

Table(1):Means of CMS of the high and low F₄, F₅ selections and bulks of the five populations as measured under combined drought + heat stresses in F₄ and heat stress in F₅ together with the % observed and expected responses, realized heritability and parent-offspring regressions.

Populations		Pop. (1)		Pop. (2)		Pop. (3)		Pop. (4)		Pop. (5)		
Generations		F ₄	F ₅	F ₄	F ₅	F ₄	F ₅	F ₄	F ₅	F ₄	F ₅	
Means	High	25.77	79.37	35.33	66.7	44.67	55.95	62.77	67.70	41.90	58.09	
	Bulk	23.80	70.97	29.05	61.19	30.27	35.48	56.34	57.36	29.38	42.68	
	Low	17.75	40.47	17.21	50.62	24.53	26.80	45.85	53.50	22.84	29.82	
% Response	High	Observed	8.27*	11.83**	21.62*	9.00*	47.58**	57.71**	11.40*	18.01*	42.59**	36.11*
		Expected	2.94	5.19	6.50	11.24	19.75	16.56	1.44	18.85	17.01	12.65
	Low	Observed	25.43*	42.98**	40.77**	17.27*	18.97**	24.45*	18.62*	6.73*	22.27*	30.14*
		Expected	6.67	2.07	7.64	9.97	13.23	9.03	1.52	18.50	15.68	8.37
Heritability	Realized	0.18	0.53	0.44	0.24	0.35	0.40	0.51	0.20	0.32	0.42	
	b _{po}	0.17± 0.05**	0.58 ± 0.34	0.4± 0.07**	0.18 ± 0.2	0.34± 0.04**	0.42 ± 0.11*	0.5 ± 0.1**	0.22 ± 0.15	0.31 ± 0.07**	0.48 ± 0.09**	

* P < 0.05 ** P < 0.01

Table(2):Means of grain yield per plant (g) of the high CMS and low CMS F₄ selections and bulks of the five populations raised in favorable (F), drought stress (D) and drought + heat stresses (D+H) environments and in F₅ selections in favorable (F) and heat stress (H) environments together with % correlated responses (C. R.).

Populations		Pop. (1)			Pop. (2)			Pop. (3)			Pop. (4)			Pop. (5)			
F₄																	
Environments		F	D	D+H	F	D	D+H	F	D	D+H	F	D	D+H	F	D	D+H	
Means	High	36.06	12.65	9.59	41.62	21.11	11.93	53.13	21.07	13.34	56.29	24.28	13.41	44.67	25.78	12.33	
	Bulk	34.66	11.32	9.58	40.47	20.54	9.64	51.94	17.56	12.62	54.14	23.07	11.46	42.10	24.20	11.01	
	Low	34.84	11.45	8.34	39.54	18.44	8.99	51.27	18.80	11.77	51.23	19.30	10.71	40.33	20.05	9.72	
% correlated Response	High	C. R	4.04	11.75	0.001	2.84	2.77	23.73*	2.29	20.00	5.69	3.97	5.21	17.02*	6.10	6.53	11.98
	Low	C. R	-0.52	-1.22	12.9*	2.29	10.21	6.77	1.30	-7.07	6.78	5.36	16.4**	6.60	4.21	17.1*	11.70
F₅																	
Environments		F	H	F	H	F	H	F	H	F	H	F	H	F	H	F	H
Means	High	33.93	24.56	32.93	27.20	26.84	24.63	27.61	25.65	27.79	23.11						
	Bulk	25.68	23.77	30.27	23.23	26.05	22.41	24.66	23.95	26.11	20.81						
	Low	27.46	22.30	24.95	19.95	26.18	22.78	24.64	22.48	25.38	20.41						
% correlated Response	High	C. R	32.13*	3.34	8.78	17.06*	3.04	9.90	11.95	7.08	6.45	11.02					
	Low	C. R	-6.92	6.19	17.58	14.11*	-0.48	-1.64	0.09	6.15	2.79	1.93					

* P < 0.05 ** P < 0.01

Table(3): Means of 1000 grain weight (g) of the high CMS and low CMS F₄, F₅ selections and bulks of the five populations raised in favorable (F), drought stress (D) and drought + heat stresses (D+H) environments in F₄ and in favorable (F) and heat stress (H) environments in F₅ together with % correlated responses (C. R.).

Populations		Pop. (1)			Pop. (2)			Pop. (3)			Pop. (4)			Pop. (5)		
F₄																
Environments		F	D	D+H	F	D	D+H	F	D	D+H	F	D	D+H	F	D	D+H
Means	High	43.00	45.05	44.02	43.74	44.52	42.39	51.55	46.92	44.68	49.00	48.04	44.21	53.71	51.92	45.48
	Bulk	42.50	44.12	41.92	40.44	42.67	39.42	48.17	45.81	41.77	46.67	46.25	41.30	52.79	51.25	43.03
	Low	41.04	42.09	40.01	37.83	40.82	38.32	49.76	46.08	40.55	45.25	44.07	38.62	49.53	50.39	42.49
% correlated Response	High C. R	1.18	2.12	5.02**	8.15*	4.34	7.52**	7.03*	2.42	6.96**	5.01*	3.87	7.04**	1.74	1.31	5.71**
	Low C. R	3.45	4.60*	4.56*	6.45	4.32	2.79	-3.31	-0.60	2.92	3.04	4.70*	6.49*	6.17*	1.69	1.24
F₅																
Environments		F	H	F	H	F	H	F	H	F	H	F	H	F	H	H
Means	High	48.11	45.12	43.77	41.85	44.34	43.09	42.78	41.86	54.74	52.31					
	Bulk	43.97	43.20	40.02	39.13	42.25	41.55	41.62	39.37	52.11	48.38					
	Low	42.42	40.83	36.24	33.15	42.86	41.37	37.25	34.78	51.68	46.94					
% correlated Response	High C. R	9.43**	4.46**	9.37*	6.95**	4.93**	3.70*	2.78	6.33*	5.05*	8.12**					
	Low C. R	3.52	5.47*	9.45*	15.28**	-1.43	0.43	10.50**	11.65**	0.84	2.97*					

* P < 0.05 ** P < 0.01

Table(4): Means of stomatal frequency per mm² of the high and low F₅ selections and unselected F₅ bulks of the five populations as measured under favorable (F) and heat stress (H) in clay soil together with the % observed responses, realized heritability and parent-offspring regressions.

Populations			1		2		3		4		5	
Environments			F	H	F	H	F	H	F	H	F	H
High			78.20	89.81	83.97	89.56	74.26	83.91	78.11	91.55	76.19	87.12
Bulk			74.31	72.49	70.76	80.67	67.13	69.64	73.30	75.82	67.89	71.56
Low			64.72	66.27	57.05	69.43	59.57	64.6	62.98	72.85	60.61	64.52
% Responses	High	Observed	5.24	23.90*	18.67**	11.02**	10.62**	20.49**	6.56**	20.75**	12.22**	21.73**
	Low	Observed	12.91**	8.58*	19.38**	13.94**	11.26**	7.24**	14.08**	3.92*	10.73**	9.85*
Heritability	Realized		0.27	0.47	0.59	0.44	0.32	0.42	0.34	0.42	0.41	0.60
	b_{po}		0.34± 0.054**	0.51± 0.104**	0.63± 0.113**	0.49± 0.053**	0.36± 0.058**	0.43 ± 0.09*	0.36± 0.091*	0.4 ± 0.102**	0.42± 0.124*	0.66± 0.139**

* P < 0.05 ** P < 0.01

Table(5): Means of grain yield per plant (Upper values) and 1000 grain weight (g) (Lower values) of the high and low stomatal frequency F₅ selections as well as the F₅ bulks of the five populations grown in the favorable (F) and heat stress (H) environments together with the % correlated responses to selections.

Populations			1		2		3		4		5	
Environments			F	H	F	H	F	H	F	H	F	H
High			29.40 47.6	24.70 46.19	35.51 45.71	27.81 44.48	31.70 43.91	23.48 44.37	33.08 44.58	25.16 43.02	31.11 53.16	23.16 50.23
Bulk			25.68 43.97	23.77 43.2	30.27 40.02	23.23 39.13	26.05 42.42	22.41 42.15	24.66 41.62	23.95 39.37	26.05 52.11	20.81 49.27
Low			26.95 43.96	23.91 43.29	27.1 36.42	22.62 34.28	30.17 43.78	23.5 43.3	26.38 41.27	22.37 38.29	28.62 51.12	22.11 49.37
% Correlated Responses	High	C. R	14.49 8.26**	3.92 6.93**	17.31 14.21**	19.71* 13.96**	21.69* 3.51	4.77 5.02*	34.10** 7.12*	5.06 9.29*	19.42* 2.00	11.29* 1.95
	Low	C. R	-4.95 0.02	-0.60 0.21	10.50 8.99*	2.65 12.39*	-15.81 -3.21	-4.86 -2.48	-6.96 0..84	6.61 2.74	-9.85 1.91	-8.61 -0.13

* P < 0.05 ** P < 0.01

Table (7): Increments in grain yield per plant and 1000 grain weight (g) of the F₆ families with different combinations of CMS and stomatal frequency over the F₆ unselected bulks of the five populations in favorable, heat stress and drought + heat environments.

Population		1	2	3	4	5	Mean increment (g)	% increment of unselected bulk mean
Favorable								
High CMS	High stomata	7.622 3.62**	12.62** 4.81**	5.518* 4.29**	3.432 3.93**	5.68* 4.04**	6.93* 4.14**	17.48 8.89
	Low stomata	5.538 0.59	1.142 2.01*	-5.14 2.47**	5.648* 4.51**	1.414 3.74**	1.7204 2.66*	4.34 5.72
Low CMS	High stomata	-2.376 -1.03	6.053 4.00**	-3.465 -0.62	-10.9** -0.29	-3.274 -2.41*	-2.796 -0.07	-7.05 -0.16
	Low stomata	-12.938* -5.33**	-10.05** -4.58**	-5.79* -1.94**	-10.45** -0.73	-4.151 -6.46**	-8.677* -3.81**	-21.88 -8.19
Heat stress								
High CMS	High stomata	0.527 1.77**	2.164* 7.19**	8.018** 4.09**	2.344 3.97**	1.623 2.22*	2.935* 3.85**	11.85 8.53
	Low stomata	4.555* 1.43*	2.127 0.54	7.284** 3.80**	-3.118 2.59*	1.077 3.35**	2.385 2.34*	9.63 5.19
Low CMS	High stomata	1.145 -1.37*	3.662** 3.80**	2.69 4.17**	-3.883* 0.29	0.614 0.92	0.845 1.56	3.41 3.46
	Low stomata	-7.006* -6.29**	-4.551** -3.43**	0.62 -0.32	-5.139* -2.86*	-7.154** -3.17**	-4.646* -3.21**	-18.76 -7.13
Drought and Heat stress								
High CMS	High stomata	1.408 2.89**	3.087** 5.51**	6.464* 4.72**	0.985 4.63**	5.285* 1.82	3.445* 3.91**	17.83 9.45
	Low stomata	4.663** 1.22**	-0.802 1.14**	4.544* 1.71	4.35* 3.14**	2.544 1.88	1.195 1.82*	6.19 4.39
Low CMS	High stomata	-8.014** -2.39**	3.988** 3.31**	-0.96 0.63	-1.62 -0.67	5.67** 3.07**	-0.186 -0.44	-0.96 -1.05
	Low stomata	-9.453** -9.13**	1.222 -4.10**	0.233 -0.02	-3.98* -2.59**	-5.74** -2.44*	-3.546* -3.66**	-18.35 -8.83

* P < 0.05 ** P < 0.01