

PENNYRILE GRAIN TESTING FIELD
1953 Corn Performance Tests

The Pennyrile corn performance tests in 1953 were a continuation of the program of the Pennyrile Grain Improvement Association in cooperation with the Kentucky Agricultural Experiment Station. Results for the 1945-1952 tests were reported for those years.

Two comparative yield tests were grown as in previous years. One test was composed of the hybrid varieties grown in several other locations in the state. It included various commercial hybrids being grown extensively in the state and the more promising experimental hybrids. The other test consisted of the commercial hybrids being grown in this section of the state and two-open-pollinated varieties. The performance of hybrids tested in previous years, but not included in 1953, can be obtained from reports for previous years. The test of the effect of rate of planting was continued in 1953.

Experimental Procedure

A cover crop of lespedeza and weeds was turned under in the spring of 1953, and 600 pounds per acre of 8-8-8 fertilizer was applied before planting. The entries in the uniform test were compared in 2 by 10 hill plots using a balanced lattice design with 4 replications, while in the commercial test they were compared in the conventional randomized complete block design with 5 replications. The hill spacing was 42 inches each way with 3 plants grown per hill. The corn was planted May 25 and harvested October 6.

Measure of Performance

1. Yields are recorded as bushels per acre of shelled grain at 15.5 percent moisture. In both tests corrections were made for missing hills but not for minor variation in stand.

2. Moisture at harvest. The percentage of moisture in the corn at harvest was obtained by sampling 15-20 ears from each of two replications. The average moisture percentage of the two replications sampled was used in calculating the yields.

3. Broken stalks. The percentage of broken stalks was determined by making a count of the plants broken below the ear-bearing node and are recorded as mechanical or corn borer. Plants broken because of corn-borer damage were determined by examining the plants for corn borer punctures or the presence of frass. Percentage of plants erect is 100 minus the sum of the mechanical and corn borer broken stalks.

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4. Dead stalks were determined by examining the base of the stalk just above the crown. Structural weakness in the internodes just above the crown is indicative of premature killing of plant tissues due to the action of stalk rotting organisms.

5. Ear height was measured, as it is found to be important in relation to stalk breakage. Lower-eared hybrids are generally less susceptible to breakage, and more desirable for mechanical harvesting.

Interpretation of Results

Experimental results cannot be freed completely from an element of error. Hybrids of equal yielding capacity may vary appreciably in any one test. The data reported in the following table have been analyzed statistically to eliminate varietal differences in yield which may be due only to chance. The computed least significant difference (L. S. D.) which is indicative of true yield difference between hybrids is found at the foot of each table. Unless the two hybrids being compared differ by as much or more than the L. S. D., little confidence can be placed in the superiority of one over the other. Superior performance by a hybrid over a period of years is stronger evidence of real superiority than are the results of any one year. For this reason the period of years results are much more reliable and should be used when selecting a hybrid for a particular locality or purpose.

Uniform Hybrid Test

Forty-nine hybrids were included in the 1953 uniform hybrid test. The average yield for the test was 59.4 bushels per acre which is a 12.2 bushel increase over the 1952 average. The yellow hybrids averaged 59.3 bushels per acre and the white hybrids 59.4 bushels per acre. The data for the uniform hybrid test are given in Table 1.

Twenty-six hybrids tested in 1952 were included in the 1953 tests, eighteen hybrids have been tested for three years, thirteen hybrids have been tested for four years, nine hybrids have been tested for five years, and five hybrids have been tested for eight years. Data on hybrids which have been tested for two or more years are presented in Table 2.

Commercial Hybrid Test

Thirty hybrids were included in the 1953 commercial hybrid test. The average yield of all entries in the test was 56.2 bushels per acre. The average yield for the comparable test in 1952 was 42.2 bushels per acre. The yellow hybrids averaged 58.6 bushels per acre compared to an average of 53.5 bushels per acre for the white hybrids. In 1952 the yellow hybrids were 3.2 bushels higher yielding than the white hybrids. The data for the commercial hybrid test given in Table 3.

Twenty-one hybrids tested in 1952 were repeated in 1953, fourteen hybrids have been tested for three years, nine hybrids have been tested for four years, seven hybrids have been tested for six years, and four hybrids have been tested for seven years. Data on hybrids which have been in the commercial hybrid test for two or more years are given in Table 4. The white hybrids US 523W, Stull 400W, and Ind. 750B, and the yellow hybrid Funk G91 are the highest yielding for both the two year and three year periods. The white hybrids Pioneer 510, Ky 203, and Broadbent 235W, and the yellow hybrids US 13, Ky 103, Stull 100Y, Broadbent 402Y, and Meacham M33Y have performance records above the average.

Rate of Planting Test

The rate of planting test was continued in 1953 in drill plots with spacing between plants varying with the rate of planting. The white hybrid US 523W was the only hybrid used. Each plot consisted of four rows thirty-five feet long. Only the two center rows were harvested to eliminate competition between different rates of planting in adjacent plots. In addition to the fertilizer treatment previously mentioned, this test received nitrogen fertilizer at the rate of approximately 200 pounds per acre as a side dressing.

Results of the Rate of Planting Test

Plants per acre		Acre yield of	Moisture	Nubbins	Produced	Total	Ears
Intended	Actual	shelled grain	at	Wt.	Ct.	broken	per
no.	no.	15.5% moisture	harvest	basis	basis	stalks	plant
		bu.	%	%	%	%	no.
7,110	7,236	53.9	12.9	14.7	28.5	17	1.12
10,668	9,832	55.0	13.3	19.8	30.6	40	0.95
14,223	12,624	52.6	12.9	44.1	59.1	29	0.95
17,774	15,949	40.8	13.4	71.8	83.8	18	0.74

A difference in yield of 5.5 bushels per acre is required for significance. The three lowest rates of planting give significantly greater yields than the highest rate of planting. There was no significant difference in yield among the three lower rates of planting. The lowest rates of planting have resulted in greater yields for two consecutive years, while greater yields were obtained from the higher rates of planting for the first four years. Droughty conditions during the past two years have probably depressed yields to a greater extent in the higher rates of planting.

Table 1. Performance Data on Uniform Hybrid Test - 1953.

Rank in Yield:	Hybrid	Moisture:		Broken Stalks:		Ear:		Kernel				
		at Harvest:	at Stand:	Mechan- ical:	Corn: Erect:	Dead:	Ear: Quality:		Size:			
		bu.	%	%	%	%	%	in.				
1	Ky 1110	(W)	70.4	13.9	99	0	1.7	98.3	2.5	46	M	L
2	Ky 0216	(Y)	67.8	11.5	97	1.7	8.6	89.7	2.6	54	ML	M
3	Funk's G91	(Y)	67.2	11.4	96	1.7	5.2	93.0	4.3	42	MS	M
4	Ky 0109	(W)	65.1	13.6	99	0	2.5	97.5	2.5	48	M	L
5	Ky 2111	(W)	63.5	12.5	94	3.5	5.3	91.2	14.2	46	MS	ML
6	Ky 2106	(W)	62.9	11.3	94	2.6	3.5	93.8	4.4	50	M	M
7	Ky 2030	(Y)	62.7	13.6	92	1.8	12.6	85.6	7.2	44	M	M
8	Ky 2018	(Y)	62.4	12.6	88	1.9	7.6	90.5	4.8	44	MS	ML
9	Ky 2001	(Y)	62.2	12.9	96	10.4	13.9	75.7	10.4	48	L	ML
10	Ky 0228	(Y)	62.1	13.5	99	13.4	14.3	72.3	8.4	46	M	M
11	US 523W	(W)	61.9	12.5	91	3.7	5.5	90.8	4.6	46	MS	M
11	Ky 2113	(W)	61.9	12.3	89	0	1.9	98.1	4.7	44	MS	M
13	Ky 1005	(Y)	61.8	12.4	98	7.7	4.3	88.0	0	48	MS	M
14	Ky 2107	(W)	61.7	11.5	97	0	3.4	96.6	2.6	46	M	ML
14	Ky 103	(Y)	61.7	11.3	100	5.0	12.5	82.5	7.5	54	M	ML
16	Ky 2109	(W)	61.1	13.9	88	1.9	0.9	97.1	0	44	M	M
17	Funk's G134	(Y)	60.9	13.1	92	0	2.7	97.3	0.9	48	L	ML
18	Ky 9105B	(W)	60.8	13.3	95	1.8	2.6	95.6	1.8	52	ML	M
18	Ky 0217	(Y)	60.8	10.2	98	3.4	6.8	89.7	1.7	46	M	M
20	Pfister 347	(Y)	60.7	10.9	99	1.7	2.5	95.8	4.2	38	M	ML
21	Ky 2105	(W)	60.6	11.2	100	0.8	5.8	93.3	1.7	44	MS	ML
22	Ky 1102A	(W)	60.5	14.2	98	3.4	3.4	93.2	3.4	48	M	M
23	S. S. Mohawk	(Y)	60.2	10.8	88	1.9	1.9	96.2	2.9	42	MS	M
24	Ky 2114	(W)	60.0	12.8	96	0.9	0	99.1	1.7	40	MS	ML
25	Ky 1002	(Y)	59.9	11.7	93	2.7	8.9	88.4	1.8	58	M	M
25	Ky 2026	(Y)	59.9	12.0	93	8.0	10.7	81.2	6.2	49	MS	M
27	Ky 7114B	(W)	59.8	12.9	94	15.0	5.3	79.6	5.3	46	ML	M
27	S. S. Pocahontas	(Y)	59.8	11.2	98	1.7	0	98.3	0.8	40	M	M
29	Ky 2108	(W)	59.4	12.7	87	16.3	5.8	77.9	5.8	46	MS	M
30	Ky 0108	(W)	59.1	13.6	98	1.7	4.2	94.1	0.8	48	M	M

Table 1. Continued.

Rank in Yield	Hybrid		Acre : Yield:	Moisture: at Harvest :	Total : Stand :	Broken Stalks :				Ear Quality	Kernel Size	
						Mechanical	Corn Borer	Erect Plants:	Dead Stalks:			
			bu.	%	%	%	%	%	in			
31	CB 8911W	(Exp)	59.0	13.5	95	1.8	4.4	93.9	0.9	62	G-	M
31	Ky 2004	(Exp)	59.0	13.0	92	0	2.7	97.3	3.6	50	G-	MS
33	Ky 1023	(Exp)	58.9	14.9	95	7.0	7.9	85.1	3.5	44	F-	MS
34	Ky 0105	(Exp)	58.7	13.1	98	17.1	9.4	73.5	12.0	50	G-	M
35	Stull 400W	(W)	57.9	13.9	92	1.8	2.7	95.5	3.6	54	G	MS
35	US 13	(Y)	57.9	12.2	100	6.7	6.7	86.7	2.5	48	F-	M
37	Funk's G704	(Y)	57.7	13.1	99	1.7	1.7	96.6	2.5	44	G	MS
38	Ind. 750B	(W)	57.3	14.9	94	0	2.7	97.3	4.4	48	F	M
38	Funk's G512W	(W)	57.3	12.7	91	4.6	3.7	91.7	1.8	42	F	MS
40	Ky 9107	(Exp)	56.8	12.9	97	1.7	2.6	95.7	0.8	50	F+	M
41	Ky 0110	(Exp)	56.0	13.3	94	0.9	5.3	93.8	0	54	F+	MS
42	Ky 203	(W)	55.9	12.7	87	10.6	7.7	81.7	6.7	48	F-	MS
43	Broadbent 235W	(W)	55.1	14.4	99	0.8	0.8	98.3	3.4	54	F	ML
44	CB 8925	(Exp)	54.5	12.0	94	1.8	5.3	92.9	5.3	52	F	M
45	Ind. 844D	(Y)	54.4	11.3	92	4.5	12.6	82.9	7.2	42	P+	S
46	Ky 1008	(Exp)	53.8	12.1	98	8.5	21.4	70.1	4.3	60	G-	MS
47	Ky 102	(Y)	48.9	12.1	97	6.0	24.1	69.9	3.4	48	F+	MS
48	CB 8902	(Exp)	48.5	13.9	100	5.0	5.0	90.0	0	44	F	MS
49	Neals Paymaster	(OP)	42.6	14.6	89	2.8	7.5	89.7	2.8	60	P+	S
Means			59.4	12.7	95	4.0	6.1	89.9	3.8	48		L

(W) White hybrid, (Y) yellow hybrid, (Exp) experimental hybrid, not available commercially, (OP) open-pollinated

Differences of less than 5.5 bushels per acre are not significant.

Table 2. Average performance Data for Hybrids in Uniform Hybrid Corn Test 1946-53.

Rank in yield 1951-52	Hybrid	2-yr. 1952-53		3-yr. 1951-53		4-yr. 1950-53		5-yr. 1949-53		8-yr. 1946-53	
		bu.	%	bu.	%	bu.	%	bu.	%	bu.	%
1	Ky 0109	(Exp)	(W)	60.3	96	66.2	96				
2	Ky 1110	(Exp)	(W)	59.8	94						
2	Ky 1102A	(Exp)	(W)	59.8	92						
4	Ky 0228	(Exp)	(Y)	59.0	74	68.5	77				
5	Funk's G91	(Y)	(Y)	58.2	96	68.7	91				
6	Ky 1005	(Exp)	(Y)	57.3	86						
7	Ky 1002	(Exp)	(Y)	57.2	90						
8	Ky 0108	(Exp)	(W)	57.0	86	66.5	86				
9	Ky 103	(Y)	(Y)	56.4	85	62.6	74	71.0	78	72.6	84
10	Ky 0105	(Exp)	(W)	55.2	81	62.3	80	68.9			
11	US 523W	(W)	(W)	55.1	84	73.0	83	80.3	88		
12	Ky 0217	(Exp)	(Y)	54.4	94	60.6	90	64.6	88	69.8	91
13	US 13	(Y)	(Y)	54.2	92						
14	Ky 2106	(Exp)	(W)	54.0	93						
15	CB 891W	(Exp)	(W)	53.5	92	67.2	89	75.0	87		
16	Ky 7114B	(Exp)	(W)	53.4	82	62.8	79	69.0	78	77.9	82
16	Ky 2105	(Exp)	(W)	53.4	89						
18	Broadbent 235W	(W)	(W)	53.3	91						
19	Stull 400W	(W)	(W)	52.8	87	63.2	92	68.8	92	72.8	93
19	Ky 9105B	(Exp)	(W)	52.0	90	64.0	86	72.0	86	79.5	88
21	Ky 9107	(Exp)	(W)	51.7	89	62.5	91	72.2	91		
22	Ky 0110	(Exp)	(W)	51.0	91	61.6	90	69.2	90		
23	Ky 203	(W)	(W)	50.8	84	59.9	91				
24	Ind. 750B	(W)	(W)	50.0	96	63.9	84	67.8	80	75.1	85
25	Funk's G512W	(W)	(W)	49.8	90	58.0	97	65.6	96	71.8	97
26	Ky 102	(Y)	(Y)	44.4	68	53.1	74	58.7	70	66.0	74
				44.4	68	5.1		4.8		4.4	3.1
				5.6							

L. S. D.

(W) White hybrid, (Y) yellow hybrid, (Exp) experimental hybrid, not available commercially.

1/ Differences in yield of less than the L. S. D. figure at the bottom of the table for the respective periods are not significant.

Rank in Yield	Hybrid	Acres Yield	Moisture at Harvest	Broken Stalks		Root lodged plants	Dead Stalks	Erect Plants
				Mechan- ical	Corn Borer			
1	Stull 100 Y	67.6	12.1	4.2	3.4	0	3.4	92.4
2	Meacham M33Y	64.6	12.9	1.8	0.9	0	6.2	97.3
3	Broadbent 402Y	63.9	13.4	8.7	5.2	0	3.5	86.1
4	Funk's G91	63.0	12.4	5.7	3.8	0	0.9	90.5
4	Pfister 347	63.0	11.6	8.0	4.4	0	11.5	87.6
6	Ind. 750B	62.7	16.2	8.3	4.6	0	2.8	87.1
7	US 523W	62.4	13.3	10.3	8.5	0	2.6	81.2
8	Pioneer 339	60.4	11.1	1.7	1.7	0	6.1	96.6
9	S. S. Mohawk	60.3	11.7	2.6	1.7	0	3.4	95.7
10	Pioneer 510	60.2	12.4	3.6	2.7	0	4.5	93.7
11	Ind. 608	60.1	10.7	15.3	7.2	0	17.1	77.5
12	Ind. 840	59.9	12.0	8.0	3.5	0	7.1	88.5
13	US 13	59.3	11.8	22.1	6.2	0	5.3	71.7
14	Stull 400W	59.1	14.7	7.2	4.5	0	2.7	88.3
15	Ind. 844D	58.1	10.8	5.2	0.9	0	4.3	93.9
16	Dixie 33	58.0	15.4	5.3	5.3	0	2.6	89.4
17	Funk's G134	57.6	13.5	6.6	1.6	0	6.6	91.8
18	Ky 203	56.6	13.5	12.9	7.0	0	7.8	80.1
18	Broadbent 235W	56.6	13.8	7.6	4.2	0	2.5	88.2
20	Ky 103	55.9	11.9	18.8	11.1	0	4.3	70.1
21	Funk's G512W	55.0	12.4	4.5	2.7	0	1.8	92.8
22	DeKalb 817	53.9	11.0	5.1	3.4	0	5.1	91.5
23	Pfister 403	53.2	11.8	12.0	6.0	0	6.0	82.0
24	DeKalb 923	50.8	13.4	6.8	1.7	0	8.5	91.5
25	Pfister 636	50.1	14.4	8.1	5.0	4.0	1.0	82.9
26	Meacham M5	49.7	14.0	10.7	2.5	0	7.4	86.8
27	SS 903W	47.4	12.5	5.5	4.6	0	1.8	89.9
28	Dixie 17	43.4	13.2	6.0	2.6	0.9	6.0	90.5
29	Neals Paymaster							
	(OP)	37.6	16.0	13.2	5.3	0	2.6	81.5
30	Jar. Gol. Prol							
	(OP)	37.1	15.6	13.9	7.0	0	6.1	79.1
	(Y)	56.2	13.0	8.3	4.3		5.1	87.2
	Means							

(Y) Yellow hybrid, (W) white hybrid, (OP) open-pollinated.

Table 4. Average Performance Data for Hybrids in Commercial Hybrid Corn Test - 1947-53

Rank in Yield 1952-53	Hybrid	2-yr. 1952-53		3-yr. 1951-53		4-yr. 1950-53		6-yr. 1948-53		7-yr. 1947-53	
		Acres Yield ^{1/} bu.	Plants Erect %	Acres Yield ^{1/} bu.	Plants Erect %	Acres Yield ^{1/} bu.	Plants Erect %	Acres Yield ^{1/} bu.	Plants Erect %	Acres Yield ^{1/} bu.	Plants Erect %
1	US 523W	(W) 63.9	78	70.2	80	76.3	88	81.9	91	74.3	87
2	Stull 400W	(W) 62.8	88	69.8	90	70.4	90				
3	Ind. 750B	(W) 61.9	88	67.6	89						
4	Funk's G91	(Y) 61.5	93	66.1	88	66.6	81	74.6	86		
5	US 13	(Y) 58.8	83	63.0	80	69.3	94	78.0	96		
6	Pioneer 510	(W) 57.9	96	62.5	95	65.6	72	74.2	80	73.4	81
7	Ky 103	(Y) 57.8	88	61.3	72						
8	Stull 100Y	(Y) 57.4	90	62.0	79	67.4	78	77.0	84	75.1	84
9	Ky 203	(W) 56.9	84	62.2	91	67.4	91	76.4	93		
9	Broadbent 235W	(W) 56.9	88								
11	Broadbent 402Y	(Y) 56.8	90								
12	Meacham M33Y	(Y) 55.4	96								
13	Funk's G512W	(W) 55.3	86	60.5	86	64.2	82	74.8	87	73.6	87
14	Meacham M5	(W) 53.0	81	57.1	81	63.2	86				
15	Dekalb 923	(W) 51.5	90	57.3	86						
16	Ind. 608	(Y) 50.4	86								
16	Ind. 844D	(Y) 50.4	93								
18	Dekalb 817	(Y) 48.8	92								
19	Jar. Gol. Prol. (OP)	(Y) 41.6	79	47.3	79						
20	Neals Paymaster (OP)	(OP) 41.3	79	48.2	81						
21	Dixie 17	(W) 37.6	88								
	L. S. D.	5.4		4.5		3.6		3.0		3.0	

(W) White hybrid; (Y) yellow hybrid, (OP) open-pollinated variety.

^{1/} Differences in yields of less than the L. S. D. figure at the bottom of the table for the respective periods are not significant.