

## RESULTS OF THE KENTUCKY CORN PERFORMANCE TESTS IN 1954

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The eight tests reported herein were designed primarily for the evaluation of experimental hybrids developed by the Kentucky Agricultural Experiment Station in its breeding program. There were also included experimental and commercially available hybrids developed by other state and federal agencies, several privately controlled hybrids, hybrids currently recommended for certification in Kentucky, and two open-pollinated varieties.

The planting arrangements provide a basis for adequate comparison between experimental and commercial hybrids, as well as for comparison within each classification. The eight test areas were chosen to sample the varying soil types, climates, and other conditions under which corn is grown in Kentucky. The locations of the various performance trials are indicated in Figure 1.

Yield data for 36 hybrids that were entered in tests at six locations are given in Table 2. Also included in Table 2 are yield data for 25 of these hybrids and two open-pollinated varieties tested at two additional locations.

Data on moisture, standing ability, dead stalks, and ear height are given in Table 3 for the 36 hybrids entered in the tests.

#### Experimental Procedure

Cultural practices commonly followed in each community determined the spacing of hills and the number of plants per hill in each test. Such data, along with fertilizer treatment and date of planting and harvesting, are given in Table 1. The conditions within each trial were maintained as uniformly as possible.

The entries in each test were compared on their performance in 2 x 10 hill plots. A simple lattice design of four replications was used at all locations. On the average, four replications of the simple lattice design were equivalent to approximately six replications of a simple randomized block design. Seed of privately controlled commercial hybrids was purchased on the open market, while seed of state or federally controlled hybrids was obtained from the respective experiment stations or from growers of certified seed.

1. Yields are recorded as bushels per acre of shelled corn with 15.5 per cent moisture. Correction was made for missing hills and one-stalk hills but not for minor variations in stand.

2. Moisture at harvest. The percentage of moisture in the corn at harvest was obtained by sampling 15 to 20 ears from each of two or more replications. The average of the moisture determinations for each hybrid was used in calculating its yield.

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3. Broken stalks. The percentages of broken stalks were determined by making a count of the stalks broken below the ear-bearing node. Stalks broken because of corn borer damage were determined by examining the stalk at the point of the break for corn borer punctures or the presence of frass. Root-lodged plants were determined by counting the plants leaning at an angle of 30 degrees or more. Plants erect at harvest were determined by an actual plant count at Princeton and Quicksand, while at other locations they were recorded as the difference between 100 per cent and the sum of the root-lodged and/or broken. Corn borer damage was negligible in all but one of the tests; therefore, the sum of the root-lodged, broken and erect plants will not necessarily equal 100 per cent.

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 Data

The difference necessary to assure reasonably that inherent yield potential exists between varieties has been calculated and is given at the foot of each table as the L. S. D. (least significant difference). Unless the yields of the two hybrids being compared differ by as much as or more than this L. S. D., little confidence can be placed in the indicated superiority of one hybrid over the other under the conditions of the particular test.

Data on agronomic characteristics other than yield have not been subjected to statistical analysis; however, small differences between any two hybrids are likely to be of little importance and should not be considered strongly indicative of a true difference.

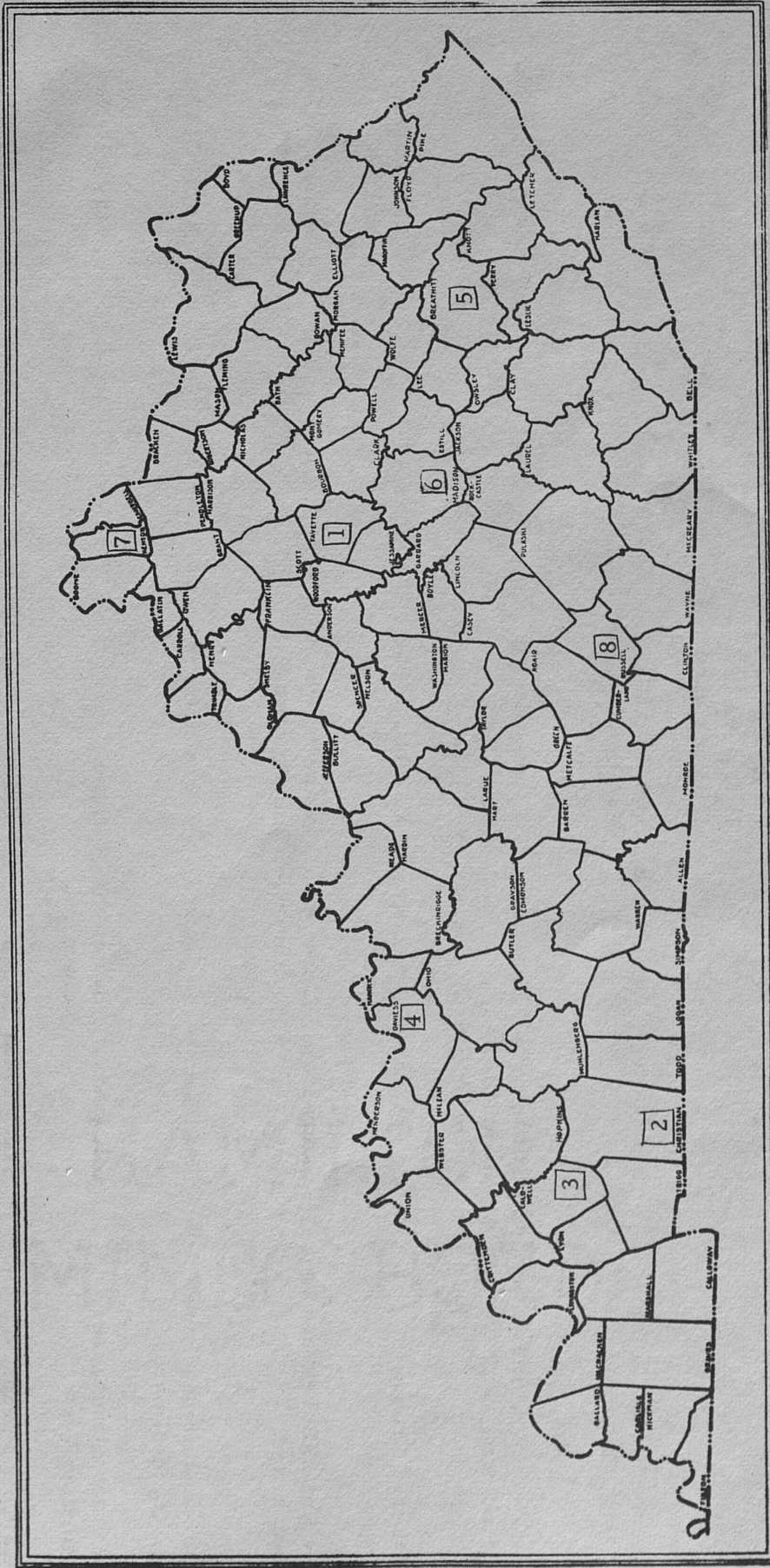
1954 results. Yield data for the individual locations and the average for all locations are given in Table 2. Moisture, root-lodged plants, broken stalks, erect plants, dead stalks, and ear height are given in Table 3 as an average of the locations in which the data were obtained. Data for agronomic characteristics other than yield, moisture, and stand were not obtained on the Kenton County and Jamestown tests and are not included in Table 3. Hybrids with a high average yield for all tests tended to be among the high-yielding group in any one test.

Twenty experimental hybrids from the Kentucky Agricultural Experiment Station were re-entered for more advanced testing. They are not available commercially, but may be released if they continue to perform well.

Period of years results. Evaluation of hybrids for yield and standing ability over a period of years is more valuable than the results from a single year. Hybrids may be outstanding one year and undesirable another year. Results over a period of years tend to average these fluctuations. The recommendation of an experimental hybrid for certification and commercial production is dependent upon its continued excellence in several tests and season.

Data on hybrids which have been tested in all locations for two or more years are

Figure 1. Location of Corn Performance Trials



1. Lexington, Fayette County
2. Hopkinsville, Christian County
3. Princeton, Caldwell County
4. Owensboro, Daviess County
5. Quicksand, Breathitt County
6. Berea, Madison County
7. Morning View, Kenton County
8. Jamestown, Russell County

Table 1. Cooperators, Location Soil Type, Previous Cropping, Fertilizer Applied, Plant Spacing, and Dates of Planting and Harvesting for the Yield Tests in the Eight Locations in Kentucky, 1954

Cooperators	Soil Type	Previous Crop	Fertilizer Applied	Hill Spacing	Plants per Hill	Date Planted	Date Harvested
1. Agr. Expt. Sta., Lexington	Maury silt loam	Red clover	6 tons manure, 24 lbs. N, 32 lbs. P <sub>2</sub> O <sub>5</sub> , 92 lbs. K <sub>2</sub> O per acre	36" x 42"	3	May 13 and 14	Oct. 20-21
2. Pennyrite Grain Imp. Assn., Hopkinsville	Silt loam	Lespedeza	600 lbs. 8-8-8 240 lbs. 4-12-8 per acre	42" x 42"	3	April 27	Oct. 12
3. Western Ky. Substation, Princeton	Silt to clay loam - lime-stone origin	Tobacco	8 tons manure	42" x 42"	2	May 13	Oct. 5 and 6
4. *Milton Crowe, Owensboro	Sandy loam	Corn; Rye cover crop	150 lbs. 6-8-6	40" x 40"	3	May 13 and 14	Sept. 20
5. Robinson Substation Quicksand	Sandy loam	Corn; small grain cover crop	Manure; wheat cover crop	36" x 36"	2	About May 10	Oct. 14
6. Berea College, Berea C. O. Spillman	Silt loam		7 tons manure	36" x 36"	2	April 27	Oct. 18
7. Wilmer Steinhauser, Morning View	Silt loam	Sweet clover	None	42" x 42"	3	May 27	Nov. 13
8. Carl B. Phelps, Jamestown	Sandy loam	Corn	500 lbs. 5-20-20	42" x 42"	3	May 26	Nov. 10

\*All plots at this location were irrigated and received approximately five inches of supplemental water.

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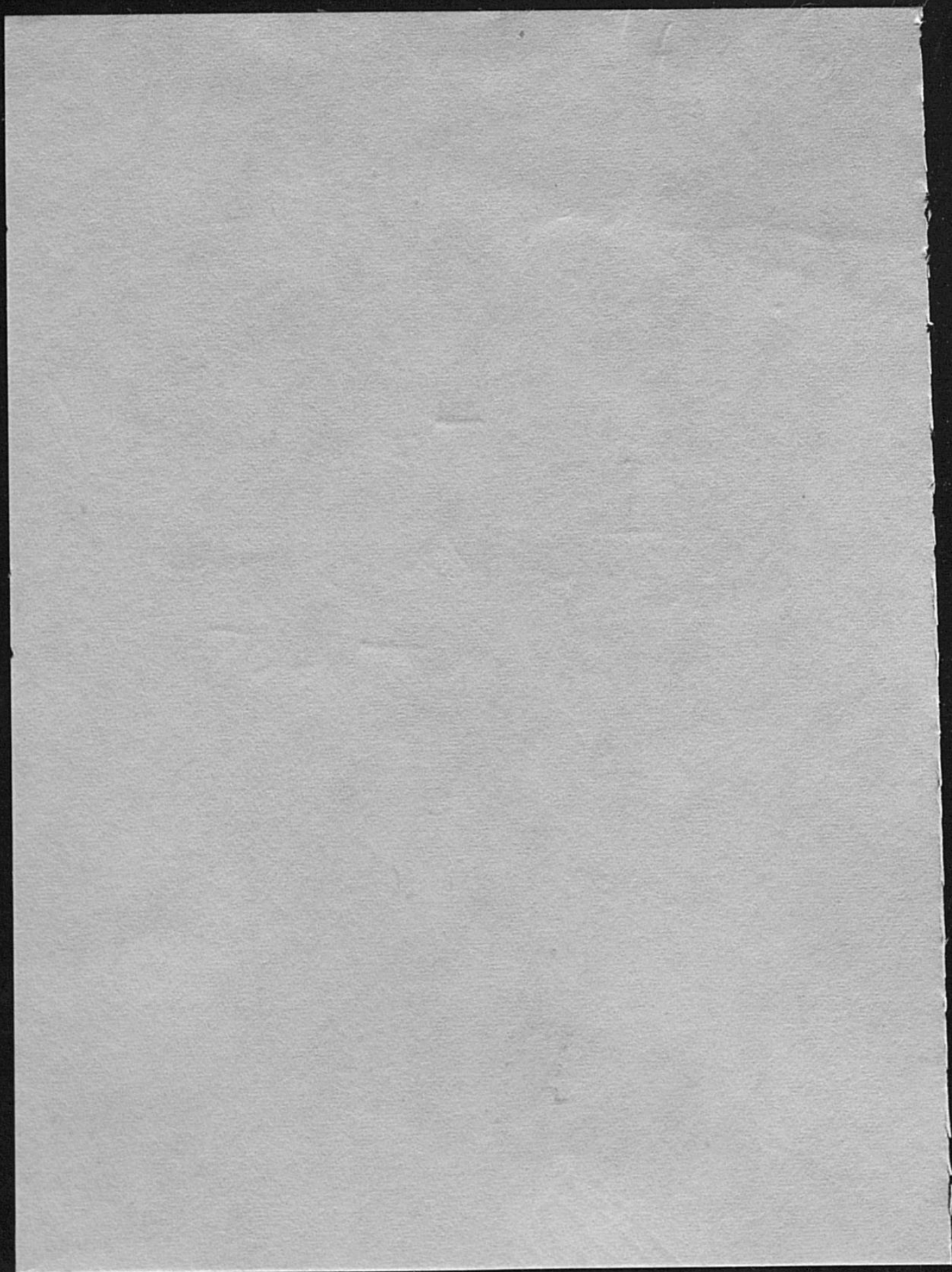


Table 2. Average Acre Yields of Commercial and Experimental Hybrids at Eight Locations in Kentucky, 1954.

Rank in yield	Hybrid number	Lex- ing- ton	Hop- kins- ville	Prince- ton	Owens- boro	Quick- sand	Berea	James- town	Ken- ton Co.	Comparable Average
1	Ky 1002	68.3	66.9	83.5	108.0	89.6	85.0	66.5	66.4	79.3
2	Ky 1005	72.8	59.0	81.0	94.0	97.1	85.3	59.5	63.5	76.5
3	Ky 0228	73.0	60.9	77.2	89.6	92.7	78.4	66.2	58.1	74.5
4	Ky 2105	72.0	62.3	78.4	93.1	99.6	74.8	--	--	74.0
5	Ky 2030	60.5	65.8	74.2	78.6	91.5	81.1	69.0	70.7	73.9
6	Ky 2111	65.9	60.1	84.2	97.4	87.4	75.5	--	--	72.5
7	Ky 1023	70.5	59.8	82.9	85.8	97.9	74.6	58.8	46.3	72.1
8	Pioneer 301A	66.3	62.8	84.1	92.2	80.5	72.2	63.9	53.0	71.9
9	Ky 2026	70.6	57.3	80.8	96.6	98.8	75.7	55.0	39.2	71.8
10	Ky 0109	68.3	61.5	81.9	86.8	87.9	78.6	--	--	71.7
11	Stull 400W	63.2	55.1	72.2	87.0	94.0	74.4	63.4	63.6	71.6
12	Ky 2106	66.7	57.8	72.3	82.4	98.1	79.7	68.5	44.8	71.3
13	Ky 2004	63.8	56.1	80.2	82.1	91.8	83.8	--	--	70.6
13	Ky 9105B	66.4	58.3	84.1	69.1	97.0	75.4	64.8	49.4	70.6
15	US 523W	68.6	60.8	76.9	74.0	81.0	84.4	60.8	57.5	70.5
15	US 13	58.2	62.4	73.8	95.3	80.7	73.8	70.4	49.3	70.5
17	Ky 2001	70.3	61.3	76.4	85.8	86.7	75.8	--	--	70.3
18	Ky 2018	64.4	59.5	78.9	82.2	94.5	77.5	--	52.0	69.9
18	Ky 2109	62.2	55.1	78.5	86.8	87.4	83.1	--	--	69.9
20	Stull 100Y	63.9	56.1	73.3	77.9	81.5	71.2	65.4	65.4	69.3
20	Broadbent 402Y	65.5	61.2	79.8	76.3	--	--	62.6	59.0	69.3
20	Ind 750B	69.5	54.6	67.7	76.1	90.1	70.4	67.0	58.8	69.3
23	Funk's G512W	63.4	59.7	75.7	70.8	92.0	69.3	63.3	58.7	69.1
23	Ky 0216	70.0	61.3	69.4	97.2	78.7	71.6	--	--	69.1
25	Ky 1110	56.0	57.3	80.2	74.8	91.1	85.6	--	--	68.6
26	Ky 9107	65.2	53.5	77.0	72.3	89.9	76.6	60.0	53.0	68.4
26	Funk's G134	62.5	54.1	72.0	79.6	90.4	70.3	70.4	48.0	68.4
28	Funk's G91	64.3	58.8	73.4	81.8	78.1	70.0	68.1	52.1	68.3
29	Ky 102	58.4	56.2	72.1	77.2	84.8	75.0	60.8	58.3	67.8
30	Ky 103	64.8	60.6	69.3	80.8	68.1	72.0	65.7	51.7	66.6
31	Ky 0105	52.6	58.6	81.2	79.4	96.5	61.3	--	--	66.3
32	Broadbent 235W	56.6	52.1	69.3	71.2	85.1	69.8	67.7	48.6	65.0
33	Pfister 347	58.8	60.1	63.9	76.0	68.2	66.3	60.0	55.7	63.6
34	Ind 844D	68.8	49.1	70.4	76.4	77.6	68.8	--	--	63.4
35	Ky 203	57.0	51.7	71.0	58.2	94.7	69.8	57.3	39.8	62.4
36	Ky 1102A	49.1	48.8	65.9	--	95.2	--	--	--	61.8

Table 2 (continued). Average Acre Yields of Commercial and Experimental Hybrids at Eight Locations in Kentucky, 1954

Rank in yield	Hybrid Number	Lex- ing- ton	Hop- kins- ville	Prince- ton	Owens- boro	Quick- sand	Berea	James- town	Ken- ton Co.	Comparable Average
	Davis Yellow Butler	(OP) (OP)	(Y) (W)		87.7	49.8				
	Means	64.4	58.2	75.9	81.6	87.9	73.8	62.7	54.5	
	L.S.D.	10.8	6.4	8.3	12.2	9.8	11.8	9.8	12.1	

Varieties Tested at Individual Locations



Table 3. Summary of Performance Data of Hybrid Tests in Kentucky, 1954

Rank in yield	Hybrid Number	Acre yield 8 tests bu.	Moisture		Broken stalks		Erect plants 6 tests %	Dead stalks 2 tests %	Ear height 3 tests in.
			at harvest 8 tests %	lodged plants 6 tests %	Mechanical breakage 6 tests %	Corn borer 1 test %			
1	Ky 1002	(Y)	79.3	16.9	2.5	6.7	90.6	21.1	46
2	Ky 1005	(Exp)	76.5	18.2	1.8	5.6	92.6	10.9	49
3	Ky 0228	(Y)	74.5	19.6	14.7	14.0	66.2	3.0	49
4	Ky 2105	(W)	74.0	17.3	5.1	3.2	91.9	9.6	44
5	Ky 2030	(Y)	73.9	17.7	6.1	5.9	87.0	5.5	45
6	Ky 2111	(W)	72.5	16.9	6.8	7.1	85.6	1.8	44
7	Ky 1023	(Y)	72.1	18.5	6.1	8.1	85.8	8.4	49
8	Pioneer 301A	(Y)	71.9	16.5	1.8	4.8	93.0	21.4	42
9	Ky 2026	(Exp)	71.8	18.8	28.0	17.3	54.4	3.8	48
10	Ky 0109	(W)	71.7	19.1	8.4	4.8	86.6	4.2	45
11	Stull 400W	(W)	71.6	17.9	4.8	7.2	88.0	12.8	47
12	Ky 2106	(W)	71.3	17.0	5.8	5.7	88.3	8.9	44
13	Ky 2004	(Exp)	70.6	19.6	6.8	7.9	84.9	11.0	47
13	Ky 9105B	(W)	70.6	18.1	5.4	3.2	91.2	10.6	47
15	US 523W	(W)	70.5	19.0	14.8	11.1	74.0	12.2	45
15	US 13	(Y)	70.5	16.7	1.8	10.4	87.6	10.4	47
17	Ky 2001	(Exp)	70.3	17.3	5.2	11.3	83.3	12.8	45
18	Ky 2018	(Exp)	69.9	18.7	7.9	8.4	83.5	10.6	45
18	Ky 2109	(W)	69.9	17.8	3.9	3.2	92.6	9.6	43
20	Stull 100Y	(Y)	69.3	17.0	1.4	4.7	93.6	10.6	44
20	Broadbent 402Y	(Y)	69.3	17.9	7.8	11.1	80.9	10.4	45
20	Ind 750B	(W)	69.3	18.8	3.9	3.5	92.4	5.4	45
23	Funk's G512W	(W)	69.1	17.6	8.6	5.3	86.1	5.7	47
23	Ky 0216	(Exp)	69.1	16.2	9.9	9.6	80.4	3.8	47
25	Ky 1110	(W)	68.6	19.2	6.2	3.8	89.7	4.3	41
26	Ky 9107	(W)	68.4	18.0	3.6	4.4	92.0	5.2	46
26	Funk's G134	(Y)	68.4	18.4	6.5	11.2	81.6	9.0	45
28	Funk's G91	(Y)	68.3	17.6	2.1	10.3	87.4	10.1	44
29	Ky 102	(Y)	67.8	18.6	2.0	15.6	82.0	13.0	49
30	Ky 103	(Y)	66.6	17.6	2.5	7.2	89.8	12.1	45
31	Ky 0105	(W)	66.3	18.5	3.4	7.8	88.6	10.8	46
32	Broadbent 235W	(W)	65.0	18.9	5.9	3.6	90.4	12.6	45
33	Pfister 347	(Y)	63.6	16.3	3.1	4.6	92.2	12.9	40
34	Ind 844D	(Y)	63.4	16.1	4.6	4.1	90.9	9.8	44
35	Ky 203	(W)	62.4	17.8	5.9	16.5	77.2	6.0	51
36	Ky 1102A	(Exp)	61.8	18.7	4.0	3.5	92.0	8.2	46

Table 3 (continued). Summary of Performance Data of Hybrid Tests in Kentucky, 1954

Rank in yield	Hybrid Number	Acre yield 8 tests bu.	Moisture at harvest 8 tests %	Root lodged plants 6 tests %	Broken stalks		Erect plants 6 tests %	Dead stalks 2 tests %	Ear height 3 tests in.	
					Mechanical breakage 6 test %	Corn borer 1 test %				
Varieties Tested at Individual Locations										
	Davis Yellow	68.8	19.6	8.0	11.5	--	80.5	--	59	
	Butler	48.3	15.5	--	--	--	--	--	--	

