

**Results of the KENTUCKY
HYBRID POPCORN
PERFORMANCE TRIALS - 1957**

By F. A. Loeffel, H. R. Richards and J. A. Shone



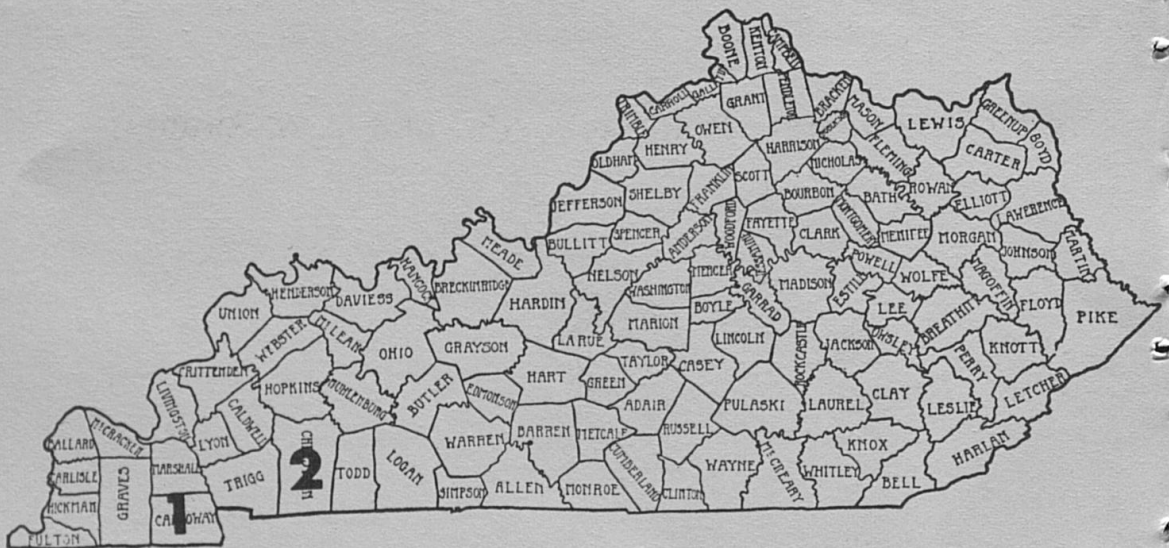
Progress Report 62

Filing Code: 1-1

**UNIVERSITY OF KENTUCKY
AGRICULTURAL EXPERIMENT STATION
LEXINGTON**

JANUARY 1958

LOCATIONS OF
1957 POPCORN PERFORMANCE TRIALS



Location

Murray

Hopkinsville

Cooperator

Murray Kentucky State College
A. Carman

Pennyriple Grain Improvement Assoc.
W. G. Duncan III

RESULTS OF THE KENTUCKY HYBRID POPCORN
PERFORMANCE TRIALS-1957

F. A. Loeffel, H. R. Richards
and J. F. Shane

Kentucky ranks fourth in the acreage devoted to popcorn in the United States following the states of Iowa, Indiana and Illinois. The annual income realized from popcorn by the farmers of Kentucky is approximately one million dollars. The importance of this crop in Kentucky is even greater when it is realized that the production is concentrated in the Murray and Trenton areas.

The evaluation of popcorn hybrids was initiated as a part of the corn improvement project of the Department of Agronomy to provide information on the relative performance of available hybrids under Kentucky conditions. Hybrids developed in the breeding programs of the Iowa, Purdue, Kansas and Georgia Agricultural Experiment Stations are included. Land is made available for these tests by the Pennyrile Grain Improvement Association (W. G. Duncan III) and Murray Kentucky State College (A. Carman). The cooperation of these institutions and persons is appreciated and acknowledged.

One- and two-year summaries of these tests are presented in tables 1-4. The average yield of the 30 hybrids grown in 1957 at Hopkinsville was 4,411 pounds per acre and 3,344 pounds per acre at Murray. On the basis of two-year data (table 1), several tentative conclusions may be made. All of the hybrids are equal or superior to P32 in standing ability and have equal or lower ear placement. P303, a white hybrid, has an outstanding performance record and should be considered if white corn is grown. P406, another hybrid developed at the Purdue Agricultural Experiment Station, is the highest yielding yellow hybrid tested. It has satisfactory standing ability, appears to have high disease resistance and excellent popping expansion. Iowa 4258, a yellow hybrid, is outstanding in its resistance to root and stalk lodging and possesses satisfactory yielding ability.

The following hybrids performed very well in the 1957 experiments and merit additional consideration (table 2):

Yellow Hybrids

Purdue Exp.	23156	Kansas K.P.	1116
"	"	"	"
"	3323	"	1101
"	6415	Georgia	GACP3999
"	6448	Iowa	4259

White Hybrid

Iowa 2007

Experimental Procedures

Field Design

Each hybrid was planted in 4 plots at each of the two locations, with individual plots being 2 hills wide and 5 hills long. These plots were located in different parts of the testing field to minimize cultural and soil differences.

Yield

The corn from each plot was harvested and weighed individually. The yield of the hybrids was determined and is reported on the basis of pounds of ear corn per acre with a moisture content of 13.5 percent. Adjustments were made also for missing hills but not for other variation in stand. Therefore, the yields at each location reported in this report constitute an average yield of the 4 plots after all adjustments were made.

Moisture

The moisture content at harvest is the best measure of relative maturity of hybrids. A hybrid may be considered to be earlier than a second hybrid if its moisture content at harvest is consistently lower. Maturity thus determined is not absolute but is relative to the hybrids being compared.

The moisture in the grain of individual hybrids was determined at harvest by removing 2 rows of kernels from each of 8 ears selected at random from each of the first three replications. The grain from the 24 ears was thoroughly mixed and the moisture content of a 150 gram sample was determined with a Steinlite moisture meter.

Root Lodging

Plants which lean from the base at an angle of more than 30 degrees from the vertical are considered to be root lodged. This character is expressed as a percentage which is obtained by counting the number of root-lodged plants and dividing by the number of plants present.

Stalk Lodging

A plant is considered to be stalk lodged when the stalk is broken between the ear bearing node and ground level. This attribute is computed in a manner similar to that indicated for root lodging.

Ear Height

Ear height, distance from the base of the plant to the point of attachment of the upper ear, was measured visually using a scale with one foot intervals. Visual ratings were taken on four plots of each hybrid at each location.

Stand

All tests are planted at the rate of 5 kernels per hill and the resulting plants thinned to 3 per hill. The percent stand was computed on the basis of the total plants present divided by the number of plants which would have been present if all had survived.

Disease

Disease ratings were taken visually on a plot basis using a scale of 1-5 with 1 being resistant. This rating measures relative resistance to leaf blight caused by the fungus Helminthosporium maydis.

Table 1. Two-year summary of agronomic data recorded on popcorn hybrids grown near Hopkinsville and Murray, Kentucky in 1956-57.

Pedigree	Color	Acre yield lbs. ear corn at 13.5% moisture	Moist. %	Lodging Root	% Stalk	Disease rating ^{1/}	Popping expansion vol. ^{2/}	Ear ht. grade	Stand
Purdue 303	W	3442	12.9	6.6	4.6	5.0	31.2	3.6	89.4
Iopop 7	W	2297	12.4	5.9	4.4	4.5	28.3	3.1	85.7
Iowa Popcorn hybrid 882	W	2486	12.5	6.4	9.7	5.0	33.0	3.3	91.7
Purdue 32	Y	3799	13.5	12.6	8.6	3.0	35.2	4.0	86.3
Purdue 406	Y	4611	13.4	5.2	4.2	2.0	34.2	4.0	92.5
Iopop 6	Y	4310	13.3	6.6	8.2	3.5	31.8	3.9	90.7
Iopop 8	Y	3926	13.1	2.0	7.5	3.5	33.5	4.1	95.2
Iopop C-2	Y	3315	12.9	5.1	7.3	4.0	34.0	3.6	87.7
Iowa Popcorn hybrid 4258	Y	3797	13.7	1.1	2.8	3.0	33.5	4.1	91.9
GACP 6002	Y	3585	14.0	2.5	13.9	3.5	25.0	3.4	86.3
GACP 6004	Y	3749	13.6	6.6	13.2	4.0	29.0	3.3	87.9
Mean		3574	13.2	5.5	6.8	3.7	31.7	3.7	89.6

1/ Hopkinsville, 1957
2/ 1956 Data

Table 2. Summary of agronomic data recorded on popcorn hybrids grown near Hopkinsville and Murray, Kentucky in 1957.

Pedigree	Color	Acre yield lbs. ear corn at 13.5% moisture	Moist. %	Lodging Root	% Stalk	Disease rating ^{1/}	Dropped ears ^{2/} %	Ear ht. grade	Stand
----------	-------	--	-------------	-----------------	------------	---------------------------------	---------------------------------	---------------------	-------

P 303		3510	13.6	11.1	5.8	5.0	3.3	93.8
Iopop 7		2568	13.5	5.2	0.9	4.5	2.9	87.9
Iowa 882		2517	13.5	5.2	5.7	5.0	3.0	95.4
Iowa 884		2213	14.0	1.9	5.6	5.0	2.9	89.2
Iowa 2007		4137	13.6	4.3	3.9	3.0	3.6	95.8
P 32		3585	14.7	9.0	7.0	3.0	3.8	83.8
P 406		4463	14.4	3.9	2.2	2.0	4.0	95.8
Purdue Exp. 3323		4551	14.7	3.1	2.2	2.0	3.9	94.2
Purdue Exp. 5369		4395	14.3	2.7	7.6	2.5	3.9	93.3
Purdue Exp. 6415		4293	14.9	2.6	1.7	2.0	3.9	95.4
Purdue Exp. 6435		4268	14.6	4.0	4.4	2.0	3.9	94.2
Purdue Exp. 6448		4260	14.7	3.5	0.9	1.5	4.0	95.4
Purdue Exp. 23156		4728	14.0	1.3	3.0	1.5	4.0	98.8
Purdue Exp. 53545		3843	14.9	5.2	3.9	2.5	3.6	95.4
Purdue Exp. 53547		4187	15.5	3.6	5.4	2.5	4.1	92.5
Kan. KP1088		3690	15.2	6.2	3.5	2.0	3.6	94.6
Kan. KP1101		4222	14.6	2.9	2.9	2.5	4.0	99.6
Kan. KP1102		3828	14.7	3.8	1.3	2.5	4.1	99.2
Kan. KP1106		4222	14.6	3.6	5.4	2.5	4.3	92.1
Kan. KP1116		4261	14.8	1.7	4.2	2.0	3.8	98.3
Iopop 6		4373	14.4	11.2	4.3	3.5	3.5	97.1
Iopop 8		3930	14.0	3.0	6.4	3.5	3.6	97.9
Iopop C-2		3432	14.0	7.1	8.0	4.0	3.5	93.3
Iowa 4258		3801	15.4	1.7	3.4	3.0	3.9	97.9
Iowa 4259		3952	13.9	1.8	0.4	3.0	3.6	95.0
GACP 6002		3715	15.5	2.3	17.2	3.5	3.0	92.1
GACP 6004		3960	14.9	6.1	8.7	4.0	3.0	95.4
GACP 6024		3786	16.1	2.4	6.8	3.0	3.0	85.8
GACP 6036		3999	15.5	2.7	1.4	3.0	3.0	92.1
GACP 6026		3645	14.0	5.6	11.6	4.0	3.3	89.6
Mean		3878	14.6	4.3	4.9	3.0	3.6	94.0

0.5

0.9

.05

Table 3. Average agronomic data recorded on popcorn hybrids grown near Hopkinsville, Kentucky in 1957.

Pedigree	Color	Acre yield lbs.		Moist. %	Lodging %	Stalk %	Disease rating	Dropped ears %	Ear	
		ear corn at 13.5% moisture	13.5% moisture						ht.	grade
P 303	W	4110	12.8	13.8	7.3	5.0		3.3	90.8	
Iopop 7	W	2600	12.4	7.1	1.0	4.5		2.8	82.5	
Iowa 882	W	2901	12.9	9.9	5.4	5.0		3.0	92.5	
Iowa 884	W	2561	12.8	0.0	8.7	5.0		2.8	86.7	
Iowa 2007	W	4679	12.5	8.8	3.5	3.0		3.3	95.0	
P 32	Y	4201	13.6	16.2	10.5	3.0		3.5	87.5	
P 406	Y	5173	13.2	5.3	2.6	2.0		4.0	95.0	
(8) Purdue Exp. 3323	Y	5003	13.6	5.5	4.5	2.0		3.8	91.7	
Purdue Exp. 5369	Y	5383	13.6	4.6	8.3	2.5		4.0	90.8	
Purdue Exp. 6415	Y	4824	13.8	2.6	2.6	2.0		3.8	95.0	
Purdue Exp. 6435	Y	4959	13.7	5.4	3.6	2.0		3.8	93.3	
Purdue Exp. 6448	Y	4660	13.8	6.3	1.8	1.5		4.0	92.5	
Purdue Exp. 23156	Y	5201	13.4	2.6	4.3	1.5		4.0	97.5	
Purdue Exp. 53545	Y	4676	14.0	8.5	5.1	2.5		3.5	97.5	
Purdue Exp. 53547	Y	4819	13.9	7.1	8.8	2.5		4.0	94.2	
Kan. KP1088	Y	4413	14.8	9.6	5.2	2.0	0.9	3.3	95.8	
Kan. KP1101	Y	4776	13.6	5.9	5.0	2.5		4.0	99.2	
Kan. KP1102	Y	4347	13.2	6.8	2.5	2.5		4.0	98.3	
Kan. KP1106	Y	5043	13.6	5.7	6.7	2.5		4.3	87.5	
Kan. KP1116	Y	5062	13.6	2.6	5.1	2.0		3.5	97.5	
Iopop 6	Y	4929	13.2	7.8	6.9	3.5	1.7	3.3	96.7	
Iopop 8	Y	4674	13.2	1.7	7.8	3.5		3.3	95.8	
Iopop C-2	Y	3623	13.1	9.7	6.2	4.0		3.3	94.2	
Iowa 4258	Y	4143	13.2	0.0	3.4	3.0		3.8	96.7	

Iowa 4259	Y	4261	13.2	2.8	0.9	3.0	3.5	90.1
GACP 6002	Y	4573	14.7	0.9	26.6	3.5	3.0	90.8
GACP 6004	Y	4489	14.1	9.5	12.1	4.0	2.8	96.7
GACP 6024	Y	4204	14.5	0.9	11.2	3.0	3.0	89.2
GACP 6036	Y	4490	13.7	2.6	1.8	3.0	3.0	95.0
GACP 6026	Y	3555	13.6	10.3	18.5	4.0	3.0	80.8
Mean		4411	13.5	6.0	6.6	3.0	3.5	92.9

Source of variation	D/F	Net sum of squares	Mean square	F value	5%	1%
Reps	3	2.24	0.75			
Components (a)	10	7.22				
(b)	10	11.15				
Blocks (adj.)	20	18.37	0.92			
Varieties (unadj.)	29	406.98	14.03	13.24	1.68	2.09
Error	67	71.14	1.06			
Total	119	498.73				

Difference necessary for significance at 5% level 568 lbs.

Table 4. Average agronomic data recorded on popcorn hybrids grown near Murray, Kentucky in 1957.

Pedigree	Color	Acre yield lbs. ear corn at 13.5% moisture	Moist. %	Lodging % Root	Stalk	Ear ht. grade	Stand
P 303	W	2909	14.4	8.6	4.3	3.3	96.7
Iopop 7	W	2535	14.6	3.6	0.9	3.0	93.3
Iowa 882	W	2133	14.1	0.8	5.9	3.0	98.3
Iowa 884	W	1864	15.2	3.6	2.7	3.0	91.7
Iowa 2007	W	3595	14.7	0.0	4.3	4.0	96.7
P 32	Y	2969	15.8	1.0	3.1	4.0	80.0
P 406	Y	3752	15.5	2.6	1.7	4.0	96.7
Purdue Exp. 3323	Y	4099	15.7	0.9	0.0	4.0	96.7
Purdue Exp. 5369	Y	3406	14.9	0.9	7.0	3.8	95.8
Purdue Exp. 6415	Y	3761	16.0	2.6	0.9	4.0	95.8
Purdue Exp. 6435	Y	3577	15.4	2.6	5.3	4.0	95.0
Purdue Exp. 6448	Y	3860	15.5	0.8	0.0	4.0	98.3
Purdue Exp. 23156	Y	4255	14.5	0.0	1.7	4.0	100.0
Purdue Exp. 53545	Y	3010	15.7	1.8	2.7	3.8	93.3
Purdue Exp. 53547	Y	3554	17.0	0.0	1.8	4.3	90.8
Kan. KP1088	Y	2967	15.5	2.7	1.8	4.0	93.3
Kan. KP1101	Y	3668	15.5	0.0	0.8	4.0	100.0
Kan. KP1102	Y	3308	16.1	0.8	0.0	4.3	100.0
Kan. KP1106	Y	3400	15.5	1.7	4.3	4.3	96.7
Kan. KP1116	Y	3460	15.9	0.8	3.4	4.0	99.2
Iopop 6	Y	3817	15.6	14.5	1.7	3.8	97.5
Iopop 8	Y	3185	14.8	4.2	5.0	4.0	100.0
Iopop C-2	Y	3240	14.9	4.5	9.9	3.8	92.5
Iowa 4258	Y	3458	15.5	3.4	3.4	4.0	99.2

Iowa 4259	Y	3643	14.5	0.8	0.0	3.8	100.0
GACP 6002	Y	2856	16.3	3.6	8.0	3.0	93.3
GACP 6004	Y	3430	15.7	2.7	5.3	3.3	94.2
GACP 6024	Y	3368	17.7	4.0	2.0	3.0	82.5
GACP 6036	Y	3508	17.2	2.8	0.9	3.0	89.2
GACP 6026	Y	3735	14.4	1.7	5.9	3.5	98.3
Mean		3344	15.5	2.6	3.2	3.7	95.2

Source of variation	D/F	Net sum of squares	Mean square	F value	5%	1%
Reps	3	319.78	106.59			
Components (a)	10	49.15				
(b)	10	26.46				
Blocks (adj.)	20	75.61	3.78			
Varieties (unadj.)	29	220.30	7.60	3.08	1.68	2.09
Error	67	165.18	2.47			
Total	119	780.87				

Difference necessary for significance at 5% level 888 lbs.