DESCRIPTION OF NEW WHITE MAIZE INBRED LINES FOR SOME AGRONOMIC PERFORMANCE AND RESISTANCE TO LATE WILT DISEASE CHARACTERS

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ABSTRACT

Sixty five white inbred lines which have a good general combining effects for grain yield were evaluated in two separate experiments under two nitrogen levels, i.e., 70 and 120 kg N/fed using a randomized complete blocks design with three replications at Sakha Station during 2005 growing season in two field experiments. The first field under normal condition, observations were recorded on: silking date, plant and ear heights, ear length, number of rows/ear and grain yield. The second field, under artificial soil infestation by *Cephalosporium maydis* and observation was recorded on percentage of resistance to late wilt disease.

Differences between the two nitrogen levels in the combined analysis were ranged from significant to highly significant for all studied characters except resistance to late wilt disease. The highest values of all studied characters were obtained by applying with 120 kg N/fed treatment except silking date.

Differences between inbred lines were highly significant for all studied characters. Means of inbred lines, for silking date ranged from 60.50 for the inbred SK 6006/24 to 75.66 days for inbred SK 6046 with 13 inbred lines ranged from 60.50 to 65 days, 32 inbred lines ranged from 65 to 70 days and 20 inbred lines ranged from 70 to 75.66 days. For resistance to late wilt disease, 46 inbred lines exhibited highly resistance of about 95%, nine inbred lines showed resistance to late wilt disease, with percentage ranged from 90 to 95%, two inbred lines exhibited moderately resistance with percentage ranged from 85 to 90% and eight inbred lines were susceptible, with resistance less than 85%. Meanwhile, grain yield of the inbred lines ranged from 3.51 ard/fed for the inbred SK U 17 to 15.48 ard/fed for the inbred SK 5069, with 13 inbred lines ranged from 3.51 to 5 ard/fed, 45 inbred lines ranged from 5 to 10 ard/fed and 7 inbred lines ranged from 10 to 15.48 ard/fed.

The interaction between inbred lines x nitrogen levels was highly significant for silking date, plant height, ear length and grain yield. For silking date the inbred line SK 5027/2 produced the highest value under low nitrogen level (N_1) while the inbred line SK 6006/24 produced the lowest value under high nitrogen level (N_2), whereas for plant height the inbred line SK 7005/10 had the lowest value under (N_1), while inbred line SD 1050 had the highest value under (N_2). For ear length, the highest value was obtained under (N_2) for inbred line SK 6046 while the lowest value was obtained under (N_1) for inbred line SK 6056.For grain yield the inbred lines SK 6016/9, SK 8014/1, SK 8055, SK 6016/20, SK 5027/2 and SK 5069 had the higher values under (N_2) while the lowest value was obtained for inbred SK 8170/4 under (N_1).

INTRODUCTION

Resistance to late wilt disease caused by *Cephalosporium maydis*, growth and yield of maize plants are influenced by genotype, environment and genotype x environment interaction. Nitrogen fertilization is among the most important cultural practices which, control maize production (Mandour 1977 and Balko and Russel 1980). Abou-Khadrah (1984) mentioned that increasing nitrogen levels from 80 up to 120 kg N/fed. significantly increased the yield of grain per plant and per feddan and the highest grain yield/fed. was recorded by applying 120 kg N/fed. Mourad *et al.* (1986) found that increasing nitrogen levels from 60, 90 to 120 kg N/fed. significantly reduced days to 50% silking and increased plant height. El-Shafey *et al.* (1988), tested a number of maize genotypes for resistance to *Cephalosporium maydis*, under artificial soil inoculcation, they classified them as highly resistant (infection percentage less than 5%), resistant (infection percentage less than 10%), moderately resistant (infection percentage 10-15%) and susceptible (infection percentage more than 15%). El-Hosary and Salwau (1989) reported that the application of 45, 90 and 135 kg N/fed. due to increased the percentage values of grain yield/fed. by 47.52, 72.73 and 80.73 over the control treatment (non fertilization). Galal *et al.* (1992) found that nitrogen levels did not affect resistance to late wilt disease. Nawar *et al.* (1992) found that means, gene actions and heritability in narrow sense in two crosses

were more under high nitrogen level than low nitrogen level. Esmail and El-Sheikh (1994) found that nitrogen fertilization had a significant effects on plant and ear heights and grain yield. El-Sheikh (1998) stated that applying of 120 kg N/fed increased plant growth, grain yield and yield components more than 60 kg N/fed. Mosa (2001) mentioned that increased nitrogen fertilizer from 70 to 140 kg N/fed. increased grain yield for inbred lines.

The objective of this investigation was to study and determine the following aspects:

1- Describe sixty five inbred lines for yield characters and resistance to late wilt disease.
2- Study the response of these inbred lines to nitrogen fertilizer.

MATERIALS AND METHODS

Sixty five white maize inbred lines (61 new inbreds and 4 old inbreds) had good general combining effects for grain yield which selected from top crosses and diallel cross experiments at Sakha Research Station during 2000 to 2004 growing seasons, were used in this investigation. The sources of the 65 inbred lines are illustrated in Table (1). The 65 inbred lines were evaluated in two separate experiments: the first experiment was fertilized by 70 kg nitrogen per feddan while the second experiment used 120 kg N /fed. in a randomized complete blocks design with three replications. Two experiments were grown in two field experiments at Sakha Station in 2005 growing season. The first one was under normal condition, where the characters recorded were: number of days from planting to 50% silking emergence, plant and ear heights (cm), grain yield ard/fed. adjusted based on 15.5% grain moisture content and shelling percentage, ear length (cm) and number of rows/ear .The second field experiment was under artificial soil infected by *Cephalosporium maydis*, disease. where the percentage of resistance to late wilt disease was recorded. Plot size in all experiments was one row 4 m long (in the first field experiment) and 2 m (in the second field experiment), 80 cm apart and 25 cm between hills. The analysis of variance for each experiment and their combined were computed according to Steel and Torrie (1980).

Table 1: Sources of the studied inbred lines

Code no.	Name	Source
1	SD 1048	Giza-2 composite -variety
2	SK 9195	TWC SC 10 x SK 43
3	SD 7	American Early Dent- variety
4	SD 1050	Giza-2 composite -variety
5	SK 6017	SC SD 7x SK 132
6	SK 6016/9	SC SD 63 x SK 8238
7	SK 6014	SC SD 63 x SK 132
8	SK 6018/48	Giza-2 composite -variety
9	SK 6018/97	Giza-2 composite -variety
10	SK 6016/3	SC SD 63 x SK 8238
11	SK 6016/17	SC SD 63 x SK 8238
12	SK 6015/9	SC SD 7 x SK 8238
13	SK U 13	Exotic, Yugoslav
14	SK U 17	Exotic, Yugoslav
15	SK N 1	Exotic, Niger
16	SK N 2	Exotic, Niger
17	SK 8170/7	Giza-2 composite -variety
18	SK 7001/8	Giza-2 composite -variety
19	SK 5170/5	Giza-2 composite -variety
20	SK 8170/4	Giza-2 composite -variety
21	GM 152	SD 118-Pop SD 7734
22	SK 8012/1-106	SC SD 63 x SK 132
23	SK 8012/1-140	SC SD 63 x SK 132
24	SK 8014/1	DMR pop. White F_2 BA 90-2613 x Tep-5
25	SK 8014/2	DMR pop. White F_2 BA 90-2613 x Tep-5
26	SK 8014/3-2	DMR pop. White F_2 BA 90-2613 x Tep-5
27	SK 8045	SC GZ 613 x GZ 628
28	SK 8151	Giza-2 composite -variety
29	SK 6001	SC L11 x SK 7008
30	SK 6004	SC L12 x SD 62
31	SK 6005	SC L12 x SD 63
32	SK 6006/24	SC L14 x SD 63

Table 1 : Continued

Code no.	Name	Source
33	SK 6006/29	SC L 14 x SD 63
34	SK 6011	SC L 12 x SD 34
35	SK 8050/1-6	SC L 14 x SD 7
36	SK 8050/1-14	SC L 14 x SD 7
37	SK 8051	SC L 14 x SD 34
38	SK 8054/6-1	SC L 16 x SD 7
39	SK 8054/5-1	SC L 16 x SD 7
40	SK 8055	SC L 16 x SD 58
41	SK 7 /2	Back crossed between SD 7 with L 16
42	SK 7/4	Back crossed between SD 7 with L 16
43	SK 7 /7	Back crossed between SD 7 with L 16
44	SK 7/9	Back crossed between SD 7 with L 14
45	SK 34/1	Back crossed between SD 34 with L 14
46	SK 58 /8	Back crossed between SD 58 with L 16
47	SK 63 /12	Back crossed between SD 63 with L 12
48	SK 63 /14	Back crossed between SD 63 with L 14
49	SD 58	Tepalcingo (Tep-5)- variety
50	SD 63	Tepalcingo (Tep-5)- variety
51	GM-4	Sub tropical
52	GM-141	Fam. 258/1106 A.E.
53	SK 6056	SC SD 62 x L16
54	SK 8174	Tepalcingo (Tep-5)- variety
55	SK 8238	Al-Khera-1
56	SK 7005/10	Giza-2 composite -variety
57	SK 6016/20	SC SD 63 x SK 8238
58	SK 5024	Exotic, Cimmyt's CMS-1-4 x Pop-50 C_1
59	SK 5027/1	Exotic, Cimmyt's CMS-1-3 x Pop-50 C_1
60	SK 5027/2	Exotic, Cimmyt's CMS-4-3 x Pop-50 C_1
61	SK 5037	Exotic, Cimmyt's CMS-6-1 x Pop-50 C_1
62	SK 6046	Exotic, Cimmyt's CR x 95-02(3-1 x Pop-50 C_1)
63	SK 5068	Exotic, Cimmyt,s CMS-935605 x 321
64	SK 5069	Exotic, Cimmyt's CMS-975089 x P-43
65	SK 6016/5	SC SD 63 x SK 8238

RESULTS AND DISCUSSION

Mean squares of 65 inbred lines for seven characters over two nitrogen levels are presented in Table 2. Differences between two the nitrogen levels (N) ranged from significant to highly significant for all studied characters except for resistance to late wilt disease. These results indicated that all characters, except for resistance to late wilt disease were affected by nitrogen fertilization.

Table 2: Mean squares of 65 inbred lines for seven characters over two nitrogen levels.

S.O.V	d.f	Silking date (days)	Plant height (cm)	Ear height (cm)	Ear length (cm)	No.of rows/ ear	Grain yield ard/fed	Resistance to late wilt disease %
Nitrogen (N)	1	630.81**	26076.20**	15491.70**	82.06*	55.93**	700.01**	52.41
Rep / N	4	11.13	959.04	272.26	10.50	1.72	1.90	55.13
Lines (L)	64	73.63**	1626.94**	879.76**	15.88**	10.94**	38.41**	256.72**
(N x L)	64	11.80**	204.60**	76.46	2.38**	1.01	10.66**	43.08
Error	256	3.58	132.20	78.45	1.25	0.95	2.40	54.87

*, ** Significant at the 0.05 and 0.01 levels of probability, respectively.

Means of the seven characters under the two nitrogen levels and their combined means are presented in Table 3. Applying 120 kg N/fed increased all studied characters except silking date. These results agreed with other results obtained by Shafshak *et al.* (1981), Nawar *et al.* (1992). Gouda *et al.* (1993) and El-Shenawy (2003) for grain yield, El-Habbak (1996) for ear length, Mosa (1996) for number of rows/ear. Soliman (1986) and Mosa (1996) for plant and ear heights, Galal *et al.* (1992) and Mosa (2001) for resistance to late wilt disease.

Regarding to Table 2, it appeared that the mean squares for inbred lines (L) were highly significant for all studied characters, indicating that the inbred lines significantly differed from one line to another.

Mean performances of 65 inbred lines for the seven characters over two nitrogen levels are shown in Table 4. Means of inbred lines for silking date ranged from 60.50 days for inbred no.32 to 75.66 days for inbred no.62, with 13 inbred lines; no. 2, 17, 19, 30, 31, 32, 33, 36, 37, 43, 44, 47 and 54 ranged from 60.50 days to 65 days, 32 inbred lines; no. 3, 4, 5, 6, 7, 9, 13, 18, 20, 21,

23, 24,25, 26, 27, 28, 29, 34, 35, 38, 40, 41, 42, 45, 46, 48, 49, 51, 52, 53, 56 and 57 ranged from 65 days to 70 days and 20 inbred lines; no.1, 8, 10, 11, 12, 14, 15, 16, 22, 39, 50, 55, 58, 59, 60, 61, 62, 63,64 and 65 ranged from 70 days to 75.66 days. Means of inbred lines for plant height ranged from 109.50cm for inbred no.47 to 187.83 cm for inbred no.4. Means of inbred lines for ear height ranged from 52.83 cm for inbred no.34 to 102.16 cm for inbred no.4. Means of inbred lines for ear length ranged from 11.05 cm for inbred no.52 to 18.06 cm for inbred no.5, Means of inbred lines for number of rows/ear ranged from 9.53 for inbred no.7 to 15.48 for inbred no.21, with 4 inbred lines; no. 7, 33, 43 and 51, ranged from 9.50 to 10 rows/ear, 37 inbred lines; no. 3, 4, 5, 8, 9, 11, 12, 14, 15, 17, 22, 24, 25, 27, 29, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 44, 45, 46, 47, 48, 50, 53, 56, 57, 58, 62 and 65 ranged from 10 to 12 rows/ear and 24 inbred lines; no. 1, 2, 6, 10, 13, 16, 18, 19, 20, 21, 23, 26, 28, 30, 40, 49, 52, 54, 55, 59, 60, 61, 63, and 64 ranged from 12 to15.48. Which, means of grain yield for inbred lines ranged from 3.5 ard/fed for inbred no.14 to 15.48 ard/fed for inbred no. 64, with 13 inbred lines; no. 13, 14, 27, 28, 29, 31, 33, 34, 35, 37, 39, 56, and 63 ranged from 3.5 to 5 ard/fed, while 45 inbred lines; no. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 30, 32, 36, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 52, 53, 54, 55, 58, 59, 61, 62and 65 ranged from 5 to 10 ard/fed. and 7 inbred lines; no. 6, 24, 25, 48, 57,60 and 64 ranged from 10 to 15.48 ard/fed .For resistance to late wilt disease 46 inbred lines; no. 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28,29, 37, 38, 39, 40, 41, 44, 45, 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64 and 65 exhibited high resistance to late wilt disease with percentage up 95%, nine inbred lines; no. 10, 12, 14, 23, 34, 35, 43, 46 and 53 showed resistance to late wilt disease with percentage ranged from 90 to 95%, two inbred lines; no. 22 and 52 moderately exhibited resistance with 89.84% and 86.06%, respectively. Eight inbred lines; no. 6, 15, 30, 31, 32, 33, 36 and 42 showed susceptible to late wilt disease with percentage resistance less from 85 %.

Mean squares due to inbred lines x nitrogen levels interaction presented in Table 5, were highly significant for silking date, plant height, ear length and grain yield, but not significant for

ear height, number of rows/ear and resistance to late wilt disease, meaning that silking date, plant height, ear length and grain yield were affected by change in nitrogen levels. Effect of interaction between inbred lines and nitrogen levels for four characters are presented in Table 5. For silking date the inbred line no.60 produced the highest value under low nitrogen level N_1 (78.66 days), while the inbred line no.32 produced the lowest value under high nitrogen level N_2 (59 days). However the inbred lines; no.31, 32, 33 and 37 exhibited the lowest values under N_1 and N_2. This findings indicated that these inbreds showed earliness under stress and non stress environments, while the inbreds 39,60 and 62 showed the highest values under N_1 and N_2, indicating that these inbreds delayed silking under stress and non stress environments. For plant height the inbred line no.56 had the lowest value under N_1 (100.66 cm) while the inbred line no. 4 had the highest value under N_2 (193 cm). For ear length the highest value was obtained under N_2 for inbred no.62 while the lowest value was obtained under N_1 for inbred no. 53 .The higher values for grain yield were obtained for the inbreds no. 6, 24, 40, 57, 60 and 64 under N_2 while the lowest value was obtained under N_1 for the inbred line No. 20. On the other hand the inbred lines; no. 6, 24, 57 and 64 were high yielding under $N_1$and N2, meaning that these inbreds seemed stable under stress and non stress environments.

General knowledge about mean performance of inbred lines for earliness, productivity and resistance to late wilt disease and genetic behavior are very important for plant breeder, when starts any work exploiting these inbred lines.

Table 3: Means of seven characters under two nitrogen levels and their combined data.

Nitrogen level	Silking date (days)	Plant height (cm)	Ear height (cm)	Ear length (cm)	No.of rows/ ear	Grain yield ard/fed	Resistance to late wilt disease %
70 kg N/fed N_1	69.51	138.85	70.97	95.22	13.65	11.40	6.17
120 kg N/fed N_2	66.96	155.20	83.58	95.96	14.56	12.16	8.85
Combined over two N-levels	68.24	147.02	77.28	95.59	14.10	11.78	7.51

Table 4: Mean performance of 65 inbred lines for seven characters over two nitrogen levels.

Code no.	Silking date (days)	Plant height (cm)	Ear height (cm)	Ear length (cm)	No. of rows/ ear	Grain yield ard/fed	Resistance to late wilt disease %
1	72.16	154.16	94.00	12.22	12.93	7.41	95.45
2	64.50	148.50	78.66	14.43	12.66	9.36	98.48
3	69.83	159.16	87.50	14.36	10.26	7.69	100.00
4	68.50	187.83	102.16	14.23	11.20	8.58	100.00
5	69.33	170.16	96.66	18.06	11.06	9.58	100.00
6	66.50	133.00	88.50	14.76	15.40	12.04	83.18
7	68.00	133.66	72.83	14.26	9.53	5.78	96.97
8	71.61	181.50	90.16	15.63	11.33	6.64	100.00
9	66.00	151.66	84.83	13.96	10.40	8.14	98.48
10	71.83	182.50	98.83	14.36	12.86	8.63	94.44
11	71.50	180.33	101.83	14.63	11.60	7.71	100.00
12	70.16	175.00	92.83	17.33	11.93	8.44	93.07
13	68.66	142.83	76.16	13.60	14.73	3.78	100.00
14	71.00	120.16	55.33	11.93	11.16	3.51	94.44
15	72.83	151.00	91.50	15.86	10.73	5.17	83.33
16	73.66	130.16	72.16	15.83	12.20	7.06	100.00
17	63.16	141.16	76.33	12.33	11.66	8.27	100.00
18	66.16	141.33	75.50	14.43	13.20	8.96	100.00
19	61.83	147.83	72.16	14.90	12.26	8.17	96.97
20	68.16	157.50	82.66	13.53	14.73	5.63	100.00
21	68.33	148.33	82.83	12.73	15.48	6.24	100.00
22	70.33	142.0	73.83	12.26	11.33	5.66	89.84
23	68.00	150.16	78.16	12.63	12.66	8.41	93.78
24	66.50	162.82	90.16	15.03	11.46	13.15	100.00
25	68.33	153.00	83.66	15.23	11.60	11.50	100.00
26	65.50	150.66	82.16	15.13	12.66	9.93	98.48
27	69.00	148.66	80.16	13.13	11.80	4.77	98.48
28	69.16	132.50	67.83	12.86	12.53	4.72	100.00
29	67.16	145.16	79.00	12.90	10.60	3.90	96.97
30	64.33	143.00	79.66	13.70	12.80	7.74	81.26
31	61.17	131.50	59.83	12.53	11.26	4.63	73.90
32	60.50	141.83	62.83	11.86	11.20	7.74	82.48
33	62.66	148.83	80.16	13.06	9.80	4.80	74.22

Table 4: Continued

Code no.	Silking date (days)	Plant height (cm)	Ear height (cm)	Ear length (cm)	No.of rows/ ear	Grain yield ard/fed	Resistance to late wilt disease %
34	66.16	128.00	52.83	11.33	11.26	4.73	91.91
35	66.33	114.00	56.50	11.98	10.33	3.61	93.63
36	64.00	155.83	81.50	13.10	11.40	8.11	81.90
37	62.16	147.83	65.16	14.93	10.53	3.79	100.00
38	69.00	126.66	54.66	15.23	10.06	7.61	96.97
39	74.33	137.00	74.16	15.70	10.55	3.81	100.00
40	66.83	119.50	54.00	11.36	13.40	8.58	98.33
41	66.83	150.33	71.16	13.56	10.01	5.87	100.00
42	68.16	155.50	71.33	15.36	10.93	8.39	82.69
43	64.83	136.33	65.33	14.80	9.93	6.57	92.42
44	61.16	140.66	75.66	13.13	11.06	6.28	100.00
45	65.50	153.66	81.50	15.16	11.80	8.82	98.48
46	68.33	143.33	74.66	13.88	10.13	6.27	93.93
47	63.83	109.50	55.50	12.33	10.33	9.02	100.00
48	68.00	134.83	72.50	15.63	11.00	10.65	100.00
49	68.50	154.83	88.33	13.76	12.66	5.18	100.00
50	71.33	153.00	80.83	13.43	11.66	8.39	98.48
51	66.50	154.33	80.33	13.46	9.93	8.77	100.00
52	67.66	141.00	64.33	11.05	13.35	7.03	86.06
53	67.16	141.16	59.83	11.23	11.93	6.00	93.93
54	64.66	131.00	63.16	14.00	12.86	8.75	97.91
55	71.66	156.33	80.83	14.60	12.66	7.14	97.91
56	67.66	121.66	69.50	12.83	10.51	4.31	98.48
57	68.33	179.00	96.00	14.96	10.93	12.74	98.33
58	73.83	129.16	68.83	14.46	11.80	8.00	100.00
59	75.16	139.00	74.16	14.86	12.86	8.31	98.33
60	75.33	147.83	85.00	16.73	13.66	12.76	98.48
61	70.33	156.00	82.83	17.96	12.33	8.88	98.48
62	75.66	150.66	85.33	17.46	10.93	7.26	96.29
63	71.83	160.83	84.16	13.50	13.46	4.48	98.48
64	72.16	132.83	74.00	14.55	13.03	15.48	100.00
65	70.33	167.16	88.33	16.78	11.60	8.80	100.00
L.S.D 0.05	2.12	13.01	10.02	1.26	1.10	1.75	8.38
0.01	2.79	17.12	13.19	1.66	1.45	2.30	11.03

Table 5: Effects of interaction between inbred lines and nitrogen levels on four characters.

Code no.	Silking date (days)		Plant height (cm)		Ear length (cm)		Grain yield ard/fed.	
	N1	N2	N1	N2	N1	N2	N1	N2
1	73.33	71.00	150.33	158.00	11.8	12.66	6.57	8.24
2	65.33	63.66	141.66	155.33	13.73	15.13	6.16	12.57
3	70.33	69.33	143.33	175.00	13.26	15.46	5.39	10.00
4	70.33	66.66	182.66	193.00	14.06	14.40	6.97	10.20
5	71.00	67.66	159.66	180.00	17.80	18.33	7.47	11.69
6	68.66	64.33	129.00	137.00	13.86	15.66	10.59	13.57
7	73.33	62.66	117.33	150.00	13.20	15.33	4.05	7.51
8	71.66	70.66	176.66	186.33	15.53	15.73	7.00	6.28
9	65.00	67.00	154.00	149.33	13.33	14.60	7.45	8.84
10	71.66	72.00	177.66	187.33	14.33	14.40	8.97	8.30
11	71.33	71.66	182.33	178.33	14.46	14.80	6.73	8.69
12	70.66	69.66	163.66	186.33	16.13	18.53	7.72	9.16
13	70.00	67.33	141.00	144.66	13.40	13.80	3.71	3.85
14	71.00	71.00	114.00	126.33	12.06	11.80	2.25	4.77
15	75.66	70.00	149.66	152.33	18.06	13.66	3.58	6.75
16	77.33	70.00	120.00	140.33	15.00	16.66	6.12	8.00
17	63.00	63.33	132.33	150.00	12.26	12.40	7.54	9.00
18	66.33	66.00	135.00	147.66	14.13	14.73	6.38	11.54
19	64.66	59.10	131.66	164.00	13.26	15.53	6.19	10.15
20	72.33	64.00	142.66	172.00	13.00	14.06	2.04	9.23
21	69.33	67.33	140.00	156.66	12.20	13.26	3.04	9.45
22	72.00	68.66	133.66	150.33	11.40	13.13	3.50	7.81
23	70.66	65.33	146.66	153.66	12.00	13.26	8.14	8.68
24	67.00	66.00	159.33	166.33	14.40	15.66	11.67	14.63
25	68.00	68.66	147.33	158.66	14.60	15.86	10.18	12.81
26	66.33	64.66	139.66	161.66	14.73	15.53	7.45	12.41
27	71.00	67.00	146.66	150.66	12.13	14.13	3.61	5.94
28	70.66	67.66	130.00	135.00	10.86	14.86	4.40	5.04
29	68.66	65.66	131.33	129.00	12.06	13.73	2.39	5.41
30	65.33	63.33	141.00	145.00	13.60	13.80	8.71	6.77
31	61.33	61.00	120.33	142.66	12.06	13.00	3.59	5.67
32	62.00	59.00	131.66	152.00	12.06	11.66	7.76	7.72
33	62.00	63.33	140.00	157.60	11.86	14.26	3.92	5.67

Table 5: Continued

Code no.	Silking date (days)		Plant height (cm)		Ear length (cm)		Grain yield ard/fed.	
	N1	N2	N1	N2	N1	N2	N1	N2
34	68.66	63.66	123.33	132.66	10.73	11.93	2.66	6.59
35	69.66	63.00	107.00	121.00	11.43	12.53	2.42	4.81
36	63.66	64.33	146.66	165.00	12.33	13.86	5.38	10.83
37	62.00	62.33	137.00	158.66	14.13	15.73	3.05	4.53
38	70.33	67.66	117.33	136.00	15.46	15.00	6.99	8.22
39	75.33	73.33	130.66	143.33	13.06	18.33	3.27	4.36
40	69.66	64.00	116.00	123.00	11.06	11.66	2.19	14.98
41	67.33	66.33	125.66	175.00	13.80	13.33	4.04	7.71
42	69.66	66.66	143.66	167.33	14.80	15.93	6.00	10.78
43	64.66	65.00	129.33	143.33	14.86	14.73	5.42	7.73
44	67.66	66.66	125.00	156.33	12.93	13.33	3.88	8.72
45	66.33	64.66	150.33	157.00	14.40	15.93	8.91	8.72
46	69.65	67.00	133.33	153.33	13.23	14.53	5.62	6.92
47	64.33	63.33	102.66	116.33	11.66	13.00	6.88	11.16
48	68.33	67.66	132.33	137.33	15.73	15.53	11.49	9.80
49	72.00	65.00	141.66	168.00	13.20	14.33	5.11	5.25
50	71.66	71.00	139.33	166.66	13.60	13.26	7.50	9.29
51	65.66	67.33	151.33	157.33	13.40	13.53	6.34	11.19
52	68.66	66.66	129.66	152.33	10.76	11.33	6.17	7.89
53	69.33	65.00	135.33	147.00	10.60	11.86	3.82	8.17
54	64.33	65.00	122.66	139.33	13.66	14.33	8.46	9.05
55	73.00	70.33	130.33	182.33	13.80	15.40	6.91	7.37
56	69.00	66.33	100.66	142.66	11.93	13.73	3.81	4.81
57	69.33	67.33	167.66	190.33	15.26	14.66	12.58	12.90
58	76.00	71.66	134.00	124.33	13.93	15.00	4.70	11.29
59	77.66	72.66	132.00	146.00	14.93	14.80	7.25	9.36
60	78.66	72.00	138.00	157.66	16.60	16.86	7.01	18.51
61	75.33	65.33	146.00	166.00	17.93	18.00	9.15	8.62
62	78.00	73.33	137.33	164.00	15.66	19.26	5.29	9.23
63	73.66	70.00	153.66	168.00	13.13	13.86	3.95	5.02
64	72.33	72.00	124.33	141.33	14.76	14.33	15.19	15.78
65	69.00	71.66	168.66	165.66	16.63	16.93	8.37	9.22
LSD 0.05	3.00		18.40		1.78		2.47	
0.01	3.95		24.22		2.35		3.26	

REFERENCES

Abou-Khadrah, S. (1984). Effect of plant densities and nitrogen fertilization on growth and yield of two maize cultivars. Agric. Res. Tanta Univ., 10(3): 891-903.

Balko, L.G. and W.A.Russell (1980). Response of maize inbred lines to N fertilizer. Agron. J. 72:723-728.

El-Habbak, K.E. (1996). Response of some maize varieties to plant density and nitrogen fertilization. Annals of Agric. Sc., Moshtohor. 34 (3): 951-970.

El-Hosary, A.A. and Salwau, M.I.M. (1989). Effect of N-levels and plant density on yield and some agronomic characters. Annals of Agric.Sc., Moshtohor, 27 (2): 783-795.

El-Shafey, H.A.; F.A. El-Shorbagy; K.I. Ikbal; E.M. El-Assiuty (1988). Additional sources of resistance to the late wilt disease of maize caused by *Cephalosporium maydis*, Agric. Res. Rev., 66 (2): 221-230.

El-Sheikh, F.T. (1998). Effect of plant population densities on nitrogen use efficiency of some maize varieties. Annals of Agric. Sc., Moshtohor 36(1): 143-162.

El-Shenawy, A.A. (2003). Response of two Egyptian maize hybrids to nitrogen fertilization under sub-tropical condition. J. Agric. Sci. Mansoura Univ., 28(1): 37-42.

Esmail, S.E. and M.H. El-Sheikh (1994). Relationship between the nitrogen fertilizer levels and the yield of some maize varieties supported by response curve. Menofiya J. Agric. Res., 19(1): 139-152.

Galal, A.A.; F.A. El-Zeir and M.A. Younis (1992). Genetic x plant density x nitrogen fertilizer of resistance to late wilt (*Cephalosporium maydis*) in maize. J. Agric. Res. Tanta Univ., 18(2): 292-298.

Gouda, A.S.; M.M. Ragheb and A.A. Bedeer (1993). Grain yield of some maize hybrids as affected by plant population density and nitrogen fertilizer levels under different environmental conditions. Bull Fac. Agric. Univ. Cairo, 44: 599-618.

Mandour, S.A.M. (1977).Effect of nitrogen fertilization on growth and yield of some corn varieties under different populations. M. Sc. Thesis Alexandria Univ., Egypt.

Mosa, H.E. (1996). Studies on corn breeding. M.Sc. Thesis, Fac. Agric., Kafr El-Sheikh, Tanta Univ., Egypt.

Mosa, H.E.(2001).A comparative study of the efficiency of some maize testers for evaluation a number of white maize inbred lines and their combining ability under different environmental conditions. Ph.D. Thesis, Fac. Agric., Kafe El-Sheikh, Tanta Univ., Egypt.

Mourad, S.E; M.A. El-Lakany, A.I. El-Agamy and F.H. Soliman (1986). Response of some varieties and hybrids of maize to plant denities and nitrogen fertilization. 1- Growth and flowering traits. Res. Bull., 6: 401-410, Fac. Agric., Al-Azhar Univ., Egypt.

Nawar, A.A.; A.N.M. Khalil and S.A. El-Shamarkha (1992). Heterosis and genetic effects of maize grain yield under three nitrogen fertilizer rates. Menofiya. J. Agric. Res., 17(4): 1753-1762.

Shafshak, S.E.; M.S. Salem and A.Roshdy (1981). Response of maize germplasm to application of Mg and Micro elements. Indian J. Sci., 17 (4):493-499.

Soliman, F.H.S. (1986). Response of some maize genotypes for plant densities and nitrogen fertilization. M.Sc. Thesis, Fac. Agric., Al-Azhar Univ., Egypt.

Steel, R.G and J.H. Torrie (1980). Principals and procedures of statistics. A Biometrical Approach. 2nd Ed. Me. Graw Hill, N.Y. USA.

الملخص العربى

توصيف سلالات جديدة من الذرة الشامية البيضاء لبعض صفات النمو والإنتاجية ومقاومة مرض الذبول المتأخر

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تم تقييم 65 سلالة بيضاء من الذرة الشامية تمتلك قدرة عالية على الائتلاف لصفة المحصول فى تجربتين الاولى تحت معدل 70 كجم نتروجين / فدان والثانية تحت معدل 120 كجم نتروجين / فدان فى تصميم القطاعات كاملة العشوائية فى ثلاث تكرارات. كلا التجربتين أقيمتا فى حقلين منفصلين فى سخا خلال موسم عام 2005. الحقل الأول كان تحت الظروف الطبيعية وأخذت القراءات للصفات التالية : تاريخ ظهور 50% من الحرابر للنورات المؤنثة وارتفاع النبات والكوز وطول الكوز وعدد الصفوف فى الكوز ومحصول الحبوب اردب للفدان. الحقل الثانى كان تحت

ظروف العدوى الصناعية بمرض الذبول المتأخر وأخذت القراءة لنسبة المقاومة للمرض الذبول المتأخر.

كانت الاختلافات بين معدلى التسميد النتروجينى للتحليل المشترك معنوية لجميع الصفات ماعدا صفة نسبة المقاومة لمرض الذبول المتأخر.

اظهر معدل التسميد النتروجينى المرتفع 120 كجم نتروجين / فدان اعلى قيم لجميع الصفات ما عدا صفة تاريخ ظهور 50% من الحرايز للنورات المؤنثة .

كانت الاختلافات بين السلالات عالية المعنوية لجميع الصفات المدروسة. متوسطات السلالات لصفة ظهور 50% من الحرايز للنورات المؤنثة تراوحت من 60.5 يوم للسلالة سخا 24/6006 الى 75.6 يوم للسلالة سخا 6046 كذلك 13 سلالة تراوح تزهيرها من60.5 الى 65 يوم، 32 سلاله من اعلى 65 الى 70 يوم و20 سلاله اعلى من 70 الى 75.6 يوم. أظهرت صفه نسبة المقاومة لمرض الذبول المتاخر أن هناك 46 سلاله عاليةالمقاومة بنسبة اعلى من 95 % و 9 سلالات مقاومة بنسبة اعلى من 90 الى 95% و2 سلالة متوسطة المقاومة بنسبة اعلى من 85 الى 90% و8 سلالات اظهرت حساسية للمرض حيث نسبة المقاومة اقل من 85 % . بينما صفة المحصول للسلالات تتراوح من 3.51 اردب للفدان للسلاله سخا-ى 17 الى 15.48 اردب للفدان للسلاله سخا 5069 و تراوح محصول 13 سلالة من 3.51 الى5 اردب للفدان و 45 سلاله اعلى من 5 الى 10 اردب للفدان و6 سلالات اعلى من 10 الى 15.48 اردب للفدان.

اظهر التفاعل بين السلالات والتسميد النتروجينى معنوية عالية لصفات تاريخ ظهور 50% من حرايز النورات المؤنثة وارتفاع النبات وطول الكوز ومحصول الحبوب. اظهرت السلاله سخا 1/5027-1 اعلى متوسط لتاريخ ظهور 50% من حرائر النورات المؤنثة تحت معدل التسميد المنخفض بينما اعطت السلاله سخا 24/6006اقل متوسط تحت معدل التسميد المنخفض. أظهرت السلالة سخا 10/7005 اقل متوسط لارتفاع النبات تحت معدل التسميد المنخفض والسلالة سدس 1050اعطت اكبر متوسط تحت معدل التسميد العالى. أعطت السلالة سخا 6046 أعلى متوسط طول الكوز تحت معدل التسميد العالى بينما أعطت السلالة سخا 6056 اقل متوسط تحت معدل التسميد المنخفض. أعطت السلالات سخا 9/6016 وسخا 1/8014وسخا 8055 وسخا 2/5027 وسخا20/6016 وسخا 5069 اعلى متوسطات محصول الحبوب اردب/ فدان تحت معدل التسميد العالى بينما أعطت السلالة سخا 4/8170 اقل متوسط تحت معدل التسميد المنخفض.