

Table (4): Mean squares for all studied traits of the selected families, parents, bulk sample and the check cultivar on the basis of earliness and grain yield in F<sub>3</sub> and F<sub>4</sub> generations under normal (N) and drought stress (D).

Generation	Treatments	S.o.v	Mean Squares						
			D.F	Direct selection		Correlated traits			
				Days to heading	Spike length	Number of spikes / plant	100 kernel weight	Number of kernels / spike	Grain yield / plant
<b>Selection for early families</b>									
F <sub>3</sub>	N	Reps	3	13.69	0.36	0.16	0.38	10.23	0.50
		Families	63	48.55**	7.50**	6.34**	1.76**	175.87**	25.42**
		Error	189	2.80	0.13	0.13	0.04	9.65	0.64
	D	Reps	3	3.41	0.33	0.24	0.21	14.32	2.34
		Families	63	42.65**	6.97**	5.63**	1.88**	179.63**	13.19**
		Error	189	2.58	0.10	0.11	0.03	7.54	0.54
F <sub>4</sub>	N	Reps	3	9.63	0.05	0.11	0.07	7.91	1.12
		Families	18	0.73**	8.68**	11.94**	0.85**	294.32**	18.09**
		Error	54	1.74	0.28	0.16	0.03	7.09	0.75
	D	Reps	3	1.21	0.26	0.13	0.02	9.58	0.45
		Families	18	49.56**	8.60**	8.75**	0.78**	215.77**	11.97**
		Error	54	2.48	0.37	0.22	0.03	11.50	0.46
<b>Selection for high yield families</b>									
F <sub>3</sub>	N	Reps	3	2.91	25.64	0.32	0.04	0.27	5.52
		Families	63	14.90**	115.43**	11.08**	7.42**	1.35**	123.87**
		Error	189	1.24	3.36	0.13	0.23	0.04	7.25
	D	Reps	3	10.13	2.09	0.32	0.98	0.05	23.96
		Families	63	6.21**	95.80**	9.87**	6.61**	2.12**	153.91**
		Error	189	0.71	3.63	0.10	0.23	0.04	5.81
F <sub>4</sub>	N	Reps	3	1.68	0.10	0.35	0.04	0.43	3.86
		Families	19	26.02**	76.30**	9.70**	12.71**	0.62**	152.54**
		Error	57	1.56	1.90	0.22	0.37	0.07	7.80
	D	Reps	3	0.85	4.81	0.44	0.14	0.03	1.65
		Families	19	12.42**	72.83**	6.84**	12.84**	0.47**	165.35**
		Error	57	0.87	2.23	0.38	0.31	0.04	7.41

- & \*\*Significant at 5 % and 1 % levels of probability, respectively.

Table (5): Mean grain yield and other traits of early families in F<sub>4</sub> generation under normal (N) and drought (D) conditions.

Earliness families	Selection criteria		Correlated traits									
	Days to heading		Spike length		No. of spikes / plant		100 kernel weight		No. of kernels/spike		Grain yield/ plant	
	N	D	N	D	N	D	N	D	N	D	N	D
<b>3</b>	71.75	72.25	13.73	12.70	7.50	6.10	5.16	4.78	46.34	45.40	15.96	13.22
<b>12</b>	72.00	70.75	14.10	12.28	7.10	6.15	5.72	5.22	38.56	32.52	17.46	12.15
<b>35</b>	68.50	68.00	13.15	11.95	6.80	5.90	5.53	4.99	51.64	46.29	19.44	15.18
<b>37</b>	69.00	68.00	12.50	11.55	10.60	9.00	5.61	5.06	34.01	27.96	19.72	15.59
<b>52</b>	73.00	71.00	13.13	11.98	6.75	6.05	5.59	5.05	48.33	42.22	16.33	13.72
<b>53</b>	71.00	70.75	12.13	10.48	7.40	6.30	5.41	5.09	54.51	44.27	17.79	12.87
<b>56</b>	69.50	69.00	14.98	13.63	8.95	8.40	5.31	5.00	63.38	54.11	22.02	15.09
<b>57</b>	71.25	72.25	12.15	10.70	7.80	7.00	4.71	3.74	50.07	46.39	16.16	11.82
<b>75</b>	71.50	71.00	13.55	12.10	5.10	4.40	4.14	3.76	52.48	47.50	13.94	10.85
<b>85</b>	72.50	73.00	12.45	10.50	6.95	6.05	5.58	4.76	50.94	41.46	16.79	14.12
<b>89</b>	69.00	68.25	11.03	9.48	6.15	5.75	4.54	4.21	58.91	46.05	14.39	10.94
<b>100</b>	70.00	69.50	15.28	13.45	5.10	4.45	5.04	4.22	52.51	48.12	14.57	10.90
<b>103</b>	71.00	70.00	12.78	11.25	7.80	6.95	5.46	4.73	41.62	37.91	16.94	13.99
<b>105</b>	72.75	71.25	15.93	14.23	4.50	4.45	5.32	4.61	64.12	53.87	14.38	10.10
<b>106</b>	73.00	71.00	11.43	9.28	5.90	5.25	5.11	4.60	42.42	33.06	13.82	9.47
<b>Average</b>	<b>71.05</b>	<b>70.40</b>	<b>13.23</b>	<b>11.70</b>	<b>6.96</b>	<b>6.15</b>	<b>5.21</b>	<b>4.65</b>	<b>49.99</b>	<b>43.14</b>	<b>16.65</b>	<b>12.67</b>
<b>P1</b>	71.75	71.25	15.75	14.15	4.05	3.60	5.60	4.62	58.38	53.02	17.46	13.11
<b>P2</b>	80.00	79.50	11.53	9.95	10.15	9.10	5.26	4.50	40.09	35.48	18.16	13.90
<b>Bulk</b>	75.25	75.00	12.78	11.60	7.70	6.30	5.20	4.36	38.57	33.13	16.80	12.72
<b>Sahel 1</b>	82.50	81.75	11.82	10.97	7.85	6.95	4.29	3.98	52.48	46.32	17.08	13.38
<b>RLSD<sub>0.05</sub></b>	1.63	2.06	0.65	0.80	0.49	0.58	0.22	0.22	3.29	4.44	1.10	0.86
<b>RLSD<sub>0.01</sub></b>	2.14	2.71	0.86	1.05	0.65	0.76	0.29	0.29	4.31	5.83	1.49	1.12

Table (6): The observed and expected response to selection in F<sub>4</sub> generation for all studied traits of early families under normal (N) and drought stress (D) conditions.

Trait	Condition	Response to selection as deviation from							
		Bulk		Best patent		Check (Sahel 1)		Expected response	
		unit	%	unit	%	unit	%	unit	%(from families mean)
Days to heading	N	Direct response						2.24	3.15
	D	-4.20**	-5.58**	-0.70	-0.98	-11.45**	-13.88**	2.59	3.68
Spike length	N	Correlated response in						1.11	8.39
	D	0.45	3.52**	-2.52**	-16.00**	1.41**	11.93**	0.99	8.46
No. of spikes / plant	N	-0.74**	-9.61**	-3.19**	-31.43**	-0.89**	-11.34**	1.89	27.16
	D	-0.15	-2.43**	-2.95**	-32.45**	-0.80**	-11.56**	1.27	20.65
100 kernel weight	N	0.01	0.28**	-0.39**	-6.89**	0.92**	21.55**	0.48	9.21
	D	0.29**	6.71**	0.03	0.70**	0.67**	16.90**	0.39	8.39
No. of kernels/spike	N	22.42**	29.61**	-8.39**	-14.37**	-2.49*	-4.74**	9.22	18.63
	D	10.01**	30.22**	-9.88**	-18.63**	-3.18	-6.86**	7.66	17.76
Grain yield / plant	N	-0.15	-0.92*	-1.51**	-8.34**	-0.43	-2.54**	1.91	11.47
	D	-0.05	-0.42	-1.23**	-8.88**	-0.71*	-5.33**	1.67	13.18

\* & \*\*Significant at 5 % and 1 % levels of probability, respectively.

Table (7): Genetic parameters for days to heading of the early families and grain yield/plant of the highest yielding families in the F<sub>3</sub> and F<sub>4</sub> generations under normal and drought conditions.

Items	Selection for earliness				Selection for high yield			
	Days to heading				Grain yield/plant			
	Normal		Drought		Normal		Drought	
	F <sub>3</sub>	F <sub>4</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>3</sub>	F <sub>4</sub>
<b>Pheno. Var.</b>	14.24	13.99	12.60	14.25	4.66	7.68	2.09	3.76
<b>Geno. Var</b>	11.44	12.25	10.02	11.77	3.42	6.12	1.38	2.89
<b>P.C.V. %</b>	4.75	5.17	4.55	5.26	14.57	13.40	13.32	12.43
<b>G.C.V. %</b>	4.26	4.84	4.05	4.78	12.48	11.96	10.82	10.89
<b>Heritability</b>								
<b>Broad – sense</b>	80.33	87.57	79.52	82.59	73.36	79.66	65.96	76.76
<b>Narrow – sense</b>	--	34.34	--	39.40	--	53.34	--	43.43

Table (8): Drought susceptibility index (DSI), grain yield (G.Y) of early and the highest yielding families in F<sub>3</sub> and F<sub>4</sub> generations under normal and drought stress conditions.

Selection for earliness							Selection for grain yield						
No.	F <sub>3</sub> generation			F <sub>4</sub> generation			No.	F <sub>3</sub> generation			F <sub>4</sub> generation		
	G.Y		DSI	G.Y		DSI		G.Y		DSI	G.Y		DSI
	N	D		N	D			N	D		N	D	
<b>3</b>	12.97	10.51	<b>0.73</b>	15.96	13.22	<b>0.72</b>	<b>1</b>	15.61	11.08	<b>1.00</b>	19.21	14.51	<b>0.98</b>
<b>12</b>	14.76	10.66	<b>1.07</b>	17.46	12.15	<b>1.27</b>	<b>6</b>	19.55	12.83	<b>1.19</b>	26.32	16.28	<b>1.53</b>
<b>35</b>	15.29	11.39	<b>0.98</b>	19.44	15.18	<b>0.91</b>	<b>13</b>	18.11	12.82	<b>1.01</b>	21.44	14.91	<b>1.22</b>
<b>37</b>	15.64	10.78	<b>1.19</b>	19.72	15.59	<b>0.87</b>	<b>19</b>	14.42	11.45	<b>0.71</b>	20.69	17.23	<b>0.67</b>
<b>52</b>	12.70	10.32	<b>0.72</b>	16.33	13.72	<b>0.67</b>	<b>22</b>	14.97	11.99	<b>0.69</b>	20.51	17.43	<b>0.60</b>
<b>53</b>	14.04	10.23	<b>1.04</b>	17.79	12.87	<b>1.15</b>	<b>24</b>	16.40	12.83	<b>0.75</b>	19.35	16.37	<b>0.62</b>
<b>56</b>	17.64	10.77	<b>1.50</b>	22.02	15.09	<b>1.31</b>	<b>25</b>	17.85	13.93	<b>0.76</b>	21.50	17.39	<b>0.76</b>
<b>57</b>	13.42	9.99	<b>0.98</b>	16.16	11.82	<b>1.12</b>	<b>28</b>	17.44	10.94	<b>1.29</b>	21.24	15.11	<b>1.15</b>
<b>75</b>	9.98	7.27	<b>1.05</b>	13.94	10.85	<b>0.92</b>	<b>33</b>	16.26	12.89	<b>0.71</b>	21.32	17.70	<b>0.68</b>
<b>85</b>	9.11	7.39	<b>0.73</b>	16.79	14.12	<b>0.66</b>	<b>35</b>	15.29	11.39	<b>0.88</b>	19.44	15.18	<b>0.88</b>
<b>89</b>	12.16	8.98	<b>1.00</b>	14.39	10.94	<b>1.00</b>	<b>38</b>	15.74	12.29	<b>0.76</b>	21.31	17.45	<b>0.73</b>
<b>100</b>	10.01	7.50	<b>0.97</b>	14.57	10.90	<b>1.05</b>	<b>39</b>	16.82	10.84	<b>1.23</b>	20.18	15.17	<b>0.99</b>
<b>103</b>	12.44	10.11	<b>0.72</b>	16.94	13.99	<b>0.72</b>	<b>42</b>	19.44	12.50	<b>1.23</b>	21.30	14.28	<b>1.32</b>
<b>105</b>	10.14	7.35	<b>1.06</b>	14.38	10.10	<b>1.24</b>	<b>43</b>	17.59	10.91	<b>1.31</b>	22.21	16.01	<b>1.12</b>
<b>106</b>	10.97	7.69	<b>1.15</b>	13.82	9.47	<b>1.31</b>	<b>45</b>	18.90	13.12	<b>1.05</b>	26.55	19.37	<b>1.08</b>
							<b>56</b>	17.64	10.77	<b>1.34</b>	22.02	15.09	<b>1.26</b>

Table (9): Mean grain yield and other traits of the highest yielding families in F<sub>4</sub> generation under normal (N) and drought (D) conditions.

Selected families	Selection criteria		Correlated traits									
	Grain yield/plant		Days to heading		Spike length		No. of spikes / plant		100 kernel weight		No. of kernels/ spike	
	N	D	N	D	N	D	N	D	N	D	N	D
<b>1</b>	19.21	14.51	83.50	82.75	13.53	12.63	8.45	6.35	5.09	4.72	50.34	41.66
<b>6</b>	26.32	16.28	79.00	78.25	13.35	12.30	11.40	10.35	5.98	5.24	44.90	34.51
<b>13</b>	21.44	14.91	75.75	75.00	12.63	11.55	10.70	9.75	4.95	4.41	48.97	38.52
<b>19</b>	20.69	17.23	82.50	81.25	16.95	14.70	9.05	8.70	5.33	4.83	41.05	36.52
<b>22</b>	20.51	17.43	76.00	75.75	13.45	12.00	7.60	7.00	5.78	5.03	52.70	47.61
<b>24</b>	19.35	16.37	77.25	76.50	16.20	14.75	6.00	5.00	5.43	5.18	40.56	34.09
<b>25</b>	21.50	17.39	78.25	77.25	12.65	11.73	11.20	10.55	5.44	4.93	43.15	38.92
<b>28</b>	21.24	15.11	76.00	75.00	12.73	12.18	8.05	7.03	5.76	5.06	50.38	41.30
<b>33</b>	21.32	17.70	75.75	75.25	13.03	11.98	8.35	7.75	5.91	5.35	46.17	40.72
<b>35</b>	19.44	15.18	68.50	68.00	13.15	11.95	6.80	5.90	5.53	4.99	51.64	46.29
<b>38</b>	21.31	17.45	78.75	78.00	16.03	14.23	8.05	7.50	5.11	4.60	50.28	43.10
<b>39</b>	20.18	15.17	85.25	84.50	14.40	13.53	9.00	8.00	5.33	4.89	46.27	34.04
<b>42</b>	21.30	14.28	78.75	78.25	14.50	13.23	9.65	8.00	5.22	4.48	46.60	32.29
<b>43</b>	22.21	16.01	80.75	80.25	15.20	13.43	9.05	8.50	5.14	4.55	50.88	43.13
<b>45</b>	26.55	19.37	78.00	77.25	12.38	11.40	10.45	9.88	5.87	4.88	50.26	45.74
<b>56</b>	22.02	15.09	69.50	69.00	14.98	13.63	8.95	8.40	5.31	4.65	63.38	54.11
<b>Average</b>	<b>21.54</b>	<b>16.22</b>	<b>77.72</b>	<b>77.02</b>	<b>14.07</b>	<b>12.82</b>	<b>8.92</b>	<b>8.04</b>	<b>5.45</b>	<b>4.86</b>	<b>48.60</b>	<b>40.78</b>
<b>P1</b>	17.46	13.11	71.75	71.25	15.75	14.15	4.05	3.60	5.60	4.62	58.38	53.02
<b>P2</b>	18.16	13.90	80.00	79.50	11.53	9.95	10.15	9.10	5.26	4.50	40.09	35.48
<b>Bulk</b>	16.80	12.72	75.25	75.00	12.78	11.60	7.70	6.30	5.20	4.36	38.57	33.13
<b>Sahel 1</b>	17.08	13.38	82.50	81.75	11.82	10.97	7.85	6.95	4.29	3.98	52.48	46.32
<b>RLSD<sub>0.05</sub></b>	1.63	1.22	1.71	1.85	0.58	0.78	0.75	0.69	0.36	0.26	3.65	3.56
<b>RLSD<sub>0.01</sub></b>	2.15	1.60	2.23	2.42	0.76	1.06	0.98	0.90	0.48	0.34	4.80	4.68

Table (10): Observed and expected response to selection in F<sub>4</sub> generation for all studied traits of the highest yielding families under normal (N) and drought stress (D) conditions.

Trait	Condition	Response to selection as deviation from							
		Bulk		Best patent		Check (Sahel 1)		Expected response	
		Unit	%	Unit	%	Unit	%	Unit	%(from families mean)
Grain yield / plant		<b>Direct response</b>							
	N	4.74**	28.19**	3.38**	18.59**	4.46**	26.09**	2.58	11.98
	D	3.50**	27.49**	2.32**	16.67**	2.84**	21.20**	1.47	9.06
Days to heading		<b>Correlated response in</b>							
	N	2.47**	3.28**	5.97**	8.32**	-4.78**	-5.80**	2.79	3.59
	D	2.02**	2.69**	5.77**	8.09**	-4.73**	-5.79**	2.75	3.57
Spike length	N	1.29**	10.10**	-1.68**	-10.66**	2.25**	19.04**	1.62	11.51
	D	1.22**	10.55**	-1.33**	-9.38**	1.85**	16.90**	1.27	9.91
No. of spikes / plant	N	1.22**	15.87**	-1.23**	-12.10**	1.07**	13.65**	1.86	20.85
	D	1.74**	27.63**	-1.06**	-11.64**	1.09**	15.69**	1.63	20.27
100 kernel weight	N	0.25	4.79**	-0.15	-2.79**	1.16**	27.02**	0.39	7.16
	D	0.54**	11.98**	0.26**	5.68**	0.90**	22.68**	0.23	4.73
No. of kernels/spike	N	10.03**	26.00**	-9.78**	-16.76**	-3.88**	-7.40**	5.54	11.40
	D	7.65**	23.10**	-12.24**	-23.08**	-5.54**	-11.95**	6.63	16.26

\* & \*\*Significant at 5 % and 1 % levels of probability, respectively.