ESULTS AND DISCUSSION

Seasonal effects:

Mean squares associated with years were found to reach the level of significance for all the studied traits except, harvest index (Table 3). This finding revealed that the majority of the studied traits were subjected to environmental changes .

Mean values of the second season were mostly higher than the corresponding in the first one for all traits except, number of spikes /plot m^2, no of kernels and weight of kernels/spike and protein % (Table 4).

Effect of Irrigation:

Irrigation mean squares in the combined analysis over (stress and normal irrigation over two seasons) were significant for all the studied traits (Table 3). These results indicated that over all differences between the stress and normal irrigation treatments.

Mean values of normal irrigation were significantly higher than those of stress irrigation for all the studied traits, except harvest index and protein % (Table 5), indicating that selection for stress tolerance should give a positive yield response under stress. **El-kalla *et.al* (1995)** reported that the application of one and two supplementary irrigation in wheat had a significant effect on 1000 – kernel weight . On the other hand, heading and maturity dates behaved the earliest one under stress condition than those of non stress condition and they were significant for those traits. Also, the results indicated that mean values of normal environments for yield and its components were higher than those of stress condition.

Table 3 : Mean squares of ordinary analysis for all the studied traits in each environments (drought and normal irrigation) and in the combined over them and combined over two seasons.

S.O.V	*Single*	*Comb.*	*Com. c*	*Heading (days)*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							595.01**
Irri.		1	1			2875.3**			2859.8**	5735.04**
Irri. x S			1							0.01
R/ IxS	3	6	12	15.82	2.87	9.1	9.81	30.79	20.3	14.70
Varieties	23	23	23	83.96**	124.83**	187.7**	77.88**	26.02**	73.2 **	229.51**
V x S			23							31.43**
V x I		23	23			26.2			30.7**	23.53*
V x I x S			23							33.39**
Error	69	138	276	24.57	14.06	17.3	8.82	10.687	9.8	13.51
Mean										
F-Test										88.69
Var. x s										**
Var. x Ir										**
Var. x Ir x s										*
										**

Table 3: Cont.

S.O.V	***Single***	***Comb.***	***Com. c***	***Maturity (days)***						***All over mean***
				1999/2000			***2000/2001***			
				Drought	***Irrigation***	***Comb.***	***Drought***	***Irrigation***	***Comb.***	
Season			1							648.44 **
Irri.		1	1			15265.3**			7512.5**	22097.8**
Irri. x S			1							680.00**
R/ IxS	3	6	12	14.73	0.59	7.7	36.59	6.15	21.4	14.52**
Varieties	23	23	23	32.86**	38.04**	54.3**	43.09**	57.26**	93.6**	126.48**
V x S			23							21.41**
V x I		23	23			16.6**			6.7	15.27**
V x I x S			23							8.08
Error			276	9.09	2.58	5.8	6.811	3.41	5.1	5.47
Mean										140.94
F-Test										**
Var. x s										**
Var. x Ir										**
Var. x Ir x s										n.s

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*Plant height (cm)*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							834.17**
Irri.		1	1			6646.6**			3650.5**	10074.42**
Irri. X S			1							222.76**
R/ IxS	3	6	12	86.68	17.17	51.9	29.87	6.62	18.2	35.08
Varieties	23	23	23	142.51**	165.53**	275.2**	193.03**	232.71**	414.8**	649.42**
V x S			23							40.59
V x I		23	23			32.8			10.9	25.40
V x I x S			23							18.37
Error			276	37.62	14.84	26.2	47.90	27.85	37.9	32.05
Mean										107.8
F-Test										**
Var. x s										n.s
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*Spike length (cm)*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							34.08**
Irri.		1	1			128.70**			109.20**	237.51**
Irri. x S			1							0.40
R/ IxS	3	6	12	1.40	0.53	0.96	0.31	0.12	0.19	0.58
Varieties	23	23	23	2.88**	2.57**	4.69**	4.72**	1.06	4.34**	6.44**
V x S			23							2.58**
V x I		23	23			0.75			1.52	1.37
V x I x S			23							0.90
Error			276	1.166	1.11	1.13	1.34	1.17	1.21	1.17
Mean										12.11
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*No.of kernels/spike*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							1124.43**
Irri.		1	1			9124.6**			4413.1**	13114.55**
Irri. x S			1							423.15**
R/ IxS	3	6	12	106.08	235.46	170.8	103.78	133.00	118.4	144.58**
Varieties	23	23	23	144.81**	244.36**	331.5**	134.60**	78.93*	197.4**	339.60**
V x S			23							189.27**
V x I		23	23			57.7			16.2	31.11
V x I x S			23							42.72
Error			276	40.90	83.87	62.4	43.97	42.43	43.2	52.79
Mean										59.75
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*No. of spikes / m2*						*All over Mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							22622.06**
Irri.		1	1			206521.9**			155248.8**	359944.80**
Irri. x S			1							1825.92
R/ IxS	3	6	12	124.30	736.0	430.2	2719.5	1780.6	2250.0	1340.09*
Varieties	23	23	23	2320.7**	4728.3**	4039.7**	1979.5**	1169.2*	1866.0**	4474.88**
V x S			23							1430.86**
V x I		23	23			3009.3**			1282.7*	1948.19**
V x I x S			23							2343.86**
Error			276	622.62	518.2	570.4	852.27	641.4	746.9	658.64
Mean										297.4
F-Test										**
Var. x s										**
Var. x Ir										**
Var. x Ir x s										**

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*W. of kernels/ spike (g)*						**All over mean**
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	**Comb.**	
Season			1							0.445**
Irri.		1	1			13.71**			14.69**	28.396**
Irri. x S			1							0.009
R/ IxS	3	6	12	0.03	0.012	0.02	0.07	0.11	0.09	0.053**
Varieties	23	23	23	0.19**	0.11	0.17**	0.30**	0.11**	0.31**	0.232**
V x S			23							0.251**
V x I		23	23			0.12**			0.10**	0.118**
V x I x S			23							0.106**
Error			276	0.02	0.02	0.02	0.02	0.03	0.03	0.023
Mean										
F-Test										2.27
Var. x s										**
Var. x Ir										**
Var. x Ir x s										**
										**

Table 3: Cont.

S.O.V	Single	Comb.	Com. C	W. of 1000- kernel (g)						All over mean
				1999/2000			2000/2001			
				Drought	Irrigation	Comb.	Drought	Irrigation	Comb.	
Season			1							854.64**
Irri.		1	1			3086.9**			4394.9**	7424.30**
Irri. x S			1							57.61*
R/ IxS	3	6	12	1.47	11.334	6.4	6.134	4.114	5.1	5.76
Varieties	23	23	23	40.34**	39.144**	62.2**	78.637**	42.151**	99.8**	73.67**
V x S			23							88.29**
V x I		23	23			17.3			20.9**	11.77
V x I x S			23							26.55**
Error			276	13.97	8.836	11.4	5.955	10.803	8.4	9.89
Mean										44.19
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										**

Table 3: Cont.

S.O.V	Single	Comb.	Com. c	Straw yield (ton./fad.)						All over Mean
				1999/2000			2000/2001			
				Drought	Irrigation	Comb.	Drought	Irrigation	Comb.	
Season			1							5.41**
Irri.		1	1			135.17**			140.64**	275.77**
Irri. x S			1							0.03
R/ IxS	3	6	12	0.22	0.76	0.45	0.07	0.33	0.20	0.32*
Varieties	23	23	23	0.75**	0.91**	1.48**	0.61**	0.87**	1.37**	2.46**
V x S			23							0.40**
V x I		23	23			0.18			0.12	0.12
V x I x S			23							0.17
Error	69	138	276	0.12	0.27	0.19	0.14	0.21	0.18	0.18
Mean				3.66	5.34	4.50	3.88	5.59	4.73	4.62
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3: Cont.

S.O.V	*Single*	*Comb.*	*Com. c*	*Grain yield (ard./fad.)*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	Comb.	
Season			1							45.45**
Irri.		1	1			1396.84**			1045.80**	2429.96**
Irri. x S			1							1268*
R/ IxS	3	6	12	5.41*	25.90*	15.65	1.29	0.80	1.05	8.35**
Varieties	23	23	23	9.14**	14.48**	21.14**	8.64**	12.70**	20.02**	33.34**
V x S			23							7.82**
V x I		23	23			2.48			1.31	1.29
V x I x S			23							2.51
Error	69	138	276	1.43	4.92	3.17	1.35	2.08	1.72	2.45
Mean				11.62	17.01	14.32	12.67	17.34	15.00	14.66
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3:Cont .

S.O.V	*Single*	*Comb.*	*Com. c*	*Biology (ton/fad.)*						*All over mean*
				1999/2000			*2000/2001*			
				Drought	*Irrigation*	*Comb.*	*Drought*	*Irrigation*	*Comb.*	
Season			1							11.29**
Irri.		1	1			297.32**			278.58**	575.75**
Irri. x S			1							0.15
R/ IxS	3	6	12	0.66*	2.05*	1.36	0.18	0.30	0.24	0.80**
Varieties	23	23	23	1.69**	2.02**	3.43**	1.44**	2.12**	3.34**	5.78**
V x S			23							0.98**
V x I		23	23			0.29			0.22	0.19
V x I x S			23							0.32
Error	69	138	276	0.21	0.52	0.36	0.25	0.40	0.33	0.35
Mean				5.40	7.89	6.65	5.78	8.20	6.99	6.62
F-Test										**
Var. x s										**
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3: Cont .

S.O.V	***Single***	***Comb.***	***Com. c***	***Harvest index***						***All over mean***
				1999/2000			***2000/2001***			
				Drought	***Irrigation***	***Comb.***	***Drought***	***Irrigation***	**Comb.**	
Season			1							0.0001
Irri.		1	1			0.0001			0.008*	0.003**
Irri. x S			1							0.004**
R/ IxS	3	6	12	0.0001	0.003*	0.002	0.001	0.001**	0.001	0.001**
Varieties	23	23	23	0.0001	0.001*	0.001*	0.001	0.0001	0.001*	0.001**
V x S			23							0.001*
V x I		23	23			0.001			0.0001	0.0001
V x I x S			23							0.001
Error	69	138	276	0.0001	0.001	0.001	0.0001	0.0001	0.0001	0.0001
Mean				0.344	0.344	0.344	0.351	0.338	0.345	0.344
F-Test										**
Var. x s										*
Var. x Ir										n.s
Var. x Ir x s										n.s

Table 3:Cont .

S.O.V	Single	Comb.	Com. c	Protein %						All over mean
				1999/2000			2000/2001			
				Drought	Irrigation	Comb.	Drought	Irrigation	Comb.	
Season			1							15.912**
Irri.		1	1			2.846*			25.553*	22.727**
Irri. x S			1							5.672**
R/ IxS	3	6	12	0.054	0.365**	0.21	0.303	4.529	2.416	1.313
Varieties	23	23	23	16.292	10.698**	12.436**	6.702**	4.689**	4.462**	10.972**
V x S			23							5.926**
V x I		23	23			14.554**			6.929**	14.385**
V x I x S			23							7.098**
Error	69	138	276	0.127	0.087	0.107	1.737	1.167	1.452	0.78
Mean				10.308	10.065	10.187	10.144	9.415	9.778	9.983
F-Test										**
Var. x s										**
Var. x Ir										**
Var. x Ir x s										**

Table 4: The average values of seasonal effects on earliress, yield and its components of wheat and Protein % in 1999/2000 and 2000/2001 .

Trait / *Season*	*Heading (days)*	*Maturaty (days)*	*Plant height (cm.)*	*Spike length (cm)*	*No.of kernels/ Spike*	*W.of kernels/ spike (g)*	*No.of spikes/ m^2*
Season 1	89.93 b	142.24 b	106.64 b	11.81 b	61.46 a	2.85 a	305.09 a
Season 2	87.44 a	139.44 a	109.30 a	12.41 a	58.04 b	2.30 b	289.74 b

Table 4: Cont.

Trait / *Season*	*W.of 1000 kernel (g)*	*Straw yield (ton.fad.)*	*Grain yield (ard./fad.)*	*Biology (ton/fad.)*	*Harvest index*	*Protein %*
Season 1	42.70 b	4.50 b	14.32 b	6.65 b	0.344 b	10.19 a
Season 2	45.69 a	4.73 a	15.00 a	6.98 a	0.345 a	9.88 b

Table 5: The average values of both irrigation treatments (stress and normal) on thirteen traits studied over both seasons.

Trait / *Irr. Treat.*	*Heading (days)*	*Maturity (days)*	*Plant height (cm.)*	*Spike length (cm)*	*No.of kernels/ Spike*	*W.of kernels/ spike (g)*	*No.of spike/ m^2*
Stress	84.82 a	133.35 a	102.70 b	11.33 b	53.91 b	2.00 b	266.74 b
Non stress	92.46 b	148.53 b	112.94 a	12.89 a	65.60 a	2.54 a	328.03 a
Reduction %	8.26	10.22	9.07	12.10	17.82	21.26	18.68

Table 5: Cont.

Trait / *Irr. Treat.*	*W.of 1000 kernel (g)*	*Straw yield (ton.fad.)*	*Grain yield (ard./fad.)*	*Biology (ton/fad.)*	*Harvest Index*	*Protein %*
Stress	39.79 b	3.77 b	12.14 b	5.59 b	0.347 a	10.23 a
Non stress	48.59 a	5.79 a	17.17 a	8.04 a	0.341 b	9.74 b
Reduction %	18.11	34.89	29.3	30.47	1.73	4.79

The average values of interaction effects between season and irrigation treatments over both seasons are presented in (Table 6).

Mean values of non-stress condition gave the highest mean values with significant or insignificant for all traits studied than those of stress condition, except harvest index and protein %. While heading and maturity dates behaved the earliest one under stress condition than those of non-stress condition.

Grain yield decreased under stress condition as a result of the decrease in yield components in both seasons. On the other side, harvest index and protein % increased under stress condition.

Mean squares for genotypes were significant for most the studied traits in the combined analysis over both irrigation treatments and both seasons (Table 3). These results indicated that the wide diversity among genotypes used in the present study for these traits.

Varietal performance :

Data in (Table 7) show the mean performance of genotypes over irrigation treatments and both seasons for all the studied traits.

Heading date:

For heading date, Yecora variety (no.4) was the earliest over irrigatin treatments and seasons, but without significant superiority over those genotypes no. 18 (CPAN/80/PPSN//PRL "S"PVN), no. 22 (G158/5/CFN/CNO "S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59*2), no. 23 (G 164/ Sakha 61), and no. 24 (G 144 X P5 N/BJW "S").

Table 6: The average values of interaction effects between season and irrigation treatments over both seasons.

Season	*Irr. Treat.*	*Heading (days)*	*Maturity (days)*	*Plant height (cm.)*	*Spike length (cm)*	*No.of kernels/ Spike*	*W.of kernel/spike (g)*	*No.of spikes/ M^2*
S1	Drought	86.06	133.32 c	100.46 c	10.99	54.57 c	1.97	272.29
S2	Drought	83.58	133.39 c	104.93 b	11.67	53.25 c	2.02	261.30
S1	Irrigation	93.62	151.16 a	112.23 a	12.63	68.36 a	2.50	337.89
S2	Irrigation	91.30	145.90 b	113.65 a	13.14	62.84 b	2.58	318.17

Table 6: Cont.

Season	*Irr. Treat.*	*W.of 1000 kernel (g)*	*Straw yield (ton.fad.)*	*Grain yield (ard./fad.)*	*Biology (ton/fad.)*	*Harvest index*	*Protein %*
S1	Drought	38.69 d	3.66	11.62 c	5.40	0.344 b	10.308 a
S2	Drought	40.90 c	3.88	12.67 b	5.78	0.351 a	10.144 a
S1	Irrigation	46.71 b	5.34	17.01 a	7.89	0.344 b	10.065 a
S2	Irrigation	50.47 a	5.59	17.34 a	8.20	0.338 c	9.415 b

On the other hand, Penwawa variety no. 5 (Penwawa) had the latest with regard to days to heading, but without significant superiority over those genotypes no. 2 (Sahel), No.3 (Sakha 8), no.6 (Nesser), no.7 (KVZ/Coolfen//Tsi/vve (s) , no.8 (BAVIACORA M92), no.13 (CNO79* 2/HOEL//vve "S" /ANC), no.19 (NAC/ANGRA) and no.20 (STK/4/JO/3/ CR//CIT71). These results are in agreement with those reported by **Nachit and Ketata (1989) and Islam (1990),** Who found significant differences among varieties for earliress (days to heading).

Maturity date:

Data in Table (7) include the measurements obtained for no. of days to maturity over irrigation treatments and seasons (combined analysis). Yecora variety (no. 4) followed by genotype no. 9 (IL5-264/4/CAR//KAL/BB/3/NAC/5/CAA) showed the earliest of maturity date. However, Penwawa variety (no. 5) is the latest one. These results are in agreement with those recorded by **Gharti-Chhetri and Lales (1990), Ibrahim *et al (1995)* and Ghandorah *et al* (1997).** They found significant differences among varieties for earliness **of days to** maturity.

Earliness, if found in wheat is favorable escaping destructive injures caused by stress conditions i.e ..... drought, heat, disease and salinity. Both varieties Yecora (no. 4) and genotypes no. 9 as previously mentioned expressed significant earliness of days to maturity. Hence, it could be concluded that both varieties (genotypes) are valuable in breeding for earliness.

Plant height (cm):

Data in Table (7) show the measurements obtained for plant height at the combined analysis. Genotype, no. 7 (KVZ/Coolfen//Tsi/vee (s)), had significantly taller than other genotypes. However, Yecora variety (no.4) was significantly shorter than the other genotypes, followed by Penwawa (no. 5), Nesser (no. 6), no.11 (ACSAD 529// Yr/ sprw "S"), no. 13 (CNO 79* 2/HOEL//vee "s"/ANC), No. 16 (MYNA "S"/ VUL "s" YD "S" //PCI "S"), no. 17 (MYNA "S" VUL "S" YD "S"//PCI "S"), no. 18 (CPAN/80/PPSN//PRL "S"/PVN), no. 20 (STK/4/JO/3/CR//CIT 71) and no. 21 (VAN-14). These results were in accordance with those obtained by **Ibahim *et al* (1995) and Tawfelis *et al*(1998).**

The most interesting genotypes mentioned above were shorter, hence agronomic (short plant) significance could be obtained from these genotypes if it used in hybrid wheat program.

Spike length (cm):

The mean performance of 24 genotypes for spike length at the combined analysis are presented in (Table 7). With the exception of genotypes no. 9 (IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA) , no.14 (VEE#5NAC), no. 19 (NAC/ANGRA) no. 20 (STK/4/JO/3/CR//CIT 71) and no. 21 (VAN-14), all genotypes gave the same performance for spike length. The genotype no.22 (G158/5/CFN/CNO"S"// RON/3/Bb/NOR/4/ TL/3FN//TH/ NAR59 *2) had the highest spike length. However, the two genotypes no. 9 (IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA and no. 14 (VEE#5NAC) gave the shortes ones. **Kheiralla (1994)** reported that drought conditions reduced spike length

Table 7: Mean performance of genotypes for the studied trails over both seasons (over all mean)

	Genotype	*Heading data*	*Maturity date*	*Plant height (cm)*	*Spike length (cm)*	*No.of Kernels/ Spike*
1	Sids 1	89.69 b-e	142.0 bcd	114.8 b	12.60 abc	67.28 ab
2	Sahel 1	91.56 a-d	142.1 bcd	108.5 c-j	11.98 abc	69.22 a
3	Sakha 8	93.19 ab	140.4 c-g	110.2 c-h	11.98 abc	60.44 c-f
4	Yecora	82.06 h	135.2 k	88.1 n	12.02 abc	55.38 f-l
5	Penwawa	94.75 a	149.4 a	103.4 kl	12.16 abc	57.41 d-h
6	Nesser	93.19 ab	141.8 b-e	105.3 l-l	12.11 abc	60.56 c-f
7	KVZ/Coolfen// Tsi/vee(s)	93.19 ab	141.4 b-f	122.8 a	12.21 abc	63.16 bcd
8	BAVIACORA M92	91.88 a-d	142.2 bc	108.0 d-j	12.43 abc	64.91 abc
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	84.44 fgh	136.1 jk	110.8 b-g	11.77 c	52.97 hi
10	PASTOR*2/OPATA	89.44 b-e	140.1 e-h	112.3 b-e	12.04 abc	56.10 f-l
11	ACSAD529//Yr/sprw "s"	87.13 d-g	140.2 d-h	102.6 l	12.51 abc	57.13 d-h
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	85.69 e-h	139.7 fgh	106.8 g-l	12.69 abc	63.71 abc
13	CNO79*2/HOEI//vee "s"/ANC	91.44 a-d	143.3 b	97.9 m	12.28 abc	56.76 e-h
14	VEE#5 NAC	89.19 b-f	141.9 b-e	108.1 d-j	11.97 bc	60.69 c-f
15	MYNA/VUL//JUN	87.75 c-g	141.7 b-e	112.6 bcd	12.72 ab	63.75 abc
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	85.56 e-h	142.9 b	105.7 h-l	12.59 abc	58.86 c-h
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	87.75 c-g	143.3 b	107.6 e-k	12.21 abc	50.61 l
18	CPAN/80/PPSN//PRL "S"PVN	82.81 gh	139.5 gh	107.3 f-k	12.06 abc	54.09 ghi
19	NAC/ANGRA	92.69 abc	141.9 b-e	111.9 b-f	10.98 d	62.46 b-e
20	STK/4/JO/3/CR//CIT71	92.25 abc	142.6 b	104.9 jkl	10.22 d	54.00 ghi
21	VAN-14	89.56 b-e	140.4 c-g	106.4 g-l	10.84 d	62.26 b-e
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	85.31 e-h	138.8 ghi	112.9 bc	12.91 a	62.37 b-e
23	G 164/Sakha 61	83.56 gh	138.5 ij	109.7 c-l	12.75 ab	60.22 c-f
24	G 144 X P5 N/BJW "S"	84.44 fgh	138.4 hi	109.0 c-j	12.38 abc	59.72 c-g
	Mean	88.69	140.94	107.8	12.11	59.75
	Var x s	**	**	n.s	**	**
	Var x Irr.	*	**	n.s	n.s	n.s
	Var x Irr. x S	**	n.s	n.s	n.s	n.s
	L.S.D 0.05	2.98	1.628	3.94	0.753	5.057

Number of kernels/spike:

The differences among genotypes regarding number of kernels/spike in the combined analysis reached the significant levels (Table 7). Sahel 1 (no. 2) gave the highest no. of kernels/spike but without superiority over these of no. 1 (Sids 1), no. 8 (BAVIACORA M92), no.12 (ACSAD529/4/CI 82.24/C168 /3/CNO*2//Ce/TOP) and no. 15 (MYNA/VUL//JUN). However genotypes no. 17 (MYNA "S" VUL "S" YD"S"//PCI"S") had the lowest one. **Shalaby *et al* (1992) and Tomar *et al* (1993)** found that significant differences between variety for no. of kernels/spike.

No. of spikes/ m^2:

Mean values of no. of spikes/ m^2 resented in Table (7)indicated clearly that the three genotypes no. 18 (CPAN/80/PPSN//PRL "S"/ PVN), no. 17 ((MYNA "S" VUL "S" YD"S"//PCI"S") and Yecora (no. 4) gave the highest. However, Sahel 1 (no. 2) gave the lowest one. **El-Kalla *et al* (1995)** showed that one and two supplementary irrigation in wheat had a significant effect on number of spikes per m^2 and **Abd El-Gawad *et al* (1993)** found that a significant reduced number of spikes/ m^2 due to water stress

Weight of kernels/spike (g):

Data in (Table 7) show weight of kernels/spike in the combined analysis. The genotypes no. 19 (NAC/ANGRA) and no.22 (G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59*2) gave heaviest kernels/spike, followed by genotypes No. 1 (Sids 1) , no. 21 (VAN-14) and no. 23 (G 164/SAKHA 61). However, no. 3 Sakha 8 variety gave the lowest one.

Table 7: Cont....

	Genotype	*No.of spikes/ m^2*	*W.of kernels spike (g)*	*W.of 1000- kernel (g)*	*Grain yield (ard./fad.)*
1	Sids 1	303.6 b-e	2.35 a-d	44.71bcd	13.83 I
2	Sahel 1	271.8 h	2.22 def	45.82 abc	14.29 f-I
3	Sakha 8	298.2 c-f	2.00 h	44.64 bcd	14.47 f-I
4	Yecora	318.7 abc	2.27 cde	44.91 a-d	15.89 abc
5	Penwawa	302.4 b-f	2.09 gh	36.95 g	10.03 k
6	Nesser	309.5 bcd	2.17 efg	46.22 abc	15.15 b-g
7	KVZ/Coolfen// Tsi/vee(s)	310.2 bcd	2.14 fg	44.09 cd	14.50 e-I
8	BAVIACORA M92	285.9 e-h	2.24 def	44.99 a-d	14.97 c-h
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	317.8 bc	2.39 abc	44.22 cd	16.06 ab
10	PASTOR*2/OPATA	286.9 e-h	2.19 efg	44.24 cd	15.56 b-e
11	ACSAD529//Yr/sprw "s"	286.2 e-h	2.07 gh	43.03 def	11.57 j
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	305.8 b-e	2.32 bcd	43.81 c-f	14.38 f-I
13	CNO79*2/HOEI//vee "s"/ANC	293.3 d-g	2.32 bcd	44.56 bcd	13.79 i
14	VEE#5 NAC	292.2 d-h	2.17 efg	41.37 f	15.36 b-f
15	MYNA/VUL//JUN	294.2 d-g	2.23 def	43.69 c-f	14.00 hi
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	286.1 e-h	2.26 de	44.63 bcd	14.15 ghi
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	320.0 ab	2.33 bcd	43.94 cde	14.64 d-I
18	CPAN/80/PPSN//PRL "S"PVN	337.3 a	2.41 ab	42.78 def	14.04 b-h
19	NAC/ANGRA	311.2 bcd	2.46 a	41.49 ef	14.72 d-I
20	STK/4/JO/3/CR//CIT71	271.9 h	2.32 bcd	46.89 ab	15.19 b-g
21	VAN-14	274.1 gh	2.39 abc	47.29 a	16.96 a
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	281.7 fgh	2.45 a	44.09 cd	16.05 abc
23	G 164/Sakha 61	284.3 e-h	2.34 a-d	45.39 a-d	15.56 b-e
24	G 144 X P5 N/BJW "S"	294.8 d-g	2.28 cde	46.89 ab	15.66 bcd
	Mean	297.4	2.27	44.19	14.66
	Var x s	*	**	**	**
	Var x Irr.	**	**	n.s.	n.s
	Var x Irr. x S	**	**	**	n.s.
	L.S.D. 0.05	17.86	0.1056	2.189	1.088

Weight of 1000 - kernel (g):

Regarding 1000-kernel weight, genotype no. 21 (VAN-14) recorded the highest kernel index, but without superiority over the recorded by genotype no. 2 (Sahel 1), no.23 (G 164/Sakha 61), and no. 24 (G 144 X P5 N/BJW "S") followed by no. 4 (Yecora). However, genotypes no. 5 (Penwawa), no. 14 (VEE# 5 NAC) and no 19 (NAC/ANGRA) gave the lowest one (Table 7).

Grain yield (ard./fad.)

Van-14 (no. 21) gave the highest grain yield ard./fad, but without superiority over that recorded by genotypes no. 4 (Yecora), no. 9 (IL75-264/4/CAR//KAL/BB/3/NAC/5/CAA and no.22 (G158/5/CFN/CNO "S"//RON/ 3/Bb/ NOR/4/ TL/3FN/TH/NAR59*2). However the lowest grain yield ard./fad. was recorded by Penwawa genotype (no.5).

The high grain yield ard./fad. of Van-14 (no.21) could be attributed to high weight of 1000-kernel and weight of kernels/spike. Also the high grain yield ard./fad. of Yecora (no.4) and (no.9) genotype could be attributed to its high seed index and no. of spikes plant. However, the high grain yield ard./fad. of genotypes no. 22 (G158/5/CFN/CNO"S" //RON/3/Bb/NOR/4/TL/3FN/TH/NAR59*2) could be attributed to high weight of kernels/spike, spike length and no. of kernels/spike.

Generally, the high grain yield/fad. of any genotype could be attributed to a high value of one or more of its components. Wheat genotypes differ widely in their yielding ability. All investigators using different varieties reached this finding. **Ibrahim *et al* (1995)** found that

wheat genotypes exhibited significant differences in number of spikes/m^2 and number of kernels/spike. Oppositely, 1000 kernel weight was decreased.

Straw yield ton/fad:

For straw yield ton/fad., the genotype no. 21 (VAN-14) gave the highest value, followed by no. 9 (IL75-2264/4/CAR//KAL/BB/3/ NAC/5 /CAA), then by no. 20 (STK/4/JO/3/CR//CIT 71) and no.24 (G 144 X P5 N/BJW "S"). However, the genotype no.5 (Penwawa) gave the lowest one (Table 7).

Biological yield ton/fad.:

The two genotypes no. 21 (VAN-14) and no.9 (IL75-2264/4/ CAR//KAL/BB/3/ NAC/5/CAA) had the highest values. However, the genotype no.5 (Penwawa) gave the lowest one (Table 7).

Harvest index:

Regarding harvest index , (no.6) Nesser genotype recorded the highest harvest index followed by Van –14 genotype (no.21). However, Penwawa variety (no.5) gave the lowest one (Table 7). **Clarke *et al* *(1992)*** found that the harvest index ranged from 0.52 to 0.6 over the five years, and tended to be higher under dry condition. **Ellen (1990)** found that the difference in grain yield was mainly attributed to a higher harvest index.

Table 7: Cont.....

	Genotype	*Straw yield (ton./fad.)*	*Biology yield (ton/fad.)*	*Harvest Index*	*Protein %*
1	Sids 1	4.46 ghi	6.54 hi	0.342 e-h	9.29 hij
2	Sahel 1	4.57 e-h	6.71 ghi	0.339 e-k	9.59 f-l
3	Sakha 8	4.64 c-g	6.82 e-h	0.341 e-l	9.48 g-j
4	Yecora	4.88 bcd	7.27 bc	0.359 c	9.11 ij
5	Penwawa	3.41 k	4.92 k	0.326 m	12.20 a
6	Nesser	4.34 hi	6.61 hi	0.377 a	10.29 b-f
7	KVZ/Coolfen// Tsi/vee(s)	4.67 c-g	6.85 e-h	0.331 klm	9.34 g-j
8	BAVIACORA M92	4.60 d-h	6.85 e-h	0.354 cd	10.03 c-g
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	5.15 ab	7.56 ab	0.340 e-l	9.98 d-h
10	PASTOR*2/OPATA	4.87 bcd	7.21 b-e	0.338 g-k	8.82 j
11	ACSAD529//Yr/sprw "s"	3.81 j	5.54 j	0.334 l-m	10.48 b-e
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	4.57 e-h	6.73 ghi	0.346 efg	10.75 bc
13	CNO79*2/HOEI//vee "s"/ANC	4.25 l	6.32 l	0.357 c	8.08 k
14	VEE#5 NAC	4.76 c-f	7.07 c-g	0.338 g-k	9.93 e-h
15	MYNA/VUL//JUN	4.67 c-g	6.77 fgh	0.336 h-l	9.71 f-l
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	4.48f-l	6.60 hi	0.338 f-k	10.28 b-f
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	4.43 ghi	6.63 hi	0.355 c	10.44 b-e
18	CPAN/80/PPSN//PRL "S"PVN	4.64 c-g	6.90 c-h	0.339 e-j	10.65 b-e
19	NAC/ANGRA	4.83 cde	7.04 c-g	0.330 lm	10.27 b-f
20	STK/4/JO/3/CR//CIT71	4.92 abc	7.20 b-e	0.332 j-m	9.65 f-l
21	VAN-14	5.20 a	7.75 a	0.366 b	9.34 g-j
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	4.90 bc	7.31 bc	0.346 ef	10.71 bcd
23	G 164/Sakha 61	4.80 cde	7.14 c-f	0.346 ef	10.90 b
24	G 144 X P5 N/BJW "S"	4.91 abc	7.26 bcd	0.347 de	10.26 b-f
	Mean	4.62	6.82	0.344	9.98
	Var x s	**	**	**	**
	Var x Irr.	n.s	n.s	n.s	**
	Var x Irr. x S	n.s	n.s	n.s	**
	L.S.D 0.05	0.298	0.41	0.0069	0.615

Protein %:

Data in (Table 7) show protein % in the combined analysis. Penwawa variety (no.5) gave the highest protein % followed by G 164/Sakha 61 genotype (no.23). But, Pastor * 2/OPATA (no.10) recorded the lowest one (Table 7).

Effect of interaction between genotypes and seasons:

Table (3) showed that the effect of interaction between genotypes and seasons was statistically significant for all traits except, plant height. This interaction with season was caused mainly by different ranking of genotypes from season to another.

For plant height, insignificant effect of interaction between genotypes and seasons was detected revealing that the performance of genotypes were constant from season to another .

Mean performance of the investigated genotypes in the two seasons for all the studied traits are presented in (Table 8).

Heading date:

Regarding heading date, Yecora (no.4) is the earliest variety in the first season. Yecora variety earliest one but without significant superiority over those genotypes no.18 (CPAN/80/PPSN//PRL "S"/PVN) and no.23 (G 164/Sakha 61). While, Penwawa was the latest ones in the first season.

In the second season, genotype no.18 (CPAN/80/PPSN//PRL "S"/PVN) was the earliest, but genotype no.7 (KVZ/Coolfen// Tsi/vee (s)) was the latest one.

Table 8: Mean performance of the investigated durum and bread wheat for twenty four traits in two seasons at both treatments.

	Genotype	Heading (days)		Maturity (days)		Plant height (cm)	
		1999/2000	2000/2001	1999/2000	2000/2001	1999/2000	2000/2001
1	Sids 1	90.38 d-g	89.00 f-j	143.10 c-f	140.90 e-k	112.7	116.9
2	Sahel 1	92.00 b-f	91.13 c-f	142.80 c-g	141.40 d-j	103.8	113.3
3	Sakha 8	95.13 abc	91.25 c-f	140.90 e-k	139.90 h-m	108.1	112.2
4	Yecora	80.00 r	84.13 m-r	135.30 qr	135.10 qr	89.1	87.1
5	Penwawa	97.75 a	91.75 b-f	147.40 b	151.40 a	101.9	104.8
6	Nesser	94.88 abc	91.50 b-f	144.00 cd	139.60 h-m	100.1	110.6
7	KVZ/Coolfen// Tsi/vee(s)	94.50 a-d	91.88 b-f	142.10 c-h	140.60 e-l	120.1	125.5
8	BAVIACORA M92	94.25 a-e	89.50 f-l	143.40 cde	141.00 e-j	108.4	107.7
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	84.50 k-q	84.38 l-q	138.90 j-o	133.30 r	107.2	114.4
10	PASTOR*2/OPATA	88.50 f-m	90.38 d-j	140.40 f-l	139.80 h-m	110.6	113.9
11	ACSAD529//Yr/sprw "s"	88.75 f-l	85.50 h-q	140.90 e-k	139.50 h-n	102.3	102.9
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	88.00 f-n	83.38 o-r	141.90 d-l	137.50 m-q	106.7	107.0
13	CNO79*2/HOEI//vee "s"/ANC	95.25 abc	87.63 f-q	144.80 c	141.90 d-l	97.1	98.6
14	VEE#5 NAC	90.88 c-f	87.50 f-p	144.10 cd	139.80 h-m	107.7	108.4
15	MYNA/VUL//JUN	89.88 e-h	85.63 h-q	143.30 cde	140.10 g-m	109.5	115.7
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	86.13 g-q	85.00 j-q	144.80 c	141.10 e-j	105.5	106.0
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	89.38 f-j	86.13 g-q	143.40 cde	143.10 c-f	107.4	107.8
18	CPAN/80/PPSN//PRL "S"PVN	82.50 q-r	83.13 pqr	142.80 c-g	136.30 opq	105.9	108.6
19	NAC/ANGRA	95.13 abc	90.25 d-g	144.80 c	139.10 l-n	110.2	113.7
20	STK/4/JO/3/CR//CIT71	95.63 ab	88.88 f-k	144.10 cd	141.00 e-j	103.2	106.5
21	VAN-14	91.13 c-f	88.00 f-n	142.90 c-g	138.00 l-p	107.2	105.6
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	85.50 h-q	85.13 l-q	139.40 h-n	138.10 k-p	111.6	114.3
23	G 164/Sakha 61	83.13 pqr	84.00 n-r	138.10 k-p	136.90 n-q	109.1	110.3
24	G 144 X P5 N/BJW "S"	85.25 l-q	83.63 n-r	140.60 e-l	136.10 pq	106.7	111.3
	Mean	89.93	87.44	142.24	139.64	106.64	109.3

These results agreement with those reported by **Ibrahim *et al* (1995) and Bayoumi (1999)** found significant differences among varieties for earliness.

Maturity date:

The results in (Table 8) recorded that Yecora (no.4) is the earliest genotype in the first season for no. of days to maturity and significant superiority over all the genotype. While Penwawa (no.5) was the latest ones in this trait. In the second season, no.9 (IL75-2264/4/CAR//KAL /BB/3/NAC/5/CAA) was the earliest genotype but without significant superiority over the genotype Yecora (no.4). While Penwawa (no.5) was the latest one in number of days to maturity.

Plant height (cm):

The data in (Table 8) showed that genotype no.7 (//KVZ/Coolfen Tsi/vee (s)) was the tallest one in the first and second season with 120.1 and 125.5 (cm), respectively. While, Yecora (no.4) was the shortest genotype in poth seasones with 89.1 and 87.1 respectively.

Spike length (cm):

Data in Table (8) showed that Sakha 8 (no.3) had the longest spikes in the first season, but genotype no.19 (NAC/ANGRA) produced the shortest spikes.

In the second season, genotype no.1 (Sids 1) had the logest spike, while variety no.20 (STK/4/JO/3/CR//CIT 71) was the shortest one in this triat . This results agreement with those reported by **Semaike (1994) and**

Table 8:

	Genotype	Spike length (cm)		No.of kernels/spike		No.of spikes/ m^2	
		1999/2000	*2000/2001*	*1999/2000*	*2000/2001*	*1999/2000*	*2000/2001*
1	Sids 1	11.70 e-h	13.50 a	70.50 ab	64.05 b-g	309.4 b-j	297.8 c-n
2	Sahel 1	12.02 c-h	11.94 e-h	74.60 a	63.85 b-g	278.1 j-o	265.6 o
3	Sakha 8	12.80 a-f	11.25 ij	68.04 abc	52.85 ijk	303.4 c-l	293.0 d-o
4	Yecora	12.07 c-h	12.25 a-h	52.95 ijk	57.81 e-j	335.0 b	302.3 c-m
5	Penwawa	12.13 b-h	12.19 a-h	61.36 c-l	53.46 ijk	315.6 b-g	289.2 e-o
6	Nesser	11.34 g-j	12.88 a-f	54.45 hij	66.68 a-e	326.9 bc	292.1 d-o
7	KVZ/Coolfen// Tsi/vee(s)	12.05 c-h	12.38 a-h	67.71 a-d	58.60 e-j	335.9 b	284.4 g-o
8	BAVIACORA M92	11.54 f-l	13.31 a-d	66.53 a-e	63.29 b-h	285.9 f-o	285.9 f-o
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	11.54 f-l	12.00 d-h	53.05 ijk	52.89 ijk	335.6 b	300.0 c-m
10	PASTOR*2/OPATA	12.27 a-h	11.81 e-h	59.50 c-j	52.70 ijk	297.8 c-n	275.9 k-o
11	ACSAD529//Yr/sprw "s"	12.40 a-h	12.63 a-g	58.54 e-j	55.72 g-j	288.6 e-o	283.8 g-o
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	12.44 a-h	12.94 a-e	64.13 b-g	63.29 b-h	300.6 c-m	311.0 b-l
13	CNO79*2/HOEI//vee "s"/ANC	11.94 e-h	12.63 a-g	53.61 ijk	59.91 c-j	292.2 d-o	294.5 d-o
14	VEE#5 NAC	11.88 e-h	12.06 c-h	65.46 b-f	55.92 g-j	294.1 d-o	290.3 e-o
15	MYNA/VUL//JUN	12.69 a-g	12.75 a-f	70.39 ab	57.11 f-j	289.1 e-o	299.4 c-m
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	12.19 a-h	13.00 a-e	57.78 e-g	59.94 c-j	299.1 c-m	273.1 l-o
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	12.04 c-h	12.38 a-h	55.90 g-j	45.31 k	322.8 bcd	317.2 b-f
18	CPAN/80/PPSN//PRL "S"PVN	11.69 e-h	12.44 a-h	51.47 jk	56.70 f-j	361.3 a	313.4 b-h
19	NAC/ANGRA	9.85 k	12.10 b-h	61.35 c-l	63.56 b-j	307.8 b-k	314.5 b-h
20	STK/4/JO/3/CR//CIT71	10.00 k	10.44 ijk	55.20 g-j	52.80 ijk	277.8 j-o	265.9 no
21	VAN-14	10.30 jk	11.38 g-j	63.24 b-h	61.29 c-l	273.1 l-o	275.0 lo
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	12.38 a-h	13.44 ab	65.45 b-f	59.29 cj	280.3 l-o	283.1 h-o
23	G 164/Sakha 61	12.13 b-h	13.38 abc	65.01 b-f	55.44 g-j	292.6 d-o	275.9 k-o
24	G 144 X P5 N/BJW "S"	12.06 c-h	12.69 a-g	58.91 d-j	60.53 c-l	319.1 b-e	270.4 mno
	Mean	11.81	12.405	61.46	58.04	305.09	289.74

Ibrahinim *et al* (1995) found that wheat genotypes exhibited significant differences in spike length.

Number of kernels/spike:

Over the two irrigation treatments, genotypes differed significantly in both seasons in number of kernels per spike (Table 8). Data indicated that season variety no.2 Sahel 1 in the first season was the highest in number of kernels/spike. However, variety no.6 (Nesser) in the second season produced the highest number of kernels/spike (Table 8).

Number of spikes/m^2:

Table (8) show that number of spikes/m^2 was significantly affected by both irrigation treatments and genotypes in the two seasons of study. Variety no.18 (CPAN/80/PPSN//PRL "S"/PVN) produced the highest number of spikes/m^2 in the first season. While the lowest number of spikes/m^2 was obtained from variety no. 21 (Van-14). In the second season variety no. 17 (MYNA "S" VUL "S" YD"S"//PCI"S") gave the highest one for this trait. On the other hand, variety no.3 (Sakha 8) was the lowest one in the number of spikes/m^2.

Weight of kernels/spike (g):

Overall the two irrigation treatments, genotypes significantly differed in weight of kernels in both seasons. Genotype no.9 (IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA) had the heavier kernels in the first season. While, in the second season, genotype no.21 (VAN-14) was the heaviest one for this trait followed by genotype no.22 (G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59* 2).

Table 8: Cont

	Genotype	W.of kernels/spike (g)		W.of 1000 kernel (g)		Straw yield(ton. /fad.)	
		1999/2000	2000/2001	1999/2000	2000/2001	1999/2000	2000/2001
1	Sids 1	2.18 I-o	2.51 bc	41.13 l-p	48.30 a-e	4.20 lmp	4.72 b-k
2	Sahel 1	2.03 op	2.42 b-f	41.35 l-p	50.29 ab	4.33 l-n	4.80 b-k
3	Sakha 8	1.85 q	2.15 k-p	42.85 I-p	46.42 c-I	4.77 b-k	4.51 f-l
4	Yecora	2.35 c-I	2.19 I-o	38.88 nop	49.94 abc	5.05 a-e	4.72 b-k
5	Penwawa	2.19 I-q	1.98 pq	34.81 q	39.09 p	3.37 q	3.45 pq
6	Nesser	2.32 e-k	2.02 op	44.25 f-l	48.20 a-e	3.95 mno	4.73 b-k
7	KVZ/Coolfen// Tsi/vee(s)	2.19 I-q	2.09 m-p	44.59 e-l	43.60 h-n	4.62 c-l	4.72 b-k
8	BAVIACORA M92	2.22 g-n	2.26 e-m	47.53 b-g	42.46 j-p	4.43 g-m	4.77 b-k
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	2.50 bcd	2.29 e-l	42.90 I-p	45.55 d-k	5.17 ab	5.13 abc
10	PASTOR*2/OPATA	2.34 c-j	2.04 nop	46.65 b-I	41.84 k-p	4.78 b-k	4.95 a-f
11	ACSAD529//Yr/sprw "s"	2.14 k-p	2.01 op	46.39 c-I	39.67 op	3.72 opq	3.89 nop
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	2.42 b-f	2.22 g-n	40.97 I-p	46.64 b-I	4.61 c-l	4.53 e-l
13	CNO79*2/HOEI//vee "s"/ANC	2.23 g-m	2.40 c-g	43.00 I-o	46.11 d-j	4.21 lmn	4.30 j-n
14	VEE#5 NAC	2.11 l-p	2.22 g-n	42.46 j-p	40.28 m-p	4.35 l-n	5.17 ab
15	MYNA/VUL//JUN	2.29 l	2.17 j-p	43.58 h-n	43.80 g-m	4.49 f-l	4.85 b-l
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	2.21 h-n	2.32 e-k	41.26 l-p	47.99 b-f	4.37 h-n	4.59 d-l
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	2.24 f-m	2.42 b-f	40.35 m-p	47.53 b-g	4.29 k-n	4.57 d-l
18	CPAN/80/PPSN//PRL "S"PVN	2.42 b-f	2.39 c-h	41.26 l-p	44.30 f-l	4.19 lmn	5.10 a-d
19	NAC/ANGRA	2.42 b-f	2.50 bcd	41.88 k-p	41.10 l-p	4.65 b-l	5.01 a-f
20	STK/4/JO/3/CR//CIT71	2.23 g-m	2.40 c-g	42.09 k-p	51.70 a	4.90 b-g	4.93 a-g
21	VAN-14	2.08 m-p	2.71 a	46.22 c-I	48.36 a-e	4.99 a-f	5.41 a
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	2.32 d-k	2.59 ab	41.21 l-p	46.97 b-h	4.74 b-k	5.05 a-e
23	G 164/Sakha 61	2.25 e-m	2.43 b-e	41.63 l-p	49.15 a-d	4.79 b-k	4.82 b-j
24	G 144 X P5 N/BJW "S"	2.04 nop	2.51 bc	46.61 b-I	47.16 b-h	4.93 a-g	4.89 b-h
	Mean	2.85	2.30	42.70	45.69	4.50	4.73

other hand , Penwawa variety (no.5) had the lowest mean value of grain yield/ plant.

Biological yield ton/fad.

Table 8 show that biology yield ton/fad. was significantly affected by two irrigation treatments and genotypes in the two seasons of study. In the first season genotype no 4 (Yecora) gave the higest values of biology yield. While the lowest value was genotype no 5 (Penwawa) . In the secand season, genotype no 21 (VAN-14) durum wheat was the highest one in biology yield **Trethowan *et al (1991)*** found that duration of the vegetative phase under drought positively influnced **accumulated** biomass.

Harvest index:

The results in (Table 8) showed that significant differences were found between genotyes. VAN-14 (no 21) durum wheat was the highest mean value in harvest index in the first season, while genotype no 19 (NAC/ANGRA) was the lowest value in harvest index. In the second season, genotype no 6 (Nesser) produced higher mean value for harvest index.

Protein %:

For protein % genotype no 5 (Penwawa) gave the heighest mean value in the first, season while genotype no ***10*** (PASTOR * 2/OPATA) Was the lowest one in protein %. In the second season, genotype no 22 (G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59* 2) was the highest mean value in protein % (Table 8).**Jafari-shabestari and**

Table 8: Cont.

	Genotype	*Harvest index*		*Protein %*	
		1999/2000	*2000/2001*	*1999/2000*	*2000/2001*
1	Sids 1	0.3 50 c-l	0.335 mr	9.63 l-p	8.95 m-r
2	Sahel 1	0.345 f-m	0.333 o-s	9.36 j-p	9.82 g-o
3	Sakha 8	0.346 e-m	0.336 l-r	9.31 j-p	9.66 l-p
4	Yecora	0.345 f-m	0.373 b	8.69p-s	9.52 l-p
5	Penwawa	0.333 o-s	0.320 t	13.43 a	10.97 b-f
6	Nesser	0.348 d-l	0.406 a	11.10 bcd	9.49 l-p
7	KVZ/Coolfen// Tsi/vée(s)	0.331 o-t	0.331 o-t	9.52 l-p	9.17 l-q
8	BAVIACORA M92	0.353 c-h	0.355 c-f	10.05 d-l	10.01 e-m
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	0.345 f-n	0.336 l-r	8.88 n-s	11.09bcd
10	PASTOR*2/OPATA	0.346 f-m	0.330 p-t	8.02 rs	9.62 l-p
11	ACSAD529//Yr/sprw "s"	0.342 h-p	0.326 q-t	10.83 b-g	10.13 d-l
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	0.345 f-n	0.347 e-m	11.57 b	9.93 f-n
13	CNO79*2/HOEI//vee "s"/ANC	0.356 c-f	0.358 cde	8.22 qrs	7.94 s
14	VEE#5 NAC	0.339 l-p	0.336 k-r	11.02 b-e	8.83 o-s
15	MYNA/VUL//JUN	0.333 n-r	0.339 l-p	9.15 l-q	10.27 d-k
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	0.335 l-r	0.342 h-p	10.89 b-f	9.68 l-p
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	0.349 d-j	0.361 c	11.55 b	9.34 j-p
18	CPAN/80/PPSN//PRL "S"PVN	0.342 h-p	0.337 j-q	10.57 b-l	10.74 b-h
19	NAC/ANGRA	0.321 st	0.338 l-p	10.82 b-g	9.72 h-p
20	STK/4/JO/3/CR//CIT71	0.325 rst	0.338 l-p	10.01 e-m	9.29 k-p
21	VAN-14	0.373 b	0.359 cd	9.34 j-p	9.33 j-p
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	0.354 c-g	0.339 l-p	10.32 d-k	11.11 bcd
23	G 164/Sakha 61	0.350 c-l	0.343 g-o	11.41 bc	10.39 c-j
24	G 144 X P5 N/BJW "S"	0.346 f-m	0.348 d-k	10.80 b-g	9.71 h-p
	Mean	0.344	0.345	10.19	9.78

Abd-Mishani (1987) found that a dquate soil maisture decreased protein content but increased in grain yield

Effect of interaction between genotypes and irrigation treatments:

Mean squares associated with genotypes were found herein to reach the level of significance in all traits at stress and non-stress irrigation treatments as well as the combined over them, except spike length in normal irrigation in the second season, weight of kernels/spike at normal irrigation and harvest index and protein % at stress condition in the first season (Table 3). Mean squares for the interaction between genotypes and irrigation treatment were significant for all traits except plant height, spike length, no. of kernels/spike and grain yield ard./fad., straw, biological yields ton /fad. and harvest index in both seasons as well as the combined data, heading date and weight of 1000-kernel in the first season and maturity date in the second season (Table 3).

Significant mean squares of interaction revealed that the tested genotypes ranked differently from normal to stress irrigation treatments.

Mean performances of the investigated genotypes at stress and normal irrigation treatments overall two seasons for all traits are presented in Table (9).

Heading date:

With regard to heading date, Yecora (no.4) is the earliest variety under drought or irrigation conditions. Also, Yecora variety was the earliest one but without significant superiority over those genotypes no. 9

(IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA), no. 17 (MYNA "S" VUL "S" YD"S"//PCI"S") no. 18 (CPAN/80/PPSN//PRL "S"/PVN), no.22 (G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/TH//NAR59*2), no.23 (G 164/Sakha 61) and no.24 (G 144 X P5 N/BJW "S") in stress irrigation and no. 9 (IL75-2264/4/CAR//KAL/ BB/3/NAC/ 5/ CAA), no.12 (ACSAD 529/4/CI82.24/C168/3/CNO*2//Cc/TOP), no.17 (MYNA "S" VUL "S" YD"S"//PCI"S"), no. 18 (CPAN/80/PPSN// PRL "S" / PVN), no.23 (G 164/Sakha 61) and no. 24 (G 144 X P5 N/BJW "S") in normal irrigation. However, Penwawa (no.5) and Sakha 8 (no.5) Gave the latest ones at both conditions, respectively (Table 9) .

These results are agreement with those reported by **Islam (1990)** and **Ibrahim *et al* (1995)** who found significant differences among varieties for earliers (days to heading).

Maturity date:

For maturity date, Yecora variety showed the earliest one followed by genotype no.9 (IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA) in stress and normal irrigation treatments over two seasons. However, Penwawa variety (no.5) exhibited the latest one in both irrigation treatments, but without significant superiority over those no.13 (CNO 79* 2/HOEL//vee "S"/ANC), and no. 17 (MYNA "S"/ VUL "S" YD"S"//PCI"S") in stress condition (Table 9).

Plant height (cm):

For plant height, Yecora variety (no. 4) had the shortest one at stress and normal conditions, but without significantly differ than genotype no. 13 (CNO 79* 2/HOEL//vee "S"/ANC) in normal

Table 9: Mean performances of the investigated durum and bread wheat for all the studied trails in two irrigation treatments (stress and normal over two seasons).

	Genotype	Heading (days)		Maturity (days)		Plant height (cm)	
		Drought	Irrigation	Drought	Irrigation	Drought	Irrigation
1	Sids 1	84.50 o-s	94.88 a-e	133.50 l-o	150.50 b	111.85	117.73
2	Sahel 1	88.13 l-o	95.00 a-e	134.75 k-n	149.38 bc	103.94	113.15
3	Sakha 8	91.25 d-l	95.13 a-d	132.50 nop	148.25 b-g	105.00	115.30
4	Yecora	77.88 u	86.25 k-q	127.50 s	142.88 l	82.48	93.79
5	Penwawa	90.38 g-l	99.13 a	138.13 j	160.63 a	98.65	108.06
6	Nesser	89.88 g-m	96.50 abc	134.38 k-n	149.25 bcd	99.28	111.39
7	KVZ/Coolfen// Tsi/vee(s)	90.00 g-m	96.38 abc	133.50 l-o	149.25 bcd	114.36	131.20
8	BAVIACORA M92	88.38 h-o	95.38 a-d	135.50 kl	148.88 b-e	103.63	112.46
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	79.75 tu	89.13 h-n	128.13 rs	144.00 hi	104.58	117.03
10	PASTOR*2/OPATA	88.38 h-o	90.50 f-k	133.38 l-o	146.75 c-g	107.83	116.68
11	ACSAD529//Yr/sprw "s"	82.38 q-t	91.88 d-l	132.63 m-p	147.75 b-g	96.21	108.98
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	82.75 p-t	88.63 h-o	131.38 opq	148.00 b-g	102.13	111.57
13	CNO79*2/HOEI//vee "s"/ANC	88.00 l-o	94.88 a-e	136.50 jk	150.13 b	93.19	102.58
14	VEE#5 NAC	85.63 m-q	92.75 c-h	135.38 klm	148.50 b-f	104.09	112.06
15	MYNA/VUL//JUN	84.75 n-r	90.75 e-j	134.38 k-n	149.00 bcd	105.29	119.89
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	82.25 q-t	88.88 h-o	135.63 jkl	150.25 b	101.20	110.29
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	80.88 r-u	94.63 b-f	136.63 jk	149.88 b	102.86	112.35
18	CPAN/80/PPSN//PRL "S"PVN	78.88 t-u	86.75 j-p	132.50 nop	146.50 d-h	102.03	112.50
19	NAC/ANGRA	88.38 h-o	97.00 abc	134.38 k-n	149.50 bc	106.84	117.03
20	STK/4/JO/3/CR//CIT71	86.00 l-q	98.50 ab	134.63 k-n	150.50 b	102.08	107.65
21	VAN-14	85.38 n-q	93.75 c-g	134.00 k-o	146.88 c-g	101.15	111.69
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	82.00 q-u	88.63 h-o	131.50 opq	146.00 fgh	107.39	118.41
23	G 164/Sakha 61	79.63 tu	87.50 l-o	129.25 qrs	145.75 gh	103.44	115.94
24	G 144 X P5 N/BJW "S"	80.38 stu	88.50 h-o	130.50 pqr	146.25 e-h	105.23	112.84
	Mean	84.82	92.46	133.35	148.50	102.70	

irrigation. However , genotypes showed that Table 9 no. 7 (KVZ/Coolfen// Tsi/vee "s") expressed significant taller than other genotypes in both irrigation treatments, but without significant superiority than those Sids 1 (no.1), no.10 (PASTOR * 2/OPATA) and no.22(G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59* 2) in stress condition.

Spike length (cm):

Regarding spike length, genotype no.20 (STK/4/JO/3/CR//CIT 71) had the shortest one at both stress and non stress conditions, but without significantly differ than all genotypes. On the other hand, genotypes no.23 (G164/Sakha 61) exhibited the tallest one under stress condition and genotype no.22 (G158/5/CFN/CNO"S"//RON/3/Bb/NOR/4/TL/3FN/ TH/NAR59* 2) under non-stress condition (Table 9).

Number of kernels/spike:

With respect to no. of kernels/spike, the lowest mean values were detected by genotype no.17 (MYNA "S" VUL "S" YD"S"//PCI"S") at both conditions, while Sahel 1 variety (no.2) gave the highest mean values, but without significantly differ than the other genotypes (Table 9).

Number of spikes/m^2:

For number of spike/m^2 , VAN-14 genotype (no.21) gave the lowest mean values, while the highest values were detected by genotype no.18 (CPAN/80/PPSN//PRL "S"/PVN) followed by no.17 (MYNA "S" VUL "S" YD"S"//PCI"S") , no.6 (Nesser) and no. 19 (NAC/ANGRA) under stress condition.

Table 9: Cont.

	Genotypes	Spike length (cm)		No.of kernels/spike		No.of spikes/ m2	
		Drought	Irrigation	Drought	Irrigation	Drought	Irrigation
1	Sids 1	11.81	13.39	59.04	75.51	268.06 k-o	339.06 bcd
2	Sahel 1	11.26	12.70	62.61	75.84	254.06 nop	289.63 h-m
3	Sakha 8	11.05	13.00	54.25	66.64	265.19 l-o	331.25 cde
4	Yecora	11.44	12.89	49.80	60.96	274.19 j-o	363.13 ab
5	Penwawa	11.56	12.75	53.03	61.80	251.06 nop	353.75 abc
6	Nesser	11.75	12.46	53.49	67.64	293.06 g-l	325.94 c-f
7	KVZ/Coolfen// Tsi/vee(s)	11.38	13.04	55.33	70.99	278.13 l-n	342.21 bcd
8	BAVIACORA M92	11.85	12.94	58.48	71.34	249.94 nop	321.88 d-g
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	11.23	12.31	49.03	56.91	259.38 m-p	376.25 a
10	PASTOR*2/OPATA	11.56	12.53	48.09	64.11	250.94 nop	322.81 d-g
11	ACSAD529//Yr/sprw "s"	11.59	13.44	51.35	62.91	255.69 nop	316.75 d-h
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	11.88	13.50	58.60	68.81	271.00 j-o	340.56 bcd
13	CNO79*2/HOEI//vee "s"/ANC	11.69	12.88	50.70	62.83	272.19 j-o	314.50 d-h
14	VEE#5 NAC	11.13	12.81	53.01	68.38	259.06 nop	325.31 c-f
15	MYNA/VUL//JUN	12.00	13.44	58.83	68.68	266.88 l-o	321.56 d-g
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	11.94	13.25	55.91	61.80	255.88 nop	316.25 d-h
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	11.63	12.79	44.36	56.85	301.25 e-j	338.75 bcd
18	CPAN/80/PPSN//PRL "S"PVN	11.63	12.50	48.69	59.49	307.19 e-l	367.50 ab
19	NAC/ANGRA	9.98	11.97	58.86	66.05	293.75 g-l	328.56 c-f
20	STK/4/JO/3/CR//CIT71	8.81	11.63	47.39	60.61	245.31 op	298.44 f-k
21	VAN-14	9.30	12.44	56.49	68.04	234.38 p	313.75 d-h
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	11.75	14.06	56.05	68.69	269.69 k-o	293.75 g-l
23	G 164/Sakha 61	12.19	13.31	55.23	65.23	254.63 nop	313.88 d-h
24	G 144 X P5 N/BJW "S"	11.50	13.25	55.21	64.23	272.25 j-o	317.25 d-h
	Mean	11.33	12.89	53.91	65.60	266.79	328.03

At favorable condition, the lowest mean values were detected by Sahel 1 variety. On the other hand, genotype no.9 (IL75-2264/4/CAR// KAL/BB/3/NAC/5/CAA) gave the highest mean value followed by Yecora (no. 4), Penwawa (no.5) varieties and genotype no. 18 (CPAN/80/PPSN//PRL "S"/PVN) without significant superiority (Table 9).

Weight of kernels/spike (g):

As for irrigation treatment, well watered treatment produced heavier grains than the stress treatment in both seasons (Table 9). Weight of kernels/spike were 2.54 and 2.00 with well watered and stress condition, respectively .

Data in (Table 9) showed genotype that no.19 (NAC/ANGRA) had the heaviest kernels/spike over the two irrigation treatments (stress condition). On the contrary, no.3 and no.5 (Sakha 8 and Penwawa) gave the lightest kernels/spike with average 1.58 and 1.66 g respectively.

At favorable condition, the lowest mean value was detected by line no.11 (ACSAD 529// Yr/ SPRW "S"). On the other hand, genotypes no. 20 and no.22 (STK/4/JO/3/CR//CIT 71) and (G158/5/CFN/CNO "S"//RON/3/Bb/NOR/4/TL/3FN/TH/NAR59* 2) gave the highest mean values with 2.70 and 2.70 g respectively.

Weight of 1000-kernel (g):

Data in (Table 9) indicated that interaction between genotype x irrigation treatments did not reach to the significance level in the two seasons of study .

Table 9 : Cont.

	Genotype	W.of kernels /spike (g)		W.of 1000 kernel (g)		Straw yield (ton /fad.)	
		Drought	Irrigation	Drought	Irrigation	Drought	Irrigation
1	Sids 1	2.20 l-l	2.50 c-g	40.74	48.69	3.58	5.34
2	Sahel 1	2.02 l-o	2.42 e-h	41.98	49.66	3.76	5.37
3	Sakha 8	1.58 t	2.42 e-h	39.17	50.11	3.71	5.58
4	Yecora	2.05 ko	2.49 c-g	40.84	48.98	4.17	5.60
5	Penwawa	1.66 st	2.52 a-g	33.43	40.48	2.61	4.22
6	Nesser	1.99 m-p	2.35 f-l	41.84	50.61	3.64	5.04
7	KVZ/Coolfen// Tsi/vee(s)	1.73 rst	2.55 a-e	38.83	49.36	3.81	5.53
8	BAVIACORA M92	1.97 m-q	2.52 a-g	40.76	49.23	3.75	5.44
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	2.11 k-n	2.68 ab	38.78	49.68	4.32	5.98
10	PASTOR*2/OPATA	1.94 n-q	2.44 d-h	38.53	49.96	3.80	5.94
11	ACSAD529//Yr/sprw "s"	1.81 qrs	2.34 ghi	40.28	45.79	2.97	4.64
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	2.12 j-m	2.52 a-g	40.31	47.30	3.75	5.38
13	CNO79*2/HOEI//vee "s"/ANC	2.06 k-o	2.57 a-e	40.46	48.65	3.57	4.93
14	VEE#5 NAC	1.83 pqr	2.50 b-g	37.04	45.70	3.80	5.72
15	MYNA/VUL//JUN	1.92 opq	2.54 a-e	39.85	47.53	3.85	5.49
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	1.84 pqr	2.69 a	40.96	48.29	3.64	5.32
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	2.14 j-m	2.52 a-f	39.33	48.55	3.61	5.25
18	CPAN/80/PPSN//PRL "S"PVN	2.20 l-l	2.61 a-d	37.15	48.41	3.77	5.52
19	NAC/ANGRA	2.29 hij	2.63 abc	36.34	46.64	3.93	5.73
20	STK/4/JO/3/CR//CIT71	1.94 n-q	2.70 a	42.88	50.91	4.12	5.71
21	VAN-14	2.19 l-l	2.60 a-e	41.88	52.71	4.32	6.09
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	2.21 ijk	2.70 a	41.26	46.93	3.98	5.81
23	G 164/Sakha 61	2.06 k-o	2.62 a-d	40.70	50.08	3.84	5.77
24	G 144 X P5 N/BJW "S"	2.03 l-o	2.53 a-e	41.83	51.95	4.12	5.70
	Mean	2.00	2.54	39.80	48.59	3.77	5.79

Favorable condition produced heavier grains than the stress condition in both seasons. Weight of 1000-kernel weight were 48.59 and 39.80 respectively. **Islam (1990) and Bayaoumi (1999)** pointed out that water deficit decreased 1000 kernel weight in bread wheat by 17 % as an average of two seasons.

Straw yield ton/fad.:

The results (Table 9) indicated that genotypes x irrigation treatments interaction was insignificant different in straw yield in the two seasons of study. It means that the 24 genotypes showed similar response to irrigation and stress condition.

Grain yield ard./fad.:

The results of combined analysis for this trait showed that the interaction between wheat genotypes under this study and both irrigation treatments (non stress and stress) was insignificant differences between all genotypes (Table 9). This result indicates that genotypes ranked the same from normal to stress irrigation treatments. The results recorded that variety no.21 (VAN-14), durum wheat was the highest one in grain yield under non stress and stress condition which gave 19.72 and 14.20 ard./fad. respectively. While variety no.5 Penwawa bread wheat was the lowest one also under non-stress and stress condition which gave 12.00 and 8.07 ard./fad., respectively.

Biological yield ton/fad.

Insignificant difference for compared analysis for interaction between genotypes and water treatments was found (Table 9) but variety no.21 (VAN-14) durum wheat was the highest one in this trait under non

Table 9: Cont..

	Genotype	Grain yield (ard./fad.)		Biology yield (ton/fad.)	
		Drought	Irrigation	Drought	Irrigation
1	Sids 1		16.31	5.28	7.79
2	Sahel 1		16.53	5.57	7.85
3	Sakha 8		16.92	5.51	8.12
4	Yecora		18.40	6.18	8.36
5	Penwawa		12.00	3.82	6.02
6	Nesser	11.90	18.39	5.43	7.80
7	KVZ/Coolfen// Tsi/vee(s)	12.23	16.78	5.65	8.05
8	BAVIACORA M92	12.45	17.48	5.62	8.07
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	13.66	18.46	6.37	8.76
10	PASTOR*2/OPATA	12.68	18.45	5.70	8.71
11	ACSAD529//Yr/sprw "s"	9.14	14.00	4.34	6.74
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	11.52	17.24	5.49	7.97
13	CNO79*2/HOEI//vee "s"/ANC	11.81	15.77	5.35	7.30
14	VEE#5 NAC	12.60	18.12	5.69	8.44
15	MYNA/VUL//JUN	11.54	16.45	5.58	7.96
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	11.80	16.49	5.41	7.80
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	11.96	17.32	5.41	7.85
18	CPAN/80/PPSN//PRL "S"PVN	12.60	17.49	5.67	8.14
19	NAC/ANGRA	11.93	17.51	5.75	8.36
20	STK/4/JO/3/CR//CIT71	12.89	17.48	6.11	8.34
21	VAN-14	14.20	19.72	6.45	9.05
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	13.50	18.60	6.00	8.61
23	G 164/ Sakha 61	13.00	18.13	5.79	8.50
24	G 144 X P5 N/BJW "S"	13.18	18.14	6.10	8.43
	Mean	12.14	17.17	5.59	8.04

stress and stress condition. On the other hand Penwawa no.5 have low values for biology yield under non stress and stress condition.

Harvest index:

Overall the studied irrigation treatments genotypes were insignificantly different in harvest index values (Table 9). Genotypes x irrigation treatments interaction did not reach the significance level in both seasons. It means that the studied genotypes showed similar response to irrigation treatments in both seasons of study. **Fischer and Wood (1979)** they found that comparisons between selected lines under well-watered condition and those under drought stress conditions were insignificant in both seasons.

Protein %:

The results showed that Penwawa variety no.5 gave the highest protein % under water stress while Sahel 1 no. 1 recorded the lowest one under drought (Table 9). Meanwhile was the highest one in protein under non.stress.

The high grain yield (ard./fad.) of the previous genotypes could be attributed to the high values of one or more of yield components. It could be concluded that these genotype would be efficient and promising in wheat breeding programs for improving grain yield under stress condition.

Table 9: Cont..

	Genotype	Harvest index		Protein %	
		Drought	Irrigation	Drought	Irrigation
1	Sids 1	0.344	0.335	10.21 g-l	8.36 Qrs
2	Sahel 1	0.345	0.336	7.68	11.50 cd
3	Sakha 8	0.348	0.333	9.61 j-o	9.36 k-q
4	Yecora	0.346	0.353	9.20 l-r	9.02 n-r
5	Penwawa	0.338	0.319	13.64 a	10.77 c-h
6	Nesser	0.351	0.375	10.67 d-l	9.91 h-o
7	KVZ/Coolfen// Tsi/vee(s)	0.347	0.333	9.01 n-r	9.67 l-o
8	BAVIACORA M92	0.354	0.347	10.14 g-m	9.91 h-o
9	IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA	0.343	0.337	9.57 j-p	10.40 f-k
10	PASTOR*2/OPATA	0.355	0.339	9.09 m-r	8.54 p-s
11	ACSAD529//Yr/sprw "s"	0.336	0.333	11.39 c-f	9.58 J-p
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	0.336	0.346	12.64 b	8.86 o-r
13	CNO79*2/HOEI//vee "s"/ANC	0.353	0.348	8.32 qrs	7.85 s
14	VEE#5 NAC	0.353	0.342	9.87 h-o	9.98 h-n
15	MYNA/VUL//JUN	0.331	0.331	11.14 c-g	8.29 r-s
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	0.347	0.339	9.18 l-r	11.39 c-f
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	0.354	0.352	10.44 e-j	10.44 e-j
18	CPAN/80/PPSN//PRL "S"PVN	0.355	0.343	10.86 c-h	10.44 e-j
19	NAC/ANGRA	0.337	0.335	9.04 n-r	11.50 cd
20	STK/4/JO/3/CR//CIT71	0.346	0.334	11.52 cd	7.78 s
21	VAN-14	0.354	0.348	9.25 l-r	9.43 j-p
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	0.359	0.346	9.98 h-n	11.45 cde
23	G 164/Sakha 61	0.358	0.341	11.72 c	10.07 h-n
24	G 144 X P5 N/BJW "S"	0.344	0.345	11.26 c-f	9.25 l-r
	Mean	0.347	0.341	10.23	9.74

Effect of interaction between genotypes x irrigation treatment x season:

Mean squares of genotypes x irrigation x season were significant for heading date, no. of spikes/m^2, weight of kernels/spike, 1000- kernel weight and protein percentage (Table 3). The other traits were insignificant by **Shalaby *et.al. (1992),*** they reported that water stress is a major environmental limitation to grain yield however differences among the irrigation treatments were limited to some extent and the results indicated that their were significant among wheat genotypes in heading data, no of spike/m2, 1000-kernels weight and plant height. significant mean squares of interaction revealed that the tested genotypes ranked differently from stress to non-stress conditions and from season to another.

Significant mean squares for interactions between genotypes irrigation treatments and season were detected for heading date, no. of spikes/plot, no. of kernels/spike and 1000-kernel weight, (Table 3). These results indicated that ranked of effect of interaction between genotypes and irrigation treatment was differed from season to another for these traits.

Heading date:

Data in (Table 10) indicated that variations in days to heading due to irrigation treatments were significant in the two seasons. Drought stress treatment produced earlier heading than the recommend irrigation treatment, in both seasons. These results were in accordance with those of **Shalaby *et al (1992)* and Ibrahim *et al (1995).*** Data showed that Yecora variety (no.4) was the earliest genotypes with average number of

days to heading of 76.5 days in the first season under stress condition while genotype (no. 5) Penwawa was the latest genotype under stress and non stress.

In the second season, genotype no. 24 (G 144 X P5 N/BJW "S") was the earlier genotype with average 77.25 days followed by Yecora with average 79.25 days under stress condition. While genotype no.20 (STK/4/JO/3/CR//CIT 71) was the latest one.

Number of spikes/m2

The results in (Table 10) showed that the number of spikes/m^2 was significantly affected by effect of irrigation treatments and genotypes in the two seasons. Stress treatment decreased average number of spikes/m^2 compared to non stress treatment in the two seasons. These results agreed with those obtained by **Blum and Puel (1990), Abd El-Gawad *et.al* (1993) and El-Monoufi and Harb (1994).** Genotype no.7 (KVZ/Coolfen// Tsi/vee (s)) produced the highest number of spikes/m^2 with average 321.88 under stress condition in the first season. In the other hand the lowest number of spikes /m^2 was obtained from genotype no.21 (VAN-14) durum wheat with average 227.50 under stress condition.

In the second, season genotype no.19 (NAC/ANGRA) was the highest number of spikes/ m^2 under stress condition with average 303.13. While the lowest one was genotype no.8 (BAVIACORA M92) with average 224.88.

Table 10: The average values of interaction effect between genotypes, irrigation treatments and seasons for all the studied traits of wheat.

		Heading (days)				*No. of spike / m2*			
		1999/2000		*2000/2001*		*1999/2000*		*2000/2001*	
		Drought	*Irrigation*	*Drought*	*Irrigation*	*Drought*	*Irrigation*	*Drought*	*Irrigation*
	Sids 1	81.50	99.25	87.50	90.50	265.63	353.13	270.50	325.00
	Sahel 1	87.25	96.75	89.00	93.25	254.38	301.88	253.75	277.38
4	Yecora	92.25	98.00	90.25	92.25	281.88	325.00	248.50	337.50
5	Penwawa	76.50	83.50	79.25	89.00	266.88	403.13	281.50	323.13
6	Nesser	93.00	102.50	87.75	95.75	257.50	373.75	244.63	333.75
7	KVZ/Coolfen// Tsi/vee(s)	90.00	99.75	89.75	93.25	316.88	336.88	269.25	315.00
8	BAVIACORA M92	90.25	98.75	89.75	94.00	321.88	350.00	234.38	334.41
9	IL75-2264/4/CAR//KAL/BB/3/ NAC/5/CAA	90.25	98.25	86.50	92.50	275.00	296.88	224.88	346.88
10	PASTOR*2/OPATA	81.75	87.25	77.75	91.00	246.25	425.00	272.50	327.50
11	ACSAD529//Yr/sprw "s"	87.00	90.00	89.75	91.00	261.25	334.38	240.63	311.25
12	ACSAD629/4/CI82.24/C168/3/CON*2 //Cc/TOP	84.75	92.75	80.00	91.00	260.00	317.25	251.38	316.25
13	CNO79*2/HOEI//vee "s"/ANC	85.50	90.50	80.00	86.75	257.50	343.63	284.50	337.50
14	VEE#5 NAC	91.00	99.50	85.00	90.25	269.38	315.00	275.00	314.00
15	MYNA/VUL//JUN	86.50	95.25	84.75	90.25	258.75	329.38	259.38	321.25
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	87.75	92.00	81.75	89.50	256.25	321.88	277.50	321.25
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	83.75	88.50	80.75	89.25	260.63	337.50	251.13	295.00
18	CPAN/80/PPSN//PRL "S"PVN	80.75	98.00	81.00	91.25	308.13	337.50	294.38	340.00
19	NAC/ANGRA	79.50	85.50	78.25	88.00	313.13	409.38	301.25	325.63
20	STK/4/JO/3/CR//CIT71	90.00	100.25	86.75	93.75	284.38	331.25	303.13	325.88
21	VAN-14	92.00	99.25	80.00	97.75	256.88	298.75	233.75	298.13
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	88.00	94.25	82.75	93.25	227.50	318.75	241.25	308.75
23	G 164/Sakha 61	82.25	88.75	81.75	88.50	265.00	295.63	274.38	291.88
24	G 144 X P5 N/BJW "S"	80.50	85.75	78.75	89.25	266.13	319.00	243.13	308.75
		83.50	87.00	77.25	90.00	303.88	334.38	240.63	300.13
	Mean	86.06	93.62	83.58	91.30	272.29	337.89	261.30	318.17

Protein %

Results in (Table 10) revealed that protein percentage of twenty four genotypes under study as affected by irrigation treatments during two seasons.

The results showed significant differences among the tested genotypes. Penwawa variety (no.5) occupied the first rank among the twenty four genotypes under stress condition in the first season. However, the twenty four genotypes were in a limited range (7.73-15.31%). **Ahmed *et.al.* (1997)** showed that hundred-grain weight of all the water stress tolerant lines of wheat had highest protein 12.8%.

Genotype no.16 (MYNA "S"/ VUL "S" YD "S" //PCI "S") recorded the highest protein % and showed significant differences among the tested genotypes but without superiority over the recorded by genotypes no.19 (NAC/ANGRA) and no.18 (CPAN/80/PPSN//PRL "S"/PVN).

On the other hand, genotype no.13 (CNO 79* 2/HOEL//vee "S"/ ANC) recorded the lowest protein % (7.85) under non stress condition during the first season.

In the second season genotype no.18 (CPAN/80/PPSN//PRL "S"/PVN) was the hiehest one in protein % under stress condition with 12.66% followed by Penwawa variety no.5 with 11.96. While the lowest one in protein % was Sahel 1 no. 2 under non stress condition.

Table 10: Cont.

	Genotypes	*Protein %*			
		1999/2000		*2000/2001*	
		Drought	*Irrigation*	*Drought*	*Irrigation*
1	Sids 1	10.76	8.50	9.67	8.24
2	Sahel 1	7.73	10.99	7.63	12.01
3	Sakha 8	10.67	7.95	8.55	10.76
4	Yecora	8.60	8.78	9.80	9.25
5	Penwawa	15.31	11.56	11.96	9.98
6	Nesser	11.50	10.70	9.85	9.13
7	KVZ/Coolfen// Tsi/vee(s)	8.74	10.29	9.27	9.06
8	BAVIACORA M92	9.39	10.70	10.90	9.13
9	IL75-2264/4/CAR//KAL/BB/3/ NAC/5/CAA	8.20	9.56	10.94	11.24
10	PASTOR*2/OPATA	8.03	8.00	10.15	9.09
11	ACSAD529//Yr/sprw "s"	11.56	10.10	11.22	9.05
12	ACSAD629/4/CI82.24/C168/3/CON*2//Cc/TOP	15.06	8.08	10.22	9.63
13	CNO79*2/HOEI//vee "s"/ANC	8.60	7.85	8.04	7.85
14	VEE#5 NAC	10.70	11.35	9.05	8.61
15	MYNA/VUL//JUN	10.26	8.04	12.01	8.53
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	8.69	13.09	9.67	9.67
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	11.55	11.55	9.34	9.34
18	CPAN/80/PPSN//PRL "S"PVN	9.07	12.06	12.66	8.83
19	NAC/ANGRA	9.22	12.43	8.87	10.57
20	STK/4/JO/3/CR//CIT71	12.22	7.79	10.82	7.76
21	VAN-14	9.25	9.44	9.25	9.41
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	8.98	11.66	10.98	11.24
23	G 164/Sakha 61	11.83	10.98	11.62	9.16
24	G 144 X P5 N/BJW "S"	11.51	10.10	11.02	8.41
	Mean	10.308	10.065	10.114	9.415

Susceptibility index (SI):

Mean square for susceptibility index (SI) of grain , straw and biological yields in the three methods used, are presented in (Table 11) . The three Method used for estimating (SI) were (I-D)/I, I/D and **Fischer and Maurer 1978).**

Results indicated that season mean squares were significant for grain yield (ard./fad.) in the three methods and biological yields(ton/fad.) in the two methods used for estimating (SI) , indicating that the ground mean values of SI for both traits were differed from season to season. While, season mean squares for straw yield (ton/fad.) were insignificant (Table 11).

Genotype mean squares for SI were significant for grain, straw and biological yields in the three methods. Also, significant genotypes x season mean squares interaction were obtained for grain, straw and biological yields in the three methods, indicating that genotypes behaved somewhat differently from season to another. **Clarke *et.al* (1984)** reported large year to year shifts in the SI values of certain genotypes, and associated this variation with yearly variation in timing and intensity of stress relatives to differing genotypes maturities. Considerable variation in (SI) values of certain genotypes occurred between stress.

The mean performances of the genotypes of wheat for susceptibility to drought resistance by using the three equation (methods i.e. (I-D/I, I/D and **Fischer and Maurer, 1978)** were used for grain, straw and biological yields are presented in (Tables 12, 13 and 14) respectively.

Table 11 : Mean squares for susceptibility index (SI) of grain and straw estimated by the three methods.

S.O.V.	d.f		(1-D)/I%					
			Grain yield (ard/fad.)			Straw yield (ard./fad.)		
	Single	Comb.	1	2	Comb.	1	2	Comb.
S		1			939.62*			22.16
R	3	6	69.54	52.69	61.11	50.89	79.64	65.26
G	23	23	92.40*	65.14*	54.25*	113.00*	54.97*	78.68*
S x G		23			103.29*			89.29*
E	69	138	51.99	33.62	42.81	58.68	30.86	45.32
S.O.V.	d.f		D/I %					
			Grain yield (ard/fad.)			Straw yield (ard./fad.)		
	Single	Comb.	1	2	Comb.	1	2	Comb.
S		1			939.62*			22.16
R	3	6	69.54	52.69	61.11	50.89	79.64	65.26
G	23	23	92.40*	65.14*	54.25*	113.00*	54.97*	78.68*
S x G		23			103.29*			89.29*
E	69	138	51.99	33.62	42.81	58.68	30.86	45.32
S.O.V.	d.f		S= (1-Y/YP) /(1-X/XP)					
			Grain yield (ard/fad.)			Straw yield (ard./fad.)		
	Single	Comb.	1	2	Comb.	1	2	Comb.
S		1			0.498**			0.001
R	3	6	0.86**	0.004	0.430	0.004	0.000	0.002
G	23	23	0.12*	0.091*	0.074*	0.177*	0.058*	0.083*
S x G		23			0.134*			0.092*
E	69	138	0.06	0.052	0.055	0.0.070	0.023	0.046

Table 11: Mean squares for (SI) biological yield estimated by the three metgods.

S.O.V.	d.f		(I-D)/I%		
			Biology yield (ard/fad.)		
	Single	Comb.	1	2	Comb.
S		1			198.68*
R	3	6	15.45	18.98	17.22
G	23	23	83.65*	48.02*	57.08*
S x G		23			74.59*
E	69	138	43.25	22.92	33.08
	D/I%				
			Biology yield (ard/fad.)		
	Single	Comb.	1	2	Comb.
S		1			198.68*
R	3	6	15.45	18.98	17.22
G	23	23	83.65*	48.02*	57.08*
S x G		23			74.59*
E	69	138	43.25	22.92	33.08
	S= (1-Y/YP) /(1-X/XP)				
			Biology yield (ard/fed.)		
	Single	Comb.	1	2	Comb.
S		1			0.000
R	3	6	0.002	0.00	0.001
G	23	23	0.85*	0.06*	0.061*
S x G		23			0.08*
E	69	138	0.04	0.03	0.035

Grain yield (ard./fad.):

Genotypes no.2 (Sahel 1), no. 16 (MYNA "S"/ VUL "S" YD "S" //PCI "S") and no. 13 (CNO 79* 2/HOEL//vee "S"/ANC) gave the highest desirable SI for grain yield ard./fad. by the three methods in the first, second season as well the combined data, respectively. With the exception of genotypes no. 5 (Penwawa), no.6 (Nesser), no.11 (ACSAD 529// Yr/ SPRW "S"), no.12 (ACSAD 529/4/CI 82.24/C168/3/CNO* 2//Ce/TOP) and no. 19 (NAC/ ANGRA) all genotypes not differed for SI for grain yield ard./fad. Meanwhile, the exceptional genotypes gave undesirable susceptibility to drought (Table 12).

Straw yield ton/fad.:

Yecora (no. 4), no.13 (CNO 79* 2/HOEL//vee "S"/ANC) and no.20 (STK/4/JO/3/CR//CIT 71) gave the best desirable susceptibility to drought resistance by the three methods at the first, second season and the combined analysis, respectively. With the exception of genotypes no. 1 (Sids 1) no. 3 (Sakha 8), no. 5 (Penwawa), no.10 (PASTOR * 2/OPATA), no.11 (ACSAD 529// Yr/ SPRW "S"), no. 14 (VEE# 5 NAC) and 23 (G 164/SAKHA 61), and 24 (G 144 X P5 N/BJW "S") all genotypes do not different significantly between them for SI.

Biological yield ton/fad.

Genotypes no. 13 (CNO 79* 2/HOEL//vee "S"/ANC), no. 20 (STK/4/JO/3/CR//CIT 71) and no. 4 (Yecora) , no. 9 (IL75-2264/4/CAR//KAL/BB/3/NAC/5/CAA) and no.20 (STK/4/JO/3/CR//CIT 71) gave the best tolerance of stress irrigation for biological yield /fed in the first, second and the combined analysis, respectively in the three methods used for estimating SI. Also, all genotypes gave the same SI for

Table 12: Mean performance of genotypes of wheat for (SI) to drought resistance by using formula given by Ali Dib et.al (1990) SI= (NS-S)/NS

	Genotypes	Grain yield (ard.fad.)		Mean	Straw yield (tonfad.)		Mean	Biology (ton/fad.)		Mean
		1999/2000	2000/2001		1999/2000	2000/2001		1999/2000	2000/2001	
1	Sids 1	31.93	28.98	30.46	36.14	30.10	33.12	34.82 abc	29.75	32.28
2	Sahel 1	21.97	31.22	26.60	26.05	33.05	29.55	24.76 de	32.46	28.61
3	Sakha 8	32.88	24.35	28.62	36.11	29.80	32.95	35.10 abc	28.15	31.63
4	Yecora	29.29	24.47	26.78	20.63	29.17	24.90	24.09 e	27.73	25.91
5	Penwawa	35.96	29.19	32.57	39.83	36.30	38.06	38.75 a	34.32	36.53
6	Nesser	40.37	25.90	33.13	24.77	29.37	27.07	32.41 a-e	28.25	30.33
7	KVZ/Coolfen// Tsi/vee(s)	26.57	26.71	26.64	26.39	35.23	30.81	26.45 cde	32.56	29.50
8	BAVIACORA M92	29.08	28.42	28.75	28.60	32.82	30.71	28.82 b-e	31.41	30.12
9	IL75-264/4/CAR//KAL/BB/3/ NAC/5/CAA	24.41	26.99	25.70	27.36	27.46	27.41	26.51 cde	27.31	26.91
10	PASTOR*2/OPATA	27.83	33.98	30.90	32.37	38.48	35.42	31.11 a-e	37.03	34.07
11	ACSAD529//Yr/sprw "s"	30.87	38.15	34.51	35.46	35.28	35.37	34.16 abc	36.44	35.30
12	ACSAD629/4/CI82.24	36.58	29.14	32.86	36.19	23.53	29.86	36.32 ab	25.35	30.83
13	CNO79*2/HOEI//vee "s"/ANC	23.90	26.35	25.13	22.65	30.39	26.52	23.39 e	29.34	26.36
14	VEE#5 NAC	35.39	24.95	30.17	36.74	30.22	33.48	36.35 ab	28.51	32.43
15	MYNA/VUL//JUN	36.65	22.71	29.68	34.76	25.15	29.95	35.37 abc	24.41	29.89
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	35.50	20.29	27.90	33.30	27.68	30.49	34.02 a-d	25.44	29.73
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	38.70	21.77	30.23	35.55	26.56	31.06	36.63 ab	25.17	30.90
18	CPAN/80/PPSN//PRL "S"PVN	31.67	25.12	28.39	32.62	30.37	31.50	32.44 a-e	28.65	30.54
19	NAC/ANGRA	32.78	30.41	31.59	27.93	34.47	31.20	29.51 a-e	33.20	31.36
20	STK/4/JO/3/CR//CIT71	28.25	23.26	25.76	23.38	31.61	27.49	24.86 de	29.04	26.95
21	VAN-14	27.81	27.20	27.50	32.13	26.12	29.12	30.98 a-e	26.44	28.71
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	28.55	25.70	27.12	33.39	29.33	31.36	31.90 a-e	28.25	30.08
23	G 164/SAKHA 61	33.76	21.78	27.77	36.32	30.21	33.27	35.66 abc	27.54	31.60
24	G 144 X P5 N/BJW "S"	28.33	25.82	27.08	27.59	27.24	27.42	28.00 b-e	26.85	27.43
	Mean	31.21	26.79	29.00	31.09	30.41	30.75	31.35	29.32	30.33
	L.S.D 0.05	10.19	8.2	6.41	10.83	7.86	6.59	9.30	6.77	5.64

Table 13: ***Mean performance of genotypes of wheat for (SI) to drought resistance by using formula given by Saleaeu et.al (1975) SI = S/NS***

	Genotypes	Grain yield (ard.fad.)		Mean	Straw yield (tonfad.)		Mean	Biology (ton/fad.)		Mean
		1999/2000	2000/2001		1999/2000	2000/2001		1999/2000	2000/2001	
1	Sids 1	68.07	71.02	69.54	63.86	69.90	66.88	65.18 cde	70.26	67.72
2	Sahel 1	78.03	68.78	73.40	73.95	66.95	70.45	75.24 ab	67.54	71.39
3	Sakha 8	67.12	75.65	71.39	63.89	70.20	67.05	64.90 cde	71.85	68.37
4	Yecora	70.72	75.53	73.12	79.37	70.83	75.10	75.91 a	72.28	74.09
5	Penwawa	64.04	70.81	67.43	60.17	63.70	61.94	61.25 e	65.68	63.47
6	Nesser	59.63	74.10	66.87	75.23	70.63	72.93	67.59 a-e	71.75	69.67
7	KVZ/Coolfen// Tsi/vee(s)	73.43	73.29	73.36	73.61	64.77	69.19	73.55 abc	67.44	70.50
8	BAVIACORA M92	70.92	71.58	71.25	71.40	67.18	69.29	71.18 a-d	68.59	69.88
9	IL75-264/4/CAR//KAL/BB/3/ NAC/5/CAA	75.59	73.01	74.30	72.64	72.54	72.59	73.49 abc	72.69	73.09
10	PASTOR*2/OPATA	72.17	66.02	72.59	67.64	61.52	64.58	68.89 a-e	62.97	65.93
11	ACSAD529//Yr/sprw "s"	69.13	61.85	65.49	64.54	64.72	64.63	65.84 cde	63.57	64.70
12	ACSAD629/4/CI82.24	63.42	70.68	67.14	63.91	76.47	70.14	63.68 de	74.65	69.17
13	CNO79*2/HOEI//vee "s"/ANC	76.09	73.65	74.87	77.35	69.61	73.48	76.61 a	70.66	73.64
14	VEE#5 NAC	64.61	75.05	69.83	63.26	69.78	66.52	63.65 de	71.49	67.57
15	MYNA/VUL//JUN	63.35	77.29.	70.32	65.24	74.85	70.04	64.63 cde	75.59	70.11
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	64.50	79.71	72.11	66.70	72.32	69.51	65.98 b-e	74.56	70.27
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	61.30	78.23	69.77	64.46	73.44	68.95	63.38 de	74.83	69.10
18	CPAN/80/PPSN//PRL "S"PVN	68.36	74.88	71.61	67.38	69.63	68.51	67.56 a-e	71.35	69.46
19	NAC/ANGRA	67.22	69.60	68.41	72.07	65.53	68.81	70.49 a-e	66.80	68.64
20	STK/4/JO/3/CR//CIT71	71.75	76.74	74.25	76.62	68.39	72.51	75.14 ab	70.96	73.05
21	VAN-14	72.19	72.80	72.50	67.87	73.89	70.88	69.02 a-e	73.56	71.29
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	71.46	74.30	72.88	66.61	70.67	68.64	68.10 a-e	71.75	69.92
23	G 164/SAKHA 61	66.24	78.22	72.23	63.68	69.79	66.73	64.34 cde	72.46	68.40
24	G 144 X P5 N/BJW "S"	71.67	74.18	72.92	72.41	72.76	72.59	72.00 a-d	73.15	72.57
	Mean	68.79	73.22	71.00	68.91	69.89	69.25	68.65	70.68	69.67
	L.S.D 0.05	10.19	8.20	6.41	10.83	7.86	6.59	9.3	6.77	5.64

Table 14: Mean performance of genotypes of wheat for (SI) to drought resistance by using formula given by Fischer and Mauner 1978 = SI= 1-$Y_D/Y_I/D$

	Genotypes	Grain yield (ard.fad.)		Mean	Straw yield (tonfad.)		Mean	Biology (ton/fad.)		Mean
		1999/2000	2000/2001		1999/2000	2000/2001		1999/2000	2000/2001	
1	Sids 1	1.11	1.07	1.09	1.15	0.99	1.07	1.11 a-d	1.12	1.06
2	Sahel 1	0.78	1.16	0.97	0.83	1.09	0.96	0.79 ef	1.11	0.95
3	Sakha 8	1.15	0.90	1.02	1.15	0.96	1.05	1.12 a-d	0.95	1.04
4	Yecora	1.02	0.91	0.96	0.66	0.95	0.80	0.77 f	0.94	0.86
5	Penwawa	1.28	1.07	1.18	1.27	1.19	1.23	1.24 a	1.17	1.20
6	Nesser	1.43	0.96	1.20	0.77	0.96	0.87	1.03 a-f	0.96	1.00
7	KVZ/Coolfen// Tsi/vee(s)	0.91	0.98	0.95	0.84	1.16	1.00	0.84 def	1.11	0.98
8	BAVIACORA M92	1.02	1.05	1.04	0.91	1.07	0.99	0.92 b-f	1.07	1.00
9	IL75-264/4/CAR//KAL/BB/3/ NAC/5/CAA	0.86	1.00	0.93	0.87	0.89	0.88	0.85 c-f	0.93	0.89
10	PASTOR*2/OPATA	0.99	1.25	1.12	1.04	1.26	1.15	0.99 a-f	1.26	1.13
11	ACSAD529//Yr/sprw "s"	1.07	1.41	1.24	1.13	1.14	1.14	1.09 a-d	1.24	1.16
12	ACSAD629/4/CI82.24	1.27	1.08	1.18	1.15	0.77	0.96	1.16 ab	0.86	1.01
13	CNO79*2/HOEI//vee "s"/ANC	0.83	0.97	0.90	0.72	0.99	0.85	0.75 f	1.00	0.87
14	VEE#5 NAC	1.25	0.91	1.08	1.17	0.99	1.08	1.16 ab	0.97	1.07
15	MYNA/VUL//JUN	1.29	0.83	1.06	1.10	0.84	0.97	1.13 a-d	0.84	0.98
16	MYNA "S"/VUL "S" YD "S"//PCI "S"	1.25	0.76	1.00	1.06	0.89	0.98	1.08 a-e	0.86	0.97
17	MYNA "S"/VUL "S" YD "S"//PCI "S"	1.35	0.80	1.07	1.13	0.87	1.00	1.17 ab	0.86	1.01
18	CPAN/80/PPSN//PRL "S"PVN	1.09	0.93	1.01	1.03	0.99	1.01	1.03 a-f	0.97	1.00
19	NAC/ANGRA	1.14	1.13	1.14	0.89	1.12	1.01	0.94 a-f	1.12	1.03
20	STK/4/JO/3/CR//CIT71	0.95	0.86	0.91	0.74	1.03	0.88	0.79 ef	0.99	0.89
21	VAN-14	0.97	1.01	0.99	1.02	0.86	0.94	0.99 a-f	0.90	0.94
22	G158/5/CFN/CNO"S"//RON/3/ Bb/NOR/4/TL/3FN/TH//NAR59*2	0.99	0.94	0.97	1.06	0.99	1.01	1.02 a-f	0.96	0.99
23	G 164/SAKHA 61	1.18	0.80	0.99	1.16	1.00	1.08	1.14 abc	0.94	1.04
24	G 144 X P5 N/BJW "S"	0.99	0.95	0.97	0.88	0.90	0.89	0.89 a-f	0.92	0.91
	Mean	1.09	0.99	1.04	0.99	0.99	0.99	1.00	1.00	1.00
	L.S.D. 0.05	0.34	0.32	0.22	0.37	0.21	0.21	0.28	0.24	0.18

irrigation tolerance except no. 1 (Sids 1), no. 3 (Sakha 8), no. 5 (Penwawa), no.10 (PASTOR * 2/OPATA), no.11 (ACSAD 529// Yr/ SPRW "S"), no. 14 (VEE# 5 NAC) and 23 (G 164/Sakha 61), and no. 23 (G 164/Sakha 61) whereas it gave the poorest SI in the combined analysis over two seasons.

A stress tolerant genotypes, as defined SI values, need not have a high yield potential since SI provides a measure of tolerance based on minimization of yield loss under stress rather than on stress yield per se.

Genotypes identified as stress tolerant using SI should possess tolerance mechanisms, which may need to be incorporated in to germplasm with higher yield potential for development of high yielding, and stress tolerant cultivatrs.