

F<sub>2</sub> Linkage Data from the Cross Pn bd x gl ij

Genes XY	XY	Xy	xY	xy	Total	Recombination % <sup>1</sup>	Map Units <sup>2</sup>
G1 Pn	192	62	60	23	337	47.6	79.0
G1 Bd	178	75	63	21	337	46.9	74.0
G1 Ij	234	19	24	60	337	13.8	14.5
Ij Pn	200	59	52	26	337	42.9	58.6
Ij Bd	177	81	64	15	337	40.7	54.0

<sup>1</sup>Product method from tables of Immer, 1930.

<sup>2</sup>Conversion from tables of Haldane, 1919.

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1. Correlations among 28 characteristics of 145 inbred lines of maize.

A group of 145 standard American inbred lines were compared in many locations in 1948 by members of the North Central Corn Improvement Conference of the United States. These lines were involved in most of the open-pedigree hybrids developed by the Corn Belt agricultural experiment stations and in use prior to 1948. Data were summarized in 1948 in a mimeographed report by Brunson, Ullstrup and Dicke. The 378 possible correlations involving 28 plant and ear characters of the 145 widely used inbred lines are shown in Table 1. Many of the correlations were statistically significant and should have some predictive value in maize breeding research. These 378 correlations were obtained quickly and easily on the University of Illinois Illiac electronic digital computer.

R. W. Jugenheimer

Table 1. Correlations among 28 characteristics of 145 inbred lines.

Code	Character	1	2	3	4	5	6	7	
1.	Days to half pollen		+ .934**	+ .928**	+ .731**	+ .820**	-.542**	+ .115	
2.	Days to half silk	+ .928**		+ .896**	+ .732**	+ .805**	-.518**	+ .101	
3.	Days to maturity	+ .731**	+ .896**		+ .718**	+ .812**	-.491**	+ .104	
4.	Plant height, in.	+ .820**	+ .732**	+ .718**		+ .885**	-.344**	+ .081	
5.	Ear height, in.	-.542**	-.518**	-.491**	+ .885**	-.426**	-.426**	+ .215*	
6.	Root-lodged plants, %	+ .115	+ .101	+ .104	-.344**	+ .215*	+ .038	-.059	
7.	Stalk-lodged plants, %	+ .025	+ .023	+ .077	+ .215*	+ .059	-.060	+ .216*	
8.	Plot yield, lb.	-.049	-.009	-.062	+ .031	+ .001	-.038	+ .055	
9.	Ears per plant, no.	+ .077	+ .102	+ .098	+ .248**	+ .204*	+ .133	-.059	
10.	Reaction to 2-4D, gr.	-.166	-.153	-.186*	-.218*	-.216*	+ .132	-.162	
11.	Mg. deficiency, gr.	-.542**	-.534**	-.559**	-.396**	-.537**	+ .255**	-.086	
12.	H. Turcicum, gr.	-.056	-.042	-.066	-.011	-.041	-.040	+ .149	
13.	H. Maydis, gr.	-.245**	-.222**	-.211*	-.152	-.139	+ .260**	-.022	
14.	Diplodia stalk rot, gr.	-.412**	-.394**	-.439**	-.322**	-.389**	+ .198*	-.003	
15.	Gibberella stalk rot, gr.	-.315**	-.294**	-.305**	-.244**	-.270**	+ .339**	-.094	
16.	Smutted plants, %	+ .015	+ .030	+ .036	+ .133	+ .066	-.112	+ .160	
17.	Kernel rot, gr.	+ .079	+ .111	+ .096	+ .040	+ .084	-.185*	+ .022	
18.	Eur. borer oviposition, gr.	-.323**	-.339**	-.279**	-.122	-.153	+ .151	+ .090	
19.	Eur. borer leaf feeding, gr.	-.234**	-.274**	-.233**	-.256**	-.187*	+ .154	+ .120	
20.	Eur. borer plant injury, gr.	-.275**	-.305**	-.282**	-.294**	-.239**	+ .217*	-.028	
21.	Eur. plant tolerance, gr.	-.304**	-.265**	-.284**	-.160	-.234**	+ .198*	+ .070	
22.	Corn ear worm, gr.	+ .509**	+ .512**	+ .573**	+ .373**	+ .452**	-.227*	+ .002	
23.	Leaf aphids, index	+ .143	+ .112	+ .162	+ .069	+ .123	-.214*	+ .039	
24.	Thrips, gr.	+ .501**	+ .469**	+ .571**	+ .469**	+ .478**	-.138	-.183*	
25.	Weight per 1,000 seeds, gm.	-.279**	-.257**	-.299**	-.434**	-.331**	+ .157	-.163	
26.	Protein, %	-.317**	-.305**	-.330**	-.492**	-.394**	+ .153	+ .063	
27.	Alcohol soluble nitrogen, %	-.049	-.011	+ .030	-.110	-.063	+ .028		
28.	Oil, %								
		Range, mean, and standard deviation of 145 inbred lines							
	Lowest	59	60	99	42	10	0	0	
	Highest	93	97	148	95	49	88	66	
	Mean	75.861	77.943	123.492	65.119	27.934	17.664	8.844	
	Standard deviation	6.814	7.204	10.511	10.067	8.904	17.044	10.645	

\*Exceeds the 5 percent level of significance of .174.

\*\*Exceeds the 1 percent level of significance of .228.

Table 1. Correlations among 28 characteristics of 145 inbred lines (Continued).

Code	Character	8	9	10	11	12	13	14	
1.	Days to half pollen	+.025	-.049	+.077	-.166	-.542**	-.056	-.245**	
2.	Days to half silk	+.023	-.009	+.102	-.153	-.534**	-.042	-.222**	
3.	Days to maturity	+.077	-.062	+.098	-.186*	-.559	-.066	-.211*	
4.	Plant height, in.	+.215*	+.031	+.248**	-.218*	-.396**	-.011	-.152	
5.	Ear height, in.	+.059	+.001	+.204*	-.216*	-.537**	-.041	-.139	
6.	Root-lodged plants, %	-.060	-.038	+.133	+.132	+.255**	-.040	+.260**	
7.	Stalk-lodged plants, %	-.059	+.216*	+.055	-.059	-.162	-.086	+.149	
8.	Plot yield, lb.		+.164	+.125	-.205*	+.250**	-.189*	-.292**	
9.	Ears per plant, no.	+.125	+.025	+.025	-.112	+.137	-.029	-.061	
10.	Reaction to 2-4D, gr.	-.205*	-.112	-.012	-.012	-.111	-.150	-.064	
11.	Mg. deficiency, gr.	+.250**	+.137	-.111	-.014	-.014	+.144	+.087	
12.	H. Turcicum, gr.	-.189*	-.029	-.150	+.114	+.017	+.017	-.081	
13.	H. Maydis, gr.	-.292**	-.061	-.064	+.087	-.081	+.001	+.267**	
14.	Diplodia stalk rot, gr.	-.200*	+.050	-.076	+.195*	+.091	+.036	+.186*	
15.	Gibberella stalk rot, gr.	-.069	+.002	+.162	+.077	+.211*	+.028	+.128	
16.	Smutted plants, %	+.244**	+.003	-.074	-.049	+.122	+.080	+.059	
17.	Kernel rot, gr.	-.037	-.029	-.201*	-.070	-.018	+.056	+.168	
18.	Eur. borer oviposition, gr.	-.013	-.028	+.035	-.112	+.226*	-.048	+.123	
19.	Eur. borer leaf feeding, gr.	-.265**	+.038	-.029	+.035	+.184*	+.147	+.202*	
20.	Eur. borer plant injury, gr.	-.351**	+.086	-.093	+.066	+.161	+.137	+.031	
21.	Eur. plant tolerance, gr.	+.123	+.234**	-.072	-.022	+.245**	+.029	-.144	
22.	Corn ear worm, gr.	+.106	-.127	+.077	-.064	-.297**	-.285**	+.002	
23.	Leaf aphids, index	-.158	-.151	-.070	+.084	-.169	+.155	-.074	
24.	Thrips, gr.	+.031	-.102	+.112	-.097	-.308**	-.007	+.329**	
25.	Weight per 1,000 seeds, gm.	-.522**	-.096	-.092	+.328**	-.007	+.019	+.283**	
26.	Protein, %	-.427**	-.084	-.095	+.304**	+.040	-.079	+.047	
27.	Alcohol soluble nitrogen, %	+.051	+.121	-.126	+.014	+.038	+.106		
28.	Oil, %								
		Range, mean, and standard deviation of 145 inbred lines							
	Range	14.2	1.92	2	0.5	1	0.5	1.6	
	Desirable								
	Undesirable	2.1	.65	5	5.5	5	5.0	5.0	
	Mean	8.525	1.172	3.754	2.666	4.398	2.996	2.900	
	Standard deviation	2.216	0.224	0.852	0.969	0.958	1.033	0.635	

\*Exceeds the 5 percent level of significance of .174.

\*\*Exceeds the 1 percent level of significance of .228.

Table 1. Correlations among 28 characteristics of 145 inbred lines (Continued).

Code	Character	15	16	17	18	19	20	21	
1.	Days to half pollen	-.412**	-.315**	+.015	+.079	-.323**	-.234**	-.275**	
2.	Days to half silk	-.394**	-.294**	+.030	+.111	-.339**	-.274**	-.305**	
3.	Days to maturity	-.439**	-.305**	+.036	+.096	-.279**	-.233**	-.282**	
4.	Plant height, in.	-.322**	-.244**	+.133	+.040	-.122	-.256**	-.294**	
5.	Ear height, in.	-.389**	-.270**	+.066	+.084	-.153	-.187*	-.239**	
6.	Root-lodged plants, %	+.198*	+.339**	-.112	-.185*	+.151	+.154	+.217*	
7.	Stalk-lodged plants, %	-.022	-.003	-.094	+.160	+.022	+.090	+.120	
8.	Plot yield, lb.	-.200*	-.069	+.244**	-.037	-.013	-.265**	-.351**	
9.	Ears per plant, no.	+.050	+.002	+.003	-.029	-.028	+.038	+.086	
10.	Reaction to 2-4D, gr.	-.076	+.162	-.074	-.201*	+.035	-.029	-.093	
11.	Mg. deficiency, gr.	+.195*	+.077	-.049	-.070	-.112	+.035	+.066	
12.	H. Turcicum, gr.	+.091	+.211*	+.122	-.018	+.226*	+.184*	+.161	
13.	H. Maydis, gr.	+.036	+.028	+.080	+.056	-.048	+.147	+.137	
14.	Diplodia stalk rot, gr.	+.267**	+.186*	-.128	+.059	+.168	+.123	+.202*	
15.	Gibberella stalk rot, gr.	+.104	+.104	-.051	+.019	+.036	+.225**	+.355**	
16.	Smutted plants, %	-.051.	-.039	-.039	-.143	+.302**	+.215*	+.166	
17.	Kernel rot, gr.	+.019	-.143	-.029	-.029	+.016	-.075	-.129	
18.	Eur. borer oviposition, gr.	+.036	+.302**	+.016	+.014	+.010	+.010	+.022	
19.	Eur. borer leaf feeding, gr.	+.225**	+.215*	-.075	+.022	+.344**	+.344**	+.311**	
20.	Eur. borer plant injury, gr.	+.355**	+.166	-.129	+.012	+.128	+.039	+.884**	
21.	Eur. plant tolerance, gr.	+.018	+.176*	+.268**	+.098	-.215*	-.111	-.164	
22.	Corn ear worm, gr.	-.200*	-.053	-.045	+.098	+.081	+.049	+.076	
23.	Leaf aphids, index	+.026	+.008	+.026	-.005	+.141	-.010	-.049	
24.	Trips, gr.	-.202*	-.039	+.097	+.072	-.142	+.262**	+.317**	
25.	Weight per 1,000 seeds, gm.	+.207*	+.269**	-.271**	-.026	+.164	+.177*	+.214*	
26.	Protein, %	+.206*	+.252**	-.211*	-.028	+.164	+.177*	+.214*	
27.	Alcohol soluble nitrogen, %	-.109	+.062	-.039	+.074	-.063	-.001	+.011	
28.	Oil, %								
		Range, mean, and standard deviation of 145 inbred lines							
Range	Desirable	1.0	0	1	1	1	1	1	
	Undesirable	4.5	35	6	5	5	5	5	
Mean		3.089	6.770	2.115	3.008	3.000	3.205	3.074	
Standard deviation		0.747	7.293	1.249	0.707	0.830	0.949	1.018	

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