

8. Heterotic genes in the long arm of chromosome 3.

Field tests for heterotic genes in the long arm of chromosome 3 were continued in 1955. A homozygous inversion 3a strain carrying the recessive a_1 allele in the inverted segment was crossed to a number of inbred lines with the A_1 allele. F_1 plants, all heterozygous for the inversion and for $A:a$, were backcrossed by the homozygous inversion strain. There was a ratio of 1 colored : 1 colorless kernels on the F_1 backcrossed ears. The colored kernels were heterozygous for the inversion and for $A:a$. The colorless kernels were homozygous for the inversion and for $A:a$. The kernels of the two classes were planted in the replicated plots. Data for ear height, maturity, grain yield, and kernel weight are presented in the following tables. In the cases where a significant difference is found, the heterotic genes were contributed by the inbred lines except possibly for kernel weight. In the latter case, the difference is either due to the heterotic genes from the inbred lines or the 21% of ovule abortion in the class heterozygous for the inversion. There are some discrepancies between the grain yield data obtained in 1955 and in 1954. There were two inbred lines, K 187-2 and M 14, out of fourteen inbred lines tested in 1954, which showed significant differences between the two classes at the 1% level. None of them had such a difference in 1955. This might be due to environmental differences in the two growing seasons.

	Ear height in cms.				Days from planting to half silking			
	No. reps.	Aa	aa	't' value	No. reps	Aa	aa	't' value
Oh 45	12	115	101	13.15**	12	67.1	65.5	11.00**
Oh 41	12	119	108	9.83**	12	70.0	69.2	3.04**
M 14	12	96	92	2.84**	12	67.7	67.6	0.44
K 4	12	126	112	7.35**	12	73.4	72.8	2.10
I 205	12	116	107	4.84**	12	68.9	68.5	0.85
C 103	12	108	97	7.68**	12	69.8	70.4	1.80
5120 B	12	114	101	8.64**	12	69.5	68.8	2.50*
K 187-2	12	114	93	10.20**	12	68.2	67.2	2.81**
38-11	12	122	111	5.52**	12	69.1	68.3	3.43**
O 7	12	125	99	13.13**	12	69.5	68.6	3.14**
WF 9	12	103	98	2.25*	12	65.7	65.8	0.52
W 26	12	104	92	7.64**	12	67.0	66.3	2.59*
R 59	12	120	110	9.00**	12	69.4	69.0	1.68

**Significant at 1% level

*Significant at 5% level

	Ave. yield per rep. in lbs.				Wt. of 1,000 kernels in gms.			
	No. reps.	Aa	aa	't' value	No. reps	Aa	aa	't' value
Oh 45	12	3.54	3.60	0.86	12	270	240	2.37
Oh 41	12	3.03	2.96	0.58	12	239	212	4.95**
M 14	12	3.46	3.44	0.20	12	237	205	7.23**
K 4	12	2.72	2.72	0.00	12	248	206	10.87**
I 205	12	3.20	3.02	1.50	12	254	222	3.76**

WF 9	12	3.23	3.24	0.09	12	241	202	7.21**
W 26	12	2.73	2.67	0.63	12	236	209	3.69**
R 59	12	3.54	3.71	1.13	12	256	217	4.61**

**Significant at 1% level

*Significant at 5% level

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