

**Shandaweel 1: a new bread wheat (*Triticum aestivum* L.)
Cultivar**

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ABSTRACT

The new promising bread wheat cultivar Shandaweel 1 has been selected from one of the advanced lines among the International Maize and Wheat Improvement Center collections (CIMMYT) grown in wheat research department, Field Crops Research Institute, ARC. Egypt at Shandaweel Research Station. The grain yield of the new cultivar Shandaweel 1 was evaluated through 99 experiments conducted at four different levels; (8 macro, 56 micro and 35 verification yield trials) in 2005/2006, 2006/2007, 2007/2008 and 2011/2012 seasons, respectively. Results proved superiority of the new bread wheat cultivar Shandaweel 1 compared to the commercial checks cultivars Sakha 93, Sakha 94, Gemmeiza 9 and Giza 168 for grain yield at North, South and Middle Delta and Upper Egypt regions. Moreover, the results of the verification yield trials ensure the superiority of Shandaweel 1 cultivar on the commercial wheat cultivar Giza 168 at North, Middle, South Delta and Upper Egypt. Also the superiority of Shandaweel 1 cultivar on the commercial wheat cultivar Giza 168 and Gemmeiza 9 at North and South Delta and the Out Valley region was observed and recorded.

Thus, we can highly recommend the new cultivar Shandaweel 1 to be grown at North Delta, South Delta, Middle Delta, Middle and Upper Egypt and the Out Valley regions.

INTRODUCTION

Wheat is the most important cereal crop in terms of its total acreage and production; also it is a staple diet for more than one third of the world population. Wheat contributes more calories and protein to the world diet than any other cereal crop.

Increasing production / unit area appears to be the mainly possible alternative of reducing the wheat production gap. The required yield increases may be achieved by introducing high yielding cultivars and simultaneously implementing improved cultural practices. Such improved varieties must resist or tolerate the unfavorable environments and be stable in broad spectrum of environments.

Heat stress is a common abiotic stress that causes stunted plants, reduced tillering, and accelerates development leading to small heads, shriveled grains and finally translated to low yields (Tawfelis, 2006). Respecting agronomic traits affected by this abiotic stress such as days to heading, days to maturity, plant height and grain yield can be found easily identifiable traits as indices for heat tolerance. Therefore, evaluation of breeding materials under different environments has to be done. Understanding the nature of genotype x environment interaction empowers breeders to test and select of more efficient genotypes. Breeding genotypes with wide adaptability has long been a universal goal among plant breeders. To achieve this goal, evaluating breeding lines over time and space has become an integral part of any plant breeding program. Adaptability and stability performance of cultivars over environments are important for national policy in crop production, therefore a grain producer is interested primarily in growing a cultivar with high yield and stability performance at his location.

In mid 1990 s, Sids 1, the commercial bread wheat cultivar was released for cultivation in Middle and Upper Egypt as well as in saline soils (Ghanem, Enayat et al., 1996). Two high yielding bread wheat cultivars, Sakha 93 and Giza 168 were released by Shehab El-Din et al., in 1999 year, when they proved their superiority and wide adaptability to all Egyptian districts. Sakha 93 cultivar showed good tolerance to unfavorable environmental conditions, e.g. salinity and drought. In different successive series, further bread wheat cultivars, i.e. Gemmeiza 7 (Shehab El-Din et al., 2000), Gemmeiza 9 (Mosaad et al. 2000). Sakha 94 (Shehab El-Din et al., 2005), Gemmeiza 10 (El-Shami et al., 2005) and Sids 12 (Mahrous et al., 2009) were released during the last eight years, for the same goal.

The present investigation is actually an evaluation for yielding ability of the new developed bread wheat cultivar, Shandaweel 1, comparing to the superior Egyptian commercial cultivars.

MATERIALS AND METHODS

The new promising cultivar Shandaweel1, has been selected from the exotic materials tested at Shandaweel Agricultural Research Station, Egypt. The cross and pedigree of the new cultivar is :

Site / Mo / 4/ Nac / Th. Ac //3* Pvn /3/ Mirlo / Buc

CMSS93 B00S 67S -72Y - 010M - 010Y - 010M – 3Y – 0M – 0THY – 0SH

To evaluate the yielding ability and rust resistance of the new cultivar Shandaweel 1, the following characters were studied:

1-Yield evaluation :

The new released cultivar Shandaweel 1, was tested in 2005/2006 growing season for grain yield ability against those of the commercial cultivars Sakha 93, Sakha 94, Gemmeiza 9 and Giza 168 in preliminary yield trials conducted at eight research stations, representing different locations, Sakha (North Delta), El-Gemmeiza (Middle Delta), Kafr-El Hamam (East Delta), Sids (Middle Egypt), Shandaweel , El-Matanaa and Kom- Ombo (Upper Egypt) and El- Nobariaa (Out Valley) . The statistical design used in these trials was the randomized complete block design (RCBD) with four replicates according to *Steel and Torrie (1980)*. The plot area was 4.2 m² included 6 rows, 3.5m long and 20 cm apart.

Moreover, Shandaweel 1, was tested in all over the country for yielding ability versus the same commercial cultivars (checks) in 28 advanced yield trials including 16 entries in 2006/2007 growing season and 27 advanced yield trials in 2007/2008 growing season including 12 entries. In these advanced yield trials, all promising lines as well as the commercial wheat cultivars were tested in large plot area experiments (3 x 3.5= 10.5m² each). All recommended cultural practices for each region were applied on all trials.

For the demonstration aspects, 35 verification yield trials for Shandaweel 1, and the local checks were conducted in both old and new lands in 2011/2012 growing season. The area of each selected field was 500 m² (100 m² for each cultivar). At harvesting time, five randomly selected samples (4 m² each) from each plot were harvested and threshed. The kernels of each sample were weighted and adjusted to ardab/ faddanto estimate the grain yield.

2-Disease severity;

Disease severity score, expressed as the % coverage of leaves with rust pustules and plant reaction, to indicate the infection type; 0=immune ,R=resistant, MR=moderately resistant, MS=moderately susceptible and S= Susceptible were recorded. Moreover, Average Coefficient of infection (ACI) was calculated using adapted scale of Saari and Wilcoxson (1974) as follows:

O=0.0, R=0.2, MR=0.4, X(mixed reaction)= 0.6, MS=0.8 and S=1.0

RESULTS AND DISCUSSION

1- Preliminary yield trials:

The results in Table 1 shows the grain yields of the new cultivar Shandaweel 1 and the four bread wheat commercial cultivars, Sakha 93, Sakha 94, Gemmeiza 9 and Giza 168 in the preliminary yield trials conducted at eight research stations in 2005/2006 growing season. These research stations represent the old and new lands of Egypt. It is obvious from this table that Shandaweel 1 had significantly surpassed Sakha 93 at four out of the eight tested locations. Moreover, Shandaweel 1 was not significantly differed from the other three checks. The results indicated that Shandaweel 1 cultivar surpassed Sakha 93 cultivar in the preliminary yield trials by 13.63 % over eight locations. The results also show that Shandaweel 1 cultivar exceeded Sakha 93 cultivar at El-Gemmeiza location by 12.20% , 39.68% at Kafr-El Hamam, 17.66% at Shandaweel and by 18.25% at El- Nobaria location. In addition, Shandaweel 1 cultivar produced the highest grain yield at the over all mean locations compared with Sakha 93, Gemmeiza 9 and Giza 168 cultivars.

Table 1: Grain yield (ard/fad) of the preliminary yield trials for Shandaweel 1 and four bread wheat cultivars in 2005/2006 season.

Cultivars	Locations								Mean
	Sakha	EL-Gemmeiza	Kafr-EL Hamam	Sids	Shandaweel	EL-Matanaa	Kom Ombo	EL-Nobaria	
Sakha 93	23.95	19.75	18.07	23.84	18.46	17.44	22.27	15.89	19.96
Sakha 94	24.85	20.17	24.35	22.75	23.61	16.05	23.92	17.75	21.67
Gemmeiza 9	23.36	21.66	23.80	22.86	20.85	14.85	20.76	20.96	21.14
Giza 168	22.88	21.74	21.96	23.30	22.37	18.68	22.67	17.68	21.41
Checks mean	23.76	20.83	22.05	23.19	21.32	16.76	22.41	18.07	21.05
Shandaweel 1	25.13	22.16	25.24	24.94	21.72	19.04	21.41	18.79	22.30
LSD 5%	1.73	2.16	3.62	2.87	2.53	2.77	3.62	2.57	0.95
CV%	5.52	7.85	12.08	9.22	8.75	25.70	13.34	11.12	9.83

2-Advanced yield trials :

The results of the advanced yield trials at North Delta in 2006/2007 season revealed that Shandaweel 1 significantly overcame the four checks at one location only (Beheira) and had significantly exceeded the three checks, Sakha 93, Gemmeiza 9 and Giza 168 at El-Serwand Sakha 93 and Giza 168 at Etai El-Barood location (Table 2-a). Meanwhile, the over all mean of North Delta, proved that, Shandaweel 1 mean was significantly higher than those of the three checks, Sakha 93, Gemmeiza 9 and Giza 168 while, the difference did not reach the level of significance with Sakha 94. It could be stated that Shandaweel 1 cultivar significantly surpassed Sakha 93, Gemmeiza 9 and Giza 168 cultivars by 46.94, 51.12 and 27.92% at El-Serw location and exceeded the four checks, Sakha 93, Sakha 94, Gemmeiza 9 and Giza 168 by

12.30, 25.94, 49.03 and 16.9%, respectively at Behira location. Meanwhile, the grain yield of the new bread wheat cultivar Shandaweel 1 exceeded significantly the two checks Sakha 93 and Giza 168 at Etai El-Barod and the check cultivar Gemmeiza 9 at Sakha location. While, at Tag El-Ezz, Dakhlia 1 and Dakhlia 2 locations no significant difference between Shandaweel 1 and each of the four checks was detected. In addition, the results of the advanced yield trials at South Delta in 2006/2007 season shown in Table 2-b clearly indicated that Shandaweel 1 cultivar significantly overcame the four commercial wheat checks at one location only (Sharkia 2) and had significantly exceeded the three checks, Sakha 94, Gemmeiza 9 and Giza 168 at Sers El-Liaan and Sakha 93, Sakha 94 and Giza 168 at Kafr-El Hamam location. Meanwhile, in the over all mean of South Delta, Shandaweel 1 cultivar significantly surpassed Sakha 93, Sakha 94, Gemmeiza 9 and Giza 168 cultivars by about 15.37, 11.58, 11.82 and 9.60%, respectively.

Table 2a: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and four bread wheat cultivars at North Delta in 2006/2007 season.

Cultivars	Locations							Mean
	EL-Serw	Sakha	Tag EL-EZZ	Dakh lia-1	Dakh Lia2	Etai EL-Barood	Beheira	
Sakha 93	13.72	26.66	22.67	17.67	20.19	21.04	24.64	20.94
Sakha 94	16.36	27.05	21.40	17.00	20.36	24.87	21.97	21.29
Gemmeiza 9	13.34	25.58	19.40	12.00	20.96	24.54	18.57	19.20
Giza 168	15.76	27.43	19.27	14.67	17.35	23.90	23.67	20.29
Checks mean	14.80	26.68	20.69	15.34	19.72	23.59	22.21	20.43
Shandaweel 1	20.16	28.42	20.40	13.74	17.45	26.37	27.67	22.03
LSD 5%	3.85	1.86	3.52	2.63	3.39	2.31	0.99	1.04
CV%	16.74	4.7	12.35	12.66	12.24	6.68	3.11	9.56

Table 2b: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and four bread wheat cultivars at South Delta in 2006/2007 season.

Cultivars	Locations							Mean
	EL-Gemmeiza	Sers EL-Liaan	Kafr-EL Hamam.	Sharkia 1	Sharkia 2	Monufia	Qaluobia	
Sakha 93	25.50	26.80	22.80	16.85	21.03	21.60	23.87	22.64
Sakha 94	27.04	21.47	22.01	19.92	24.17	26.07	23.17	23.41
Gemmeiza 9	24.94	20.04	25.48	19.86	18.46	26.60	28.14	23.36
Giza 168	27.30	22.84	22.81	17.70	23.65	27.94	26.40	24.09
Checks mean	26.20	22.79	23.28	18.59	21.83	25.55	25.40	23.37
Shandaweel 1	28.40	27.84	26.06	18.84	27.00	27.60	27.07	26.12
LSD 5%	--	3.11	2.71	1.96	2.64	4.07	--	1.22
CV%	5.09	8.79	8.16	7.47	8.09	11.06	14.60	9.67

Table 2c: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and four bread wheat cultivars at Middle Egypt in 2006/2007 season.

Cultivars	Locations					Mean
	Giza	Fayoum	Sids	Mallawy	Menia	
Sakha 93	26.74	26.34	30.20	21.88	23.10	25.65
Sakha 94	29.75	27.00	28.67	19.50	21.35	25.25
Gemmeiza 9	26.88	27.34	28.57	19.66	23.10	25.11
Giza 168	29.19	28.47	28.64	19.58	24.50	26.08
Checks mean	28.14	27.29	29.02	20.16	23.01	25.52
Shandaweel 1	28.57	26.34	29.50	20.27	20.30	25.00
LSD 5%	2.27	--	--	2.69	2.91	1.13
CV%	6.01	7.82	4.76	9.15	9.53	7.31

Table 2d : Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1

Cultivars	Locations			Mean
	Shandaweel	EL- Matanaa	KomOmbo	
Sakha 93	20.84	23.47	14.65	19.65
Sakha 94	22.70	23.60	19.71	22.01
Gemmeiza 9	17.71	23.27	17.05	19.34
Giza 168	19.17	24.27	17.16	20.20
Checks mean	20.11	23.66	17.15	20.30
Shandaweel 1	20.96	25.14	18.78	21.63
LSD 5%	2.02	--	3.24	1.62
CV%	6.89	9.03	11.86	9.37

Table 2 e : Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and four bread wheat cultivars at Out Valley in 2006/2007 season.

Cultivars	Locations						Mean
	Nobarria	Ismaliaa	Assuit	New Valley	Toshkey	Eoinaat	
Sakha 93	26.65	7.27	14.87	14.67	17.32	15.07	16.00
Sakha 94	27.84	9.28	14.54	17.24	14.17	14.87	16.30
Gemmeiza 9	26.50	7.76	11.67	16.04	12.69	11.44	14.40
Giza 168	26.46	10.18	14.47	14.80	15.96	13.30	15.90
Checks mean	26.86	8.63	13.88	15.69	15.04	13.67	15.65
Shandaweel 1	26.47	9.25	14.80	15.77	14.55	12.80	15.61
LSD 5%	--	0.55	1.79	1.79	2.55	--	0.90
CV%	8.16	3.79	8.64	8.00	12.14	14.19	9.95

Concerning Middle Egypt region, data presented in Table 2-c showed that Shandaweel 1 cultivar had no significant difference in grain yield compared to the four wheatchecks either at the tested locations or in the over all mean of Middle Egypt region.

The results presented in Table 2-d for the advanced yield trials carried out at Upper Egypt in 2006/2007 season indicated that, the grain yield of the new bread wheat cultivar Shandaweel 1 exceeded Gemmeiza 9 cultivar by 18.35% at Shandaweel location and exceeded Sakha 93 cultivar by 30.78% at Kom-Ombo location. Also, The results showed that Shandaweel

1cultivarsignificantly surpassed Sakha 93andGemmeiza 9cultivars atoverall locations .

Furthermore, results of the advanced yield trials at Out Valley locations in 2006/2007 season indicated that the new bread wheat cultivar Shandaweel 1 showed insignificant difference in grain yield compared with the check cultivars at all locations and overall locations except producedsignificantly higher yield thanSakha 93 andGemmeiza 9 cultivars at Ismaliaa location andproduced greater yield compared to the cultivar Gemmeiza 9atToshkey ,Eoinaat andAssuit locations(Table 2-e).

The average grain yield of thewheat cultivar Shandaweel 1 compared to those of the commercial wheat cultivarsSakha 93, Gemmeiza 9 and Giza 168 in 27 advanced yield trials conducted at different sites all over the country in 2007/2008 growing season are shown in Tables (3a, b, c,d and e).

Table 3a: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and three bread wheat cultivars at North Delta in 2007/2008 season.

Cultivars	Locations						Mean
	EL-Serw	Dakhliaa1	Dakhliaa2	Sakha	Etai EL-Barod	Behiraa	
Sakha 93	14.55	16.87	19.07	23.29	23.47	26.60	20.64
Gemmeiza 9	13.34	17.60	20.34	20.84	24.74	21.34	19.70
Giza 168	12.96	17.27	21.00	21.01	22.80	25.07	20.02
Checks mean	13.62	17.25	20.14	21.71	23.67	24.34	20.12
Shandaweel 1	13.39	19.47	22.67	20.30	24.54	29.00	21.56
LSD 5%	1.80	1.56	1.35	2.18	1.59	1.95	0.70
CV%	9.51	6.32	4.74	6.99	4.62	5.57	6.11

Table 3b: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and three bread wheat cultivars at South Delta in 2007/2008 season.

Cultivars	Locations								Mean
	EL-Gemmeiza	Sers EL-Liaan	Tag EL-Ezz	Kafr-EL Hamam	Sharkia 1	Sharkia 2	Monufia	Qalubia	
Sakha 93	24.58	26.17	16.90	20.05	21.64	16.54	23.60	28.67	22.27
Gemmeiza 9	24.26	21.94	19.05	18.98	20.17	19.27	24.80	26.54	21.88
Giza 168	24.29	26.37	20.10	20.65	21.40	19.14	24.20	27.94	23.01
Checks mean	24.38	24.83	18.68	19.89	21.07	18.32	24.2	27.72	22.39
Shandaweel 1	24.73	28.70	21.76	16.47	18.20	22.07	22.60	23.07	22.20
LSD 5%	1.45	4.04	1.52	1.82	n.s	2.29	n.s	n.s	1.06
CV%	4.04	10.49	5.73	6.92	8.11	8.51	14.41	9.73	9.51

Table 3c: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and three bread wheat cultivars at Middle Egypt in 2007/2008 season.

Cultivars	Locations					Mean
	Giza	Fayoum	Sids	Mallawy	Menia	
Sakha 93	25.00	31.85	26.07	20.58	20.33	24.77
Gemmeiza 9	25.00	33.95	22.40	19.78	19.62	24.15
Giza 168	26.34	30.80	22.14	21.60	22.76	24.73
Checks mean	25.45	32.2	23.53	20.65	20.90	24.55
Shandaweel 1	25.67	32.38	26.00	20.32	15.41	23.96
LSD 5%	2.07	4.40	1.43	2.37	1.30	1.12
CV%	5.61	9.50	3.87	7.22	4.39	7.03

Table 3d : Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and three bread wheat cultivars at Upper Egypt in 2007/2008 season.

Cultivars	Locations			Mean
	Shandaweel	EL- Matanaa	KomOmbo	
Sakha 93	17.19	22.74	20.66	20.20
Gemmeiza 9	17.50	19.94	15.83	17.76
Giza 168	17.57	23.67	18.68	19.97
Checks mean	17.42	22.12	18.39	19.31
Shandaweel 1	18.57	26.74	21.75	22.35
LSD 5%	2.73	3.81	3.56	1.91
CV%	10.16	11.00	13.30	11.55

Table 3e: Grain yield (ard/fad) of the advanced yield trials for Shandaweel 1 and three bread wheat cultivars at Out Valley in 2007/2008 season.

Cultivars	Locations					Mean
	Ismaliaa	Nobaria	Assuit	New Valley	Toshkey	
Sakha 93	10.98	21.67	11.44	20.00	7.30	14.28
Gemmeiza 9	9.94	17.87	9.40	18.20	6.57	12.40
Giza 168	19.14	23.67	12.40	13.94	8.25	15.48
Checks mean	13.35	21.07	11.08	17.38	7.373	14.05
Shandaweel 1	17.84	18.27	13.47	18.67	7.24	15.10
LSD 5%	1.02	2.71	2.06	1.78	0.95	0.79
CV%	4.29	8.70	10.57	6.62	9.45	8.20

Date in Table3-a proved that Shandaweel 1 significantly exceeded the commercial cultivars Sakha 93, Gemmeiza 9 and Giza 168 at Dakhliya 1, Dakhliya 2, Beheira locations and in the overall mean of North Delta. Shandaweel 1 cultivar significantly exceeded Giza 168 cultivar only at Etai El-Barood location. However, at Sakha location the cultivar Sakha 93 significantly out yielded the new cultivar Shandaweel 1.

The results of the advanced yield trials at South Delta presented in Table 3-b indicated that Shandaweel 1 cultivar had significantly surpassed the local checks at Tag El-Ezz, and Sharkia 2 locations and it had significantly overcome Gemmeiza 9 at Sers El Lian location while it had no significant

differences with the three checks at four locations, namely El-Gemmeiza, Sharkia 1, Monufia and Qaluobia.

Data of the advanced yield trials of the Middle Egypt in 2007/2008 growing season presented in Table 3-c showed that the grain yield of the new bread wheat cultivars Shandaweel 1 had significantly exceeded Gemmeiza 9 and Giza 168 cultivars by 16.07% and 17.43% , respectively, at Sids location. On the other hand, Shandaweel 1 had no significant difference compared with the three checks at the other locations; Giza, Fayoum, Mallawy, Menia and at over all mean of Middle Egypt. Meanwhile, the new cultivar Shandaweel 1 significantly yielded less than the commercial wheat cultivar at Menia location.

For advanced yield trials in Upper Egypt (Table 3-d), the results showed that the new bread wheat cultivar Shandaweel 1 yielded the same as the check cultivars at Shandaweel location, while surpassed and exceeded significantly Sakha 93 and Gemmeiza 9 at El-Matanaa location and Gemmeiza 9 only at Kom-Ombo location. The results clearly showed that Shandaweel 1 cultivar exceeded Sakha 93 by 10.7%, Gemmeiza 9 by 25.84% and Giza 168 by 11.82 % over all locations.

The grain yield of the advanced yield trials at Out Valley in 2007/2008 season are presented in Table 3-e. The results proved that Shandaweel 1 cultivar was significantly superior than Sakha 93 and Gemmeiza 9 at Ismailia and it had significantly exceeded Gemmeiza 9 only at Assiut location and Giza 168 cultivar at New Valley. The new wheat cultivar Shandaweel 1 significantly exceeded the yield of both Sakha 93 and Gemmeiza 9 cultivars at all over locations mean, while yielded almost the same as Giza 168 cultivar at new Valley location.

3-Verification yield trials

The results presented in Table 4 show the average grain yield estimated for 35 On-Farm trials for Shandaweel 1 and some other cultivars which were carried at 22 Governorates representing the old and new lands in 2011/2012 growing season.

The results proved that the yield potentiality of the new cultivar Shandaweel 1 was almost the same as the local checks; Giza 168 and Gemmeiza 9 at North Delta, South Delta, Middle and Upper Egypt and New Lands region.

The grain yield of the new released cultivar Shandaweel 1 exceeded the check cultivar Giza 168 and was less than the check cultivar Gemmeiza 9 at Middle Delta (Dakahlia and Gharbia locations). Meanwhile, the grain yield of the new cultivar Shandaweel 1 was less than the commercial wheat cultivar Giza 168 and Gemmeiza 9 at East Delta region.

Table 4 : Grain yield (ard / fed) of verification yield trials of the newly released cultivar Shandaweel 1 in 2011/2012 season.

Zones	Governorates	No. of trials	Shandaweel 1	Checks	
				Giza 168	Gemmiza 9
North Delta	Beheira	2	23.94	20.86	22.63
	Alexandria	2	20.65	22.26	22.88
	Kafr El-Sheikh	4	21.21	22.52	19.33
Mean		--	21.90	21.88	21.61
Middle Delta	Dakahlia	2	16.80	21.68	23.80
	Gharbia	2	30.00	22.23	30.00
Mean		--	23.40	21.96	26.90
South Delta :	Monufia	3	23.75	24.12	20.81
	Qalyubia	2	25.90	24.97	28.51
Mean		--	24.83	24.55	24.66
EastDelta	Ismailia	1	17.50	24.50	21.00
	Port Said	1	18.76	17.89	22.93
Mean		--	18.13	21.19	21.96
Middle and Upper Egypt	Giza	2	28.35	29.05	27.30
	Fayoum	2	26.20	27.65	--
	Bani-Sweif	2	19.95	19.25	--
	Menia	1	20.12	21.41	--
	Assiut	1	23.80	24.36	--
	Sohag	1	21.00	22.40	--
Mean		--	22.42	22.95	27.30
Out Valley	Suez	1	17.64	17.64	17.92
	Damietta	1	12.20	10.08	11.02
	Nobaria	1	20.53	17.73	14.93
	Bani-Sweif	1	15.11	18.77	--
	Gena	1	13.60	11.40	--
	New Valley	1	15.11	18.00	--
Mean		--	15.70	15.60	14.62
Zones mean		35	20.44	20.70	21.77

4- Some technological and quality characters:

Some technological and quality characters which are presented in Table 5 were carried out by Field Crops Technology Research Department ,Food Technology Research Institute, ARC . The results showed that the cultivar Shandaweel 1 had the highest hectoliter weight (83.8 kg.) while the other five cultivars were lowest in hectoliter weight and ranged from 80.3 for cultivar Gemmeiza 11 to 82.7 for the cultivar Sakha 94. This parameter is important for millers as it is positively correlated with the extraction rate (flour recovery). The extraction rate % for Shandaweel 1 was the highest than the other five cultivars.

Table 5: Some technological and quality characters of the new bread wheat cultivar Shandaweel 1 and five commercial wheat cultivars.

Cultivar	Hectoliter weight Kg.	Protein %	Ash%	Extraction rate%	Gluten%	
					Wet	Dry
Sakha 93	82.1	10.0	1.8	70.0	21.8	7.2
Sakha 94	82.7	11.5	1.5	69.0	26.9	8.5
Gemmeiza 9	81.0	12.6	1.7	68.5	30.8	10.3
Gemmeiza 11	80.3	12.2	1.7	69.0	24.3	9.0
Giza 168	82.1	12.0	1.8	68.3	28.8	9.1
Checks mean	81.6	11.7	1.7	68.9	26.5	8.8
Shandaweel 1	83.8	12.5	1.9	71.3	26.5	9.7

Protein content is an important parameter for making different products of wheat flour. Protein content % estimates of the new bread wheat cultivar Shandaweel 1 along with the check cultivars Gemmeiza 9 and Gemmeiza 11 show a high protein content >12% which are suitable for making good quality bread.

Wet gluten percentage of the six bread wheat cultivars which are presented in Table 5 show that the gluten % of Gemmeiza 9 was the highest (30.8%) followed by Giza 168 (28.8%), Sakha 94 (26.9%), Shandaweel 1 (26.5%) and Gemmeiza 11(24.3%) while the cultivar Sakha 93 had the lowest value being (21.8%). Similar rank was detected for dry gluten percentages where Gemmeiza 9, Shandaweel 1, Giza 168 , and Gemmeiza 11 show values of 10.3%, 9.7%, 9.1% and 9.0%, respectively. While the two check cultivars Sakha 93 and Sakha 94 recorded the lowest values of dry gluten percentages 7.2% and 8.5% respectively.

5- Rust Disease Reaction:

Data in Table 6 show the average response of the bread wheat cultivar Shandaweel 1 and four commercial wheat cultivars to leaf and stem rust disease at Gemmeiza, Sakha, and Nubaria Res. Stations in 2007/2008 season. The data revealed that Shandaweel 1 was completely resistant to leaf rust at Gemmeiza and Sakha stations and moderate resistant at Nubaria station(10MR) , it was completely resistant to stem rust at the three stations. In the same time, the other cultivars showed different reactions to leaf and stem rust ranged from resistant to susceptible responses.

Table 6-a : Mean average of leaf and stem rust diseases severity at adult stage for the new bread wheat cultivar Shandaweel 1 and four commercial wheat cultivars at Gemmeiza, Sakha, and Nubaria Res. Stations in 2007/2008 season.

Cultivar	Leaf Rust			Stem Rust		
	Gemmeiza	Sakha	Nubaria	Gemmeiza	Sakha	Nubaria
Sakha 93	80 S	60 S	50 S	0	0	20 S
Gemmeiza 9	0	0	5 MS/S	0	0	10 S
Giza 168	0	0	20 MR/MS	0	0	10 S
Gemmeiza 11	0	20 MS	30 MS/S	0	0	0
Shandaweel 1	0	0	10 MR	0	0	0

O=immune R= resistance MR= moderately resistance
MS= moderately susceptible S= susceptible

Table 6-b : Mean of average coefficient of leaf and stem rust diseases infection at adult stage for the new bread wheat cultivar Shandaweel 1 and four commercial wheat cultivars at Gemmeiza, Sakha, and Nubaria Res. Stations in 2007/2008 season.

Cultivar	Leaf Rust			Stem Rust		
	Gemmeiza	Sakha	Nubaria	Gemmeiza	Sakha	Nubaria
Sakha 93	80	60	50	0	0	20
Gemmeiza 9	0	0	4.5	0	0	10
Giza 168	0	0	12	0	0	10
Gemmeiza 11	0	16.00	24	0	0	0
Shandaweel 1	0	0	4.00	0	0	0

From the previous results , it could be concluded that the new released cultivar Shandaweel 1 can be grown at North and South Delta, Upper Egypt and Out Valley and can share the dominating wheat cultivars at Middle Egypt to induce wide genetic variation which ensure higher degree of yield stability all over the country.

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تم استنباط صنف جديد من قمح الخبز هو شندويل ١ من قسم بحوث القمح فى محطة بحوث شندويل من خلال انتخاب سلالة متفوقة من احدى المجاميع المستوردة من المركز الدولى لتحسين القمح والذرة بالمكسيك. وقد أجريت ٩٩ تجربة حقلية لمقارنة المحصول (٨ تجارب مصغرة ، ٥٦ تجربة مكبرة ، ٣٥ تجربة تأكيدية) خلال المواسم ٢٠٠٦/٢٠٠٥ ، ٢٠٠٧/٢٠٠٦ ، ٢٠٠٨/٢٠٠٧ و ٢٠١١/٢٠١٢. وقد أظهرت النتائج تفوق الصنف الجديد شندويل ١ على الأصناف التجارية المستخدمة للمقارنة وهى سخا ٩٣ ، سخا ٩٤ ، جميزة ٩ وجيزة ١٦٨ فى معظم المناطق الرئيسية لزراعة القمح فى مصر. أكدت نتائج التجارب التأكيدية أفضلية الصنف الجديد شندويل ١ عن الصنف الرئيسى جيزة ١٦٨ فى مناطق شمال ، وسط وجنوب الدلتا ومنطقة مصر العليا كما تفوق على الصنف جميزة ٩ فى مناطق شمال وجنوب الدلتا. كذلك تفوق الصنف شندويل ١ الجديد على الأصناف الرئيسية جيزة ١٦٨ والصنف جميزة ٩ فى مناطق خارج الوادى بالأراضى الجديدة. ولهذا يوصى بزراعة الصنف الجديد شندويل ١ فى مناطق شمال الدلتا ، جنوب الدلتا ، وسط الدلتا ، مصر الوسطى ، مصر العليا وفى الأراضى الجديدة.

قام بتحكيم البحث

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