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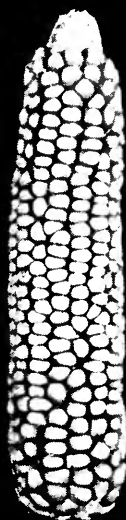
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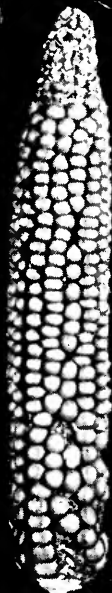
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R59
New



R61
New



L317

Two New Illinois INBRED LINES OF CORN

By R. W. Jugenheimer
E. R. Leng
C. M. Woodworth

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University of Illinois Agricultural Experiment Station



COVER PICTURES

The ears and kernels shown in the photographs on the cover are typical of the two new Illinois inbreds, R59 and R61, and of Iowa L317. In the development of R59, L317 was prominently used.

The ear of R59 is shorter than that of L317 and has greater girth. The kernels are in straighter rows and of better type. The irregular rows of R61 are typical of this inbred line.

Fronts and backs of typical kernels of each inbred line are shown directly under the ear. Kernels in the first two columns are from R59, the next from R61, and the last from L317.

TWO NEW ILLINOIS INBRED LINES OF CORN

By R. W. JUGENHEIMER, E. R. LENG, and C. M. WOODWORTH¹

TWO NEW MIDSEASON yellow inbred lines of corn, R59 and R61, were officially released by the Illinois Agricultural Experiment Station on March 15, 1947. They were developed by Oren Bolin² while he was associated with the corn-improvement project at the Illinois Station.

Inbred R59

R59 was developed from a cross of Iowa L317 \times Illinois Low Ear backcrossed once to L317, then selfed until uniform. This line is therefore closely related to L317 and may be substituted for it in hybrid combinations. R59 silks slightly earlier than L317, the plant is shorter, and more resistant to smut, and the ears are lower. R59 has a shorter, thicker ear with larger kernels than L317 (see Table 1 and cover pictures).

R59 hybrids appear to be superior to L317 hybrids in yield, in having lower ears, slightly larger ears, and a higher shelling percentage. Altho R59 hybrids tend to silk earlier than those of L317, the seed at harvest contains more moisture. Hybrids of R59 are similar to those of L317 in having somewhat weak stalks (Tables 2, 3, and 4).

The performance in 1946 of fourteen Illinois hybrids containing inbred R59 is shown in Table 5.

Inbred R61

R61 is a rather attractive inbred developed from a commercial hybrid which had been crossed with a four-year selfed line out of Lancaster yellow dent, backcrossed once to the Lancaster line, and then selfed until uniform. Plant and ear characteristics are given in Table 1. Typical ears and kernels are shown in cover pictures.

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² Formerly Assistant Chief in Plant Genetics.

Table 1. — PLANT AND EAR CHARACTERISTICS OF INBREDS R59, L317, AND R61: Urbana, Illinois, 1946

Inbred line	Days from planting to half-silk	Height		Smutted plants	Suckers	Size of ear		Rows of kernels
		Plant	Ear			Length	Circumference	
		<i>ft.</i>	<i>in.</i>	<i>perct.</i>	<i>perct.</i>	<i>in.</i>	<i>in.</i>	
Ill. R59, green silk, purple anther.....	76	6.5	26	0	0	5.7	5.2	12
Iowa L317, green silk, red anther.....	77	7.5	48	7	0	7.6	4.4	14
Ill. R61, green silk, purple anther.....	76	6.5	32	0	0	6.7	4.9	16

Table 2. — PERFORMANCE OF INBREDS R59 AND L317 IN SINGLE CROSSES: Summary for 1945 and 1946, Urbana, Illinois


Parent lines 	Ill. Hy	Ind. WF9	Ind. 38-11	Kans. K4	Mean
Acre-yield, bushels					
Ill. R59.....	108.0	94.0	104.8	103.7	102.6
Iowa L317.....	104.4	85.9	90.5	87.5	92.1
Moisture in grain at harvest, percent					
Ill. R59.....	25.7	23.3	23.1	27.1	24.8
Iowa L317.....	24.2	20.6	20.6	27.5	23.3
Shelling percentage					
Ill. R59.....	83.4	83.5	84.7	83.1	83.7
Iowa L317.....	82.3	81.9	82.0	79.7	81.4
Erect plants at harvest, percent					
Ill. R59.....	71	69	78	40	64
Iowa L317.....	69	68	63	38	59
Root-lodged plants at harvest, percent					
Ill. R59.....	11	11	4	31	14
Iowa L317.....	12	21	11	31	19
Stalk-lodged plants at harvest, percent					
Ill. R59.....	19	21	19	30	22
Iowa L317.....	19	12	27	32	22
Number of ears per hundred pounds					
Ill. R59.....	133	140	150	156	145
Iowa L317.....	136	154	149	172	153

Table 3. — PERFORMANCE OF INBREDS R59, R61, AND L317 IN SINGLE CROSSES: Wyoming, Illinois, 1945

(Means of eight replications)

Parent lines \Downarrow	Ill. Hy	CI. 187-2	Ind. WF9	Ill. RR98	Ind. 38-11	Mean
Acre-yield, bushels						
Iowa L317.....	69	67	72	62	63	66.6
Ill. R59.....	73	65	70	58	62	65.6
Ill. R61.....	64	63	..	65	65	64.2
Moisture in grain at harvest, percent						
Ill. R61.....	23.1	21.9	..	22.5	21.2	22.2
Iowa L317.....	26.3	23.6	21.8	25.7	20.9	23.7
Ill. R59.....	24.9	24.1	23.6	29.4	27.4	25.9
Root-lodged plants at harvest, percent						
Ill. R61.....	41	89	..	76	63	67
Ill. R59.....	89	79	86	96	80	86
Iowa L317.....	85	91	92	93	76	87
Stalk lodging due to corn borer injury, percent						
Ill. R61.....	26	26	..	40	24	29
Iowa L317.....	30	35	24	33	41	33
Ill. R59.....	32	46	28	33	39	36

In its ability to transmit desirable characteristics, R61 appears to be equal to or superior to such standard inbreds as Iowa L317, Illinois Hy, Indiana WF9, Ohio O7, Indiana 38-11, CI. 187-2, and Illinois 5120B (Tables 3 and 4).

The performance at Urbana and Bluffs of ten new Illinois hybrids containing inbred R61 is shown in Table 6. Hybrids of R59 and R61 in Tables 5 and 6 were grown in the same tests and can be directly compared. Performance at Aurora of six Illinois hybrids containing inbred R61 is given in Table 7.


L317 and R61 appear to be somewhat related and for best performance should not be used on opposite sides of a double cross.

Table 4. — PERFORMANCE OF 4 INBRED LINES IN SINGLE CROSSES:
 Urbana, Illinois, 1946
 (Means of three replications)

Parent lines	Ohio O7	Cl. 187-2	Ill. 5120B	Kans. K4	Ind. WF9	Ind. 38-11	Mean	Ill. Hy-2	Ill. M14	Iowa KrOsF
Acre-yield, bushels										
Ill. R59.....	124.9	115.4	121.9	118.2	112.2	117.2	118.3	121.3	106.4	99.6
Ill. R61.....	118.1	125.7	120.8	120.6	111.9	105.3	117.1	120.2	103.9	...
Ill. Hy-2.....	119.6	121.9	113.0	115.7	112.5	117.0	116.6	...	...	87.0
Iowa L317.....	122.1	117.7	122.5	100.6	113.8	104.3	113.5	118.8	104.1	113.0
Mean.....	121.2	120.2	119.6	113.8	112.6	111.0	116.4	120.1	104.8	99.9
<i>A difference of less than 8.3 bushels between yields of any two of the above entries is not significant.</i>										
Days from planting until half-silk										
Ill. R59.....	66	67	67	71	67	69	68	68	64	67
Ill. R61.....	68	68	68	72	66	67	68	67	65	..
Ill. Hy-2.....	67	68	67	70	65	68	68	..	..	72
Iowa L317.....	69	69	68	74	68	69	70	68	65	69
Mean.....	68	68	68	72	67	68	68	68	65	69
Moisture in grain at harvest, percent										
Ill. R61.....	24.4	23.5	26.8	28.2	24.9	24.9	25.5	27.4	26.4	....
Iowa L317.....	24.1	24.3	29.0	31.5	22.8	22.3	25.7	27.0	30.5	27.9
Ill. Hy-2.....	23.0	26.4	29.3	27.9	27.1	24.9	26.4	....	....	28.1
Ill. R59.....	25.8	25.5	30.2	30.9	26.4	26.1	27.5	29.1	29.3	30.6
Mean.....	24.3	24.9	28.8	29.6	25.3	24.6	26.3	27.8	28.7	28.9
Shelling percentage										
Ill. R59.....	87.7	86.8	81.8	85.5	85.2	86.7	85.6	84.5	86.4	84.1
Ill. R61.....	85.8	86.0	82.1	83.2	86.4	83.8	84.6	85.0	85.6	....
Ill. Hy-2.....	86.5	83.6	80.4	83.8	84.1	84.2	83.8	....	....	82.7
Iowa L317.....	85.7	85.7	81.7	82.1	84.1	83.0	83.7	84.0	85.6	84.0
Mean.....	86.4	85.5	81.5	83.7	85.0	84.4	84.4	84.5	85.7	83.6
Erect plants at harvest, percent										
Ill. Hy-2.....	99	96	90	100	99	98	97	..	..	72
Ill. R61.....	96	89	74	84	97	79	87	95	95	..
Ill. R59.....	94	90	71	59	92	92	83	85	99	67
Iowa L317.....	91	58	91	53	98	74	78	94	98	47
Mean.....	95	83	82	74	97	86	86	91	97	62
Root-lodged plants at harvest, percent										
Ill. Hy-2.....	1	3	0	0	0	0	1	..	..	0
Ill. R61.....	4	0	0	10	0	0	2	0	0	..
Ill. R59.....	0	0	2	15	0	0	3	6	0	0
Iowa L317.....	5	0	2	16	0	0	4	0	0	12
Mean.....	3	1	1	10	0	0	2	2	0	4
Stalk-lodged plants at harvest, percent										
Ill. Hy-2.....	0	1	10	0	1	2	2	..	..	28
Ill. R61.....	0	11	26	6	3	21	11	5	5	..
Ill. R59.....	6	10	27	26	8	8	14	9	1	33
Iowa L317.....	4	42	7	31	2	26	19	6	2	41
Mean.....	3	16	18	16	4	14	12	7	3	34

Table 4. — Performance of 4 Inbreds — Concluded

(Means of three replications)

Parent lines 	Ohio O7	Cl. 187-2	Ill. 5120B	Kans. K4	Ind. WF9	Ind. 38-11	Mean	Ill. Hy-2	Ill. M14	Iowa KrOsF
Plant height, feet										
Ill. R61.....	9.2	8.7	9.7	9.3	8.5	9.0	9.1	9.0	8.7	...
Ill. R59.....	9.3	9.2	9.7	9.5	9.2	9.2	9.4	9.5	8.2	8.7
Ill. Hy-2.....	9.5	9.8	10.0	10.0	8.8	9.5	9.6	...	...	8.7
Iowa L317.....	9.8	9.7	9.8	10.0	9.7	10.2	9.9	9.5	8.8	9.7
Mean.....	9.5	9.4	9.8	9.7	9.1	9.5	9.5	9.3	8.6	9.0
Ear height, inches										
Ill. R61.....	40	44	49	51	35	43	44	46	36	..
Ill. R59.....	43	44	47	46	43	43	44	47	34	43
Ill. Hy-2.....	46	49	50	50	39	49	47	..	..	45
Iowa L317.....	41	51	48	55	41	53	48	51	38	50
Mean.....	43	47	49	51	40	47	46	48	36	46
Number of ears per hundred pounds										
Ill. R61.....	126	121	121	120	134	151	129	126	134	...
Ill. Hy-2.....	136	128	121	125	132	135	130	...	...	161
Ill. R59.....	134	132	111	143	135	136	132	122	140	138
Iowa L317.....	134	133	110	142	144	137	133	125	140	136
Mean.....	133	129	116	133	136	140	131	124	138	145
Suckers per hundred plants										
Iowa L317.....	2	3	3	3	3	3	3	6	2	7
Ill. Hy-2.....	8	4	2	2	1	2	3	..	..	8
Ill. R59.....	4	0	13	2	5	2	4	4	5	3
Ill. R61.....	5	1	11	3	1	29	8	7	12	..
Mean.....	5	2	7	3	3	7	5	6	6	6
Dropped ears, percent										
Ill. Hy-2.....	0	0	0	0	0	0	0	..	..	0
Ill. R59.....	0	0	2	0	0	0	.3	0	0	0
Ill. R61.....	0	0	0	1	0	2	.5	0	1	..
Iowa L317.....	0	0	2	0	0	13	2.5	0	0	1
Mean.....	0	0	1.0	.3	0	3.8	.8	0	.3	.3

**Table 5. — PERFORMANCE OF DOUBLE-CROSS HYBRIDS,
14 CONTAINING AND 7 NOT CONTAINING INBRED**

R59: Urbana and Bluffs, Illinois, 1946

(Means of six replications; starred entries do not contain R59)

Rank in yield	Hybrid and pedigree	Acre- yield of shelled corn	Days to half- silk	Mois- ture at har- vest	Erect plants	Height	
						Plant	Ear
1	Ill. 246-3 (WF9×Hy) (R59×187-2)....	<i>bu.</i> 120.5	67	<i>perct.</i> 22.2	<i>perct.</i> 83	<i>ft.</i> 10.2	<i>in.</i> 52
2*	Ill. 1342 (U.S.13) (WF9×38-11) (Hy×L317)...	119.0	68	20.4	84	10.5	52
3*	Ill. 247 (187-2×38-11) (Hy×L317)...	118.5	69	22.8	76	10.7	52
4	Ill. 1233-1 (WF9×38-11) (940×R59)....	118.4	69	23.4	88	9.9	50
5*	Ill. 246 (WF9×Hy) (187-2×L317)...	117.4	70	21.5	72	10.5	50
6	Ill. 1300 (WF9×38-11) (R2×R59)....	116.8	68	21.6	75	10.1	50
6*	Ill. 200 (WF9×38-11) (K4×L317)...	116.8	70	21.6	82	10.2	50
8	Ill. 1305 (K4×H7) (R59×940).....	115.5	70	24.0	88	10.0	47
9	Ill. 201-3 (WF9×38-11) (R59×187-2)..	114.0	67	22.7	76	9.8	48
10	Ill. 1329 (O7×R61) (187-2×R59).....	112.7	67	21.6	78	9.4	46
11*	Ill. 21 (WF9×38 11) (187-2×Hy)...	111.2	68	20.6	88	10.2	50
12*	Ill. 201 (WF9×38-11) (187-2×L317)	111.1	68	23.0	75	10.2	49
13	Ill. 1348 (38-11×940) (R59×K148)...	110.8	69	25.6	72	9.8	48
14	Ill. 1312 (K4×R59) (38-11×K155)....	107.8	72	24.4	82	10.3	53
15*	Ill. 206 (WF9×38-11) (5120×L317)	107.4	68	21.8	79	10.4	50
16	Ill. 206-1 (WF9×38-11) (R59×5120)...	106.6	67	23.6	92	9.6	45
17	Ill. 1335 (WF9×38-11) (R59×K148)..	106.2	68	24.2	84	10.0	46
18	Ill. 1314 (K4×R59) (K201C×Kys)...	104.6	75	25.4	56	10.5	57
19	Ill. 200-1 (WF9×38-11) (K4×R59)....	98.4	70	23.6	73	10.4	53
20	Ill. 1343 (WF9×K155) (R59×Hy)....	96.7	67	23.4	75	9.9	48
21	Ill. 1330 (O7×187-2) (R59×Hy).....	91.8	63	21.1	72	8.6	36
	Mean.....	110.6	69	22.8	79	10.1	49

**A difference of less than 10.3 bushels between yields of any
two of the above entries is not significant.**

**Table 6. — PERFORMANCE OF DOUBLE-CROSS HYBRIDS,
10 CONTAINING AND 7 NOT CONTAINING INBRED
R61: Urbana and Bluffs, Illinois, 1946**

(Means of six replications; starred entries do not contain R61)

Rank in yield	Hybrid and pedigree	Acre- yield of shelled corn	Days to half- silk	Mois- ture at har- vest	Erect plants	Height	
						Plant	Ear
1	Ill. 1336 (WF9×38-11) (R61×5120B)	<i>bu.</i> 120.2		<i>perct.</i> 21.2	<i>perct.</i> 78	<i>ft.</i> 9.9	<i>in.</i> 48
2	Ill. 1246 (WF9×38-11) (R61×187-2)...	120.1	67	21.4	84	9.9	48
3*	Ill. 1342 (U.S.13) (WF9×38-11) (Hy×L317)...	119.0	68	20.4	84	10.5	52
4*	Ill. 247 (187-2×38-11) (Hy×L317)...	118.5	69	22.8	76	10.7	52
5	Ill. 1247 (WF9×38-11) (R61×L317)...	118.4	68	21.4	76	10.2	50
6*	Ill. 246 (WF9×Hy) (187-2×L317)...	117.4	70	21.5	72	10.5	50
7*	Ill. 200 (WF9×38-11) (K4×L317)...	116.8	70	21.6	82	10.2	50
8	Ill. 1248 (WF9×38-11) (O7×R61)....	115.6	68	21.3	90	9.4	48
9	Ill. 1337 (WF9×38-11) (Hy-2×R61) ..	114.9	67	22.4	84	9.9	50
10	Ill. 1345 (WF9×Hy) (R61×L317)....	113.0	68	24.4	72	10.2	50
11	Ill. 1329 (O7×R61) (187-2×R59).....	112.7	67	21.6	78	9.4	46
12*	Ill. 21 (WF9×38-11) (187-2×Hy)...	111.2	68	20.6	88	10.2	50
13*	Ill. 201 (WF9×38-11) (187-2×L317)	111.1	68	23.0	75	10.2	49
14	Ill. 1301 (WF9×38-11) (R2×R61)....	108.6	67	20.2	93	10.0	48
15*	Ill. 206 (WF9×38-11) (5120×L317)...	107.4	68	21.8	79	10.4	50
16	Ill. 1353 (O7×R61) (WF9×Hy)	104.8	66	22.9	87	9.8	44
17	Ill. 1351 (WF9×R61) (38-11×L317)...	104.0	70	20.5	80	10.2	53
	Mean.....	113.7	68	21.7	81	10.1	49

A difference of less than 10.3 bushels between yields of any two of the above entries is not significant.

**Table 7. — PERFORMANCE OF DOUBLE-CROSS HYBRIDS,
6 CONTAINING AND 6 NOT CONTAINING INBRED
R61: Aurora, Illinois, 1946**

(Means of four replications; starred entries do not contain R61)

Rank in yield	Hybrid	Pedigree	Acre- yield of shelled corn	Mois- ture at har- vest	Erect plants
			<i>bu.</i>	<i>perct.</i>	<i>perct.</i>
1	Ill. 1263.....	(WF9×R61) (R2×Hy)	83.8	21.2	87
2	Ill. 1261.....	(WF9×M14) (R2×R61)	80.9	19.3	88
3	Ill. 1267.....	(O7×R61) (187-2×Hy)	80.2	21.3	97
4*	Ill. 307.....	(WF9×M14) (CC5×CC7)	80.0	19.8	83
5	Ill. 1253.....	(WF9×R2) (Hy-2×R61)	78.4	20.9	86
5	Ill. 1285.....	(WF9×Y82) (M14×R61)	78.4	21.5	87
7*	Ill. 751.....	(WF9×Hy) (A×90)	75.9	22.1	82
8*	Ill. 972A-1.....	(WF9×O7) (Hy×L317)	75.6	22.4	97
9*	Ill. 101.....	(WF9×M14) (CC7×187-2)	75.2	20.7	88
10	Ill. 1237.....	(WF9×Hy) (R61×187-2)	73.7	22.3	94
11*	Ill. 1180.....	(WF9×M14) (CC10×CC24)	73.3	20.1	83
12*	U.S. 44-1.....	(4-8×187-2) (Hy×O7)	67.7	21.7	94
	Mean.....		76.9	21.1	89

A difference of less than 7.2 bushels between yields of any
two of the above entries is not significant.

DISTRIBUTION OF INBRED LINES

Each year the Illinois Station has available for distribution hand-pollinated seed of a number of inbred lines of corn. These are lines that are being used to develop promising experimental hybrids and lines that have been used in hybrids widely grown by Illinois farmers.

A list of available lines and details regarding them can be obtained from the Department of Agronomy, Illinois Agricultural Experiment Station, Urbana, Illinois. Inbred lines R59 and R61 are included in the 1947 list.

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