

Illinois Corn Management Yield Potential 2023 Hybrid Yield Report

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2023 Illinois Corn Management Yield Potential - Initial Report

The Illinois Corn Management Yield Potential Trial is conducted to help understand the interactions between commercial corn hybrids and different agronomic management factors to maximize corn productivity. Our goal is to provide information for a hybrid's management yield potential that can help farmers and agronomists better select hybrids for an intended level of crop management.

Research Approach

In our research approach, hybrids with above-average yield responses to agronomic management [i.e. broadcast fertilizer, fungicide, high plant density, and/or narrow row spacing] are considered responsive hybrids, which we expect would have much greater yields when managed appropriately. On the contrary, hybrids demonstrating exceptional yield without management or minimal response to agronomic management are considered optimal for low input production systems.

Trial Implementation

In 2023, three field trials were planted using a precision plot planter with variable rate capability (SeedPro 360, ALMACO, Nevada, IA) at Nashville, IL (38°19'17"N, 89°20'15"W; 3 May), Champaign, IL (40°03'50"N, 88°14'11"W; 5 May), and Yorkville, IL (41°35'02"N, 88°24'34"W; 11 May) (Figure 1). Soybean was the previous crop and tillage practices consisted of conventional deep ripping followed by field cultivation. Plots were 17.5 feet in length and either two 30-inch or four 20-inch rows in width. At planting, Force 6.5G soil insecticide was applied in-furrow (2.3 oz per 1000 ft; Syngenta) for below-ground insect protection. Weed control consisted of preplant applications of Acuron (3 qt per acre; Syngenta) and Atrazine (20 oz per acre), followed by postemergence applications of Laudis (3 oz per acre; Bayer), Atrazine (32 oz per acre), Roundup Powermax 3 (30 oz per acre; Bayer), Diflexx (8 oz per acre; Bayer), and Zidua SC (4 oz per acre; BASF).

How Hybrids Were Tested

The 32 commercial corn hybrids (20 at each location) listed in Table 1 were assessed at three locations that differ in inherent soil characteristics (Table 2) for their responses to the different agronomic management levels outlined in Table 3. The trial area at each site received 200 lbs N per acre as UAN (32-0-0) broadcast applied and incorporated before planting. Hybrids received either no P and K fertilizer or 80 lbs P₂O₅ per acre as MicroEssentials SZ (MESZ; 12-40-0-10S-1Zn) and 60 lbs K₂O per acre as Potash (MOP; 0-0-60) applied broadcast incorporated before planting on 2 May, 4 May, 10 May at Nashville, Champaign, and Yorkville, respectively (Table 4). Miravis Neo (13.7 oz per acre; Syngenta) and Warrior II (1.6 oz per acre; Syngenta) were applied at VT/RI (pollination stage) to assess hybrids for their responses to foliar protection. Fungicide/insecticide spray dates were 14 July, 17 July, and 21 July at Nashville, Champaign, and Yorkville, respectively. Hybrids were planted at 34,000 or 42,000 plants per acre and in 30-inch row arrangement to assess their tolerance to increased crowding stress and if management practices of fertility and/or foliar protection can alleviate that stress. Two additional comparisons were implemented to determine if narrow row arrangement (20-inch) improves response to fertility and foliar protection, and if that response is population dependent.

Data Collection and Analysis

At maturity, plots were harvested with a two-row plot combine (R1, ALMACO) and grain yield is reported as bushels per acre at 15.5% moisture (Tables 6-11). The experimental design was a split-split-split plot arrangement in four randomized complete blocks within each environment. Main plots were row spacing, sub-plots were population, sub-sub-plots were hybrid, and sub-sub-sub-plots were management. This design optimizes inference to an individual hybrid's response to specific management practices and planting populations. Statistical analysis was performed using a linear mixed model approach with PROC MIXED in SAS (version 9.4; SAS Institute, Cary, NC) and means were separated using Fisher's protected LSD test at the 0.10 level of significance.

Growing conditions

Nashville and Yorkville received normal precipitation in April, delaying planting to the first ten days of May (Table 5). While Champaign was abnormally dry in April, cool soil temperatures led many to postpone planting corn until the first week of May. The month of June exhibited pronounced dryness with an average rainfall of just 1.1, 1.8, and 0.9 inches at Nashville, Champaign, and Yorkville, respectively (23 to 38% of normal). Therefore, the early season is characterized as a moderate drought. However, this dry weather reduced overall disease pressure and nitrogen losses, along with sufficient rainfall in August during kernel fill, resulting in final yields at or above expected levels of the regions.

Table 1. Hybrid Entries and Distribution

Brand	RM	Hybrid	Nashville	Champaign	Yorkville
Channel	104	204-54SSPRIB			X
Channel	110	210-08VT2PRIB	X	X	X
Channel	112	212-52SSPRIB			X
Channel	114	214-78DGV2PRIB	X	X	
Channel	115	215-70TRERIB	X	X	
Dekalb	105	DKC105-33			X
Dekalb	106	DKC56-26			X
Dekalb	110	DKC110-10		X	X
Dekalb	111	DKC111-33			X
Dekalb	111	DKC111-35		X	
Dekalb	114	DKC64-22	X	X	
Dekalb	116	DKC66-06	X	X	
Dekalb	117	DKC67-94	X		
Dekalb	118	DKC68-35	X		
Golden Harvest	103	G03B91-AA			X
Golden Harvest	107	G07G73-D			X
Golden Harvest	108	G08B38-AA	X	X	X
Golden Harvest	110	G10L16-DV	X	X	X
Golden Harvest	110	G10B61-AA	X	X	X
Golden Harvest	111	G11V76-D	X	X	X
Golden Harvest	112	G12S75-D	X	X	X
Golden Harvest	113	G13B17-AA	X	X	X
Golden Harvest	114	G14B32-DV	X	X	X
Golden Harvest	115	G15J91-V	X	X	X
Golden Harvest	116	G16Q82-AA	X	X	
Golden Harvest	117	G17B31-V	X	X	
Stone	109	0904SP		X	X
Stone	113	1304TRE	X	X	
Stone	113	1303SP			X
Stone	115	1504TRE		X	X
Stone	115	1504SP	X		
Stone	118	1812DP	X		

Table 2. Preplant soil test levels for trial sites across IL in 2023.

Location	OM	CEC	pH	P	K	Ca	Mg	S	Zn
	%	meq/100g							
Nashville	2.4	11.4	6.4	13	98	1701	164	11	1
Champaign	3.2	20.5	6.2	33	121	2655	429	10	1
Yorkville	6.5	29.2	6.7	38	185	3893	867	12	5

Soil samples taken from the 0-6 inch depth prior to planting and extracted using Mehlich III.

Table 3. Agronomic treatments applied to corn across IL in 2023.

Treatment Description	Row Spacing	Planting Population	Broadcast Fertility ¹	Foliar Protection ²
Standard Population (SP)	30"	34,000	None	None
SP + Fertility	30"	34,000	Preplant	None
SP + Foliar Protection	30"	34,000	None	Yes – VT/R1
SP + Fertility + Foliar Protection	30"	34,000	Preplant	Yes – VT/R1
High Population (HP)	30"	42,000	None	None
HP + Fertility	30"	42,000	Preplant	None
HP + Foliar Protection	30"	42,000	None	Yes – VT/R1
HP + Fertility + Foliar Protection	30"	42,000	Preplant	Yes – VT/R1
SP + Fertility + Foliar Protection	20"	34,000	Preplant	Yes – VT/R1
HP + Fertility + Foliar Protection	20"	42,000	Preplant	Yes – VT/R1

¹ 200 lbs per acre MicroEssentials SZ (MESZ; 12-40-0-10S-1Zn) and 100 lbs per acre Potash (MOP; 0-0-60) broadcast incorporated preplant.

² Foliar fungicide and insecticide applied at flowering (VT/R1) as Miravis Neo and Warrior II (Syngenta).

Table 4. Supplied nutrients for respective management levels.

Treatment Description ¹	N	P ₂ O ₅	K ₂ O	S	Zn
	lbs per acre				
Untreated Control	200	0	0	0	0
+ Fertility	222.5	80	60	20	2
+ Foliar Protection	200	0	0	0	0
+ Fertility + Foliar Protection	222.5	80	60	20	2

¹All four treatments were replicated in a 30-inch row with plant populations of 34,000 or 42,000 plants per acre. The "+ Fertility + Foliar Protection" treatment was also replicated at both populations in a 20-inch row.

Table 5. Monthly precipitation and temperature averages at three sites across the state of Illinois used to evaluate commercial corn hybrids for their response to agronomic management in 2023.

Month	Precipitation (inches)		Temperature (°F)	
	2023	Normal ¹	2023	Normal
Nashville				
April	4.8	5.0	57	57
May	5.5	5.1	67	66
June	1.1	4.3	75	75
July	4.4	3.8	78	78
August	2.6	3.3	76	76
September	1.8	3.6	70	69
Total	20.3	25.1	-	-
Champaign				
April	1.5	4.0	53	53
May	1.9	5.0	66	63
June	1.8	4.7	72	72
July	2.9	4.4	76	75
August	3.8	3.5	73	74
September	3.1	3.3	68	67
Total	15.0	24.9	-	-
Yorkville				
April	3.4	3.2	48	49
May	1.6	4.1	62	60
June	0.9	4.0	69	70
July	6.2	3.4	71	72
August	3.1	3.6	70	70
September	2.7	3.2	65	63
Total	18.0	21.5	-	-

¹Monthly total precipitation and average temperature during the production season at Nashville, Champaign, and Yorkville, IL in 2023 compared to the 30-year average (1989-2020) of the respective region. Values were obtained from the Illinois State Water Survey.



Figure 1. Relative locations of the three trial sites to evaluate hybrid response to management across the state of Illinois in 2023.

Fertility and Foliar Protection Work Together

Fertility by itself increased yield at all sites (range of 6 to 9 bushels per acre) (Tables 7, 9, 11), even though soil test values for P and K at two of the sites were above critical threshold levels (Table 2).

With all locations experiencing drier than normal seasonal precipitation, and especially lower precipitation in June (Table 5), there was no visual evidence of nitrogen loss or foliar disease pressure, and this led to an extended period of leaf greenness and an overall healthier plant. Despite these conditions, when fungicide and insecticide were applied at tassel, there were still modest increases in yield at all locations (range of 5 to 8 bushels per acre) averaged over the hybrids (Tables 7, 9, 11); although there was considerable variation among the hybrids in the magnitude of their response (Tables 6, 8, 10).

In 2023, fertility and foliar protection worked independently as each practice resulted in the same magnitude of yield increase at each site, averaging 9 or 7 bushels at Nashville, 6 or 5 bushels at Champaign, and 9 or 8 bushels at Yorkville (Tables 7, 9, 11). Interestingly, the average combined response to both fertility and foliar protection (13 bushels at Nashville, 10 bushels at Champaign and 17 bushels at Yorkville) was additive at all sites suggesting that the two practices acted independently in 2023 to increase yield.

Standard or High Density?

All locations had minimal response to increasing the planting density in 2023, as on average, 34,000 plants per acre produced the same or slightly higher yield (2 bushels) than 42,000 plants per acre (Table 12). Fertility and foliar protection both separately and together increased yield at both densities, but the magnitude of increases was not higher at the higher density as we normally see, which we believe is due to the dry conditions experienced in June at all sites (Table 5).

The yield increase from narrow row spacing, and its ability to manage a higher density of plants was also lower than we normally observe, averaging 3 bushels in Nashville, 5 bushels in Yorkville, and 18 bushels in Champaign (Tables 7, 9, 11). We did, however, observe the typical trend that the higher planting population had a greater yield advantage

when planted in 20-inch rows than in 30-inch rows at Nashville and Champaign (Tables 6, 8).

Making A Wise Hybrid Selection

As one of the most important yearly management decisions that a grower must make, hybrid selection showed the greatest variability in yield across the state. The range in yield between the highest and lowest yielding hybrids at each site was 48 bushels in Nashville, 75 bushels in Champaign, and 73 bushels in Yorkville (Tables 6, 8, 10). In general, the highest yielding hybrids at each site were the ones with the highest relative maturities, allowing for full utilization of the growing season.

Averaged over all the 10 levels of agronomic management, three of the 20 hybrids averaged over 300 bushels per acre at Champaign (215-70TRERIB, DKC66-06, 1504TRE) and two at Yorkville (G14B32-DV, 1504TRE). Numerous instances of individual hybrid by management combinations produced more than 300 bushels (Tables 6, 8, 10).

The Overall Story

In 2023, applying fertility or foliar protection both increased yield and their application together was additive in yield response across sites and hybrids. On average, there was no advantage to increasing the plant population from 34,000 to 42,000 plants per acre, which we attribute to low June rainfall, and the highest individual yields at Nashville and Champaign occurred with the highest level of management. This included full season hybrids planted in 20-inch rows at 42,000 plants per acre and receiving fertility and foliar protection, where hybrid DKC66-06 produced 238 bushels at Nashville and hybrid 1504TRE produced 333 bushels at Champaign. G14B32-DV achieved a yield of 335 bushels for this same treatment at Yorkville, the second highest yield across the state. The highest yield observed among locations was 1504TRE, with 343 bushels at Yorkville when planted at 42,000 plants per acre with fertility and foliar protection in a 30-inch row. There is clearly a lot of yield potential in today's hybrids that can be achieved with the proper agronomic management, and we hope this report helps growers in choosing the appropriate hybrid and implementing those management practices that align with the selected hybrid's potential.

Table 6. Nashville, IL Hybrid Average Yield Responses to Agronomic Management

Brand	RM	Hybrid	Hybrid Average ¹		Treatment Yields (bushels per acre) ²									
					30-inch Row								20-inch Row	
			Moisture (%)	Yield (bu/acre)	34K Density	34K + Fertility	34K + Fung/Ins	34K + Fertility + Fung/Ins	42K Density	42K + Fertility	42K + Fung/Ins	42K + Fertility + Fung/Ins	34K + Fertility + Fung/Ins	42K + Fertility + Fung/Ins
Channel	110	210-08VT2PRIB	12.5	197	205	222	191	201	183	201	205	194	NA	204
Channel	114	214-78DGV2PRIB	15.1	193	183	210	182	205	184	184	197	188	194	204
Channel	115	215-70TRERIB	14.0	206	206	203	209	208	203	199	203	211	220	198
Dekalb	114	DKC64-22	13.1	211	198	209	198	220	196	221	216	211	226	210
Dekalb	116	DKC66-06	15.2	211	189	226	204	221	195	214	203	209	213	238
Dekalb	117	DKC67-94	16.5	179	169	184	169	193	180	169	187	179	182	183
Dekalb	118	DKC68-35	14.4	216	218	215	216	217	193	226	207	213	223	231
Golden Harvest	108	G08B38-AA	12.7	168	155	163	161	171	166	161	168	174	171	189
Golden Harvest	110	G10L16-DV	12.8	178	166	174	167	191	171	165	169	174	204	200
Golden Harvest	110	G10B61-AA	12.8	193	188	197	195	198	188	197	202	195	185	188
Golden Harvest	111	G11V76-D	12.5	192	177	186	191	188	180	190	193	190	204	218
Golden Harvest	112	G12S75-D	13.6	189	186	193	185	196	184	189	178	190	194	198
Golden Harvest	113	G13B17-AA	13.0	190	180	182	191	190	175	189	193	195	203	201
Golden Harvest	114	G14B32-DV	12.1	179	159	195	171	185	179	NA	175	204	189	191
Golden Harvest	115	G15J91-V	15.6	199	210	199	198	200	192	206	196	190	182	215
Golden Harvest	116	G16Q82-AA	13.8	191	185	197	184	199	186	175	193	200	191	199
Golden Harvest	117	G17B31-V	15.8	185	178	183	184	185	173	186	182	192	185	201
Stone	113	1304TRE	14.8	206	181	230	189	214	190	207	213	200	226	214
Stone	115	1504SP	14.1	196	193	194	191	191	184	199	204	205	189	207
Stone	118	1812DP	15.4	203	201	209	204	218	180	206	198	203	197	219
LSD ($P \leq 0.10$)			0.3	7	25	21	19	19	30	30	18	34	27	23
Mean			14.0	194	186 ^{EF}	199 ^{BC}	189 ^{EF}	200 ^B	184 ^F	191 ^{DE}	194 ^{CD}	196 ^{BCD}	197 ^{BC}	205 ^A
Range			13-17	168-216	155-218	163-230	161-216	171-221	166-203	139-226	168-216	174-213	160-226	183-238

¹Average moisture and yield across ten levels of agronomic management. Yields are adjusted to 15.5% moisture.²Values are the average of four replications.

NA, data point not available due to loss of replication.

Table 7. Nashville, IL Average Yield Response to Agronomic Management

	Average Response to Management in a 30-inch Row				Average Response
	Population ²	Fertility ³	Foliar Protection ³	Fertility + Foliar Protection ³	Response to Narrow Rows ⁴
Grain Yield (bushels per acre)¹	-2	+9	+7	+13	+3

¹Average yield response to management factor across twenty hybrids. Yields are adjusted to 15.5% moisture and presented values are the average of four replications.²Averaged across all four management levels of none, fertility, foliar protection, and fertility + foliar protection in a 30-inch row configuration (excludes narrow row yields).³Averaged across both plant populations in a 30-inch row (excludes narrow row yields).⁴Averaged across treatments receiving only fertility + foliar protection.* Statistically significant when compared to lower population², to no management (no fertility and no foliar protection)³, or an increase over 30-inch rows⁴.

Table 8. Champaign, IL Hybrid Average Yield Responses to Agronomic Management

Brand	RM	Hybrid	Hybrid Average ¹		Treatment Yields (bushels per acre) ²									
					30-inch Row								20-inch Row	
			Moisture (%)	Yield (bu/acre)	34K Density	34K + Fertility	34K + Fung/Ins	34K + Fertility + Fung/Ins	42K Density	42K + Fertility	42K + Fung/Ins	42K + Fertility + Fung/Ins	34K + Fertility + Fung/Ins	42K + Fertility + Fung/Ins
Channel	110	210-08VT2PRIB	14.2	276	267	273	281	283	262	280	265	285	281	286
Channel	114	214-78DGV2PRIB	14.7	297	281	285	301	296	290	292	296	306	309	315
Channel	115	215-70TRERIB	16.3	306	297	307	298	303	287	302	305	310	322	328
Dekalb	110	DKC110-10	14.7	256	250	256	261	250	241	246	245	249	272	287
Dekalb	111	DKC111-35	13.8	266	260	265	255	271	253	250	260	268	289	293
Dekalb	114	DKC64-22	14.1	282	281	278	288	276	270	273	271	280	291	310
Dekalb	116	DKC66-06	16.4	305	294	301	298	308	294	303	299	310	324	320
Golden Harvest	108	G08B38-AA	14.9	231	227	226	229	225	223	230	230	235	237	253
Golden Harvest	110	G10L16-DV	14.7	245	240	247	244	248	232	243	234	238	247	277
Golden Harvest	110	G10B61-AA	14.6	261	257	254	259	260	253	255	252	262	270	283
Golden Harvest	111	G11V76-D	14.3	262	251	260	256	272	243	259	256	260	279	289
Golden Harvest	112	G12S75-D	15.2	263	255	260	257	269	251	259	244	261	281	297
Golden Harvest	113	G13B17-AA	15.6	256	244	251	254	261	243	254	246	254	273	276
Golden Harvest	114	G14B32-DV	15.4	268	263	266	261	262	257	259	261	277	277	295
Golden Harvest	115	G15J91-V	17.1	273	269	263	265	267	264	270	272	277	286	302
Golden Harvest	116	G16Q82-AA	16.2	247	234	251	244	249	236	244	240	249	262	262
Golden Harvest	117	G17B31-V	17.9	243	233	244	244	243	229	236	229	249	267	255
Stone	109	0904SP	14.4	272	262	272	268	270	265	266	271	268	291	291
Stone	113	1304TRE	15.7	297	283	299	297	291	286	291	297	290	307	325
Stone	115	1504TRE	15.5	306	291	298	297	306	300	299	305	318	315	333
LSD ($P \leq 0.10$)			0.2	4	9	13	13	13	13	17	12	14	16	16
Mean			15.3	271	262 ^G	268 ^{DE}	268 ^{DE}	271 ^{CD}	259 ^H	265 ^{EF}	264 ^{FG}	272 ^C	284 ^B	294 ^A
Range			14-18	231-306	227-297	226-307	229-301	225-308	223-300	230-303	229-305	235-318	237-324	253-333

¹Average moisture and yield across ten levels of agronomic management. Yields are adjusted to 15.5% moisture.²Values are the average of four replications.**Table 9.** Champaign, IL Average Yield Response to Agronomic Management

	Average Response to Management in a 30-inch Row				Average Response
	Population ²	Fertility ³	Foliar Protection ³	Fertility + Foliar Protection ³	Response to Narrow Rows ⁴
Grain Yield (bushels per acre) ¹	-2*	+6	+5	+10	+18*

¹Average yield response to management factor across twenty hybrids. Yields are adjusted to 15.5% moisture and presented values are the average of four replications.²Averaged across all four management levels of none, fertility, foliar protection, and fertility + foliar protection in a 30-inch row configuration (excludes narrow row yields).³Averaged across both plant populations in a 30-inch row (excludes narrow row yields).⁴Averaged across treatments receiving only fertility + foliar protection.* Statistically significant when compared to lower population², to no management (no fertility and no foliar protection)³, or an increase over 30-inch rows⁴.

Table 10. Yorkville, IL Hybrid Average Yield Responses to Agronomic Management

Brand	RM	Hybrid	Hybrid Average ¹		Treatment Yields (bushels per acre) ²									
					30-inch Row								20-inch Row	
			Moisture (%)	Yield (bu/acre)	34K Density	34K + Fertility	34K + Fung/Ins	34K + Fertility + Fung/Ins	42K Density	42K + Fertility	42K + Fung/Ins	42K + Fertility + Fung/Ins	34K + Fertility + Fung/Ins	42K + Fertility + Fung/Ins
Channel	104	204-54SSPRIB	15.1	284	279	287	286	286	278	280	284	283	287	295
Channel	110	210-08VT2PRIB	15.8	294	275	295	290	304	286	293	288	300	289	316
Channel	112	212-52SSPRIB	16.1	295	269	296	292	301	294	296	286	295	306	310
Dekalb	105	DKC105-33	15.0	274	255	275	269	280	261	271	272	277	288	293
Dekalb	106	DKC56-26	14.7	279	266	278	271	283	263	274	276	279	299	297
Dekalb	110	DKC110-10	16.1	298	287	300	292	303	289	296	298	304	306	306
Dekalb	111	DKC111-33	15.5	279	272	280	283	285	270	271	270	277	292	287
Golden Harvest	103	G03B91-AA	14.2	260	240	260	254	262	249	252	259	264	268	291
Golden Harvest	107	G07G73-D	16.4	263	245	263	258	273	250	261	257	269	275	274
Golden Harvest	108	G08B38-AA	15.8	249	235	243	260	263	243	245	241	254	246	254
Golden Harvest	110	G10L16-DV	17.1	277	271	277	267	284	268	269	271	283	295	289
Golden Harvest	110	G10B61-AA	16.4	275	265	271	269	278	268	270	270	274	297	286
Golden Harvest	111	G11V76-D	16.1	280	267	291	274	294	273	273	275	279	295	277
Golden Harvest	112	G12S75-D	16.9	289	278	289	296	296	280	280	289	298	291	291
Golden Harvest	113	G13B17-AA	17.0	280	274	279	279	289	270	273	282	281	285	290
Golden Harvest	114	G14B32-DV	18.1	310	288	310	301	311	298	300	305	332	320	335
Golden Harvest	115	G15J91-V	18.9	292	270	295	282	292	289	283	285	291	316	316
Stone	109	0904SP	15.3	288	278	278	285	296	283	287	291	293	305	282
Stone	113	1303SP	16.9	295	277	301	292	310	285	292	292	299	305	291
Stone	115	1504TRE	17.4	322	301	315	320	324	318	323	317	343	327	328
LSD ($P \leq 0.10$)			0.2	4	14	15	13	14	14	15	14	16	15	17
Mean			16.2	284	270 ^F	284 ^C	281 ^D	291 ^B	276 ^E	279 ^D	281 ^{CD}	289 ^B	295 ^A	295 ^A
Range			14-19	249-322	235-301	243-315	254-320	262-324	243-318	245-323	241-317	254-343	246-327	254-335

¹Average moisture and yield across ten levels of agronomic management. Yields are adjusted to 15.5% moisture.²Values are the average of four replications.**Table 11.** Yorkville, IL Average Yield Response to Agronomic Management

	Average Response to Management in a 30-inch Row				Average Response
	Population ²	Fertility ³	Foliar Protection ³	Fertility + Foliar Protection ³	Response to Narrow Rows ⁴
Grain Yield (bushels per acre)¹	0	+9	+8	+17	+5*

¹Average yield response to management factor across twenty hybrids. Yields are adjusted to 15.5% moisture and presented values are the average of four replications.²Averaged across all four management levels of none, fertility, foliar protection, and fertility + foliar protection in a 30-inch row configuration (excludes narrow row yields).³Averaged across both plant populations in a 30-inch row (excludes narrow row yields).⁴Averaged across treatments receiving only fertility + foliar protection.* Statistically significant when compared to lower population², to no management (no fertility and no foliar protection)³, or an increase over 30-inch rows⁴.

Table 12. Grain yield of twenty commercial corn hybrids as influenced by different planting populations and agronomic managements in a 30-inch row at three sites in IL in 2023. Grain yield is presented at 15.5% moisture. Presented data is averaged across the twenty hybrids evaluated.

Main Effect	Management Factor		Trial Location			Three-Site Average*	
			Nashville (Southern IL)	Champaign (East-central IL)	Yorkville (Northern IL)		
bushels per acre †							
Population	34,000		193	267 ^A	281	247	
	42,000		191	265 ^B	281	246	
Fertility	None		188 ^B	263 ^B	277 ^B	243 ^B	
	Broadcast P&K		196 ^A	269 ^A	286 ^A	251 ^A	
Foliar Protection	None		190 ^B	264 ^B	277 ^B	244 ^B	
	R1 Fung/Ins		195 ^A	269 ^A	285 ^A	250 ^A	
Population x Fertility	Pop.	Fertility					
	34,000	None	187 ^C	265 ^B	275 ^D	243 ^C	
	34,000	Broadcast P&K	199 ^A	269 ^A	287 ^A	252 ^A	
	42,000	None	189 ^C	261 ^C	278 ^C	243 ^C	
	42,000	Broadcast P&K	193 ^B	269 ^A	284 ^B	249 ^B	
Population x Foliar Protection	Pop.	Foliar Protection					
	34,000	None	192 ^A	265	277	245	
	34,000	R1 Fung/Ins	194 ^A	269	286	250	
	42,000	None	187 ^B	262	278	243	
	42,000	R1 Fung/Ins	195 ^A	268	285	249	
Fertility x Foliar Protection	FP	Fertility					
	None	None	185	261	273	240 ^D	
	None	Broadcast P&K	194	267	282	248 ^B	
	R1 FI	None	192	266	281	246 ^C	
	R1 FI	Broadcast P&K	198	271	290	253 ^A	
Population x Fertility x Foliar Protection	Pop.	FP	Fertility				
	34,000	None	None	186	263	270 ^E	239
	34,000	None	Brd. P&K	198	268	284 ^B	250
	34,000	R1 FI	None	189	268	281 ^C	246
	34,000	R1 FI	Brd. P&K	200	271	290 ^A	254
	42,000	None	None	184	259	276 ^D	240
	42,000	None	Brd. P&K	191	265	279 ^C	246
	42,000	R1 FI	None	194	264	281 ^C	247
	42,000	R1 FI	Brd. P&K	196	272	289 ^A	252

† Data is averaged across twenty hybrids and uppercase letters represent significant differences between main effects at the 0.05 significance level while lowercase letters represent significant differences at the 0.1 level.