed.	37.90	88.40	49.32	7.67	3.30	70.60	10.93
	60 kg N/ fed.	37.70	88.80	50.87	7.50	3.17	71.50	11.13
	75 kg N/ fed.	36.67	87.87	50.43	7.40	3.13	71.67	11.00
Mean		37.46	88.36	50.21	7.52	3.20	71.26	11.02
25 cm /hills	45 kg N/ fed.	37.00	88.27	49.56	7.50	3.17	68.70	10.77
	60 kg N/ fed.	37.53	87.97	50.60	7.40	3.27	69.33	10.73
	75 kg N/ fed.	36.97	88.10	50.63	7.33	3.37	70.73	11.00
Mean		37.17	88.11	50.27	7.41	3.27	69.59	10.83
30 cm/hills	45 kg N/ fed.	37.00	88.20	50.00	7.40	3.17	69.60	11.33
	60 kg N/ fed.	37.23	87.43	51.13	7.40	3.23	69.10	11.20
	75 kg N/ fed.	37.53	88.30	51.24	7.27	3.20	70.37	11.30
Mean		37.26	87.98	50.79	7.36	3.20	69.69	11.28
General mean of (B)	45 kg N/ fed.	37.30	88.29	49.63	7.52	3.21	69.63	11.01
	60 kg N/ fed.	37.49	88.07	50.87	7.43	3.22	69.98	11.02
	75 kg N/ fed.	37.09	88.09	50.77	7.33	3.23	70.92	11.10
LSD at 0.05 for	A	N.S	N.S	N.S	N.S	N.S	N.S	N.S
	B	N.S	N.S	N.S	N.S	N.S	N.S	N.S
	A x B	N.S	N.S	N.S	N.S	N.S	N.S	N.S
2010 season								
Treatments		U.H.M	U.I	F .S	F.E%	M.R	RD %	+ b
Plant Population(A)	Nitrogen Levels (B)							
20 cm/ hills	45 kg N/ fed.	36.67	88.37	48.73	6.57	3.17	66.83	11.43
	60 kg N/ fed.	37.17	88.77	47.93	6.57	3.30	65.97	11.60
	75 kg N/ fed.	37.17	88.27	45.80	6.63	3.23	66.17	11.47
Mean		37.10	88.47	47.49	6.59	3.23	66.32	11.50
25 cm/ hills	45 kg N/ fed.	36.20	88.03	47.13	6.43	3.27	64.93	11.63
	60 kg N/ fed.	37.07	88.73	47.00	6.50	3.37	65.80	11.50
	75 kg N/ fed.	36.80	88.50	47.93	6.93	3.20	66.47	11.20
Mean		36.69	88.42	47.35	6.62	3.28	65.73	11.44
30 cm/ hills	45 kg N/ fed.	36.57	88.60	46.10	6.37	3.13	66.27	11.50
	60 kg N/ fed.	36.97	88.50	46.57	6.43	3.30	68.13	11.27
	75 kg N/ fed.	36.97	88.37	48.07	6.50	3.23	66.37	11.50
Mean		36.83	88.49	46.91	6.43	3.22	66.89	11.52
General mean of (B)	45 kg N/ fed.	36.58	88.33	47.32	6.46	3.19	66.83	11.52
	60 kg N/ fed.	37.07	88.67	47.17	6.50	3.32	65.97	11.56
	75 kg N/ fed.	36.98	88.38	47.26	6.69	3.22	66.17	11.39
LSD at 0.05 for	A	N.S	N.S	N.S	N.S	N.S	N.S	N.S
	B	N.S	N.S	N.S	N.S	N.S	N.S	N.S
	A x B	N.S	N.S	N.S	N.S	N.S	N.S	N.S

Results presented in Table (7) indicate that yield and yield components traits were significantly affected by nitrogen fertilizer levels. Increasing N level to 75 kg/fed. significantly increased no. of open bolls /plant, boll weight, seed index and seed cotton yield/fed., while lint % was significantly decreased. Similar results were obtained by El-Ganaini *et al.* (2005) and Hamoda (2010).

The nitrogen fertilizer treatments 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 were less affected by the environmental factors. The obtained results were in close agreement with those reported by Srinivasulu *et al.* (2006)

Effect of the interaction between plant population (hill spacing) and nitrogen fertilizer levels

Data in Tables (6-8) showed that the growth, earliness and yield traits significantly affected with the interaction between plant population (hill spacing) and nitrogen fertilizer levels while lint % and all fiber properties did not significantly affected in two seasons. The interaction 30 cm between hill and 75 kg N /fed gave the highest no. of sympodia plant, no. of open bolls, boll weight, seed index and seed cotton yield /fed.

REFERENCES

Abd El- Malik, R.R. and El- Shahawy, M.I.M. (1999) Impact of plant population density through row and hill spacing under different nitrogen levels on Giza 89 cotton cultivar. Egypt. J. of Agric. Res., 77 (3):1753-1767

Abd El-Karim, A.B. (2003) Effect of some environmental conditions on yield, seed fiber quality of some Egyptian cotton cultivar. M. Sc thesis, Fac. Agric., Minia Univ. Egypt pp: 72-75.

A.S.T.M. (1986). American Society for Testing and Materials. D-4605., Vol. 07, No 1, Easton, MD, USA.

Boquet, D.; Caylor, J. and Shivers, C. (2003) No-till cotton response to planting date. Proc., Beltwide Cotton Conf., Nashville TN. U.S.A., (Jan. 6-10) (2): 2045-2047.

El- Sayed, E.A. and El- Menshawi, M. (2005) Response of the promising hybrid cotton Giza 89x 86 to hill spacing and nitrogen fertilizer level J. Agric. Res. Tanta Univ., 31(3):436-456

El-Ganaini, S.S.; Saif El-Yazal, M.A. and Mohamed, S.E.A. (2005) Botanical studies on cotton (*Gossypium vitifolium,* L.) plants grown under newly reclaimed soils as affected by nitrogen and phosphorus fertilization. Annals of Agricultural Science, Moshtohor. 43(4):1599-1617.

Emara M.A.T. (2006) Effect of some agronomic treatments on cotton yield and technological of seed and lint in late sowing".. Ph. D. Thesis, Fac. Agric., Ain Shams Unvi., Egypt, pp: 1-3.

Gomez, K.A. and Gomez, A.A. (1984) Statistical procedures for agriculture research. 2nd Ed., John Willey and Sons, New York, USA.

Hamoda, S.A.F. (2006) Effect of climatic conditions on bolling, earliness, yield and fiber technology in cotton. Ph.D Thesis, Fac. of Agric, Cairo Univ., Egypt, PP: 47- 49.

Hamoda, S.A.F. (2010). Impact of water stress and nitrogen fertilizer levels on cotton grown under high temperature conditions in Upper Egypt. Minufiya J. Agric. Res. 35(5):1797-1814

Khan, K.; Z. Mahmood; A.R. Soomro and M. Ilyas (2005). Effect of different levels of nitrogen on cotton yield and its components under climatic condition of D. I. Khan. Indus Cottons. 2(3): 241-244.

Silvertooth, J.C.; Cothren, J.T. and Bednarz, C.W. (2007). The physiological basis of nitrogen demand. Proceed. Beltwide Cotton Conf., pp. 1284-1289.

Singh, K. and Rathore, P. (2007) Effect of different spacings and nitrogen levels on growth and yield attributes of American cotton (*Gossypium hirsutum*, L.) genotypes. Journal of Cotton Research and Development. 21(2): 178-179

Srinivasulu, K.; Hema, K.; Prasad, N.D. and Rao, K.V.K. (2006) Performance of cotton hybrids under different spacings and nitrogen levels in black cotton soils of costal Andhra Pradesh. Journal of Cotton Research and Development. 20(1): 99-101.

التوصيات الزراعيه المثلى لهجين القطن المبشر جيزة ٧٧ × بيما س٦

محمد ابراهيم الشهاوى و سعيد عبد التواب فرج حمودة

قسم بحوث المعاملات الزراعيه – معهد بحوث القطن – مركز البحوث الزراعيه - جيزة - مصر

أجريت التجارب الحقليه بمحطة البحوث الزراعية بسخا بمحافظة كفر الشيخ خلال موسمى ٢٠٠٩ و 2010 بهدف اعداد التوصيات الزراعيه المثلى (ميعاد الزراعة، الكثافة النباتيه والتسميد النتروجينى) لهجين القطن المبشر جيزة ٧٧ × بيما س٦ وهذا الهجين من طبقة الاقطان فائقة الطول والنعومه انتج من قسم تربية القطن بمعهد بحوث القطن بمواصفات عالية الجودة عن الاصناف المنزرعة التجاريه وفى مرحلة اعداد التوصيات الفنيه. ففى التجربه الاولى زرعت ثلاث مواعيد هى ١ ابريل، ١٥ ابريل و ١ مايو لتحديد أنسب ميعاد لزراعة الهجين واستخدم تصميم القطاعات كاملة العشوائية في أربعة مكررات اما فى التجربه الثانيه درست أنسب كثافة نباتية ومعدل تسميد ازوتى للهجين واستخدم تصميم القطع المنشقة في أربع مكررات حيث وضعت الكثافة النباتية متمثله فى المسافه بين الجور (٢٠، ٢٥ و ٣٠ سم بين الجور) فى القطع الرئيسيه ووضعت معدلات التسميد الازوتى (٤٥، ٦٠ و ٧٥ كجم أزوت/فدان) فى القطع المنشقه **واظهرت النتائج ان**:

١. هناك زيادة معنوبه في محصول القطن الزهر /فدان لهذا الهجين بتبكير ميعاد الزراعة فى ١ اول ابريل ويرجع ذلك لزيادة عدد اللوز ووزن اللوزة
٢. ادت زيادة المسافه بين الجور من ٢٠ اللى ٣٠ سم (تقليل الكثافة النباتيه من ٦٠٠٠٠ الى ٤٠٠٠٠ نبات /الفدان) لزيادة معنويه فى عدد الافرع الثمريه وعدد اللوز / النبات ووزن اللوزة ومحصول القطن الزهر بينما انخفض طول النبات واول فرع ثمرى و نسبة التصافى ونسبة التبكير للهجين
٣. بزيادة معدلات التسميد حتى ٧٥ كجم ن / فدان زاد ارتفاع النبات وعدد الافرع الثمريه وعدد اللوز / النبات ووزن اللوزة ومعامل البذرة ومحصول القطن الزهر/ الفدان للهجين
٤. اثر التفاعل بين المسافه بين الجور ومعدلات التسميد الازوتى معنويا على جميع الصفات المدروسه فيما عدا نسبة التصافى وصفات التيله واعطى التفاعل بين المسافه بين الجور ٣٠ سم و٧٥ كجم نتروجين / الفدان افضل القيم لمحصول القطن الزهر ومكوناته
٥. لم يكن لجميع المعاملات المدروسه اى تاثير معنوى على صفات التيله

التوصيه :

مما سبق يمكن يمكن التوصيه بزراعة الهجين جيزة ٧٧ × بيما س٦ مبكرا فى اول ابريل تحت مسافة ٣٠ سم بين الجور والخف علي نباتين مع التسميد الازوتي بمعدل ٧٥ كجم أزوت/ فدان.

قام بتحكيم البحث

أ.د / احمد نادر السيد عطيه	**كلية الزراعة – جامعة المنصورة**
أ.د / عبدالله عبد الغفار ابو الدهب	**كلية الزراعة – جامعة القاهرة**