Table 2. Gene effects for seed yield in ten crosses of sunflower in two years

Cross	Gene effect						Type of epistasis
2001	*m*	*d*	*h*	*i*	*j*	*l*	
C_1	79.87±4.34**	1.73±2.305	-72.48±11.61**	-27.43±3.67**	-5.06±5.25	42.72±7.765**	Duplicate epistasis between dominant decreasers
C_2	54.59±5.23**	0.05±2.13	-6.25±14.94	-0.47±4.77	1.73±6.02	0.65±9.94	-
C_3	56.81±13.45**	4.01±2.170	-9.59±30.67	-6.64±13.27	-17.74±7.58*	1.26±17.645	-
C_4	89.23±9.78**	7.80±2.19*	-70.70±23.18*	-42.86±9.53**	-25.87±6.38**	31.52±16.35	Duplicate epistasis between dominant decreasers
C_5	64.87±6.45**	1.68±2.025	-31.80±14.36*	-12.48±6.124	-6.35±4.49	17.24±8.14	Duplicate epistasis between dominant decreasers
C_6	73.71±9.515**	2.28±1.03	-49.02±20.06*	-25.27±9.46*	5.79±3.33	24.03±10.84*	Duplicate epistasis between dominant decreasers
C_7	64.21±6.35**	6.07±1.07**	-19.24±13.40	-19.57±6.26*	-0.39±2.62	-7.23±7.49	-
C_8	64.71±5.72**	3.95±0.54**	-23.70±11.63	-14.59±5.69*	13.09±1.34**	16.73±5.96*	Duplicate epistasis between dominant decreasers
C_9	57.58±3.22**	7.75±0.619**	-14.39±8.415	-11.26±3.16*	-4.61±2.65	7.99±5.31	-
C_{10}	69.38±1.75**	3.80±0.74**	-27.70±5.23**	-27.01±1.585**	18.66±2.13**	-6.63±3.79	Complementary epistasis between dominant decreasers

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Table 1. Mean value of progeny and scaling tests for seed yield in sunflower crosses in two years

Cross	Mean value of progeny						Scaling test		
2001	P_1	BC_1P_1	F_1	F_2	BC_1P_2	P_2	A	B	C
C_1	54.17	47.05	50.11	54.31	47.85	50.72	-10.17±4.97	-5.12±2.489	12.14±5.933
C_2	54.17	51.97	48.99	51.63	51.05	54.07	0.77±5.641	-0.95±2.508	0.29±5.168
C_3	54.17	48.24	48.48	52.33	53.10	46.16	-6.18±4.432	11.56±6.166	12.02±12.518
C_4	54.17	48.48	50.05	61.76	53.62	38.57	-7.27±6.546	18.61±6.650*	54.20±13.458**
C_5	54.07	49.41	50.32	53.28	50.91	50.72	-5.56±4.090	0.79±1.991	7.72±7.162
C_6	50.72	51.48	48.72	55.21	46.31	46.16	3.52±2.966	-2.27±1.994	26.52±9.501*
C_7	50.72	50.83	37.74	52.78	44.95	38.57	13.20±2.634**	13.59±1.653**	46.36±6.864**
C_8	54.07	58.64	57.74	57.04	48.14	46.16	5.48±0.787**	-7.61±1.095**	12.46±5.745
C_9	54.07	52.29	51.18	52.38	46.85	38.57	-0.67±1.279	3.94±2.341	14.53±2.499**
C_{10}	46.16	53.68	35.04	53.87	40.55	38.57	26.15±1.323**	7.49±2.020**	60.64±2.217**
2002									
C_1	54.75	52.13	50.08	57.49	57.54	49.26	-0.57±4.26	15.74±4.82*	25.78±8.221*
C_2	51.40	54.90	55.46	53.77	47.90	49.26	2.94±3.437	-8.92±1.262**	3.52±3.603
C_3	65.02	57.17	57.83	58.94	54.19	49.26	-8.51±4.765	1.30±2.674	5.80±6.158
C_4	49.26	49.84	57.83	58.94	48.57	39.52	-7.42±3.376	-0.21±2.968	31.30±6.06**
C_5	54.75	50.76	49.33	52.23	60.49	51.40	-2.56±2.881	20.25±3.494**	4.11±3.814
C_6	65.02	56.40	54.84	53.77	52.16	54.75	-7.05±3.686	-5.26±7.388	-14.35±5.748*
C_7	54.75	49.75	43.70	50.67	44.46	39.52	1.04±1.713	5.69±2.82	21.00±4.914**
C_8	65.02	59.59	60.50	62.80	58.41	51.40	-6.34±3.263	4.92±3.599	13.79±7.978
C_9	51.40	51.07	47.85	53.48	47.77	39.52	2.90±1.676	8.17±1.677	27.30±3.822
C_{10}	65.02	54.40	43.38	56.70	40.68	39.52	0.41±3.007	-1.54±2.162	35.50±4.250

* P<0,05; ** P<0,01

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Table 2. Gene effects for seed yield in ten crosses of sunflower in two years

Cross	Gene effect						Type of epistasis
2001	*m*	*d*	*h*	*i*	*j*	*l*	
C_1	62.62±4.65**	2.75±0.52**	-7.98±12.69	-10.61±4.62	-16.31±3.59**	-4.55±10.71	-
C_2	59.83±4.10**	1.07±0.47	-19.85±10.91	-9.50±4.075	11.85±3.28**	15.48±7.24	-
C_3	70.16±6.56**	7.88±0.96**	-32.56±16.74	-13.02±6.49	-9.81±4.87	20.24±10.875	-
C_4	83.32±5.85**	4.87±0.78**	-72.05±14.19**	-38.93±5.80**	-7.20±3.75	46.56±9.12**	Duplicate epistasis between dominant decreasers
C_5	39.49±5.08**	1.68±0.64	41.12±13.785*	13.59±5.04*	-22.81±4.29**	-31.28±9.03**	Duplicate epistasis between dominant increasers
C_6	57.84±7.62**	5.13±1.05**	-13.28±22.44	2.04±7.55	-1.79±7.51	10.27±15.52	-
C_7	61.41±5.34**	7.61±0.89**	-25.25±12.45	-14.27±5.26*	-4.65±3.25	7.54±7.32	-
C_8	73.41±7.63**	6.81±1.02**	-29.53±17.39	-15.21±7.56	-11.26±4.05*	16.62±10.60	-
C_9	61.69±3.52**	5.94±0.87**	-18.99±7.91*	-16.23±3.41**	-5.28±2.18*	5.16±4.655	Duplicate epistasis between dominant decreasers
C_{10}	88.90±4.08**	12.75±1.20**	-83.29±10.30**	-36.63±3.90**	1.95±3.47	37.77±6.57**	Duplicate epistasis between dominant decreasers

* P<0,05; ** P<0,01