J. Agric. Sci. Mansoura Univ., 30 (2): 743 - 754, 2005

GEMMIZA 10: A NEW EGYPTIAN HIGH YIELDING AND RUST RESISTANT BREAD WHEAT CULTIVAR

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ABSTRACT

The three wheat rusts, stripe, stem and leaf caused by *Puccinia striiformis, P. graminis and P. recondita*, sequently, are the most destructive diseases that threaten wheat production in Egypt. Therefore, resistant to these rusts are very important requirement for licensing the new cultivars released by National Wheat Research Program,, Agricultural Research Center (ARC). Egypt has been subjected to four sever attacks from the strip rust causal agent during the last decade of the last century. This gives Egyptian wheat breeders good opportunity to develop new promising resistant cultivars and /or lines . Gemmiza 10 is one of the new wheat cultivars having high yielding potentiality and simultaneously, exhibiting high resistance to the three rusts.

A total of 97 field experiments were conducted at different levels of yield trials (preliminary and advanced) as well as verification yield trials in the farmers' fields during the period from 1999/2000 to 2003/2004. The obtained results proved the superiority of the new cultivar Gemmiza 10 as compared with the commercial checks Sakha 61, Sakha 69, Sids 1 and Giza 168 at both Delta and Middle Egypt in the old land and at El-Nubara region in the new reclaimed area. Moreover, the cultivar Gemmiza 10 expressed its high resistance to the three rusts . On the other hand, Gemmiza 10 seems to be sensitive to heat stress prevailing , usually in Upper Egypt during late wheat growing season. Therefore, Gemmiza 10 is highly recommended to be grown at El-Delta , Middle Egypt and El-Nubaria regions.

INTRODUCTION

Egyptian population characterized by its rapid increase which results in increasing demand on and consequently,decreasing self-sufficiency from, various cereal crops generally and from wheat (*Tritium aestivum L.*) particularly. However, in wheat, persistent efforts have been made to increase the total wheat production from about 2 million tons in early eighties

to approximately 6.8 million tons in 2003/2004 season. Taking the total wheat consumption which, is around 12 million tons per year into consideration, there is still a wide gab between the national production and consumption estimated by nearly 45%. Reducing this gab could be possible via increasing wheat cultivated areas (horizontal expansion) and / or vertical expansion by enhancing the productivity per unit area . However, horizontal expansion in the desert is not an easy task due to the shortage and high costs of irrigation water. Therefore, vertical expansion seems to be the fast possible way. So, maximizing the total national production in the short term could be achieved by developing new cultivars having high yield potentiality, tolerent to adversed environmental conditions as well as rust resistance and simultaneously implementing the proper cultural practices according to the package of recommendation (Shehab El-Din, 1993) .

Since mid-seventies, the Egyptian Wheat Research Department has appliad the strategy of separating macro-environment into closely identified micro-environments with their recommended cultivars, suggested by Comstock and Moll (1963). The national wheat research program increased number of the identified regions from four to seven different regions (agroclimatic zones) starting from 1998/99 wheat growing season. These regions are North-; Middle-; South-; Eastern- and Western- Delta as well as Middle- and Upper- Egypt. The first three zones are usually subjected to rust diseases, while, Upper Egypt suffers heat stress. In addition, the main stress prevailling in the new lands may be drought, salinity and /or heat. On the other hand, Middle Egypt suffers no stresses other than mild infestation of aphids in some seasons. One or more of these stresses are to be considerad in the breeding program for each specific zone. Therefore, growing more than one cultivar in each region is the best poilcy for applying such strategy.

Accordingly, the first step on the way of applying this policy was releasing the cultivar Sakha 93 for El-Delta , Middle Egypt, and for saline soils in the new areas . Meanwhile, Giza 168 cultivar proved its superiority and wide adaptalility to alll regions. (Shehhab El-Din *et. al.* 1999). Moreover, two more new bread wheat cultivars, namely Gemmiza 7 (Shehab El-Din *et. al.*2000) and Gemmiza 9 (Mosaad *et al;*. 2000) characterized by their high yielding ability and rust resistance have been released and recommended for El-Delta Region.

Reistance to the three serious wheat rusts; stripe, leaf and stem caused by *Puccinia striiformis, P. recondita and P. graminis tritici*, respectively, that threaten wheat production in Egypt, is a very important requirement for licensing wheat cultivars released by Agricultural Research center (Shehab El-Din and Abdel-Latif, 1996). Many sever attacks from these rusts have been recorded. For instance, since mid-nineties, Egypt faced four aggressive attacks by only stripe rust causal agent in 1994/95, 1996/79, 1997/98 and 1999/2000 seasons. This gave the Egyptian wheat breeders good chances to screen and select their best materials to release new promising cultivars resistant to that destructive disease. However, Sakha 93 and Giza 168, the first two stripe rust resistant cultivars, followed by Gemmiza 7 and Gemmiza 9 were released for this objective during this

period. In this paper, we introduce the most recently high yielding and rust resistant cultivar, Ge...miza 10 .

MATERIALS AND METHODS

Following the principles of pedigree method , the new promising cultivar Gemmiza 10, has been selected from a local cross made at El-Gemmiza Agricultural Research Station. The pedigree and history of this cross is:

MAYA 74 "S" / ON // 1160 – 147/3/BB/GLL/4/ CHAT "S" /5/ CROW "S". CGM 5820 – 3GM – 1GM – 2GM – OGM.

Moreover, the following characters for the new cultivar Gemmiza 10 were studied.

I- Yield Evaluation and Stability Study :

The new promising line, Gemmiza 10 was tested in six preliminary yield trials in 1999/2000 growing season at six different stations ; Sakha (North Delta), El-Gemmiza (Middle Delta) Sids and Mallawy (Middle Egypt) as well as shandaweel and the New Valley (Upper Egypt). The plot area was 6 rows, 2.5m and 20 cm apart. Moreover, Gemmiza 10 has been tested for grain yielding ability versus the commercial cultivars (checks) Sakha 61, Sakha 69, Sids 1 and Giza 168 in the advanced yield trials during the two growing seasons 2000/2001 and 2001/2002.

In these advanced yield trials , all promising lines as well as checks were tested in large plot area (3 x 3.5 m = 10.5m^2) experiments. However, to represent all regions, 57 trials were carried out allover the country in the two seasons. Some of these experiments were conducted at research stations, and the others at farmers' fields. The statistical design used in these experiments was the randomized complete block design (RCBD) with four replicates according to Steel and Torrie (1980). All the recommended cultural practices for each region were applied on all experiments.

Taking the demonstration fields into consideration, 34 verification yield trials for Gemmiza 10 and the checks; were carried out in the old lands of Delta region and Middle Egypt as well as in new lands in 2003/2004 growing seasons. The area of each selected field was 750m^2 (150m^2 for each cultivar). At harvesting time, five randomly selected samples (4m^2 each) for each tested cultivar were harvested and thre hreshed. To estimate the grain yield, the clean kernels of each sample were weighed and adjusted to ardab / faddan.

In respect to the environmental differences among the seven regions, analysis of variance and stability parameters were calculated at regional level and the average of the commercial cultivars (checks) was used in the comparisons according to Joppa *et. al.* (1971) and Mitkees *et. al.* (1989).

II- Rust Diseases Reaction:

II.1 Seedling Tests :

The new promising cultivar Gemmiza 10, was tested against the prevailent leaf and stem rust pathotypes during 1998/99 and 1999/2000 wheat growing seasons. The isolates number 57,77, and 184 of leaf rust

using agent and number 11, 14, 15, 17, 19, and 39 of stem rust using agent were used. Likewise, seeding tests against stripe rust, using a mixure of the uredeniospores of different pathotypes, were conduced in the greenhouse at Sakha Agricultural Research Station . In addition, planting , inoculation with uredeniospores of the fungi, incubation and recording the infection types were carried out at Cereal Diseases Research Department, Plant Pathology Research Institution, Giza, using the scales of Johnston and Browder (1966), Roelfs and Martens (1988) and Long and Kolmer (1989).

II.2 Adult Tests:

Leaf and stem rust diseases incidences were recorded at four locations; Sakha, El-Nubaria , El-Gemmiza and Sids stations using artificial inoculation of mixed isolates from each pathogen under the field conditions . For testing against stripe rust, the cultivar Gemmiza 10 and the commercial cultivars Sakha 69, Sakha 61, Sakha 93, Gemmiza 7, Gemmeiza 9, Sids 1, Giza 164 and Giza 168 were subjected to natural infection under field conditions and artificial infecion in the greenhouse at Sakha Agricultural Research Station. The average of rust disease severities were calculated and compared with those of the commercial cultivars.

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) introduced by Saari and Wilcoxson (1974) and adjusted by Shehab El-Din and Abdel – Latif, (1996) was calculated as follows:
0= 0.05, 0;= 0.1 , R= 0.2, MR= 0.4, M= 0.6 , MS = 0.8 and S=1.

RESULTS AND DISCUSION

I- Yield and its Stability

Six preliminary yield trials representing the four main regions in Egypt (North Delta, Middle Delta, Middle Egypt, Upper Egypt) were conducted to evaluate Gemmiza 10 grain yield in 1999/2000 wheat growing season . The obtained data indicate that its grain yields were superior to those of Sakha 69 at Sakha (North Delta) , El-Gemmiza (Middle Delta) and Sids (Middle Egypt). However, the increases ranged from 16.2 to 39.9 % with an average increment of 28 % (Table 1).

Table 1 : Grain yield (ardab/feddan) of the preliminary yield trials for Sakha 69 and Gemmiza 10 in 1999/2000 season.

Locations	Sakha 69	Gemmiza 10	Significance	+ %
North Delta (Sakha)	27.58	32.04	*	+
Middle Delta (Gemmiza)	19.64	27.48	*	+ 39.9
Middle Egypt (Sids)	26.00	31.55	NS	+ 16.2
" " (Mallawy)	23.98	19.26	*	-
Upper Egypt (Shandaweel)	21.67	20.43	NS	-
" " (New Valley)	14.16	14.00	NS	-

NS = Insignificant and * = Significant at 0.05 level of probability

In addition, the average grain yield of Gemmiza 10 comparing to those of the commercial cultvars (checks), Sakha 61, Sakha 69, Sids 1 and Giza 168 in 57 advanced yield trials conducted at different sites all over the country in 2000/2001 and 2001/2002 wheat growing season are shown in Tables (2 and 3). Data in Table (2) proved that Gemmiza 10 surpassed those of commercial checks (except for Giza 168 at Kafer El-Shiehk and Demiat and for Sakha 69 at Demiat) in North Delta region in 2000/2001 growing season. Meanwhile, results of 2001/2002 season in general, indicate that Gemmiza 10 significantly exceeded the local checks except for Giza 168 in grain yield at North Delta (Table 3).

Table 2: Grain Yield (Ardab/Feddan) of the Advanced Yield Trails for Gemmiza 10 and four Commercial Cultivars (Checks) in 2000/2001 Season.

Locations	Gemmiza 10	Sakha 61	Sakha 69	Sids 1	Giza 168	Check Mean	± %
North Delta							
Sakha	22.34	17.52	17.82	17.28	21.45	18.52	+20.6
Kafr EL-Shekh	23.74	15.94 *	22.07	18.74*	24.07	20.21	+ 17.5
El-Demiat	19.87	17.94	20.07	17.60	19.67	18.82	+ 5.6
El-Dakahlia 1	18.27	16.00	17.74	19.07	18.67	17.87	+ 2.2
El-Dakahlia 2	11.27	9.20	12.00	10.47	13.87*	11.39	- 1.1
Middle Delta							
El-Gemmiza	27.15	18.78 *	21.98*	17.10*	24.22*	20.52	+ 32.3
El-Behira	19.20	15.54	16.14	14.44*	17.70	15.96	+ 20.3
Sers Ellian	17.48	14.54 *	16.83	15.39	17.41	16.04	+ 9.0
Zarzora	21.24	15.00 *	15.40	13.67*	17.54*	15.40	+ 37.9
El-Sharkia	16.19	19.37 *	16.40	18.30*	20.19*	18.57	- 12.8
El-Monofia	28.30	19.00 *	19.67*	16.34*	25.00	20.00	+ 41.5
South Delta							
El-Qalubia	24.55	17.90 *	20.30*	17.55*	22.00	19.44	+ 26.3
El-Giza	20.56	19.60	21.30	22.06	24.04	21.88	- 6.0
Middle Egypt							
El-Fayoum	9.73	4.97 *	9.73	10.15	10.92	8.94	+ 8.8
Sids	30.28	22.54 *	24.05*	22.43*	27.32	24.09	+ 25.7
Beni- Sweef	23.45	22.4	18.90*	21.00	21.00	20.83	+ 12.6
Mallawy	20.29	20.73	20.32	22.14	23.36*	21.64	- 6.2
Upper Egypt							
Asuit	13.60	10.20 *	13.40	11.10	14.50	12.30	10.6
Shandaweel	15.40	12.90	16.70*	16.70	15.60	15.48	0.00
Sohag	17.00	15.30	19.00	19.30	17.30	17.73	- 4
El-Matana	17.90	18.90	20.30*	20.10	18.40	19.43	- 7.9
Qena	20.30	19.20	18.90	19.70	19.40	19.30	+ 5.2
Kom-Ombo	14.90	11.90 *	14.30	16.50	16.60*	14.83	0.00
New Valley	11.70	11.80	12.80	12.70	13.40	12.68	- 7.6
El-Nubaria	17.41	16.24	16.04	10.15	15.64	14.52	+ 19.9
El-Ismaliaa	2.77	2.79	3.62*	3.23	3.59*	3.31	- 16.3
Sinai 1	10.15	5.49 *	9.91	11.19	11.16	9.44	+ 10.2
Sinai 2	10.82	8.08 *	11.30*	11.12	11.89*	10.60	+ 2.1

*** = Significant at 0.05 probability level**

Taking Middle Delta and El-Qualiobia at South Delta into consideration, data in Tables (2 and 3) revealed that grain yield of Gemmiza 10 significantly surpassed those of the commercial checks in most regions in the two growing seasons except for El Sharkia in the first season. Whereas the grain yields of both Sakha 61 and Sids 1 were significantly higher. In addition , Gemmiza 10 could not prove its superiority in grain yield at El-Giza in both seasons.

Table 3: Grain Yield (Ardab/Feddan) of the Advanced Yield Trails for Gemmiza 10 and four Commercial Cultivars (Checks) in 2001/2002 Season.

Locations	Gemmiza 10	Sakha 61	Sakha 69	Sids 1	Giza 168	Check Mean	± %
North Delta							
Sakha	23.74	19.06*	21.15*	20.43*	24.32	21.24	11.77
Kafr EL-Shekh	25.20	19.98*	24.60	19.50*	22.42	21.63	16.50
El-Demiat	20.67	18.80*	22.00	18.67*	22.00	20.37	1.47
El-Serw	17.32	14.75*	17.47	16.92	19.58*	17.18	0.81
Middle Delta							
El-Gemmiza	27.67	19.90*	23.77*	22.31*	24.02*	22.50	22.98
El-Gharbia	28.54	21.09*	24.22*	20.66*	27.34	23.33	22.33
El-Sharkia	17.80	15.49*	16.49	17.30	18.95	17.06	4.34
Sers Ellian	22.44	17.14*	21.87	19.80*	21.48	20.07	11.81
El-Behira	23.34	19.07*	18.97*	21.17*	20.50*	19.93	17.11
Zarzora	23.43	16.99*	18.16*	19.67*	20.86*	18.92	23.84
El-Monofia	21.00	17.94*	20.87	18.80	19.67	19.32	8.70
South Delta							
El-Qalubia	22.67	19.07	22.80	18.94	23.80	21.15	7.19
El-Giza	26.14	28.27	33.34*	33.34*	30.00*	31.24	-16.33
Middle Egypt							
El-Fayoum	19.87	19.87	21.20*	21.80	20.40*	20.82	-4.56
Sids	27.74	22.80*	21.20	24.27*	20.80	22.27	24.56
Beni- Sweef	23.83	22.52	23.99	25.00	23.32	23.71	0.51
Mallawy	23.61	19.40*	20.34*	21.90*	21.24*	20.72	13.95
Upper Egypt							
Asuit	13.36	11.89	12.49	13.16	13.08	12.66	5.53
Shandaweel	15.46	12.86*	16.54	14.95	14.17	14.63	5.67
Sohag	23.00	17.00*	21.67	20.67*	17.67*	19.25	19.48
El-Matana	21.47	13.54*	18.87*	17.40*	19.00*	17.20	24.83
Qena	23.00	24.74	24.00	26.34	28.67*	25.94	-11.33
Kom-Ombo	20.04	14.46*	17.18*	20.95	17.11*	17.43	14.97
Aswan	13.36	11.89	12.49	13.16	11.08	12.16	8.98
New Valley	11.76	9.68*	11.93	11.97	12.64	11.56	1.73
New Land							
El-Nubaria	15.96	13.54	15.76	13.44	18.27	15.25	4.66
El-Ismaliaa	4.54	4.81*	3.42*	4.27*	5.41*	4.48	1.34
North Sinai	10.41	7.10*	11.61	11.17	12.43*	10.58	-1.61
El-Oynat	15.31	12.54*	13.42	9.77*	12.69	12.11	26.42

* = Significant at 0.05 probability level Data in Table (4) show the average

Concerning Middle Egypt, data presented in the same Tables revealed that grain yield of Gemmiza 10 was in general significantly higher at El-Fayom in the first season and at Sids and Mallawy in both seasons comparing to those of the commercial checks. On the other hand, in Upper Egypt, Gemmiza 10 grain yield could not significantly increase over those of the commercial checks at some experimental sites in the two growing seasons. In respect to the new land, Gemmiza 10 grain yield insignificantly surpassed those of the comercial checks at Nubaria in the first season. Likewise, grain yield of Gemmiza 10 significantly exceeded those of Sakha 61 and Sids 1 at El-Oynat in 2001/2002 growing season (Tables 2 and Table 3). Grain yield estimated for Gemmiza 10 and the commercial cultivars in 34 verification yield trials grown in 18 governorates representing the old and new lands overall Egypt in 2003/2004 wheat growing season . These results proved that Gemmiza 10 grain yield surpassed those of local check in North Delta with percentage increase ranged from 7.69 to 15.21%. Meanwhile, in Middle Delta , Gemmiza 10 grain yield had a percentage increment ranged from 10.8 – 20.96. At South Delta , grain yield of Gemmiza 10 was higher than those of the commercial chesks with percentage increment ranged from 6.92 to 10.22. For Middle Egypt Region , Gemmiza 10 grain yield had a percentage increase comparing to those of local checks ranged from 2.75 at El-Minia governorate to 35.71 at El-Fayoum governorate. Concerning the new lands. Data in Table (4) proved that gemmiza 10 was superior to Sakha 93 in North Sinai and to Gemmiza 7 in South Sinai with an increase of 28.5% and 19.4%, respespectively. These results indicate that the maximum grain yield potentiality is expected to be obtained from Gemmiza 10 grown in old lands of Delta and probably on the rainfed area of Sinai. .

As shown in Table (5) , the stability study for the new released cultivar Gemmiza 10 grain yield comparing to the average of the local checks through the two seasons revealed its relevance to the moderate environmental conditions prevailing in Delta region during wheat growing season. Mereover, its regression slope over environmentol index did not differ from unity in the tested regions. Deviation from regression (s^2d) proved the good stability in Delta Region. In addition, this estimate was far below that for the local checks indicating that Gemmiza 10 grain yield stability is better than those of the other local checks at Delta region.Based upon these results, Gemmiza 10 is expected to be successifuly grown in North and Middle Egypt.

I- Rust Disease Reaction

Data shown in Table (6) clarify the reactions of the new bread wheat cultivar Gemmiza 10 againt the three wheat rusts; stripe (YR), leaf (LR) and stem (SR) at seedling stage in the two growing seasons. These data proved that Gemmiza 10 was highly resistant to all tested pathotypes of the three rust causing agents with infection type (0) in both seasons.

Table 4 : Grain Yield (ardab/faddan) of Verification Yield Trials of the Newly Released Cultivar Gemmeiza 10 in 2003/2004 Season.

Governorate	No.Trials	Gemmiza 10 Grain Yield	Check	Check Grain Yield	± %
North Delta					
Demiat	1	19.60	Giza 168	18.20	+ 7.69
K.El-Sheikh	2	24.06	Gemmiza 9	21.73	+ 10.72
El-Behera	4	20.41	Sakha 93	17.96	+ 13.64
Alexandria	1	18.25	" "	15.84	+ 15.21
Mean	8	20.58		18.43	
Middle Delta					
El Sharkia	4	22.38	Sakha 93	20.33	+ 10.08
El Dakahlia	3	20.35	Gemmiza 7	17.65	+ 20.96
El Gharbia	2	24.73	Giza 164	22.28	+ 11.00
Mean	9	22.82		20.07	
South Delta					
El Menofia	1	30.20	Gemmiza 9	27.40	+ 10.22
El Kalubia	3	24.25	Gemmiza 9	22.68	+ 6.92
Giza	4	27.37	Gemmiza 9	24.85	+ 10.14
Mean	8	27.27		24.98	
Middle Egypt					
El- Fayoum	1	26.60	Giza 168	19.60	+ 35.71
Beni Swef	1	17.72	B.Swef 1	15.84	+ 11.87
El- Minia	1	19.04	Giza 168	18.53	- 2.75
Mean	3	21.11		17.99	
New Land					
Port Said	2	16.10	Sakha 93	17.15	- 6.5
Ismailia	1	23.83	Gemmiza 9	25.90	- 8.7
Suez	1	21.90	Gemmiza 7	21.00	+ 4.3
N.Sinai	1	10.15	Sakha 93	7.90	+ 28.5
S.Sinai	1	4.24	Gemmiza 7	3.55	+19.4
Mean	6	15.26		15.10	

Moreover, data on the tests on the Gemmiza 10 against the three rusts at the adult stage under the field conditions are presented in Table (11). The calculated Average Coefficient of Infection (ACI) for the three rusts was Zero in both seasons indacting the high resistance of Gemmiza 10 to the three rusts. Therefore , growing Gemmiza 10 cultivar at El-Delta and El-Nubaria ragions is highly recommended.

In conclusion, due to its superiority in grain yield and its high resistance to rusts the new bread a head cultivar, Gemmiza 10 could be successfully grown at El-Delta, El-Nubaria and Middle Egypt regions.

Table 5: Yield Stability for Gemmiza 10 Comparing to the Average of the Local Checks in 2000/2001 and 2001/2002 Seasons.

Region / cultivars	Grain Yield (Ard/Fad.)	Regression Parameters		
		b	Sb	S^2d
North Delta :				
Sakha 61	16.74	0.8790	0.1452	1.0153
Sakha 69	19.63	1.0398	0.1224	0.4591
Sids 1	17.76	0.7844	0.1342	0.7357
Giza 168	20.82	0.9192	0.0944	-0.0952
Check Mean	18.74			
Gemmiza 10	20.42	1.2380	0.1040	0.0783
South Delta				
Sakha 61	17.75	0.6382	0.0947	-0.1694
Sakha 69	19.50	0.9498	0.1488	1.2015
Sids1	17.97	0.6199	0.1876	2.4992
Giza 168	21.33	1.0571	0.0930	-0.2030
Check Mean	19.14			
Gemmiza 10	22.72	1.3177	0.1840	2.3642
Middle Egypt				
Sakha 61	20.15	1.1529	0.0993	1.0181
Sakha 69	21.42	1.0391	0.1741	5.6729
Sids1	21.63	1.0075	0.1682	5.2117
Giza 168	22.74	0.9459	0.1147	1.7691
Check Mean	21.48			
Gemmiza 10	21.33	1.0099	0.1680	5.1963
Upper Egypt				
Sakha 61	14.41	0.9454	0.1779	1.6768
Sakha 69	16.69	1.1060	0.1060	0.1172
Sids1	16.95	1.1709	0.1584	1.1751
Giza 168	16.57	0.8770	0.1140	0.2501
Check Mean	16.16			
Gemmiza 10	16.76	1.2239	0.1797	1.7268
New Land				
Sakha 61	10.33	1.0651	0.1047	2.2870
Sakha 69	11.75	0.9725	0.0416	-0.2958
Sids1	10.38	0.7683	0.1123	2.7458
Giza 168	12.66	1.0120	0.489	-0.1113
Check Mean	11.28			
Gemmiza 10	12.17	1.0586	0.0535	0.0213

Table 6: Seedling reaction of Gemmiza 10 and local checks against mixtures of the identified stripe, leaf and stem rust pathotypes in two seasons.

Cultivar	2000/2001			2001/2002		
	YR*	LR	SR	YR	LR	SR
Gemmiza 10	0	0	0	0	0	0
Sakha 69	4	2	2	4	2	0
Sakha 61	0	3	2	0	4	0
Sakha 93	0	0	0	0	1	0;
Gmmiza 7	1	4	0	1	4	0
Gemmiza 9	0	0	0	0	0	0
Sids 1	0	3	0	0	4	0
Giza 164	4	3	3	4	3	0
Giza 168	0	1	0;	0	0;	0;

* YR; LR and SR = stripe ; leaf and stem rusts, respectively.

Table 7: Mean average coefficient of infection (AC1) for Gemmiza 10 and eight commerical cultivars at the adult stage in 2000/2001 and 2001/2002 seasons.

Cultivar	YR*	LR	SR	YR	LR	SR
Gemmiza 10	0.05	0.05	0.05	0.05	0.05	0.05
Sakha 69	47.50	29.40	5.00	50.00	20.00	0.05
Sakha 61	0.05	80.00	0.05	0.05	60.00	0.05
Sakha 93	2.00	2.00	0.05	1.00	2.00	0.05
Gemmiza 7	1.00	5.00	0.05	1.00	20.00	0.05
Gemmiza 9	0.05	0.00	0.05	0.05	0.05	0.05
Sids 1	23.70	15.00	0.05	43.50	43.00	1.80
Giza 164	37.50	10.00	1.80	40.00	27.40	5.00
Giza 168	1.60	0.10	0.05	2.00	0.05	0.05

* YR; LR and SR = stripe ; leaf and stem rusts, respectively.

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جميزة ١٠ : صنف قمح خبز مصري جديد عالي المحصول ومقاوم للصدأ

ممدوح الشامى ، تاج الدين شهاب الدين ، مصطفى عزب مصطفى ، مسعد عبد العليم ، محروس محروس ، أنور عجيز ، أسعد حماده ، عبد الرحمن بسيونى ، محمد عيد ، عبد الغنى مصطفى ، محمد أسكندر ، سامى صبرى ، محمد شرشر ، إيمان صادق ، أبو بكر أبو وردة ، على مصطفى موسى، صلاح الدين عبد المجيد ، أحمد تمام ، نجوى عبد الفتاح ، محمد مشرف ، حسن عشوش ، عز الدين السيد ، موريس توفيليس ، هيام محجوب ، أحمد مصطفى ، حمدى هنداوى ، فرغل حفناوى ، صلاح الدين على ، عبد الكريم عبد الكريم ، عبد السلام منشاوى ، هانى البرهامى ، محمد عبد الفتاح ، جمال الشعراوى ، سيد الصاوى ، رضا قمبر ، صباح أبو العلا ، وفاء العوضى ، ابراهيم أمين ، أحمد موسى ، صبحى عبد الدايم ، محمد زكريا ، سعيد حماد ، عبد الله سويلم ، عبد السلام جمعه ، عمر خليل ، قدرية حجازى ، عنايات غانم ، مصطفى المنوفى ، رأفت ميتكيس ، نبيل حنا ، عبد اللطيف عبد اللطيف ، عبد الخالق خطاب، ومصطفى الشامى **

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أصداء القمح الثلاثة ، الصدأ الأصفر والبرتقالى والأسود على الترتيب هى أخطر الأمراض التي تهدد زراعة القمح فى مصر . ولهذا فإن تسجيل أى صنف قمح مستنبط فى مصر يتطلب ضرورة مقاومته لهذه الأمراض. ولقد تعرضت مصر لأربع هجمات من الفطر المسبب لمرض الصدأ الأصفر خلال العقد الأخير من القرن الماضي . ولقد أعطى وجود المسبب المرضى الفرصة لمربى القمح أن ينتخبوا النباتات والسلالات المقاومة فى برنامج التربية . وجميزة ١٠ هو أحد أصناف قمح الخبز التى استنبطت بغرض المقاومة للأصداء الثلاثة بالإضافة إلى قدرته المحصولية العالية .

من خلال ٩٧ تجربه تم إجراؤها على مدى أربعة مواسم هى ١٩٩٩/٢٠٠٠ - ٢٠٠٠/٢٠٠١ ، ٢٠٠١/٢٠٠٢ و ٢٠٠٣/٢٠٠٤ فى مختلف محافظات الجمهورية أثبت الصنف تفوقه معنوياً على أصناف المقارنة وهى الأصناف التجارية سخا ٦١ ، سخا ٦٩ ، سدس ١ وجيزة ١٦٨ فى الأراضي القديمة لمنطقتى الدلتا ومصر الوسطى وكذلك فى الأراضي الجديدة بمنطقة النوبارية . كما ثبت من التجارب حساسية هذا الصنف وعدم تحمله للحرارة فى منطقة مصر العليا والوادى الجديد . ولهذا يوصى بزراعة الصنف الجديد جميزة ١٠ فى مناطق الدلتا ومصر الوسطى والنوبارية .