

ANOVA for GRAIN YIELD/PLANT gm

Source of Variations	df	Sum of Squares	Mean Squares	F Ratio	Probability	h ²	hp ²	w ²
Blocks within Environments	2	673.32601	336.66301	15.858	0.00000 ***	0.082	0.171	0.071
Treatemnts	77	4314.41538	56.03137	2.639	0.00000 ***	0.523	0.569	0.213
Parents	11	687.80499	62.52773	2.945	0.00145 **	0.083	0.174	0.051
<i>Between Groups</i>	2	237.10116	118.55058	5.584	0.00456 **	0.029	0.068	0.023
<i>Tall</i>	3	44.16403	14.72134	0.693	0.55738	0.005	0.013	-0.002
<i>Medium</i>	3	242.54017	80.84672	3.808	0.01143 *	0.029	0.069	0.021
<i>Dwarf</i>	3	163.99963	54.66654	2.575	0.05599	0.020	0.048	0.012
Hybrids	65	3538.39338	54.43682	2.564	0.00000 ***	0.429	0.520	0.183
<i>Between Groups</i>	5	327.49114	65.49823	3.085	0.01105 *	0.040	0.091	0.026
<i>Tall*Tall</i>	5	90.61991	18.12398	0.854	0.51383	0.011	0.027	-0.002
<i>Medium*Medium</i>	5	339.96512	67.99302	3.203	0.00885 **	0.041	0.094	0.027
<i>Dwarf*Dwarf</i>	5	803.55898	160.71180	7.570	0.00000 ***	0.097	0.197	0.077
<i>Tall*Medium</i>	15	343.31448	22.88763	1.078	0.38094	0.042	0.095	0.003
<i>Tall*Dwarf</i>	15	570.38858	38.02591	1.791	0.04024 *	0.069	0.149	0.029
<i>Medium*Dwarf</i>	15	1063.05516	70.87034	3.338	0.00008 ***	0.129	0.245	0.080
Parents vs. Hybrids	1	88.21702	88.21702	4.155	0.04321 *	0.011	0.026	0.008
<i>Tall Vs. Tall*Tall</i>	1	1.15520	1.15520	0.054	0.81586	0.000	0.000	-0.002
<i>Medium Vs. Medium*Medium</i>	1	219.38688	219.38688	10.334	0.00159 **	0.027	0.063	0.023
<i>Dwarf Vs. Dwarf*Dwarf</i>	1	1.57174	1.57174	0.074	0.78591	0.000	0.000	-0.002
<i>Tall+Medium Vs. Tall*Me</i>	1	138.51328	138.51328	6.525	0.01161 *	0.017	0.041	0.014
<i>Tall+Dwarf Vs. Tall*Dwa</i>	1	14.01878	14.01878	0.660	0.41769	0.002	0.004	-0.001
<i>Medium+Dwarf Vs. Medium</i>	1	140.99583	140.99583	6.642	0.01090 *	0.017	0.041	0.014
Error	154	3269.31959	21.22935					
Total	233	8257.06098	35.43803					

	1Env.	Mean
Parental Mean	21.89611	21.89611
General Mean	23.33607	23.33607
F1 Cross Mean	23.59788	23.59788
Environmental Effect	0.00000	
Average Heterosis %	7.77201	7.77201

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Source of Variations	df	Sum of Squares	Mean Squares	F Ratio	Probability
GCA	11	328.91306	29.90119	4.225	0.00002 ***
<i>Between Groups</i>	2	118.38598	59.19299	8.365	0.00036 ***
<i>Tall</i>	3	23.99278	7.99759	1.130	0.33876
<i>Medium</i>	3	141.04221	47.01407	6.644	0.00030 ***
<i>Dwarf</i>	3	45.49209	15.16403	2.143	0.09711
SCA	66	1109.22540	16.80645	2.375	0.00001 ***
<i>Tall</i>	6	21.32027	3.55338	0.502	0.80605
<i>Medium</i>	6	126.25517	21.04253	2.974	0.00893 **
<i>Dwarf</i>	6	277.55136	46.25856	6.537	0.00000 ***
<i>Tall*Medium</i>	15	114.43816	7.62921	1.078	0.38094
<i>Tall*Dwarf</i>	15	190.12953	12.67530	1.791	0.04024 *
<i>Medium*Dwarf</i>	15	354.35172	23.62345	3.338	0.00008 ***
Error	154	1089.77320	7.07645		

GENERAL G.C.A. & S.C.A. Effects Table

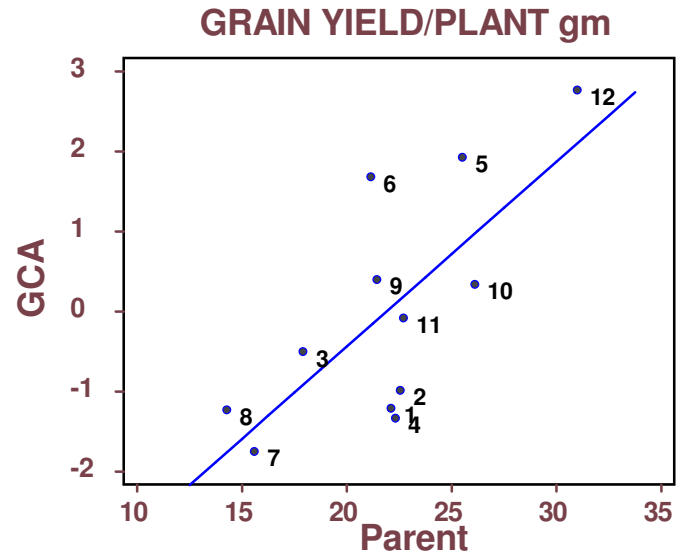
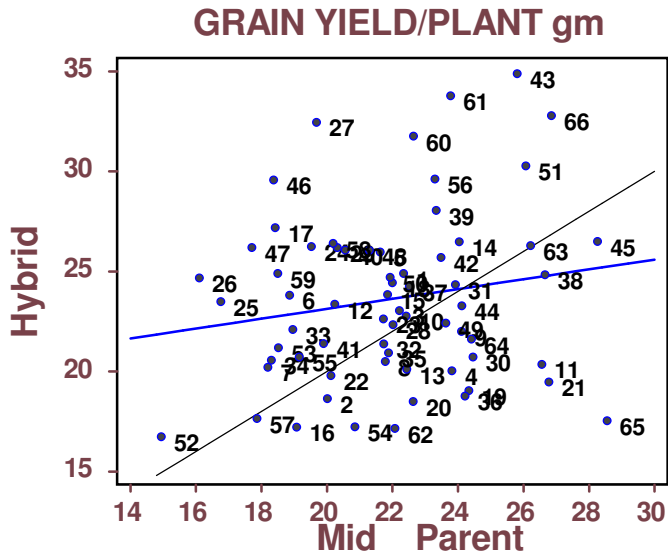
Genotypes	COGG -2	ML -267	PUSA -105	RMG -2753	PDM -89 - 221	LGG -460	LGG -410	COGG -22	ML -26 - 7	PUSA -105 / A	RMG -2753	PDM -89
COGG -2	1.210	3.750	-2.981	2.247	-4.023	2.158	3.434	-0.693	-2.031	-0.468	0.723	-4.536
ML -267		1.199	1.502	-0.917	2.203	-0.190	-3.390	6.053	1.678	-3.659	-3.785	-5.643
PUSA -105			-4.405	-1.701	-2.134	1.717	2.403	3.076	9.214	-0.836	3.432	-4.883
RMG -275				1.660	0.410	-2.316	1.834	-0.210	-1.472	-3.575	2.326	0.054
PDM -89 - 221					-1.659	1.105	2.544	-2.650	0.035	9.269	-1.907	-1.536
LGG -460						-5.551	6.298	2.391	0.626	-2.948	-0.233	2.495
LGG -410							-4.236	-3.623	-0.801	-4.708	-0.784	5.264
COGG -22								-6.590	-4.855	3.945	2.869	6.877
ML -26 - 7									-2.687	9.693	-6.499	-0.214
PUSA -105 / A										2.096	-1.990	-8.915
RMG -2753											-0.455	6.760
PDM -89												2.138
GCA Effects	-1.213	-0.986	-0.506	-1.336	1.923	1.679	-1.750	-1.230	0.399	0.339	-0.082	2.763
GCA Variance	0.829	0.329	-0.388	1.143	3.055	2.177	2.420	0.869	-0.484	-0.528	-0.637	6.991
SCA Variance	6.883	10.417	15.138	3.353	10.606	10.508	13.747	19.539	20.715	26.583	10.529	22.632
GCA/SCA Var. Ratio	0.120	0.032	-0.026	0.341	0.288	0.207	0.176	0.044	-0.023	-0.020	-0.060	0.309
Parental Means	22.120	22.563	17.920	22.323	25.523	21.143	15.600	14.287	21.447	26.110	22.717	31.000

Comparison	S.E.	S.E. Mean	C.D. 95%	C.D. 99
U	0.30120			
Gi	0.68069			
Gi -- Gj	1.00545		1.98624	2.62233
Sii	2.26547			
Sij	2.47857			
Sij -- Sjj	3.17950		6.28105	8.29254
Sij -- Sik	3.62519		7.16150	9.45495
Sij -- Skm	3.48297		6.88054	9.08402
Sii -- Sij	3.62519		7.16150	9.45495
Sii -- Sjk	3.33469		6.58762	8.69728

Y Variable Regression Equation

Hybrid =	Regression Equation	Parent	Std. Error
Hybrid =	22.2444 +0.0701x	Lesser Parent	0.1530
Hybrid =	18.2017 +0.2464x	Mid Parent	0.1766
Hybrid =	17.0061 +0.2691x	Better Parent	0.1438
GCA =	-5.0553 +0.2309x	Parent	0.0701

T-Test	Probability	R ²
0.4585	0.648	0.003
1.3951	0.168	0.030
1.8719	0.066	0.052
3.2926	0.008	0.520



Grain Yield/Plant gm

Genetic Components Fixed Effect Random Effect

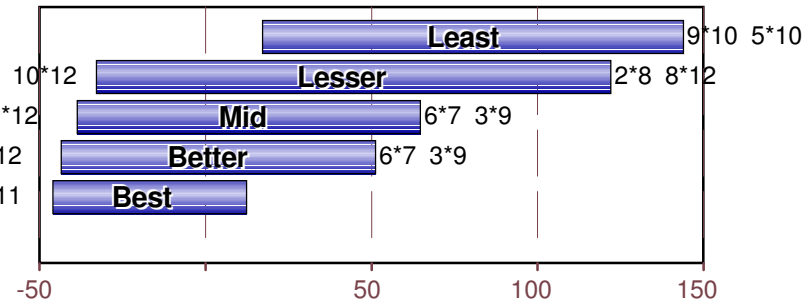
s ² G	1.63034	0.93534
s ² S	9.73000	9.73000
s ² e	7.07645	7.07645
s ² a	3.26068	1.87068
s ² D	9.73000	9.73000
s ² P	20.06712	18.67712
h ² Narrow Sense	0.16249	0.10016
GCA/SCA Ratio	0.16756	0.09613

Heterosis Table

SNo.HYBRID	Mean	Least	Lesser	Mid	Better	Best
1*2 COGG -2*ML -267	24.89	74.20 **	12.51	11.39	10.30	-19.72
1*3 COGG -2*PUSA -105	18.64	30.45	4.00	-6.91	-15.75	-39.88 **
1*4 COGG -2*RMG -275	23.03	61.22 *	4.13	3.65	3.18	-25.70 *
1*5 COGG -2*PDM -89 - 22	20.02	40.15	-9.48	-15.94	-21.55	-35.41 **
1*6 COGG -2*LGG -460	25.96	81.71 **	22.78	20.01	17.36	-16.26
1*7 COGG -2*LGG -410	23.81	66.64 *	52.61 *	26.23	7.63	-23.20
1*8 COGG -2*COGG -22	20.20	41.39	41.39	10.97	-8.68	-34.84 **
1*9 COGG -2*ML -26 - 7	20.49	43.42	-4.46	-5.94	-7.37	-33.90 **
1*10 COGG -2*PUSA -105 /	21.99	53.94 *	-0.57	-8.80	-15.77	-29.05 *
1*11 COGG -2*RMG -2753	22.76	59.33 *	2.91	1.54	0.21	-26.57 *
1*12 COGG -2*PDM -89	20.35	42.44	-8.00	-23.38	-34.35 **	-34.35 **
2*3 ML -267*PUSA -105	23.35	63.42 *	30.28	15.34	3.47	-24.69 *
2*4 ML -267*RMG -275	20.10	40.67	-9.97	-10.46	-10.93	-35.17 **
2*5 ML -267*PDM -89 - 22	26.48	85.32 **	17.34	10.12	3.74	-14.59
2*6 ML -267*LGG -460	23.84	66.87 *	12.75	9.09	5.66	-23.10
2*7 ML -267*LGG -410	17.21	20.46	10.32	-9.81	-23.73	-44.48 **
2*8 ML -267*COGG -22	27.17	90.20 **	90.20 **	47.48 **	20.43	-12.34
2*9 ML -267*ML -26 - 7	24.43	70.98 **	13.89	11.01	8.26	-21.20
2*10 ML -267*PUSA -105 /	19.03	33.20	-15.66	-21.81	-27.12	-38.61 **
2*11 ML -267*RMG -2753	18.48	29.37	-18.08	-18.36	-18.64	-40.38 **
2*12 ML -267*PDM -89	19.47	36.28	-13.71	-27.30 *	-37.19 **	-37.19 **
3*4 PUSA -105*RMG -275	19.79	38.54	10.45	-1.63	-11.33	-36.15 **
3*5 PUSA -105*PDM -89 -	22.62	58.33 *	26.23	4.14	-11.38	-27.03 *
3*6 PUSA -105*LGG -460	26.23	83.57 **	46.35 *	34.28 *	24.04	-15.40
3*7 PUSA -105*LGG -410	23.48	64.37 *	50.53 *	40.12 *	31.05	-24.25 *
3*8 PUSA -105*COGG -22	24.68	72.73 **	72.73 **	53.24 **	37.70	-20.40
3*9 PUSA -105*ML -26 - 7	32.44	127.09 **	81.05 **	64.83 **	51.27 **	4.66
3*10 PUSA -105*PUSA -105	22.33	56.32 *	24.63	1.45	-14.46	-27.96 *
3*11 PUSA -105*RMG -2753	26.18	83.25 **	46.09 *	28.85	15.25	-15.55
3*12 PUSA -105*PDM -89	20.71	44.96	15.57	-15.33	-33.19 **	-33.19 **
4*5 RMG -275*PDM -89 - 2	24.33	70.32 **	9.00	1.71	-4.66	-21.51
4*6 RMG -275*LGG -460	21.36	49.53	1.04	-1.70	-4.30	-31.09 *
4*7 RMG -275*LGG -410	22.08	54.57 *	41.56	16.46	-1.08	-28.76 *
4*8 RMG -275*COGG -22	20.56	43.91	43.91	12.32	-7.90	-33.68 **
4*9 RMG -275*ML -26 - 7	20.93	46.48	-2.42	-4.38	-6.26	-32.49 **
4*10 RMG -275*PUSA -105 /	18.76	31.33	-15.95	-22.52	-28.14	-39.47 **
4*11 RMG -275*RMG -2753	24.24	69.69 **	8.60	7.65	6.72	-21.80
4*12 RMG -275*PDM -89	24.82	73.71 **	11.17	-6.92	-19.95	-19.95
5*6 PDM -89 - 221*LGG -4	28.04	96.29 **	32.63	20.19	9.87	-9.54
5*7 PDM -89 - 221*LGG -4	26.05	82.36 **	67.01 **	26.71	2.08	-15.96
5*8 PDM -89 - 221*COGG -	21.38	49.65	49.65	7.41	-16.23	-31.03 *
5*9 PDM -89 - 221*ML -26	25.69	79.84 **	19.80	9.40	0.67	-17.12
5*10 PDM -89 - 221*PUSA -	34.87	144.05 **	36.61 *	35.05 **	33.54 *	12.47
5*11 PDM -89 - 221*RMG -2	23.27	62.88 *	2.44	-3.52	-8.83	-24.94 *
5*12 PDM -89 - 221*PDM -8	26.49	85.39 **	3.77	-6.28	-14.56	-14.56
6*7 LGG -460*LGG -410	29.56	106.93 **	89.51 **	60.92 **	39.82 *	-4.63
6*8 LGG -460*COGG -22	26.18	83.22 **	83.22 **	47.77 *	23.81	-15.56
6*9 LGG -460*ML -26 - 7	26.04	82.27 **	23.16	22.28	21.42	-16.00
6*10 LGG -460*PUSA -105 /	22.41	56.84 *	5.98	-5.16	-14.18	-27.72 *
6*11 LGG -460*RMG -2753	24.70	72.89 **	16.82	12.63	8.73	-20.32
6*12 LGG -460*PDM -89	30.27	111.90 **	43.18 *	16.12	-2.34	-2.34
7*8 LGG -410*COGG -22	16.73	17.13	17.13	11.98	7.26	-46.02 **
7*9 LGG -410*ML -26 - 7	21.18	48.27	35.79	14.36	-1.23	-31.67 **
7*10 LGG -410*PUSA -105 /	17.22	20.51	10.36	-17.45	-34.06 *	-44.46 **
7*11 LGG -410*RMG -2753	20.72	45.03	32.82	8.15	-8.79	-33.16 **
7*12 LGG -410*PDM -89	29.61	107.28 **	89.83 **	27.10	-4.47	-4.47
8*9 COGG -22*ML -26 - 7	17.65	23.54	23.54	-1.21	-17.70	-43.06 **
8*10 COGG -22*PUSA -105 /	26.39	84.72 **	84.72 **	30.65	1.07	-14.87
8*11 COGG -22*RMG -2753	24.89	74.24 **	74.24 **	34.55	9.58	-19.70
8*12 COGG -22*PDM -89	31.75	122.21 **	122.21 **	40.20 **	2.41	2.41
9*10 ML -26 - 7*PUSA -105	33.77	136.35 **	57.44 **	42.01 **	29.32 *	8.92
9*11 ML -26 - 7*RMG -2753	17.15	20.07	-20.02	-22.32	-24.49	-44.67 **
9*12 ML -26 - 7*PDM -89	26.28	83.97 **	22.55	0.23	-15.22	-15.22
10*1 PUSA -105 / A*RMG -2	21.60	51.21	-4.90	-11.51	-17.26	-30.31 *
10*1 PUSA -105 / A*PDM -8	17.52	22.66	-32.89 *	-38.63 **	-43.47 **	-43.47 **
11*1 RMG -2753*PDM -89	32.78	129.42 **	44.28 **	22.04	5.73	5.73

Comparison of hybrids	Std Difference	CD 95%	CD 99%
Mid Parent	3.258	6.436	8.497
Lesser / Better Parent	3.762	7.432	9.812
Least / Best Parent	3.762	7.432	9.812
Checks	3.762	7.432	9.812

Heterosis Ranges



Groups	Mean	Gi*Gi	Mean Av. Heterosis	Gi*Gj	Mean Av. Heterosis
Tall	21.232	Tall*Tall	21.632	1.887	14.577
		Medium*Medium	24.658	28.843	-4.022
Medium	19.138	Dwarf*Dwarf	24.851	-1.845	13.355
		Medium*Dwarf	25.197		
Dwarf	25.318				