

DEVELOPING HIGH-YIELDING BARLEY CULTIVARS UNDER DIFFERENT STRESS CONDITIONS IN EGYPT

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Abstract

Four groups of yield trials namely; Screening Yield Trial (SYT), Preliminary yield Trial (PYT), Advanced yield trial (AYT), and Demonstration yield trial (DYT) were grown under different stress conditions during the 1995/96 growing season. The SYT experiment was grown in Ismailia (poor sandy soil under sprinkler irrigation) and Malloway (high temperature and aphid infestation). The second experiment (PYT) was planted in six locations; Nubaria (calcareous soil), Sakha (disease problems), El-Serw (saline soil), Ismailia, Malloway, and the New Valley (heat stress). The third experiment (AYT) was planted in five locations; Ismailia, Malloway, El-Mataana, Kom Ombo, and the New Valley. The fourth experiment (DYT) was planted in three locations; Ismailia, Nubaria, and the New Valley.

Results showed that in SYT, remarkable variability in grain yield (GY) was observed. This variation ranged from 3308 to 5755 kg/ha. One genotype was superior to the check in both grain yield and biological yield (BY) in addition to straw yield (SY). In pyt, nine genotypes were significantly earlier than the national check ranging from 4 to 9 days earlier at Ismailia, whereas, at the New Valley, the majority of the genotypes were significantly earlier than the check. Two genotypes had relatively high BY, SY and GY. High potentiality of the New Valley area compared to Ismailia was observed. In AYT, six genotypes were significantly earlier than the national check at Ismailia. Regarding GY, only one genotype which had high BY and SY had also high GY with relatively low harvest index (HI) (0.255). Heading date at the New Valley was much earlier than that of the other two locations with an average of 72 days to heading. The average plant height in the New Valley has also been affected by the temperature and due to the short duration of growth under this condition. On the other hand, By, SY, and GY at the New Valley were higher than the other two locations.

INTRODUCTION

Barley (*Hordeum vulgare* L) is the main crop grown on large scale in the rainfed areas of Egypt. It is considered one of the most suitable crops that can be grown over a wide range of soil types and under many adverse conditions than

most other grain crops. Therefore, it is suited for dry and semi-dry areas as well as in the newly reclaimed lands. The newly reclaimed lands are located mainly in Nubaria, Ismailia, El-Fayoum, and on the East and West bank of the Nile in Middle and Upper Egypt. These new reclaimed lands have low yielding potential because of some stress problems. Few studies have been carried-out in these areas (Noaman *et al.*, 1990; and El-Sayed *et al.*, 1995) which revealed the lack of suitable cultivars practices as the main factors affecting barley production and productivity in these areas. The main objective of this study was to screen and identify barley genotypes that are suitable for the new reclaimed lands in order to increase barley production.

MATERIALS AND METHODS

Four groups of yield trials namely; Screening yield Trial (SYT, 64 entries), Preliminary yield trial (PYT, 32 entries), advanced yield trial (AYT, 16 entries), and Demonstration yield trial (DYT, 10 entries), screening yield trial (SYT) included 64 entries selected from local and exotic material with the national check, Giza 123, Preliminary yield trial (PYT) included 32 entries resulting from SYT last year, Advanced yield trial (AYT) included 16, promising lines and cultivars plus the national check, Giza 123 promoted from the AYT last year according to their yield potential and diseases resistance and other agronomic criteria. These experiments were grown under different stress conditions during the 1995/96 growing season. SYT was grown in Ismailia (poor sandy soil under sprinkler irrigation) and Mallawy (high temperature and under aphid infestation). The second experiment (PYT) was planted in six locations; Nubaria (clacareous soil), Sakha (disease problems), El-Serw (saline soil), Ismailia, Mallawy, and the New Valley (heat stress). The third experiment (AYT) was planted in five locations; Ismailia, Mallawy, El-Mataana, Kom Ombo, and the New Valley. The fourth experiment (DYT) was planted in three locations; Ismailia, Nubaria, and the New Valley. All four experiments were planted in a randomized complete block design with three replications. The experimental plot size for the SYT and PYT was six rows of 3.5 m long and 20cm apart, while for the AYT and DYT experiments plots were 12.6 m² and 25m² sown broadcast, respectively. Standard analysis of variance using least significant difference was performed (Steel and Torrie, 1980). In the analysis of the data, the varieties were treated as fixed variables, while environments were considered as random variables. Names and pedigree of the material included in the three trials are presented in Tables 1, 2, 3 and 4.

Table 1. Names and pedigree of genotypes included in the Screening yield Trial, 1995/96.

Ent. no.	Name/Pedigree
1	Giza 123
2	Giza 124
3	L-6R-93/1
4	L-6R-93/2
5	L-6R-94/1
6	Mr 25-84/Attiki x Impala/Julia// Api
7	Wi 2291/3/Api/CM67//L2966-69xAs46/Pro//Bal-16/Api/5/Balkan/Harma//Attiki/3/Avt/4/Com 182/Avt/6/Arar
8	Mari/CM67 x CC 163
9	Aths/Lignee686/3/Sawsan/Badia//Arar ICB89-0896
10	Arizona 5908/Aths//Lignee640/3/Aths/BC ICB89-0838-OAP
11	Arizona 5908/Aths/4/WI2291/3/Api/CM67//L2966-69ICB89-0587-OAP
12	Aths/Lignee686//Lignee640/Lignee66
13	Rihane-03/3/Mari/Aths*2//M-Att-73-337-1 ICB90-0061-OAP
14	Api/CM67//Harma-03/4/Cq/CM//Apm/3/RMI508/5/Attiki/6/Aths/7//JLB70-01 ICB90-0290-OAP
15	Veola32/3/Mari/Aths*2//M-Atti-73-337-1 ICB90-0502-OAP
16	Rihane-03/3/BC/Rihane//Kyb3-1294xGiza121/CI06248/4/Apm/IB65//11012-2/3/Api/CM67//Ds/AproCB83-0605-OAP
17	Bal.16/Mzq/3/M67-18/M14//Ds/Apro/4/IrisxWI2291/3/Api/CM67//L.2966-69 ICB78-0651-4AP-6AP-1AP-3AP-OAP
18	5919/1420//Aramir x Mari/CM67
19	Api/CM67//ORE/3/LBxIran/Una80//Lignee640 CMB90A-26
20	Sawsan/Badia//Arar ICB82-0074-5AP-OTR
21	Emir/Arabi Abiad/Roho ICB82-0319-6AP-OAP-1AP-OTR
22	Giza 121/Pve//Cr.366-15-2/Nopal's/3/Aths ICB 86-0460-33AP-3AP-OTR-OAP 24 WI2291/WI2269//ER/Apm /ICB86-OAP-2APH-OAP
23	Assala-02/5/Cr115/Pro//BC/3/Api/CM67/4/Giza120ICB85-0429-3AP-3AP-OTR-OAP 24
24	WI2291/WI2269//ER/Apm ICB86-0629-OAP-2APH-OAP
25	Mr 25-84/Att/Mari/Arths*3-02 CYB-5236-OAP
26	Rihane/Badia
27	Lignee 527/NK1272 ICB84-0323-8AP-OAP
28	Aths/Lignee686 ICB82-0979-5AP-OAP-OAP-24AP-OTR
29	Arar//2762/BC-2L-2Y ICB83-0687-7AP-OTR-OAP-1AP-OTR
30	M64-76/Bon//Jo/York/3/M5/Galt//As46/4/Hj34-80/Astrix/5/Aths ICB85-0704-4AP-5AP-OTR-3AP-OTR-OAP-OAP
31	Mr 25-84/Att/3/Mari/Aths//BC CYB-5235-OAP
32	Estate/4/MC1133/Fza//Tib/3/PI356456/Lignee527 CMB86-0924-B-IPAP-2Y-IP-OY
33	Api/CM67//Harma-03/4/Cq/CM/Apm/3/RMI508/5/Attiki/6/Aths/7/SP(6H)/Apro ICB90-0288-OAP
34	As46/Aths*//Aths/Lignee686 ICB89-0670-OAP
35	Assala-04
36	Arizona 5908/Aths//Lignee 640 ICB81-0210-1AP-9AP-OAP
37	Quinn/Rihane//Quinn/Lignee640 ICB83-1134-OAP-OAP-OAP-9AP-OAP
38	Beecher
39	M64-76/Bon//jo/York/3/M5/Galt//As46/4/Hj34-80/Astrix/5/CN42/CI 07772//Fun/3/Fun/Tch/4/Fun/Ki ICB84-1498-1AP-4AP
40	Lignee 527/NK1272 ICB84-0323-1AP-OAP-13AP-OTR
41	Rihane-03/3/Deir Alla 106//Mzq/DL71 ICB85-0400-3AP-OAP
42	Vg/Julia//Zy/3/CM67/Apro//Sv.02109/Mari ICB84-1320-4AP-OAP-19APH-OAP
43	Arar/3/Cr. 115/Por//G.121 ICB85-1593-6AP-OAP
44	Arar/Lignee 527 ICB85-0625-1AP-5AP-OAP
45	Sawsan/Bdia//Arar ICB82-0074-5AP-OAP-26AP-OTR
46	Arar//2762/Bc-2L-2Y ICB83-0687-7AP-OTR-OAP-4AP-1APH-OAP
47	BKF Maguelone 1604/Atem/ER//Apm/3/Lignee640/Lignee 686 ICB89-0969-3AP-OAP-1APH-OAP
48	Orge905/Cr289-53-2 ICB82-1451-8AP-OAP-9AP-OTR

Table 1. (Cont'd).

Ent. no.	Name/Pedigree
49	Arizona5908/Aths//Lignee640/4/WI2291/3/Api/CM67//L2966-69 ICB89-0778-16AP-OAP-1APH-OAP
50	Giza 121/CI 06248/4/Apm/IB65//11012-2/3/Api/CM67//Ds/Apro/5/ DeirAlla ICB88-1384-2AP-OTR-3AP-OAP-1APH-OAP
51	WI2291/WI2269//WI2291-Roho ICB86-0703-3AP-1AP-OAP-OAP
52	Rihane/Lignee 527 ICB82-0897-4AP-OAP
53	ER/Apm//Cerise/3/Lignee 131//ER/Apm ICB83-1985-2AP-OTR-OAP
54	Vg/Julia//Zy/3/CM67/Apro//Sv.02109/Mari ICB84-1320-4AP-OAP- 14APH-OAP
55	Mari/CM 67xGiza 119
56	Aths/Lignee 686//Lignee 640//Lignee 527 ICB89-0205
57	Deir Alla 106/Lignee 527//Assala/3/Bgs/Sawsan-01//Rihane/ICB89-0269
58	Mr 25-84/Attiki/3/Arizona 5908/Aths//Lignee 640 ICB89-0274
59	Aths/Lignee686/4/Ctn/RM1508//10876-2/3/70-22423/B1
60	WI2197/Cr. 272-3-4 x CC 163
61	Aths/Lignee 686 ICB82-0479-5AP-OAP-OAP-24AP-OTR
62	Bco.Mr/Avt//Cel/3Lignee 257-14/4/Rihane'S'-5 ICB84-0688-1AP-4AP-OTR-4AP-OTR
63	Sawsan/Lignee 640
64	Campille Verena//Daphne//SEN's' CMB 87A-658-M-3M-3Y-113-OY

Table 2. Names and pedigree of genotypes included in the Preliminary yield Trial, 1995/96.

Ent. no.	Name/Pedigree
1	Giza 123
2	Giza 124
3	L 6R-93/1
4	L 6R-93/2
5	L 6R-94-1
6	Agre//Api/CM 67/3/Cel/WI2269//Ore/5/CI 01021/4/CM67/U.Sask1800/ Pro/CM67/3/DL70 ICB89-0310
7	Arizona5908/Aths//Lignee640/3/As 46/Aths*2 ICB89-0326
8	Lignee640//Lignee527/5/Aths/4/Pro/Toll//Cer*2/Toll/3/5106ICB89-1052
9	As 46/Aths*2//Lignee640/Lignee 686
10	Maf102/Volla//WW319xGiza 119
11	Cr.115/Por//BC/3/Api/CM67/4/G.120xHarmal-01
12	Rihane 's'-4x CC163
13	WI2197/Cr.272-3-4xCC89
14	WI2197/Cr. 272-3-4 x CC 163
15	Mr 25-84/AttikiG.121/CI06248/4/Apm/IB65//1102-2/3/Api/CM67//DS/Apro
16	Api/CM67//Mona/3/DI//Asse/CM65-1W-1BxAs 46/Arths*2
17	Api/CM 67//Mona/3/DI//Asse/CM65-1W-1BxG.121//CI06248/4/Apm/IB65//11012-213/Api/CM67//DS/Apro
18	Giza 121xChaarani-01/Deir Alla 106/3/Asse/Aths//Apm
19	Aths/Lignee686 ICB82-0479-5AP-OAP-OAP-12AP-OTR
20	Mari/Aths*2//Arizona 5908/Aths
21	A-Att-73-337-1
22	Arar/3Cr.115/Por//G.121 ICB85-121 ICB85-1593-6AP-OAP-4AP-OTR
23	M64-76/Bon//Jo/York/3/M5/Galt//As46/4/Hj34-80/Astrix/5/Cn42/ CI07772//Fun/3/Fun/Tch/4/Fun/Ki ICB84-1498-1AP-4AP-1AP-OTR
24	Bco.Mr/Avt//Cel/3/Lignee 257-14/4/Rihane'S'-5 ICB84-0688-1AP-3AP-OTR
25	Gloria's/Copal's/Teran78/3/Shyri CMB87-447-B-6Y-38-1Y-2M-1Y-OM
26	MJA'S' CMB85A-772-S-3M-1Y-1M-OY
27	Assala-02/5/Cr.115/Pro/Bc/3/Api/CM67/4/Giza120ICB85-0429-4AP-2AP-2AP-4AP-1APH-OTR-OAP
28	85-5013/Rihane-03 ICB85-0784-4AP-4AP-OTR-5AP-OTROAP-OAP
29	Lignee 527/NK1272 ICB84-4AP-1AP-1AP-OTR-2AP-1AP-OAP
30	SUMBARD400/MOLLE'S" CMB88A-422-7M-3Y-3M-1Y-OB
31	Assala-02/5/Cr.115/Pro/Bc/3/Api/CM67/4/Giza 120 ICB85-0429-3AP-3AP-OTR-OTR-OAP
32	Estate/4/MCU33/Fza//Tib/3/PI356456/5/Lignee527CMB86-0924-B-1PAP-2Y-IB-OY

Table 3. Names and pedigree of genotypes included in the Advanced yield Trial, 1995/96.

Ent. no.	Name/Pedigree
1	Giza 123
2	Giza 124
3	L 6R-93/1
4	L 6R-93/2
5	L 6R-94/1
6	U.Sask.1766/Api//Cel/333/Weeah ICB80-1510-1AP-OAP-OAP
7	Deir Alla 106/Strain 205//Rihane-03 ICB85-0669-OAP-16APH-OAP
8	Aths/Rihane-01 ICB84-0213-1AP-3AP-OTR-1AP-OTR
9	Harmal-02/Emir ICB82-0662-3AP-OAP
10	PI 2325/Maf 102//Cossack/3/TRUMP
11	12201/ATHS/4/SD729/Por//72AB58
12	PI 2325/Maf 102//Cossack/3/TRUMP
13	Aths/Lignee 686 ICB82-0979-5AP-OAP-OAP-8AP-OTR
14	Avt/Attiki//Aths ICB87-1031-OAP
15	AVT/ATHS//Aths ICB85-1021-1AP-OAP
16	15-GP 92/93

Table 4. Names and pedigree of genotypes included in the Demonstration Yield Trial, 1995/96.

Ent. no.	Name/Pedigree
1	Giza 123
2	Giza 124
3	L 6R-93/1
4	L 6R-93/2
5	L 6R-94/1
6	Acsad 1028
7	DL 529 (Res. to aphids)
8	DL 532 (Res. to aphids)
9	CC89/Gloria's//Copal'S' CMB81-295-30B-1Y-2M-1Y-OM
10	Arizona 5908/Aths//Lignee 640

RESULTS AND DISCUSSION

1. Screening yield Trial (SYT)

Data presented in Table 5 show the number of days to heading for the 64 genotypes included in the SYT significant differences among genotypes at each environment and over all environments were observed. Genotype no. 40 was the earliest (81.5 days) in heading date. On the average over both environments, about 12 genotypes were significantly ($P < 0.05$) earlier than the national check Giza 123. High temperature at Mallawy affected heading date where most of the genotypes were earlier than at Ismailia.

The results of plant height in Table 5 show that Mallawy had significant taller plants than Ismailia because of poor soil fertility and water stress Ismailia. Over all the two environments, genotype no. 9 was the tallest (108 cm) among all 64 genotypes tested with a significant difference from the national check.

Regarding straw yield, the results in Table 6 indicate that the means of the genotypes tested varied significantly at both locations and over locations. Nine genotypes, significantly outyielded the national check with an average increase ranging from 3052 (genotype no. 36) to 4163 kg/ha (no.9). Mallawy had much higher straw yield than Ismailia because of the high soil fertility and water availability at Mallawy.

Average grain yields at the two locations are presented in Table 6. Significant differences were observed among the genotypes at each location and over locations. The highest yield values were obtained from Mallawy. Over all locations, three genotypes nos. 23, 6, and 31 with average grain yield of 5897, 5755, and 5734, kg/ha outyielded the national check significantly ($P < 0.05$). These three genotypes will be promoted and tested on a larger in the multilocation Preliminary yield trial next year.

2. Preliminary yield trial

Number of days to heading varied between locations for the same genotypes as well as among genotypes within any given location. The data in Table 7 show that the earliest location was the New Valley (77 days) followed by Mallawy (90 days), while the latest was Ismailia (99 days). These results are expected due the wide variability in environmental conditions among these locations. Significant differences

Table 5. Names of days to heading and plant height of the Screening yield Trial at two locations, 1995/96.

Entry no.	Days to heading			Plant height (cm)		
	Ismailia	Mallawy	Combined	Ismailia	Mallawy	Combined
1	97.5	85.0	91.3	73.8	110.0	91.9
2	97.5	84.0	90.8	77.5	105.0	91.3
3	97.5	90.3	94.0	76.7	110.0	93.3
4	101.6	90.5	96.1	61.0	95.0	78.0
5	95.3	90.5	93.0	65.5	118.3	91.9
6	101.6	92.3	97.0	78.0	110.0	94.0
7	104.6	93.3	99.1	82.7	120.0	101.3
8	100.0	92.0	97.5	77.7	110.0	93.8
9	96.0	84.3	94.1	86.3	130.0	108.1
10	83.6	84.3	84.0	65.1	91.5	78.4
11	94.0	84.5	89.3	85.5	111.5	98.5
12	92.5	87.3	90.0	70.1	90.0	80.0
13	94.0	90.5	82.3	76.0	86.6	81.3
14	84.3	81.3	82.8	65.8	93.3	79.5
15	85.0	80.3	82.6	68.5	93.0	81.0
16	101.3	92.5	97.0	77.0	90.0	83.5
17	91.5	85.0	88.3	75.5	101.5	88.6
18	91.3	83.0	87.1	81.5	105.0	93.2
19	95.0	89.3	82.1	70.0	100.0	85.0
20	90.5	86.5	88.6	83.5	105.0	94.2
21	93.3	84.5	89.0	79.5	100.0	89.7
22	89.6	84.5	87.2	74.7	113.3	94.0
23	89.0	90.0	94.0	83.3	111.5	97.5
24	86.0	85.0	85.5	69.6	101.5	85.5
25	90.5	81.5	86.1	69.5	105.0	87.3
26	102.33	94.5	98.5	77.0	126.5	101.8
27	95.5	81.0	88.3	65.7	93.3	79.5
28	90.0	82.3	86.1	74.5	93.0	86.5
29	95.5	83.5	89.5	77.0	105.0	91.0
30	94.5	84.5	89.6	79.8	11.5	95.7
31	89.6	85.5	87.6	83.4	103.3	93.3
32	106.3	91.3	98.8	67.0	100.0	83.5
33	92.3	83.3	87.8	77.8	103.3	90.5
34	98.5	89.0	93.8	76.5	106.5	91.5
35	101.3	93.0	97.1	78.0	13.3	95.5
36	92.5	88.5	90.5	76.9	91.5	84.3
37	107.5	98.0	102.8	104.5	98.3	101.4
38	99.0	92.0	95.5	80.0	105.0	92.5
39	102.5	88.5	95.5	81.8	115.0	98.4
40	83.5	79.3	81.5	78.5	100.0	89.3
41	100.0	90.3	95.1	81.2	105.0	93.1
42	89.3	82.3	85.8	78.0	105.0	91.0
43	95.5	89.3	92.5	78.7	103.3	91.5

Table 6. Means of straw and grain yields of the Screening Yield Trial at two locations, 1995/96.

Entry no.	Straw yield (kg/ha)			Grain yield (kg/ha)		
	Ismailia	Mallawy	Combined	Ismailia	Mallawy	Combined
1	2.864	16.779	9.821	825	7.973	4.398
2	4.031	20.111	12.071	966	7.378	4.172
3	6.224	17.017	11.620	1.391	9.282	5.336
4	3.899	14.042	8.970	860	7.021	3.940
5	3.208	17.731	10.469	838	8.925	4.881
6	4.316	17.374	10.845	919	10.591	5.755
7	4.405	22.967	13.686	1.009	7.854	4.431
8	4.217	18.683	11.450	1.078	7.735	4.406
9	5.358	22.610	13.984	1.246	6.069	3.657
10	4.555	18.802	11.678	1.335	8.449	4.892
11	6.515	17.850	12.182	1.457	7.378	4.417
12	5.995	17.850	11.922	1.442	9.282	5.362
13	7.116	15.589	11.352	1.630	7.616	4.623
14	5.250	18.445	11.847	1.295	7.615	4.455
15	4.110	15.708	9.909	769	7.735	4.251
16	5.758	16.422	11.090	1.025	7.730	4.379
17	4.550	17.255	10.902	1.221	6.902	4.061
18	4.799	17.612	11.205	1.269	9.758	5.513
19	4.545	15.470	10.007	809	7.973	4.391
20	4.987	15.113	10.050	1.379	7.970	4.676
21	4.360	19.278	11.819	1.233	9.250	5.376
22	3.797	17.255	10.526	1.082	8.092	4.586
23	5.877	17.731	11.804	1.441	10.350	5.897
24	3.636	15.589	9.612	1.004	7.140	4.072
25	5.731	17.136	11.433	1.409	8.330	4.869
26	4.585	18.564	11.574	1.127	9.044	5.085
27	2.418	17.136	9.777	735	8.925	4.830
28	4.483	11.900	8.191	1.347	5.950	3.648
29	4.694	18.445	11.569	1.374	7.973	4.673
30	6.954	17.493	12.223	1.733	7.735	4.733
31	6.142	18.207	12.174	1.711	9.758	5.734
32	3.699	17.255	10.477	763	7.259	4.010
33	5.535	17.612	11.573	1.485	9.163	5.324
34	7.923	18.683	13.303	1.597	8.211	4.903
35	4.825	16.303	10.564	1.363	7.259	4.310
36	5.278	20.468	12.873	1.445	8.330	4.887
37	8.543	19.278	13.910	2.048	8.092	5.069
38	4.796	15.232	10.014	1.153	6.902	4.027
39	5.234	17.493	11.363	894	6.188	3.540
40	4.399	14.875	9.637	1.194	5.831	3.512
41	7.677	16.303	11.990	1.902	9.163	5.532
42	3.718	17.136	10.427	1.339	8.092	4.715
43	5.984	19.873	12.928	977	7.497	4.236

Table 6. (Cont'd).

Entry no.	Days to heading			Plant height (cm)		
	Ismailia	Mallawy	Combined	Ismailia	Mallawy	Combined
44	1.483	17.255	9.369	489	8.806	4.642
45	5.228	17.374	11.301	1.138	6.426	3.781
46	4.046	14.399	9.222	833	7.378	4.105
47	6.667	20.468	13.567	1.008	8.925	4.966
48	4.537	17.969	11.253	1.115	7.259	4.187
49	8.194	19.278	13.730	1.802	9.163	5.482
50	3.922	18.326	11.124	778	8.330	4.554
51	5.416	16.660	11.038	1.247	6.902	4.074
52	5.407	16.898	11.152	1.316	8.092	4.704
53	4.737	12.376	8.556	1.034	7.616	4.325
54	8.471	18.207	13.339	2.119	8.687	5.403
55	4.927	17.731	11.329	1.379	8.687	5.033
56	5.817	17.850	11.833	1.025	5.593	3.308
57	5.294	16.065	10.679	1.608	8.687	5.147
58	6.019	17.970	11.994	1.954	9.044	5.498
59	4.330	17.969	11.149	1.263	7.259	4.260
60	5.629	18.564	12.096	1.510	8.806	5.158
61	4.112	18.683	11.397	1.361	7.021	4.191
62	4.984	17.136	11.060	906	7.020	3.963
63	4.581	17.017	10.799	1.309	8.330	4.819
64	4.594	16.065	10.329	879	7.735	4.307
Mean	5.084	17.452	11.268	1.237	7.997	4.617
CV%	38.34	17.88	23.09	41.58	22.65	28.84
LSD (0.05)	3.150	5.041	2.943	688	2.424	1.259

Table 7. Means of days to heading of the preliminary yield Trial at four locations, 1995/96.

Entry no.	Nubaria	Ismailia	Mallawy	New Valley	Mallawy
1	97.7	98.7	86.3	78.7	90.3
2	96.3	101.3	84.7	75.0	89.3
3	96.7	101.0	87.7	76.7	90.5
4	96.0	105.0	89.0	77.7	91.9
5	96.7	97.0	91.3	76.3	90.3
6	98.0	93.7	91.0	75.0	89.4
7	96.3	97.3	82.3	76.0	90.5
8	96.0	98.7	90.7	76.7	90.5
9	99.3	98.0	90.3	81.7	82.3
10	101.7	92.7	88.7	77.3	90.0
11	96.0	103.3	92.3	80.3	93.0
12	96.7	103.7	91.7	81.3	93.3
13	97.3	104.7	93.3	81.3	94.1
14	96.0	105.7	91.0	75.7	92.0
15	96.0	95.3	86.0	76.0	88.3
16	96.7	97.3	90.0	78.7	90.6
17	96.0	99.0	92.0	76.7	90.9
18	96.0	97.7	90.0	76.3	90.9
19	92.3	90.3	84.7	76.7	86.0
20	92.7	91.3	84.3	71.7	85.0
21	100.0	91.7	85.3	76.3	88.3
22	104.0	98.7	94.0	77.7	93.5
23	99.3	102.3	90.0	76.7	92.0
24	98.3	97.0	91.7	78.3	91.3
25	107.7	106.3	98.7	82.3	98.7
26	103.0	93.0	91.7	76.3	91.0
27	97.7	103.7	94.3	80.7	94.0
28	101.0	108.0	97.0	81.0	96.7
29	95.0	90.7	82.7	75.0	85.8
30	99.0	104.7	94.7	70.0	92.0
31	101.0	105.3	92.0	82.3	95.1
32	102.0	105.3	94.3	81.7	95.8
Mean	98.0	99.3	90.4	77.0	91.3
CV%	3.19	4.29	2.12	1.74	3.2
LSD (0.05)	5.1	6.9	3.1	2.2	4.6

were observed among genotypes for the date of heading over locations. The earliest genotypes were nos. 20 and 29 (85 days). These two genotypes were earlier than the national check Giza 123 by 5 days on the average.

Significant differences among genotypes in plant height were observed at Nubaria, Mallawy, and the New Valley and over locations (Table 8). The average plant height of genotypes over all environments showed that the tallest genotypes were nos. 31, 12, 11, 27, 30, 24, 18, 16 and 14 in this order. On the other hand, it was found in each location that 10 genotypes at Nubaria and 12 at Mallawy were significantly taller than the national check by about 8-27 cm at Nubaria and 23-43 cm at Mallawy, respectively. Regarding environmental variability, it was found that, on the average, the tallest genotypes were found at Mallawy followed by the New Valley, whereas the shortest genotypes were found at Ismailia (poor sandy soils).

Straw yield varied significantly among the investigated locations (Table 9). The highest value of straw yield over all locations was 14, 835 kg/ha obtained from genotype no. 31. On the other hand, genotypes nos. 19, 25 and 31 at Ismailia and nos. 7, 25, 27, 31 and 32 at Mallawy and nos. 18 and 30 at the New valley had the highest straw yield which was significantly different from the national check Giza 123. The highest straw yield among locations was obtained from Nubaria (19, 970 kg/ha) followed by Mallawy (18, 850 kg/ha).

All types of environmental factors, i.e., temperature, day length, soil fertility, soil salinity, etc and their interactions significantly affect grain yield (Table 10). The highest values for grain yield were obtained from Mallawy with high soil fertility and water availability (8709 kg/ha) followed by Nubaria (4805 kg/ha), while the lowest values were from Ismailia (1374 kg/ha) with poor sandy soil and nutrient and organic matter deficiencies. Highly significant differences were found among genotypes at each location and over all environments. About 11 genotypes, over all locations, significantly outyielded the national check by as much as from 1000 to 1534 kg/ha. On individual location basis, about three genotypes nos. 7, 9 and 32 at Nubaria, three genotypes nos. 10, 19, and 31 at Ismailia, three (nos. 4, 14, and 30) at Mallawy, and 10 genotypes at the New Valley significantly exceeded the national check in grain yield.

3. Advanced yield trial

Differences among locations and genotypes were significant for all the traits studied indicating the presence of genetic variability among those promising barley

Table 8. Means of plant height of the preliminary yield Trial at four locations, 1995/96.

Entry no.	Nubaria	Ismailia	Mallawy	New Valley	Combined
1	91.7	77.5	93.3	107.3	92.4
2	91.7	66.8	113.3	97.7	92.3
3	94.0	65.9	11.7	100.7	93.0
4	92.3	65.8	101.7	101.0	90.2
5	96.0	67.7	111.7	97.3	93.1
6	94.7	74.0	116.7	98.7	96.0
7	96.3	75.2	125.0	103.0	99.8
8	102.3	75.9	116.7	98.3	98.3
9	100.0	73.0	108.3	93.7	93.7
10	88.3	83.9	111.7	107.3	97.8
11	107.3	83.2	136.7	102.3	107.3
12	102.3	91.0	135.0	109.7	109.5
13	119.0	87.5	128.3	104.0	109.7
14	99.0	77.5	125.0	103.3	101.2
15	96.7	70.9	103.3	94.0	91.2
16	104.0	80.3	113.3	108.0	101.4
17	81.3	78.2	103.3	100.7	90.8
18	96.3	88.7	120.0	112.7	104.4
19	87.7	83.1	106.7	94.0	92.8
20	84.3	68.3	103.3	95.0	87.7
21	86.0	82.0	110.0	98.0	94.0
22	90.3	77.8	96.7	90.0	84.7
23	100.0	81.5	100.0	103.3	96.2
24	102.0	85.3	118.3	112.3	104.5
25	104.7	85.3	113.3	98.7	100.5
26	92.0	65.2	90.0	96.0	85.8
27	111.0	81.0	133.3	102.7	107.0
28	96.7	75.2	110.0	98.3	95.0
29	88.3	78.0	113.3	94.3	93.5
30	97.3	93.7	128.3	99.7	104.7
31	116.7	92.1	131.7	119.0	114.8
32	95.0	79.7	98.3	89.7	90.6
Mean	97.0	78.5	113.3	100.0	97.5
CV%	5.8	15.0	11.1	9.6	10.5
LSD (0.05)	9.2	NS	20.5	15.7	8.2

Table 9. Means of straw yield (kg/ha) of the preliminary yield Trial at four locations, 1995/96.

Entry no.	Nubaria	Ismailia	Mallawy	New Valley	Combined
1	21.277	3.771	16.303	7.711	12.265
2	17.760	2.819	18.445	10.138	12.290
3	22.550	3.530	15.827	10.079	12.996
4	22.556	4.184	16.779	9.472	13.247
5	19.599	3.402	17.374	8.020	12.099
6	20.438	4.275	16.303	8.782	12.449
7	23.248	3.711	22.015	9.579	14.638
8	19.629	2.896	19.278	5.140	11.736
9	20.349	6.073	17.255	4.123	11.950
10	19.575	5.984	18.088	9.240	13.222
11	21.354	3.963	20.349	7.532	13.300
12	22.294	6.183	20.587	9.163	14.556
13	19.379	2.807	18.802	7.818	12.201
14	19.664	2.406	20.468	8.478	12.754
15	16.546	4.961	17.969	7.532	11.752
16	22.943	4.386	17.731	7.253	13.078
17	16.896	6.390	19.397	8.151	12.709
18	19.635	5.018	16.898	11.441	13.248
19	17.255	7.174	18.683	8.431	12.885
20	17.945	3.479	20.111	7.098	12.158
21	21.074	4.783	19.754	8.437	13.512
22	18.421	6.503	17.255	6.539	12.179
23	18.379	6.521	14.756	4.956	11.153
24	20.860	6.040	16.779	8.187	12.966
25	23.954	7.055	21.539	5.991	14.635
26	19.831	4.686	15.470	7.532	11.880
27	15.339	6.390	23.919	5.581	12.807
28	18.135	5.803	20.230	8.092	13.065
29	20.938	5.076	18.802	7.342	13.039
30	22.383	3.332	20.825	12.251	14.697
31	18.760	7.022	23.681	9.877	14.835
32	20.093	5.199	21.539	9.329	14.040
Mean	19.970	4.869	18.850	8.103	12.948
CV%	18.1	42.9	17.95	37.8	23.9
LSD (0.05)	4.840	2.853	4.615	4.106	2.476

Table 10. Means of grain yield (kg/ha) of the preliminary yield Trial at four locations, 1995/96.

Entry no.	Nubaria	Ismailia	Mallawy	New Valley	Combined
1	4.307	1,107	7,616	2.284	3.829
2	4.849	810	7,735	5.331	4.681
3	4.819	1.169	8.687	4.200	4.719
4	3.921	992	11.186	3.974	5.018
5	5.093	1.119	9.758	4.474	5.111
6	4.849	1.436	8.092	4.307	4.671
7	6.503	927	9.401	4.581	5.353
8	5.360	911	9.758	3.427	4.864
9	5.831	1.244	8.806	2.897	4.694
10	4.522	1.988	8.806	5.039	5.089
11	4.825	1.510	9.282	4.010	4.906
12	5.670	1.373	9.282	2.737	4.765
13	4.718	1.298	8.211	2.653	4.220
14	5.622	896	10.472	3.659	5.162
15	4.575	1.107	9.282	4.367	4.833
16	5.616	1.325	8.806	2.861	4.652
17	5.117	1.344	8.211	5.414	5.021
18	4.462	1.169	9.282	6.408	5.330
19	3.867	2.345	8.449	4.063	4.681
20	4.367	1.280	6.426	4.206	4.070
21	4.807	1.624	9.163	5.842	5.363
22	4.188	1.469	7.973	1.790	3.855
23	3.635	1.570	6.069	2.778	3.513
24	4.426	1.694	8.211	4.902	4.808
25	4.605	1.869	8.330	2.933	4.434
26	5.158	1.263	7.616	4.248	4.571
27	3.700	1.285	10.234	4.533	4.938
28	4.176	1.812	9.044	4.284	4.829
29	5.539	1.468	8.211	4.319	4.884
30	5.283	1.249	11.543	3.218	5.323
31	3.552	2.140	9.401	5.593	5.171
32	5.789	1.167	5.355	3.760	4.018
Mean	4.805	1.374	8.709	4.034	4.730
CV%	22.4	35.2	22.4	32.2	27.7
LSD (0.05)	1.465	789	2.663	2.118	1.049

lines and cultivars. Six genotypes (nos. 2, 8, 13, 14, 15 and 16) had similar number of days to heading as Giza 123 (Table 11). For the location differences, the New Valley had the earliest genotype values followed by El-Mataana and Mallawy, while Ismailia was the latest in heading date. This was due to the temperature gradient among those locations.

Regarding plant height, mean plant height across the five environments ranged from 81.2 cm at the New Valley to 107.5 cm at Kom Ombo (Table 12). Over all environments, genotype no. 8 was the tallest followed by nos. 14 and 6 with significant difference from the national check.

The results of straw yield in Table 13 show that genotype no.11 had the highest value of straw yield (11313 kg/ha) over all environments and significantly exceeding the national check. On the individual location basis, genotypes nos. 3 and 11 at Ismailia, 2, 4, and 7 at Mallawy, and genotype no. 16 at the New Valley outyielded the national check significantly.

Data presented in Table 14 show significant differences among genotypes and locations for the grain yield character. However, on the individual location basis, genotypes nos. 11 and 15 at Ismailia and nos. 3, 7 and 9 at El-Mataana significantly outyielded the national check.

4. Demonstration yield trial (DYT)

This experiment included the most promising nine lines and cultivars plus the national check Giza 123 selected from the Advanced Yield Trial on the basis of agronomic performance, yield potential, and disease resistance. The results in Table 16 showed that none of the genotypes was significantly earlier or taller than the national check. For the biological, straw, and grain yields, and harvest index (Tables 17 and 18), only four genotypes, nos. 2, 3, 6 and 7, slightly outyielded Giza 123 but insignificantly. Genotype no. 8 had the highest BY and SY on the average and was the second tallest line. There was a positive correlation, to some extent, between plant height and BY as was found by many researchers.

CONCLUSION

In conclusion, at least two genotypes exhibited high potential in GY, BY, and SY, under different stress conditions in the newly reclaimed lands. One of these genotypes is the newly released drought tolerant cultivar, Giza 126 which was devel-

Table 11. Means of days to heading of the Advanced Yield Trial at four locations, 1995/96.

Entry no.	Ismailia	Mallawy	El-Mataana	New Valley	Combined
1	94.0	84.7	82.3	77.7	84.6
2	96.0	85.3	83.0	78.6	85.7
3	95.7	87.7	87.0	78.3	87.1
4	102.3	86.3	84.7	80.0	88.3
5	104.3	89.0	87.7	78.0	89.7
6	103.0	89.0	88.3	78.3	89.6
7	105.0	92.7	90.3	80.0	82.0
8	94.0	83.6	85.6	76.0	84.8
9	106.0	82.3	94.0	78.3	82.6
10	98.7	88.3	89.3	78.3	88.6
11	95.0	88.2	90.2	75.5	87.3
12	103.0	94.3	94.0	80.7	93.0
13	95.7	82.7	80.7	75.6	83.6
14	95.5	82.3	84.7	76.7	84.8
15	94.6	84.0	81.3	77.5	84.3
16	93.3	84.5	82.0	78.3	84.5
Mean	98.5	87.2	86.5	78.0	87.5
CV%	3.49	2.47	1.44	1.19	2.48
LSD (0.05)	5.7	3.4	2.1	1.5	1.7

Table 12. Means of plant height (cm) of the Advanced Yield Trial at five locations, 1995/96.

Entry no.	Ismailia	Mallawy	El-Mataana	Kom Ombo	New Valley	Combined
1	76.8	98.3	106.0	105.7	80.7	93.5
2	90.6	100.0	100.7	104.3	82.0	95.5
3	81.7	97.7	100.3	105.3	88.0	94.6
4	86.7	100.0	102.7	104.3	74.7	93.6
5	83.2	105.0	104.0	107.3	78.3	95.5
6	92.9	96.7	100.7	116.3	84.0	98.1
7	82.2	95.0	107.0	109.0	84.0	95.4
8	89.3	108.3	106.3	115.7	85.3	101.0
9	84.0	106.7	104.7	103.7	78.7	95.5
10	86.5	87.0	104.3	105.7	84.0	93.5
11	89.3	92.3	100.7	104.6	76.7	92.7
12	89.8	92.7	98.3	104.0	66.5	90.3
13	81.9	100.0	97.0	110.0	74.3	92.6
14	82.6	99.3	100.7	115.5	88.0	99.1
15	88.2	96.7	101.7	11.5	91.0	97.8
16	78.5	103.3	98.7	96.3	83.3	92.0
Mean	85.8	98.6	102.1	107.5	81.2	95.1
CV%	9.41	6.30	4.53	3.63	8.89	6.53
LSD (0.05)	11.0	10.4	6.4	6.5	12.0	4.4

Table 13. Means of straw yield (kg/ha) of the Advanced Yield Trial at five locations, 1995/96.

Entry no.	Ismailia	Mallawy	El-Mataana	Kom Ombo	New Valley	Combined
1	4.028	13.246	15.057	10.744	6.896	9.994
2	4.532	16.502	11.235	9.769	5.939	9.595
3	6.778	14.763	13.941	12.482	6.936	10.980
4	5.319	16.983	12.701	12.350	5.480	10.566
5	5.239	13.764	11.653	11.981	5.625	9.652
6	3.236	14.800	13.585	11.481	6.053	9.831
7	4.839	16.095	13.057	9.532	6.243	9.953
8	4.639	13.690	11.729	10.612	5.788	9.292
9	4.549	14.430	14.788	7.268	5.117	9.230
10	5.971	13.024	10.041	8.953	7.903	9.178
11	7.242	15.133	14.653	12.008	7.528	11.313
12	6.187	13.135	11.735	10.322	5.490	9.374
13	4.334	15.022	5.785	12.482	6.576	8.840
14	5.768	14.504	5.266	12.271	6.761	8.914
15	6.055	12.025	6.664	8.347	6.502	7.951
16	3.304	14.504	13.775	9.401	10.744	9.497
Mean	5.126	14.476	11.604	10.625	6.344	9.635
CV%	38.8	11.61	14.40	18.74	18.49	17.92
LSD (0.05)	2.744	2.318	2.787	3.320	1.619	1.034

Table 14. Means of grain yield (kg/ha) of the Advanced Yield Trial at five locations, 1995/96.

Entry no.	Ismailia	Mallawy	El-Mataana	Kom Ombo	New Valley	Combined
1	1.189	7.363	3.372	3.186	3.597	3.741
2	1.462	6.438	3.331	2.791	3.576	3.519
3	1.879	5.920	4.742	3.291	3.716	3.909
4	1.674	5.439	3.765	2.659	3.876	3.482
5	1.310	7.437	3.388	2.686	3.573	3.678
6	981	6.327	3.483	2.580	4.044	3.483
7	1.376	7.104	4.358	3.581	4.065	4.097
8	1.909	7.770	3.787	3.054	3.727	4.049
9	1.666	7.881	4.686	3.528	2.971	4.146
10	1.798	6.105	2.941	3.502	3.779	3.625
11	2.081	6.327	3.079	3.423	3.970	3.776
12	1.916	6.475	2.789	3.239	3.232	3.570
13	1.326	6.512	2.099	3.634	3.679	3.450
14	1.890	6.623	2.492	3.239	3.758	3.600
15	2.048	7.252	1.917	2.844	3.724	3.557
16	1.136	6.956	3.800	2.765	3.277	3.586
Mean	1.602	6.745	3.389	3.125	3.660	3.704
CV%	36.16	14.58	16.90	22.61	23.30	20.41
LSD (0.05)	798	1.355	955	972	1.163	452

Table 15. Mean of harvest index of the Advanced Yield Trial at five locations, 1995/96.

Entry no.	Ismailia	Mallawy	El-Mataana	Kom Ombo	New Valley	Combined
1	23	36	18	22	34	27
2	24	28	22	23	37	27
3	21	28	25	20	34	26
4	23	24	22	17	42	26
5	19	35	22	18	39	27
6	23	29	20	18	40	26
7	23	30	24	27	40	29
8	29	36	24	22	39	30
9	27	35	24	32	34	31
10	22	31	22	27	32	27
11	22	29	17	22	34	25
12	23	33	20	24	36	28
13	24	30	26	22	36	28
14	25	31	32	20	36	29
15	25	36	22	25	38	29
16	26	32	21	22	33	27
Mean	24	31	23	23	36	27
CV%	14.33	11.98	10.74	18.32	12.78	13.71
LSD (0.05)	5	6	4	7	6	3

Table 16. Mean of heading date and plant of the Demonstration Yield Trial at three locations, 1995/96.

Entry no.	Heading date			Plant height		
	Ism.	Nub.	New Val.	Ism.	Nub.	New Val.
1	95.0	90.3	74.7	71.7	75.0	108.7
2	98.3	88.3	77.3	71.3	76.7	107.3
3	92.0	87.7	73.0	64.2	67.7	103.3
4	102.3	91.7	77.0	75.8	75.7	100.0
5	98.0	89.3	75.3	71.1	72.3	101.0
6	100.0	95.0	81.0	76.5	77.3	102.7
7	89.0	87.7	74.7	73.3	83.7	109.3
8	92.3	87.0	73.7	75.2	75.7	114.0
9	94.0	92.0	74.7	71.8	68.0	87.7
10	94.3	89.3	75.3	70.5	58.3	80.0
Mean	86.0	89.8	75.7	72.1	73.0	101.4
CV%	3.06	2.49	2.48	11.5	11.5	6.47
LSD (0.05)	5.0	3.8	3.2	NS	11.9	11.2
Combined			86.7			85.1
			88.0			85.1
			84.2			78.4
			90.3			83.8
			87.6			81.5
			92.0			85.5
			83.8			88.8
			84.3			88.3
			86.9			75.8
			86.3			69.6

Table 17. Biological and straw yields of the Demonstration Yield Trial at three locations.

Entry no.	Biological yield (kg/ha)			Straw yield (kg/ha)		
	Ism.	Nub.	New Val.	Ism.	Nub.	New Val.
1	6.300	4.909	11.733	4.864	3.455	8006
2	5.200	6.629	11.666	3.970	3.570	7613
3	4.066	7.883	9.200	3.011	5.222	5293
4	4.266	4.586	9.400	3.183	3.283	6143
5	6.133	6.844	8.133	4.819	4.599	5212
6	6.866	5.446	11.333	5.142	3.673	7442
7	4.733	7.130	10.000	3.390	4.939	6450
8	5.666	7.847	11.466	4.486	6.143	7790
9	4.933	6.951	10.733	3.780	4.563	7756
10	4.333	7.560	9.066	3.379	5.160	5880
Mean	5.249	6.578	10.273	4.002	4.461	6758
CV%	20.5	45.3	17.1	23.2	45.4	21.4
LSD (0.05)	1.836	NS	NS	1317	NS	NS
			284			30.2
			7.367			5074
			6.986			4806
			7.036			4509
			7.882			4203
			7.831			4876
			7.050			5419
			7.647			4926
			7.831			6140
			7.831			5366
			7.831			4806

Table 18. Grain yield and harvest index of the Demonstration yield Trial at three locations.

Entry no.	Grain yield (kg/ha)			Harvest Index		
	Ism.	Nub.	New Val.	Ism.	Nub.	New Val.
1	1.435	1.453	3.726	23	29	32
2	1.230	3.058	4.053	24	46	35
3	1.055	2.660	3.906	27	33	46
4	1.083	1.302	3.256	26	28	35
5	1.314	2.244	2.921	22	31	35
6	1.724	1.773	3.890	25	36	34
7	1.343	2.191	3.549	29	30	36
8	1.180	1.704	3.676	21	24	32
9	1.153	2.387	2.977	23	33	26
10	954	2.400	3.186	22	31	35
Mean	1.247	2.117	3.726	24	32	35
CV%	30.3	34.9	22.1	26.2	24.3	23.1
LSD (0.05)	NS	NS	NS	NS	11	NS
			NS			NS
			2.292			30
			36.5			24.5

oped and released mainly for drought tolerance under rainfed condition. This genotype proved to be suitable for the newly reclaimed areas as well. The other promising genotype had in genetic background, CC 89, an old check cultivar recommended for these areas which explains the superiority of this genotype.

REFERENCES

1. El-Sayed, A.A., M.M. Noaman, F.A. Asaad, and A.M. El-Sherbiny. 1995. New barley cultivar tolerant to salinity conditions in Fayoum governorate. Conf. Agric. Res. & Development in Fayoum. Nov., 1995.
2. Noaman, M.M., A.A. El-Sayed, A.Zahour, F.A. Asaad & F.M. El-Rayes. 1990. Yield stability characteristics of some barley cultivars grown under different environments II. Under mild water stress conditions. Proc. The 4th Conf. of the Egyptian Soc. Crop Sci. Sep. 15-16, Vol. 1: 51-57 .
3. Steel, R.G.D., and J.H. Torrie. 1980. Principles and Procedures of Statistics, 2nd ed. McGraw-Hill Book Co., Inc., New York. 633-pp.

إستنباط أصناف من الشعير تحت ظروف التقسية المختلفة فى مصر

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أقيمت أربعة مستويات من تجارب اختيار الأصناف وهى تجارب الغربية وتجارب الاختبارات الأولية وتجارب الاختبارات المتقدمة ثم تجارب الإختيارات الموسعة للأصناف خلال الموسم الزراعى ١٩٩٥ / ١٩٩٦ وذلك تحت ظروف بيئية مختلفة. أقيمت تجارب الغربية فى محافظة الأسماعيلية (تحت ظروف الرى بالرش فى أراضى رملية فقيرة) ومحافظة ملوى (درجات حرارة عالية وأصابة بالمن) بينما أقيمت تجارب الاختبارات الأولية للأصناف فى ستة مناطق وهى النوبارية (أراضى جديدة) وسخا (انتشار الأمراض) والسرو (أراضى ذات نسبة ملوحة عالية) وملوى والوادي الجديد (حرارة مرتفعة). فى حين أقيمت تجارب الاختيارات المتقدمة فى خمسة مناطق وهى الأسماعيلية وملوى والمطاعة وكوم أمبو والوادي الجديد. وأخيرا أقيمت التجارب الموسعة فى ثلاث مناطق وهى الأسماعيلية والنوبارية والوادي الجديد.

وقد أوضحت النتائج ما يلى :-

أولاً: تجارب الغربية

- شوهدت اختلافات واضحة بين الأصناف والسلالات فى محصول الحبوب تراوحت بين ٢٢.٨ الى ٥٧٥٥ كجم/هـ وقد تفوق صنف واحد على الصنف المحلى (المقارنة) فى كل من محصول الحبوب ومحصول القش.

ثانياً: تجارب الاختبارات الأولية

- أظهرت النتائج وجود تسعة سلالات مبكرة فى طرد السنابل عن صنف المقارنة وذلك بفترة تتراوح من ٤ - ٩ أيام فى منطقة الأسماعيلية. بينما فى الوادي الجديد فان غالبية التركيب الوراثية كانت مبكرة معنوياً عن صنف المقارنة. هذا وقد تفوقت سلالتان نسبياً على صنف المقارنة فى كل من محصول الحبوب والمحصول البيولوجى الكلى. وعلى مستوى المناطق، فقد أظهرت منطقة الوادي الجديد كفاءة عالية بالمقارنة بمنطقة الاسماعيلية.

ثالثاً: تجارب الاختبارات المتقدمة

- أظهرت النتائج وجود ستة سلالات وأصناف مبكرة فى طرد السنابل معنوياً عن صنف المقارنة خاصة فى منطقة الأسماعيلية وقد تفوقت سلالة واحدة على صنف المقارنة فى المحصول الكلى ومحصول الحبوب بالرغم من أنه أعطى دليل حصاد منخفض (٢٥٪).

رابعاً: تجارب الاختبارات الموسعة

- كانت النباتات تحت ظروف الوادي الجديد مبكرة فى طرد السنابل بالمقارنة الأخرى تحت الدراسة وكان متوسط طرد السنابل هو ٧٢ يوم فى حين أنها كانت متأثرة من حيث طول النبات بدرجة كبيرة نتيجة للحرارة العالية وقصر فترة النمو. وقد كان أعلى محصول كلى وقش أمكن الحصول عليه من منطقة الوادي الجديد أيضاً.

والخلاصة أنه أمكن التوصل الى تركيبين وراثيين ذات كفاءة إنتاجية عالية من حيث محصول الحبوب والمحصول الكلى ومحصول القش تحت الظروف القاسية للمناطق حديثة الإستصلاح. أحد هذين الصنفين هو الصنف جيزة ١٢٦ والمستنبط حديثاً تحت ظروف الجفاف والزراعة المطرية بينما الصنف الآخر فهو مستنبط من أحد الأباء القديمة وهو هجين مركب ٨٩ (هـ . م. ٨٩) والذي كان ينتشر فى هذه المناطق.