

RESULTS OF THE KENTUCKY
HYBRID POPCORN PERFORMANCE
TRIALS - 1960

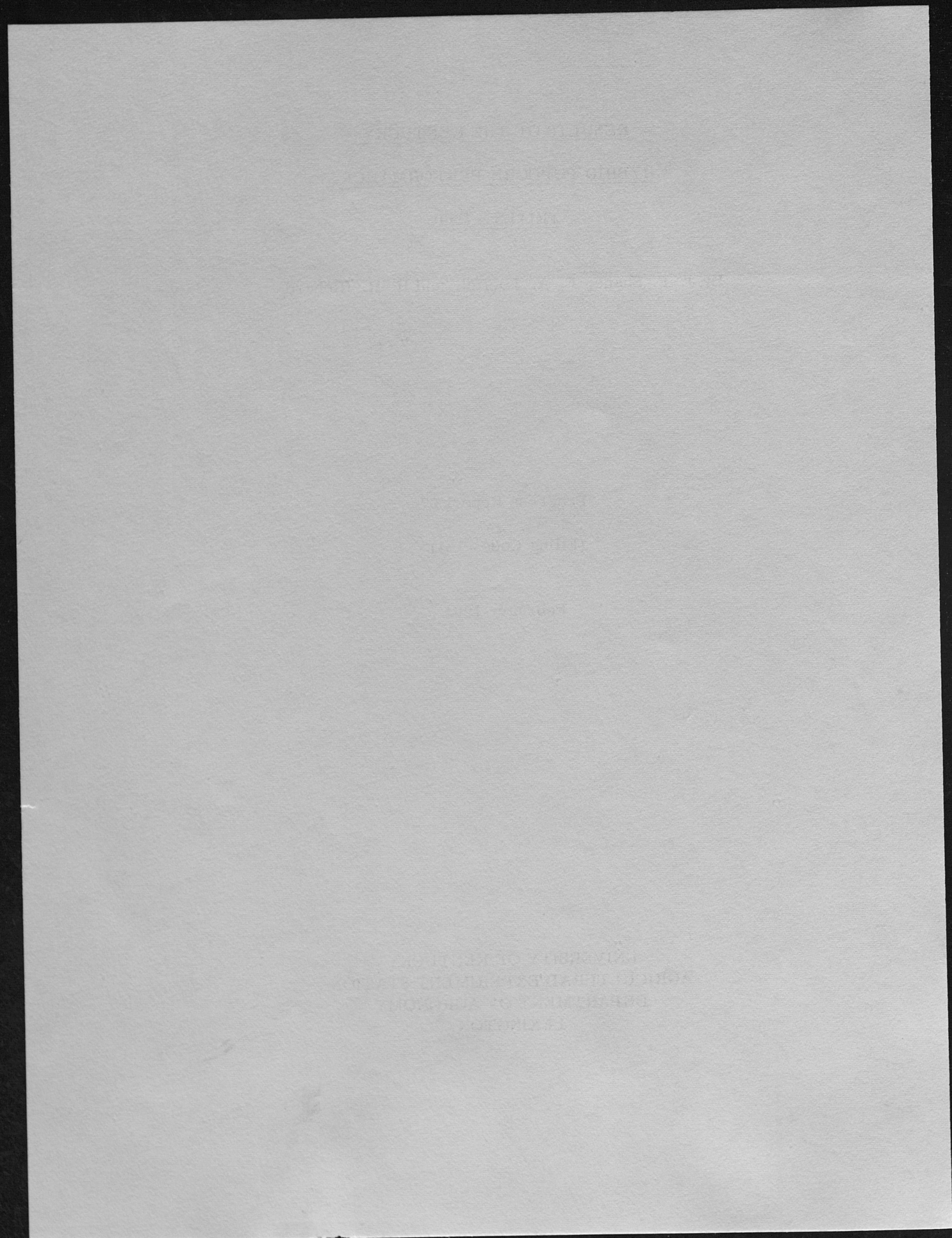
By J. F. Shane, F. A. Loeffel, and H. R. Richards

Progress Report 97

(Filing Code: 1-1)

February 1961

UNIVERSITY OF KENTUCKY
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRONOMY
LEXINGTON



RESULTS OF THE KENTUCKY HYBRID POPCORN
PERFORMANCE TRAILS - 1960

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

Kentucky ranked third in popcorn acreage in 1960, following Indiana and Illinois. The value of the crop was in excess of \$1,000,000, compared with \$812,000 in 1959 and \$1,414,000 in 1958.

Popcorn hybrids developed in the breeding programs at the Indiana, Iowa, Kansas, and Nebraska agricultural experiment stations are included in the evaluation studies in Kentucky. Land is made available for these studies by Orrin Hull of Murray State College, Murray, Ky., and Murray Wall, Hopkinsville, Ky. Their assistance and interest is appreciated and acknowledged.

One-, two- and three-year summaries of these tests are presented in tables 1-3. The results from the individual locations grown in 1960 are summarized in tables 4 and 5. The average yield per acre of the 36 hybrids grown at Hopkinsville and Murray in 1960 was 4,268 pounds of ear corn and 3,519 pounds of ear corn, respectively.

On the basis of three-year testing data in Kentucky, P303 continued to be the best performing white hybrid. KP1101, a yellow hybrid from Kansas, was superior to P32 in yielding ability and standing ability and should be of interest to Kentucky producers. Two Purdue experimental yellow hybrids, 83249 and 731160 were superior to P32 in yielding ability and equal in standing ability. P406A was superior to P32 in standing ability but yielded somewhat lower, whereas P410 was inferior to P32 in standing ability but yielded somewhat more. The performance of P32 and P632 was comparable for the three-year testing period, although P32 was definitely superior in yielding ability in 1960.

Experimental Procedures

Field Design

Each hybrid was planted in four plots at each of the two locations, with individual plots being two hills wide and five 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 four plots after all adjustments were made.

Moisture

The moisture content at harvest is the best measure of relative maturity of hybrids. One 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 two rows of kernels from each of eight 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 of 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 made on four plots of each hybrid at each location.

Stand

All tests are planted at the rate of five kernels per hill and the resulting plants thinned to three per hill. The stand percentage 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.

Diseases

Disease ratings were made visually on a plot basis, using a scale of 1-5 with 1 being resistant. This rating measures relative resistance to Southern and Stewart's Leaf Blight diseases.

Ear Appearance

Visual ratings of ear appearance were recorded at each location in 1958. A five-class rating scale was used, with the lower numbers representing the better appearing ears.

Table 1. Three-year summary of agronomic data recorded on performance evaluation study of popcorn hybrids grown near Hopkinsville and Murray, Kentucky in 1958-60.

Hybrid	Acre yield		Moist. at harv. %	Lodging		Ear ht. ft.	Dropped ears %	Foliar Disease		Ear Appear. rating	Stand %
	lb. ear corn at 13.5% moisture	W		Root %	Stalk %			Southern	Stewart's		
Iowa 894	3380	W	14.5	1.7	19.2	3.8		2.5	3.2	2	88.9
P303	3778	W	14.5	0.8	17.9	3.7		1.3	3.3	1	106.8
Iopop 8	4076	Y	15.5	1.3	19.3	3.8		1.8	2.6	3	99.8
Iowa 3574	3566	Y	15.1	0.0	12.3	3.4	0.5	3.0	3.2	2	98.1
Iowa 3591	3377	Y	15.7	0.0	9.1	3.3		1.8	3.0	1	99.7
KP 1101	4256	Y	15.5	0.3	9.7	3.9		2.3	1.9	2	98.3
P32	3921	Y	15.8	0.6	15.7	3.8		2.3	2.5	1	93.7
Purdue 406A	3771	Y	15.6	0.7	10.6	3.6		1.5	2.0	2	100.7
P410	4039	Y	15.4	1.7	22.7	3.4		1.8	2.9	3	101.8
P632	3782	Y	16.1	0.9	17.7	3.7		1.8	2.1	2	97.1
Purdue Exp. 83249	4575	Y	15.5	1.1	15.4	3.9		2.5	1.9	3	98.0
Purdue Exp. 731160	4231	Y	15.4	1.9	16.1	3.7		2.3	2.1	3	101.4
Average	3896		15.4	0.9	15.5	3.7		2.1	2.6	2	98.7

Table 2. Two-year summary of agronomic data recorded on performance evaluation study of popcorn hybrids grown near Hopkinsville and Murray, Kentucky in 1959-60.

Hybrid	W Y Y Y Y Y	Acre yield lb. ear corn at 13.5% moisture	Moist. at harv. %	Lodging		Dropped ears %	Ear ht. ft.	Foliar Disease		Stand %
				Root %	Stalk %			Southern Stewart's	grade	
Iowa 894	W	3181	14.4	2.6	19.8		3.9	2.5	3.3	86.3
P303	W	3967	14.8	1.0	21.3		3.9	1.3	3.5	102.9
Iopop 8	Y	4344	15.4	1.9	18.1		4.0	1.8	2.3	99.1
Iowa 3574	Y	3700	15.2	0	17.8		3.4	3.0	3.3	96.4
Iowa 3581	Y	3909	15.2	0.4	15.6		3.6	2.3	2.3	106.0
Iowa 3591	Y	3407	15.6		13.2		3.4	1.8	2.5	101.0
Iowa 4258	Y	3908	15.1	0.4	19.3	0.2	3.8	2.3	3.0	93.9
KP 1089	Y	4039	15.9		14.2		3.6	1.8	1.8	97.1
KP 1101	Y	4362	15.4	0.5	8.1		4.0	2.3	1.8	98.9
KP 1141	Y	4152	15.5	0.5	10.0		4.0	1.8	1.5	99.7
Purdue 32	Y	3952	15.4	0.7	16.0		3.8	2.3	1.5	91.0
Purdue 406A	Y	3670	15.5	1.0	13.0		3.6	1.5	2.0	101.4
Purdue 410	Y	3699	15.3	2.4	25.2		3.1	1.8	2.3	100.4
P632	Y	3607	15.6	0.7	15.9		3.4	1.8	1.8	98.0
Purdue Exp. 83249	Y	4507	15.3	1.7	21.2		3.8	2.5	1.5	99.5
Purdue Exp. 731160	Y	4074	15.2	2.1	18.9		3.6	2.3	2.0	98.5
Average		3905	15.3	1.0	16.8		3.7	2.1	2.3	98.2

Table 3. Annual summary of agronomic data recorded on performance evaluation study of popcorn hybrids grown near Hopkinsville and Murray, Kentucky in 1960.

Hybrid	Hybrid	Acre yield		Moist. at harv. %	Lodging		Dropped ears %	Ear ht. ft.	Foliar Disease grade		Stand %
		lb. ear corn at 13.5% moisture			Root %	Stalk %			Southern		
Iowa 894	W	2987		13.8	3.4			3.9	2.5		84.4
P303	W	4738		14.4	3.6			4.0	1.3		96.0
Purdue Exp. 9315	W	4167		14.4	4.2			3.8	1.0		82.2
Purdue Exp. 9318	W	4535		14.6	6.3			4.8	1.8		94.1
Purdue Exp. 9338	W	4497		14.5	7.2			3.9	1.0		96.0
White Average		4185		14.3	4.9			4.1	1.5		90.5
Iopop 8	Y	4761		14.8		0.4		3.9	1.8		96.3
Iowa 3574	Y	4388		14.4	10.8		1.1	3.8	3.0		90.4
Iowa 3581	Y	4262		14.5	6.4			4.2	2.3		98.8
Iowa 3591	Y	3516		14.8	15.6			3.8	1.8		91.6
Iowa 3595	Y	4176		14.6	6.4			3.9	2.5		87.2
Iowa 3613	Y	3883		14.6				3.9	1.8		96.9
Iowa 4258	Y	4258		14.7	17.8	1.0	0.7	3.5	2.3		97.2
Iowa 4297	Y	3717		14.4	3.1		0.4	3.2	2.3		91.9
Iowa 4304	Y	3900		14.7	8.0			4.0	1.5		92.9
CP 1089	Y	3788		14.9	11.5			3.6	1.8		87.5
CP 1101	Y	4183		14.6	5.3			4.1	2.3		94.1
CP 1101A	Y	3999		14.4	18.0	1.0		3.8	2.0		96.9
CP 1129	Y	3369		14.1	4.7			3.7	3.0		93.5
CP 1141	Y	3687		14.6	7.2			4.0	1.8		87.5
CP 1145	Y	3437		14.4	15.2			3.6	2.8		91.0
CP 1148	Y	4280		14.5	5.0			3.6	2.0		84.1
CP 1152	Y	3613		14.4	4.2			4.1	2.0		85.7
CP 1154	Y	3922		14.7	13.6	0.4		3.7	1.5		91.9
Febr. 104	Y	3604		14.1	6.1			3.7	2.3		88.5
32	Y	4119		14.7	4.1			4.3	2.3		86.0
406A	Y	2749		14.4	16.7	2.0		2.9	1.5		92.8
410	Y	3275		14.3	6.6			2.8	1.8		97.2
632	Y	3194		14.2	5.5			3.0	1.8		88.8

Table 3. Continued. Page 2.

Hybrid	Purdue Exp.	8367 cms	Y	Acre yield lb. ear corn at 13.5% moisture	Moist. at harv.%	Lodging		Dropped ears %	Ear ht. ft.	Foliar Disease grade Southern		Stand %
						Root %	Stalk %			grade Southern	Stand %	
Purdue Exp.	8376 cms	Y	3758	14.5	5.4				4.0	1.8	98.8	
Purdue Exp.	8376 cms	Y	4337	14.8	7.5				3.9	1.5	92.2	
Purdue Exp.	83249	Y	3932	14.0	5.6				3.3	2.5	92.6	
Purdue Exp.	83251	Y	4131	14.5	2.1	17.3			4.2	2.0	94.1	
Purdue Exp.	83258	Y	3696	14.3	0.4	7.8			3.0	1.5	86.3	
Purdue Exp.	83382	Y	3119	13.8	0.7	7.7			3.1	2.0	87.2	
Purdue Exp.	731158	Y	4097	14.3	0.7	14.1			3.7	1.8	86.9	
Purdue Exp.	731160	Y	3681	14.1	4.3				3.3	2.3	87.6	
Yellow Average			3833	14.5	0.3	9.1		0.1	3.7	2.1	91.4	
Over-all average			3882	14.4	0.2	8.5		0.1	3.7	2.0	91.3	

Table 4. Average agronomic data recorded on performance evaluation study of popcorn hybrids compared in Experiment 32 grown near Hopkinsville, Kentucky in 1960.

Hybrid		Acre yield lb. ear corn at 13.5% moisture	Moist. at harv.%	Lodging Root % Stalk %	Ear ht. ft.	Stand %
Iowa 894	W	3041	13.2	5.3	3.5	82.5
P303	W	5226	13.8	7.1	4.0	96.9
Purdue Exp. 9315	W	5006	13.7	5.2	3.8	84.4
Purdue Exp. 9318	W	5261	14.0	11.3	4.0	93.8
Purdue Exp. 9338	W	5000	13.8	8.9	3.8	98.8
White Average		4707	13.7	7.6	3.8	91.3
Iopop 8	Y	5489	14.1	17.0	3.8	99.4
Iowa 3574	Y	4199	13.8	17.5	3.0	89.4
Iowa 3581	Y	4483	13.6	12.1	3.8	98.1
Iowa 3591	Y	3687	14.8	25.2	3.5	89.4
Iowa 3595	Y	4894	13.8	12.8	3.5	83.1
Iowa 3613	Y	4353	13.7	20.0	4.0	100.0
Iowa 4258	Y	4972	14.5	31.0	3.0	98.8
Iowa 4297	Y	3847	13.8	4.0	3.0	93.1
Iowa 4304	Y	4400	13.7	14.6	4.0	98.8
KP 1089	Y	4107	14.1	19.9	3.3	95.6
KP 1101	Y	4819	13.9	7.1	3.8	96.9
KP 1101A	Y	4234	13.9	1.9	3.5	97.5
KP 1129	Y	3768	13.4	7.2	3.3	95.6
KP 1141	Y	4011	13.9	8.6	3.5	86.9
KP 1145	Y	3515	14.1	18.8	3.3	90.0
KP 1148	Y	4688	14.0	10.0	3.3	93.8
KP 1152	Y	3989	13.7	7.8	3.8	72.5
KP 1154	Y	4480	14.4	0.7	3.3	88.8
Nebr. 104	Y	3758	13.6	24.6	3.3	86.9
P32	Y	4722	14.1	10.1	4.0	83.1
P406A	Y	3211	13.9	2.5	2.8	100.0
P410	Y	3601	14.1	23.1	2.5	100.0
P632	Y	3383	13.5	13.1	3.0	84.4
				9.6		

Table 4. Continued. Page 2.

Hybrid		Acres yield lb. ear corn at 13.5% moisture	Moist. at harv.%	Lodging Root Stalk %	Stalk %	Ear ht. ft.	Stand %
Purdue Exp. 8367 cms	Y	4457	14.1	9.5		4.0	98.8
Purdue Exp. 8376 cms	Y	4556	14.3	12.9		3.5	91.9
Purdue Exp. 83249	Y	3917	13.4	9.9		3.0	88.8
Purdue Exp. 83251	Y	4630	14.0	4.1	26.2	4.0	90.6
Purdue Exp. 83258	Y	3834	13.5	0.7	10.7	3.0	93.8
Purdue Exp. 83382	Y	3442	13.5	1.4	14.7	2.8	80.6
Purdue Exp. 731158	Y	4850	13.7	1.4	18.8	3.5	86.3
Purdue Exp. 731160	Y	3805	13.7	4.9		3.0	88.8
Yellow Average		4197	13.9	0.4	14.7	3.4	91.7

Difference necessary for significance at 5% level 580 lbs.

Table 5. Average agronomic data recorded on performance evaluation study of popcorn hybrids compared in Experiment 33 grown near Murray, Kentucky in 1960.

Hybrid	Acre yield lb. ear corn at 13.5% moisture	Moist. at harv. %	Lodging		Dropped ears %	Ear ht. ft.	Foliar Disease grade Southern		Stand %
			Root %	Stalk %					
Iowa 894	2932	14.3		1.4		4.3	2.5	86.3	
P303	4249	15.0		0		4.0	1.3	95.0	
Purdue Exp. 9315	3328	15.1		3.1		3.8	1.0	80.0	
Purdue Exp. 9318	3809	15.1		1.3		4.5	1.8	94.4	
Purdue Exp. 9338	3993	15.1		5.4		4.0	1.0	93.1	
White Average	3662	14.9		2.2		4.1	1.5	89.8	
Iopop 8	4032	15.5	0.7	2.0	2.1	4.0	1.8	93.1	
Iowa 3574	4576	15.0		4.1		4.5	3.0	91.3	
Iowa 3581	4041	15.3		0.6		4.5	2.3	99.4	
Iowa 3591	3344	14.8		6.0		4.0	1.8	93.8	
Iowa 3595	3458	15.3		0		4.3	2.5	91.3	
Iowa 3613	3412	15.4	2.0	1.3	1.3	3.8	1.8	93.8	
Iowa 4258	3544	14.8		4.6	0.7	4.0	2.3	95.6	
Iowa 4297	3586	15.0		2.1		3.3	2.3	90.6	
Iowa 4304	3400	15.7		1.4		4.0	1.5	86.9	
KP 1089	3469	15.7		3.9		3.8	1.8	79.4	
KP 1101	3547	15.2		3.4		4.3	2.3	91.3	
KP 1101A	3764	14.8		8.4		4.0	2.0	96.3	
KP 1129	2969	14.7		2.1		4.0	3.0	91.3	
KP 1141	3363	15.2		5.7		4.5	1.8	88.1	
KP 1145	3359	14.6		11.6		3.8	2.8	91.9	
KP 1148	3871	15.0		0		3.8	2.0	74.4	
KP 1152	3236	15.0		0.6		4.3	2.0	98.8	
KP 1154	3363	15.0		2.6		4.0	1.5	95.0	
Nebr. 104	3449	14.5		2.1		4.0	2.3	90.0	
P32	3516	15.3		2.1		4.5	2.3	88.8	
P406A	2287	14.9	1.5	10.2		3.0	1.5	85.6	
P410	2949	14.5		0		3.0	1.8	94.4	
P632	3004	14.8		1.3		3.0	1.8	93.1	

Table 5. Continued. Page 2.

Hybrid	Acre yield		Moist. at harv.%	Lodging		Dropped ears %	Ear ht. ft.	Foliar Disease grade		Stand %
	lb. ear corn at 13.5% moisture			Root %	Stalk %			Southern		
Purdue Exp. 8367 cms	Y	3059	14.9	1.3			4.0	1.8		98.8
Purdue Exp. 8376 cms	Y	4118	15.3	2.0			4.3	1.5		92.5
Purdue Exp. 83249	Y	3947	14.6	1.3			3.5	2.5		96.3
Purdue Exp. 83251	Y	3632	15.0	8.3			4.3	2.0		97.5
Purdue Exp. 83258	Y	3558	15.1	4.8			3.0	1.5		78.8
Purdue Exp. 83382	Y	2795	14.1	0.7	1.3		3.3	2.0		93.8
Purdue Exp. 731158	Y	3344	14.8	9.3			3.8	1.8		87.5
Purdue Exp. 731160	Y	3557	14.5	3.6			3.5	2.3		86.3
Yellow Average		3469	15.0	0.2	3.5		3.9	2.1		91.2

Difference necessary for significance at 5% level 1,016 lbs.