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AN INTRODUCTION TO SAKHA 94, THE NEW BREAD WHEAT CULTIVAR

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ABSTRACT

The new bread wheat cultivar Sakha 94 has been selected from one of the advanced lines among CIMMYT collections grown in wheat breeding program at Sakha Research Station. The grain yield of the new cultivar Sakha 94 was evaluated through 78 experiments conducted at three different levels; (9 micro– ,29 macro– and 40 verification- yield trials) in 2000/2001, 2001/2002 and 2003/2004, seasons respectively. The obtained results proved the superiority of the new cultivar Sakha 94 as compared with the local commercial checks; Sakha 61, Sakha 69, Sids 1 and Giza 168 in the old land at El-Delta and Middle Egypt and in the new land of El-Nubaria, North Sinai , El-Suez and El-Ismailia.

Moreover, the new cultivar, Sakha 94 expressed its high resistance to the three wheat rusts (stripe, leaf and stem) at both seedling and adult stages. Therefore , Sakha 94 is highly recommended for El-Delta, Middle Egypt and for the new lands.

INTRODUCTION

As a result of the rapid increase in population, the demand on wheat (*Triticum aestivum* L.), the main human food in Egypt, is annually increased. The total production in 2003/2004 season reached about 6.8* million tons, while, the total consumption estimated by 12 million tons. This means that Egypt has reached approximately 55 % self suffiency and hence, about 45 % of the total needs are to be imported. To reduce this gab, between production and consumption, two ways could be followed; horizontal expansion (growing wheat in new land, mainly deserts) and /or vertical expansion

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through development of new cultivars having high yield potentiality as well as durable stability and simultaneously, implementing the proper cultural practices (Shehab El-Din, 1993). Due to the shortage of available irrigation water, growing wheat in deserts seams to be uneasy task. Thus, for the time being, vertical expansion seems to be the proper fast way to start with .

Following the concept of separating macro-environment into different micro-environments suggested by Comstock and Moll (1963), the National Wheat Research Program identified seven different agroclimatic zones namely, North-, Middle-, South-, Eastern- and Western- Delta as well as Middle- and Upper-Egypt. The first three zones are usually subjected to sever attacks by the causal agents of stripe, leaf and stem wheat rust diseases. In addition, North Delta suffers from some soil salinity problems. Whereas, Eastern-and western-Delta have drought and soil low fertility stresses. Meanwhile, heat stress is the main determinant factor for wheat production in Upper Egypt . On the other hand, Middle Egypt is considered the best region for growing wheat since it suffers no stress other than mild aphid infestation in some seasons. Therefore, the best strategy to overcome such stresses, is to grow more than two cultivars in each region,

Although, wheat leaf and stem rusts caused by *Puccinia recondita* and *P. graminis tritic*, respectively, are very distructive deaseases, the most serious and more frequent disease, in Egypt, is the stripe rust caused by *P. striiformis*. For instance, during the last decade only, Egypt faced four sever attacks by stripe rust causal agent in 1994/95, 1996/97, 1997/98, (Abu EL-Naga, *et al*.; 1999) and in 1999/2000 seasons. This gave wheat breeders in different research stations the opportunity to screen and select their breeding materials to release new promising cultivars resistant to stripe rust. Consequently, the bread wheat cvs; Sakha 93 developed at Sakha and Giza 168 developed at El-Giza by Shehab El-Din *et al*. (1999), followed by Gemmiza 7 (Shahab El-Din *et al*., 2000), and Gemmiza 9 developed at El-Gemmiza research station (Mosaad *et al.,* 2000) were the first four stripe rust resistant cultivars released during the last decade.

Since, high yielding ability as well as resistance to rusts, in general, and to stripe rust in particular, are very essential requirements for licensing wheat cultivars released by Agricultural Research Center in Egypt (Shehab El-Din and Abdel-Latif, 1996), this paper is in fact, an introduction to another new high yielding and rust resistant bread wheat cultivar, Sakha 94.

MATERIALS AND METHODS

The new promising cultivar Sakha 94, has been selected from the exotic materials tested at Sakha Agricultural Research Station, Egypt. The cross name and pedigree of the new cultuvar is :

OPATA/RAYON//KAUZ.

CMBW 90Y3180 – OTOPM – 3Y – 010M – 010M – 010Y – 10M – 015Y-OY-OAP- 0S.

To evaluate the yielding ability and rust resistance of the new cultivar Sakha 94, the following characters were studied:

I- Yield Evaluation and Stability Study :

The newly released cultivars sakha 94 was tested for grain yield ability against those of the commercial cultivars Sakha61, Sakha69, Sides 1 and Gaza 168 in nine preliminary yield trials conducted at nine research stations, representing different locations, Sakha (North Delta); El-Gammiza and Itay El-Barood (Middle Delta); Sids and Malawi (Middle Egypt); Shandaweel and El-Mataana (Upper Egypt) as well as the New Valley and El-Nubaria (Out Valley) in 2000/2001 growing season. The statistical design used in these trials was the randomized complete block design (RCBD) with four replicates according to Steel and Terrie (1980). The plot area was 6 rows, 2.5m long and 20 cm apart. Moreover, sakha 94 was tested for yielding ability versus the same commercial cultivars (checks) in 29 advanced yield trials in 2001/2002 growing season.

In these advanced yield trials , all promising lines as well as checks were tested in large plot area experiments (3 x 3.5=10.5 m^2 each) . To represent all regions, the 29 trials were carried out allover the country ; some of these experiments were conducted at research stations, and the others at farmers' fields. All recommended cultural practices for each region were applied on all trials.

For the demonstration aspects, 40 verification yield trials for Sakha 94 and the local checks; were conducted in both old and 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) from each plot were harvested and threshed. The clean kernels of each sample were weighed and adjusted to ardab / faddan to estimate the grain yield.

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

II- Rust Diseases Reaction:

II.1 Seedling Tests :

Sakha 94, the new promising cultivar was tested against isolates number 57,77, and 184 of leaf rust causal agent and number 11, 14, 15, 17, 19, and 39 of stem rust causal one in 1999/2000 and 2000/2001 wheat growing seasons. Moreover, seeding tests against stripe rust, using a mixure of the uredeniospores of different pathotypes, were carried out in the greenhouse at Sakha Agricultural Research Station . In addition, planting , inoculation with uredeniospores of leaf and stem rust causal fungi, incubation and recording the infection types were carried out at Cereal Diseases Research Department, Plant Pathology Research Institution, Giza, according to the scales of Johnston and Browder (1966), Roelfs and Martens (1988) and Long and Kolmer (1989).

II.2 Adult Tests:

Leaf and stem rust disease incidences were recorded at four different locations; Sakha, El-Nubaria, El-Gemmiza and Sids stations using artificial

inoculation with mixed spores of different isolates from each pathogen under the field conditions . For testing against stripe rust the cultivar Sakha 94 and the commercial cultivars Sakha 61, Sakha 93, Gemmiza 7, Gemmiza 9, Sakha 69, Sids 1 Giza 164 and Giza 168 were subjected to the natural infection under field conditions. Meanwhile, the artificial infecion was made in the greenhouse at Sakha Agricultural Research Station. The average of rust disease severities were calculated and compared with those of the susceptible 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 DISCUSSION

1- Crop Yield Evaluation:-

Table 1: shows the grain yields of the new cultivar Sakha 94 and four more commercial wheat cvs. (checks) in the preliminary yield trials conducted at nine research stations in 2000/2001 growing seasons. These research stations represent the old and new lands of Egypt. Data in this table, indicate that grain yield of Sakha 94 significanly surpassed those of all checks at Sakha (North Delta) and Itay El-Barood (Middle Egypt) in the old land and at El-Nubaria representing the new land. Moreover, Sakha 94 was superior and its grain yields exceeded all those of checks in Middle Egypt and at Shandaweel (Upper Egypt) . However, the increase of the grain yield could not reach the significancy. On the other hand, Sakha 94 could not express its superiority in the New Valley.

Table 1: Grain Yield (ardab/feddan) of the preliminary yieldtrails, for Sakha 94 and four bread wheat cultivars (checks) in 2000/2001 season.

Locations	Sakha 61	Sakha 69	Sids 1	Giza 168	Check Mean	Sakha 94	+ %	LSD 0.05
North Delta								
Sakha	23.40	24.90	23.10	27.40	24.70	31.20	+26.03	2.00
Middle Delta								
El-Gemmiza	18.80	24.00	16.90	24.90	21.15	21.70	+02.06	1.70
Itay El-Barood	12.00	14.20	14.10	17.00	14.33	20.70	+44.08	1.70
Middle Egypt								
Sids	26.90	24.30	26.40	23.40	25.25	28.40	+12.05	3.50
Mallawy	15.20	17.10	18.10	16.60	16.75	19.10	+14.00	2.80
Upper Egypt								
Shandaweel	22.09	19.87	21.69	19.25	20.73	23.31	+12.04	4.35
El-Matanaa	18.55	17.83	15.99	15.59	16.99	17.4	+02.04	2.02
Out Valley								
The New Valley	10.96	12.29	14.33	14.16	12.94	12.16	-06.00	2.71
El-Nubaria	11.62	13.42	7.82	16.33	12.30	21.53	+75.00	4.74

In addition, the average grain yields of Sakha 94 comparing to those of the commercial cultivars (checks), Sakha 69, Sids 1, And Giza 168 in 29 advanced yield trials conducted at different sites allover the country in 2001/2002 wheat growing season are shown in Table 2 . Data of 2001/2002 season proved that grain yield of Sakha 94 surpassed those of the commercial checks Sakha 69 and Sids 1 in the two experiments conducted at Sakha and EL-Serw. Meanwhile, the obtained results prove that Sakha 94 was significantly superior to only the commercial check Sids 1 in Kafer EL-Sheikh, and El-Dakahlia at North Delta region.

Table 2: Grain yield (Ardab/feddan) of the advanced yield trails for Sakha 94 and for three bread wheat cultivars / lines in 2001/2002season.

Locations	Sakha 69	Sids 1	Giza 168	Check Mean	Sakha 94	L.S.D.
North Delta						
Sakha	21.15	20.43	24.32	21.97	24.47	2.16
Kafr EL-Shekh	24.60	19.50	22.42	22.17	24.24	3.85
El-Dakahliaa	22.00	18.67	22.00	20.89	22.17	1.38
EL-Serw	17.47	16.92	19.58	17.99	21.02	2.13
Middle Delta						
El-Gemmiza	23.77	22.31	24.02	23.37	26.11	2.80
El-Gharbia	24.22	20.66	27.34	24.07	23.59	3.09
El-Sharkia	16.49	17.30	18.95	17.58	21.95	2.03
Sres-Liaan	21.87	19.80	21.48	21.05	20.57	2.41
El-Behira	18.97	21.17	20.50	20.21	22.34	1.70
Itay El-Barood	18.16	19.67	20.86	19.56	20.55	1.60
El-Monofia	20.87	18.80	19.67	19.78	19.27	3.07
South Delta						
El-Qalubia	22.80	18.94	23.80	21.58	22.34	5.77
El-Giza	33.34	33.34	30.00	32.22	29.34	2.36
Middle Egypt						
El-Fayoum	21.20	21.80	20.40	21.13	17.90	3.69
Sids	21.20	24.27	20.80	22.09	23.34	2.56
Beni- Sweef	23.99	25.00	23.32	24.10	22.79	1.34
Mallawy	20.34	21.90	21.24	21.16	21.21	0.72
Upper Egypt						
Shandaweel	16.54	14.95	14.17	15.22	16.25	2.17
El-Matana	18.87	17.40	19.00	18.42	19.94	2.35
Sohag	21.70	20.70	17.70	20.03	19.30	1.67
Kom-Ombo	17.18	20.95	17.11	18.41	17.55	2.70
Qena	24.00	26.34	28.67	26.34	27.34	4.76
Aswan	12.49	13.16	11.08	12.24	14.12	2.55
Out Valley						
El-Nubaria	15.76	13.44	18.27	15.82	16.39	2.81
El-Ismaliaa	3.42	4.27	5.41	04.37	6.02	0.25
North-Sainai	11.61	11.17	12.43	11.74	12.47	1.25
The New Valley	11.93	11.97	12.64	12.18	12.57	1.80
Asuit	12.49	13.16	13.08	12.19	14.12	2.00
El-Oynaat	13.42	09.77	12.69	11.96	13.71	2.75

Concerning Middle Delta region, data presented in Table 2 revealed that Sakha 94 grain yield was in general, higher at EL-Gemmiza, El-Sharkia, and EL-Behira. Moreover, Sakha 94 surpassed all commercial checks except for Giza 168 at Itay El-Barood. On the other hand, Sakha 69 and Giza 168 , grain yield exceeded that of Sakha 94 at EL-Gharbia, and El- Monofia.

Additionally, at all experimental sites of South Delta and Middle Egypt, Sakha 94 could not prove its superiority and its grain yield was insegnificantly lower than those of the other checks in general.

However, Upper Egypt region data indicated that Sakha 94 grain yield surpassed those of the commercial checks at EL-Matanaa, and Aswan. On the other hand, the differences among Sakha 94 and comercial checks could not reach the significance at Shandaweel, or Qena. Meanwhile, Sakha 94 grain yield was lower than those of Sakha 69, and Sids 1 at Sohag and Kom-Ombo experiments, respectively.

Taking the new land out of valley into cosideration, Sakha 94 grain yield, as shown in Table 2, significantly exceeded the grain yields of the checks at EL-Ismalia. Meanwhile, Sakha 94 grain yield insignificantly and significantly surpassed those of Sakha 69 and Sids 1, respectively at El-Nubaria, North Sainai, and El-Oynat. On the other hand, The differences among Sakha 94 and all comercial checks could not reach the significance at Assuit, or at The New Valley.

As shown in Table 3, the stability study for the new released cultivar Sakha 94 grain yield comparing to the average of the local checks in 2001/2002 season, revealed its relevance to the moderate environmental conditions prevailing in Delta Region. Moreover, its regression slope over environmental index did not differ from unity in the tested regions. Deviation from regression (s^2d) did not differ from zero indicating its good stability in North-, Middle- and South- Delta, Middle Egypt, Upper Egypt, and Out Valley.

Data in Table 4, show the average grain yield estimated for Sakha 94 and commercial cultivars in 40 verification yield trials carried out in 24 governorates, representing the old and new lands of Egypt in 2003/2004 wheat growing season. These results proved that Sakha 94 surpassed local check in all trails at North-; Middle-; and South-Delta in the old lands as well as in the new lands Out Valley. On the other hand, it could not prove its competency at El-Minia (Middle Egypt), Sohag and Aswan (Upper Egypt) or at South Sinai in the new land.

These res1ults indicate that the maximum grain yield potentiality is expected to be obtained from Sakha 94 growing in old land of Delta and in the new lands of El- Nubaria, North Sinai, El-Suez and El-Ismalia.

Table 3: Grain Yield Stability Parameters for Sakha 94 as Compared with Local Checks in 2001/2002 season.

Region / cultivars	Grain Yield A/F*	Regression Parameters			
		B	Sb	S^2d	Cd
North Delta :					
Sakha 69	21.31	1.24	0.37	1.23	0.84
Sids1	18.88	0.63	0.19	-0.27	0.85
Giza 168	22.08	0.76	0.33	0.74	0.73
Check Mean	20.06				
Sakha 94	22.98	0.71	0.20	-0.22	0.86
Middle & South Delta					
Sakha 69	20.89	0.91	0.28	2.12	0.64
Sids1	19.83	0.49*	0.17	-0.01	0.60
Giza 168	22.08	1.06	0.18	0.16	0.86
Check Mean	20.93				
Sakha 94	22.09	0.59	0.26	1.63	0.46
Middle Egypt					
Sakha 69	24.01	1.49	0.30	2.89*	0.89
Sids1	25.26	1.36	0.13	-0.56	0.97
Giza 168	23.15	1.10	0.23	0.97	0.89
Check Mean	24.14				
Sakha 94	22.91	1.19	0.16	-0.15	0.95
Upper Egypt					
Sakha 69	17.35	1.13	0.18	0.43	0.93
Sids1	17.43	1.03	0.35	3.41	0.74
Giza 168	15.81	1.06	0.19	0.52	0.91
Check Mean	16.86				
Sakha 94	17.44	0.80	0.12	-0.16	0.93
Out Valley					
Sakha 69	11.44	1.12	0.08	-0.03	0.98
Sids1	10.63	0.83	0.19	2.11*	0.82
Giza 168	12.42	1.08	0.11	0.39	0.96
Check Mean	11.97				
Sakha 94	12.55	0.94	0.05	-0.29	0.99

*** A/F = ardab/faddan**

II. Rust Disease Reaction

As shown in Table 5, the new bread wheat cultivar , Sakha 94 proved its high resistance to all tested pathotypes of the three rusts (YR, LR and SR) causal agents with infection type (0) at seedling stage in both seasons.

Concerning the adult stage data of Sakha 94 inoculated with the uredeniospores of the three rust fungi under the field conditions are presented in Table 6. The calculated Average Coefficient of Infection (ACI) for each of the three rusts was 0.05 in both seasone, reflecting the high resistance of Salha 94 to the three rusts. Therefore, growing Sakha 94 cultivar at El-Delta and El-Nubaria ragions is highly recommended.

In conclusion, the superiority in grain yield and the high resistance levels to the three rusts indicate that growing the new bread wheat cultivar, Sakha 94 would be very successful at El-Delta, El-Nubaria and Middle Egypt regions.

Table 4 : Grain Yield (Ardab/Faddan) of Verifecation Yield Trials of the Newly Released Cultivar Sakha 94 in 2003/2004 Season.

Governorate #	No.Trials	Sakha 94	Check	Grain Yield	+ %
North Delta					
Demiat	1	18.66	Giza 168	18.20	+ 2.53
K.El Sheikh	2	25.67	Gem. 9	21.73	+ 18.13
El Behera	4	19.45	Sakha 93	18.78	+ 8.30
Alexandria	1	16.01	" "	15.84	+ 1.07
Mean	8	19.95		18.64	+ 7.02
Middle Delta					
El Sharkia	4	22.60	Sakha 93	20.33	+ 0.90
El Dakahlia	3	20.15	Gem. 7	17.65	+ 14.16
El Gharbia	2	24.27	Giza 168	22.28	+ 8.93
Mean	9	22.34		20.09	+ 11.12
South Delta					
El Menofia	1	30.20	Gem. 9	27.40	+ 10.22
El Kalubia	3	25.85	Gem. 9	22.68	+ 13.98
Giza	4	25.15	Gem. 9	24.85	+ 1.21
Mean	8	27.07		24.98	+ 8.37
Middle Egypt					
E Fayoum	1	23.80	Giza 168	19.60	+ 21.43
Beni Swef	1	18.64	B.Swef 1	15.84	+ 17.68
El Minia	1	18.49	Giza 168	18.53	- 0.22
Mean	3	20.31		17.99	+ 12.90
Upper Egypt					
Assuit	1	25.48	Sids 1	14.67	+ 73.69
Sohag	1	18.80	Giza 168	19.04	- 1.28
Qena	1	20.16	Sakha 93	19.60	+ 2.86
Luxour	1	22.40	Sids 1	16.24	+ 37.93
Aswan	1	18.00	Sakha 93	18.30	- 1.67
N.Valley	1	18.25	B.Swef 3	16.76	+ 9.84
Mean	6	20.52		17.42	+ 17.77
New Land					
Port Said	2	18.50	Sakha 93	17.15	+ 7.87
Ismailia	1	28.70	Gem. 9	25.90	+ 10.81
Suez	1	23.80	Gem 7	21.00	+ 13.33
N.Sinai	1	9.60	Sakha 93	7.90	+ 21.52
S.Sinai	1	3.42	Gem. 7	3.55	- 3.80
Mean	6	16.81		15.10	+ 11.32

Table 5: Seedling reaction of Sakha 94 and local checks against mixtures of the identified stripe, leaf and stem rust pathotypes in two seasons.

Cultivar	1999/2000			2000/2001		
	YR*	LR	SR	YR	LR	SR
Sakha 94	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 6: Mean average coefficient of infection (AC1) for Sakha 94 and eight commerical cultivars at the adult stage in two seasons.

cultivar	2000/2001			2001/2002		
	YR*	LR	SR	YR	LR	SR
Sakha 94	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
Gmmiza 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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مقدمة لصنف قمح الخبز الجديد سخا ٩٤

تاج الدين شهاب الدين ، ممدوح الشامى ، عبد اللطيف حسين عبد اللطيف ، مصطفى مصطفى عزب ، مسعد عبد العليم ، محمد شرشر ، عبد السلام منشاوى ، هانى البرهامى ، سعيد محمد حماد ، محروس محروس ، أنور عجيز ، أسعد أحمد حماده ، عبد الرحمن بسيونى ، محمد عيد ، عبد الغنى مصطفى ، محمد أسكندر ، سامى صبرى، أيمان صادق ، أبو بكر أبو وردة ، 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 ، محمد عبد الفتاح ، جمال عبد الرازق الشعراوى ،سيد الصاوي، رضا قمبر ، صباح حمزة أبو العلا ، وفاء عبد الحميد العوضى ، ابراهيم عبد الهادى أمين ، أحمد محمد موسى ، صلاح الدين أحمد عبد المجيد ،علي موسي ، صبحى محمد عبد الدايم ، محمد مختار زكريا ، عبد الله سويلم ، عبد السلام جمعه ، عمر خليل ، قدرية حجازى ، عنايات غانم، مصطفى المنوفى ، رأفت ميتكيس، نبيل حنا ، عبد الخالق خطاب، واصف يوسف*

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*** قسم أمراض الحبوب – معهد بحوث أمراض النبات – مركز البحوث الزراعية – الجيزة.**

تم استنبــاط الصنف الجديــد من قمح الخبز (سخا ٩٤) بواسطة البرنامج القومى لبحوث القمح فى محطة بحوث سخا من خلال انتخاب سلالة متفوقة من إحدى المجاميع المستوردة من المركز الدولى لتحسين القمح والذرة بالمكسيك . وقد أجريت ٧٨ تجربة حقلية لمقارنة المحصول (٩ تجارب مصغرة ، ٢٩ تجربة مكبرة و ٤٠ تجربة تأكيدية) خلال المواسم ٢٠٠٠/٢٠٠١ ، ٢٠٠١/٢٠٠٢ و ٢٠٠٢/٢٠٠٣ على الترتيب وقد أظهرت النتائج تفوق الصنف الجديد سخا ٩٤ على الأصناف التجارية المستخدمة للمقارنة وهى سخا ٦١ ، سخا ٦٩ ، سدس ١ وجيزة ١٦٨ فى مناطق الدلتا ومصر الوسطى فى الأراضى القديمة والجديدة على حد سواء كما أظهرت تفوقاً فى مناطق شمال سيناء والسويس والإسماعيلية .

كما أثبت الصنف سخا ٩٤ مقاومته العاليه لأصداء القمح الثلاثه (الأصفر – البرتقالى والأسود) فى طور البادرة وفى الطور البالغ . لهذا يوصى بزراعة الصنف سخا ٩٤ فى أراضى الوادى بمنطقتى الدلتا ومصر الوسطى وفى الأراضى الجديدة بالنوباريه والسويس وسيناء والأسماعيلية.