Table 2. Mean performance for wheat mutants of some agronomic traits in M_3 generation of pedigree method for Gemmeiza-11 under water stress.

Mutants	Treatments	days to 50% heading	Spike length (cm).	No. of spikelits /spike	No. of spikes/ plant	No. of grains/ pike	Spike grain weight (g).	1000-grain weight (g)	Grain yield/plant (g)	Biological yield / plant (g.)	Harvest index %
	Control	**93**	**14.93**	**24.4**	**4.13**	**72.83**	**2.65**	**37.13**	**7.81**	**31.72**	**24.95**
Mutant-4	**Gem-0.06 SA**	**94.33**	**17.53**	**24.26**	**8.93**	**54.13**	**3.41**	**63.63**	**12.55**	**52.68**	**23.79**
Mutant-5	**Gem-0.08 SA**	**98.33**	**17.16**	**24.93**	**10.7**	**72.56**	**3.38**	**48.76**	**27.71**	**93.97**	**29.52**
Mutant-6	**Gem-350Gy1**	**97**	**16.8**	**24**	**8.13**	**41.73**	**1.40**	**33.66**	**8.7**	**49.31**	**17.63**
Mutant-9	**Gem-350Gy2**	**100**	**8.7**	**20.66**	**8.4**	**58.2**	**3.29**	**56.83**	**17.41**	**49.7**	**35.06**
	F. test	**	**	**	**	**	**	**	**	**	**
	L.S.D $_{0.05}$	**1.97**	**1.52**	**1.42**	**1.38**	**12.24**	**0.55**	**3.54**	**1.91**	**6.44**	**4.41**

*,**Significant at 0.05 and 0.01, respectively

Table 3. Mean performance for wheat mutants of some agronomic traits in M_3 generation of pedigree method for shandawel-1, under water stress.

Mutants	Treatments	days to 50% heading	Spike length (cm).	No. of spikelits/ Spike	No. of spikes/ plant	No. of grains/ pike	Spike grain weight (g).	1000-grain weight (g)	Grain yield/plant (g)	Straw yield/plant (g)	Biological yield / plant (g)	Harvest index %
	Control	**102.33**	**15.8**	**24.4**	**6.13**	**79.46**	**2.84**	**36.36**	**13.51**	**37.2**	**50.71**	**26.66**
Mutant-2	**Sh-0.04SA**	**94.33**	**13.2**	**23.73**	**6.33**	**88.8**	**3.62**	**40.98**	**14.72**	**28.9**	**43.62**	**33.71**
Mutant-5	**Sh-0.06SA**	**90.66**	**15.5**	**24.93**	**8.86**	**72.52**	**2.50**	**34.51**	**14.63**	**46.25**	**60.88**	**23.02**
Mutant-7	**Sh-250 Gy**	**98.33**	**16.6**	**23.86**	**8.93**	**65.26**	**3.003**	**45.94**	**18.04**	**51.01**	**69.05**	**26.11**
Mutant-8	**Sh-350Gy**	**104.33**	**16.46**	**26.53**	**6.4**	**60.4**	**2.56**	**42.28**	**11.75**	**35.57**	**47.32**	**24.79**
	F. test	**	*	Ns	Ns	*	Ns	**	*	**	**	*
	L.S.D $_{0.05}$	**2.98**	**1.67**	**2.17**	**3.91**	**11.65**	**0.66**	**3.85**	**2.81**	**4.81**	**5.78**	**4.76**

*, **Significant at 0.05 and 0.01of levels probability, respectively

Table 4. Mean performance for wheat mutants of some agronomic traits in M_3 generation of pedigree method for Sids-12 under water stress.

Mutants	Treatments	days to 50% heading	Spike length (cm).	No. of spikelits/spike	No. of spikes/plant	No. of grains/pike	Spike grain weight (g).	1000-grain weight (g)	Grain yield/plant (g)	Biological yield / plant (g)	Harvest index %
	Control	**93.33**	**12.4**	**21.6**	**5**	**75.66**	**2.98**	**39.54**	**11.69**	**30.02**	**38.99**
Mutant – 2	**Sid-0.04SA**	**95.66**	**14.1**	**23.06**	**5.66**	**107.3**	**4.26**	**39.55**	**20.62**	**48.32**	**42.68**
Mutant-3	**Sid-0.06 SA**	**101**	**13.73**	**24.4**	**7.8**	**82**	**4.43**	**54.37**	**28.15**	**79.5**	**35.44**
Mutant-4	**Sid-0.08 SA**	**92.33**	**15.16**	**22.93**	**6.6**	**120.46**	**6.20**	**51.59**	**34.08**	**75.04**	**45.39**
Mutant-5	**Sid-250 Gy**	**91.66**	**16.2**	**23.46**	**9.6**	**91.53**	**3.83**	**41.90**	**21.21**	**75.94**	**27.49**
Mutant-6	**Sid-350 Gy1**	**93.33**	**14.73**	**22.13**	**5.26**	**128.2**	**5.93**	**45.95**	**25.64**	**64.32**	**39.87**
Mutant-9	**Sid-350Gy2**	**94.33**	**8.66**	**21.2**	**4.73**	**75.06**	**3.6**	**48.24**	**12.86**	**35.34**	**36.54**
Mutant-10	**Sid-350Gy3**	**92.66**	**10.13**	**21.6**	**4.86**	**102.73**	**4.91**	**47.75**	**18.17**	**44.55**	**40.74**
	F. test	**	**	*	*	**	**	**	**	**	**
	L.S.D $_{0.05}$	**1.4862**	**1.3254**	**1.4938**	**2.394**	**15.781**	**1.234**	**3.7818**	**2.3896**	**4.6433**	**3.529**

*,**Significant at 0.05 and 0.01of levels probability, respectively

Table 5. Mean performance for wheat mutants of some agronomic traits in M_3 generation of pedigree method for Sahel -1, under water stress.

Mutants	Treatments	days to 50% heading	Spike length (cm).	No. of spikelits/ spike	No. of spikes/ plant	No. of grains/ pike	Spike grain weight (g).	1000-grain weight (g)	Grain yield/ plant (g)	Biological yield / plant (g)	Harvest index %
	Control	**96**	**11**	**22.66**	**4.46**	**54.46**	**2.10**	**38.56**	**7.76**	**23.06**	**33.65**
Mutant-1	**Sah-0.04SA**	**96.66**	**14.4**	**24**	**6**	**80.2**	**3.81**	**47.50**	**20.52**	**53.43**	**38.40**
Mutant-2	**Sah-0.06SA**	**95.33**	**15**	**24.66**	**5.46**	**117.91**	**5.15**	**43.67**	**16.41**	**54.36**	**30.18**
Mutant-3	**Sah-0.08 SA1**	**92.66**	**13.33**	**24.26**	**4.66**	**83.41**	**4.75**	**56.94**	**17.44**	**43.52**	**40.07**
Mutant-4	**Sah-0.08 SA2**	**94.33**	**12.86**	**22.26**	**4.76**	**89.83**	**4.18**	**46.53**	**13.58**	**33.78**	**40.20**
Mutant-5	**Sah-250 Gy1**	**90.33**	**14.13**	**23.2**	**3.53**	**96.55**	**5.40**	**55.92**	**16.44**	**42.94**	**38.28**
Mutant-6	**Sah-250 Gy2**	**92.33**	**9.33**	**22**	**9.7**	**61.6**	**2.90**	**47.07**	**19.33**	**53.16**	**36.36**
Mutant-7	**Sah-350 Gy1**	**94.33**	**11.53**	**24.4**	**5.8**	**54**	**2.32**	**42.96**	**8.17**	**30.67**	**26.63**
Mutant-9	**Sah-350 Gy2**	**89.33**	**14.53**	**23.6**	**4.8**	**104.2**	**5.45**	**52.30**	**21.43**	**55.72**	**38.46**
Mutant-12	**Sah-350Gy3**	**92.33**	**12.93**	**22.13**	**7.8**	**61.83**	**2.98**	**48.19**	**18.52**	**57.99**	**31.93**
Mutant-14	**Sah-350Gy4**	**93.33**	**11**	**22.93**	**4.26**	**57.6**	**3**	**52.08**	**10.28**	**28.76**	**35.74**
	F. test	**	**	**	**	**	**	**	**	**	**
	L.S.D $_{0.05}$	**1.72**	**1.03**	**1.15**	**1.50**	**8.00**	**0.55**	**6.39**	**3.46**	**8.40**	**5.79**

*,** Significant at 0.05 and 0.01of levels probability, respectively

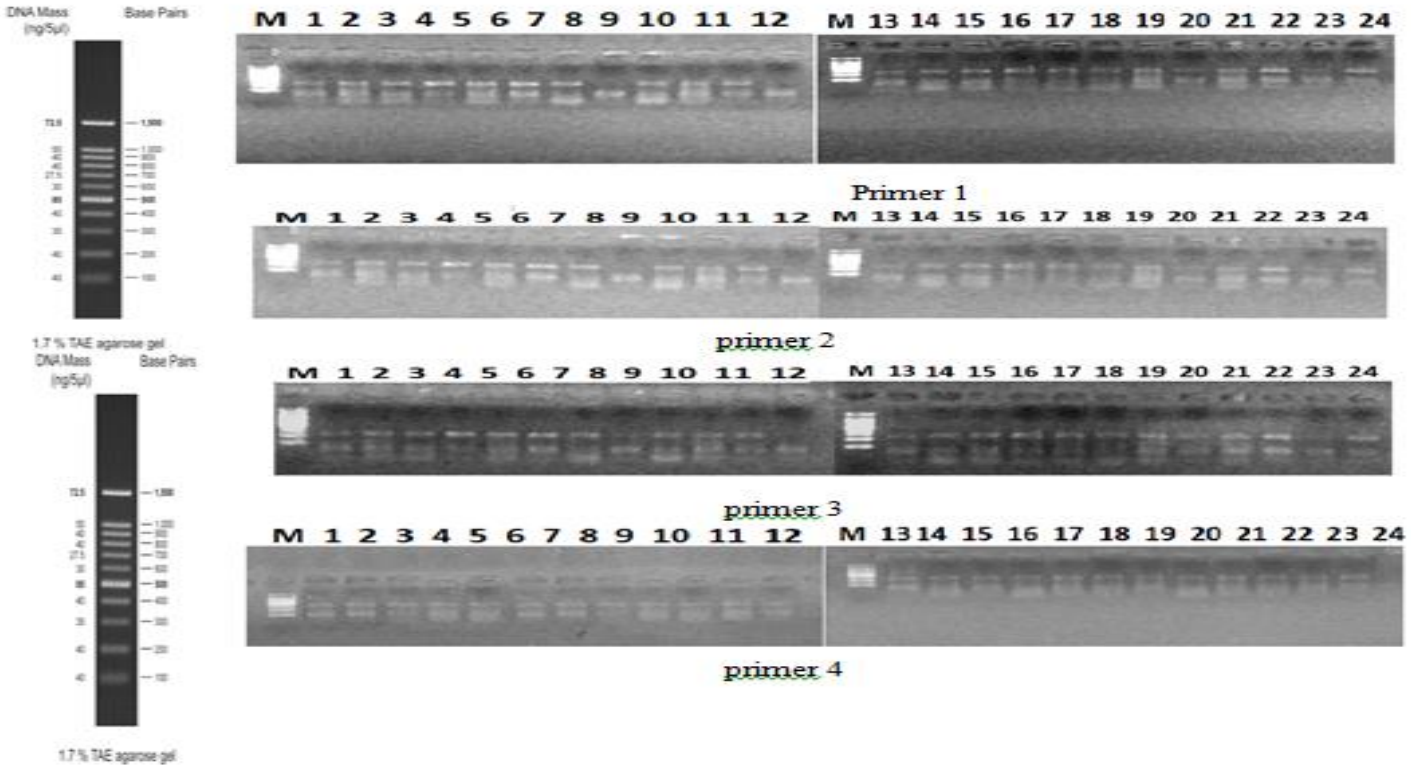

Figure 1. RAPD pattern obtained by five primers for DNA marker

1:sahel-1 control, 2:Sahel-1 250Gy, 3:Sahel-1 350Gy1, 4: Sahel-1 350Gy2 5: Sahel-1 0.04 % SA, 6:Sahel-1 0.06 % SA, 7:Sahel-1 0.08 % SA, 8: Sids-12 control, 9:Sids- 12 0.04 %SA, 10:Sids-12 0.06 %SA, 11:Sids- 12 0.08 % SA, 12:Sids-12 250Gy, 13: Sids-12 350Gy1, 14:Sids-12 350 Gy2, 15:Shandaweel-1 control, 16:Shandaweel-1 0.06 % SA, 17:Shandaweel-1 0.04 %SA, 18:Shandaweel-1 250Gy, 19:Shandweel-1 350Gy, 20: Gemmieza-11control, 21: Gemmieza-11 0.06% SA, 22: Gemmieza-110.08 %SA, 23:Gemmieza-11 350 Gy1, 24:Gemmiza-11 350Gy2.

Table (8): The similarity values between the wheat genotypes computed according to RAPD data**.**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1																						
2	0.3	1																					
3	0.3	0.3	1																				
4	0.4	0.7	0.5	1																			
5	0.3	0.2	0.3	0.6	1																		
6	0.3	0.3	0.5	0.4	0.1	1																	
7	0.4	0.5	0.3	0.4	0.3	0.4	1																
8	0.3	0.6	0.6	0.7	0.5	0.3	0.9	1															
9	0.3	0.3	0.4	0.5	0.1	0.2	0.2	0.6	1														
10	0.3	0.1	0.4	0.7	0.1	0.2	0.3	0.6	0.1	1													
11	0.2	0.4	0.6	0.3	0.2	0.1	0.5	0.3	0.3	0.3	1												
12	0.5	0.8	0.8	0.7	0.5	0.3	0.9	0.1	0.6	0.6	0.3	1											
13	0.2	0.3	0.4	0.5	0.2	0.1	0.5	0.3	0.3	0.3	0.1	0.4	1										
14	0.3	0.3	0.2	0.4	0.1	0.3	0.1	0.7	0.2	0.2	0.3	0.7	0.3	1									
15	0.3	0.3	0.2	0.6	0.1	0.3	0.3	0.5	0.2	0.2	0.3	0.5	0.3	0.1	1								
16	0.3	0.5	0.5	0.3	0.3	0.3	0.3	0.7	0.2	0.3	0.3	0.7	0.3	0.3	0.3	1							
17	0.3	0.6	0.4	0.3	0.3	0.3	0.3	0.6	0.3	0.4	0.4	0.6	0.4	0.3	0.2	0.1	1						
18	0.6	0.7	0.5	0.4	0.6	0.6	0.4	0.9	0.5	0.7	0.7	0.9	0.7	0.6	0.4	0.3	0.2	1					
19	0.3	0.3	0.3	0.7	0.2	0.3	0.3	0.6	0.3	0.1	0.4	0.6	0.4	0.2	0.1	0.3	0.3	0.5	1				
20	0.3	0.5	0.7	0.4	0.3	0.1	0.6	0.2	0.3	0.3	0.1	0.2	0.2	0.4	0.4	0.4	0.5	0.8	0.5	1			
21	0.4	0.2	0.3	0.8	0.1	0.3	0.4	0.5	0.2	0.1	0.3	0.5	0.3	0.3	0.1	0.4	0.3	0.6	0.1	0.4	1		
22	0.3	0.4	0.4	0.5	0.2	0.1	0.5	0.3	0.3	0.3	0.1	0.3	0.1	0.3	0.2	0.3	0.3	0.5	0.3	0.2	0.2	1	
23	0.4	0.7	0.7	0.6	0.4	0.3	0.8	0.2	0.5	0.5	0.2	0.1	0.3	0.6	0.4	0.6	0.5	0.8	0.5	0.1	0.4	0.2	1
24	0.3	0.5	0.5	0.4	0.3	0.1	0.6	0.2	0.3	0.3	0.1	0.2	0.2	0.4	0.3	0.4	0.3	0.6	0.3	0.1	0.3	0.1	0.1

1:sahel-1control, 2:Sahel-1250Gy, 3:Sahel-1350Gy1, 4: Sahel-1 350Gy2 5: Sahel-1 0.04 % SA, 6:Sahel-1 0.06 % SA, 7:Sahel-10.08 % SA, 8: Sids-12 control, 9:Sids- 12 0.04 %SA, 10:Sids-12 0.06 %SA, 11:Sids- 12 0.08 % SA, 12:Sids-12 250Gy, 13: Sids-12 350Gy1, 14:Sids-12 350 Gy2, 15:Shandaweel-1 control, 16:Shandaweel-1 0.06 % SA, 17:Shandaweel-1 0.04 %SA, 18:Shandaweel-1 250Gy, 19:Shandweel-1 350Gy, 20: Gemmieza-11control, 21: Gemmieza-11 0.06% SA 22: Gemmieza-110.08 %SA, 23:Gemmieza-11 350 Gy1, 24:Gemmiza-11 350Gy2.