Illinois Corn Management Yield Potential

2022 Hybrid Yield Report

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2022 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 2022, 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; 16 May), Champaign, IL (40°03'50"N, 88°14'11"W; 20 May), and Yorkville, IL (41°35'02"N, 88°24'34"W; 24 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 (8 oz per acre), followed by postemergence applications of Laudis (3 oz per acre; Bayer), Atrazine (24 oz per acre), Roundup Powermax 3 (30 oz per acre; Bayer), Diflexx (8 oz per acre; Bayer), and Zidua SC (2 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 P_2O_5 per acre as MicroEssentials SZ (MESZ; 12-40-0-10S-1Zn) and 60 lbs K_2O per acre as Potash (MOP; 0-0-60) applied broadcast incorporated before planting on 16 May, 20 May, 24 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 21 July, 28 July, and 29 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

The growing season started wet with frequent precipitation events during the months of April and early May, resulting in saturated soils and delayed planting for the state (Table 5). The month of May ended with near-normal precipitation while June was very dry (1.9, 3.9 and 1.6 inches below average at Nashville, Champaign, and Yorkville, respectively), resulting in a moderate drought during the vegetative growth stages. However, during August, plots received adequate rainfall and cool nights during seed fill, resulting in high seed weights and final yields that were at the expected levels for these regions.

Table 1. Hybrid Entries and Distribution

Brand	RM	Hybrid	Nashville	Champaign	Yorkville
Channel	106	206-16SSPRIB			X
Channel	110	210-46VT2PRIB	X		
Channel	112	212-52SSPRIB		X	X
Channel	114	214-22STXRIB		X	X
Channel	114	214-78DGVT2PRIB	X	X	
Channel	117	217-01VT2PRIB	X		
Stone	110	1103SS		X	X
Stone	111	1132TRE	X		
Stone	113	1303SP		X	X
Stone	113	1332SS		X	X
Stone	114	1403TRE	X		
Stone	118	1812DP	X		
Dekalb	105	DKC105-33			X
Dekalb	107	DKC107-33			X
Dekalb	111	DKC111-33			X
Dekalb	111	DKC111-35	X	X	
Dekalb	112	DKC62-69			X
Dekalb	112	DKC62-70	X	X	
Dekalb	116	DKC66-06	X	X	
Dekalb	117	DKC67-94	X	X	
Golden Harvest	106	G06A27-5122			X
Golden Harvest	107	G07G73-5122	X	X	X
Golden Harvest	108	G08R52-3220			X
Golden Harvest	109	G09T26-3120	X	X	X
Golden Harvest	110	G10L16-5222A	X	X	X
Golden Harvest	110	G10D21-5332	X	X	X
Golden Harvest	111	G11V76-5122	X	X	X
Golden Harvest	112	G12S75-5122	X	X	X
Golden Harvest	113	G13P84-3120	X	X	X
Golden Harvest	115	G15J91-3220	X	X	X
Golden Harvest	116	G16Q82-3120A	X	X	
Golden Harvest	117	G17A81-3220	X	X	

Table 2. Preplant soil test levels for trial sites across IL in 2022.

Location	OM	CEC	pH	P	K	Ca	Mg	S	Zn
	%	meq/100g		---------- ppm ----------					
Nashville	2.8	11.3	6.2	23	98	1633	126	8	1
Champaign	3.3	18.7	6.5	18	107	2624	456	6	1
Yorkville	5.7	27.1	5.9	19	129	3220	666	8	3

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 2022.

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_2O_5	K_2O	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

[1]All four treatments were replicated in a 30-inch row with plant populations of 34,000 or 42,000. 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 2022.

	Precipitation (inches)		Temperature (°F)	
Month	2022	Normal[1]	2022	Normal
		Nashville		
April	5.5	5.0	56	57
May	3.3	5.1	69	66
June	2.4	4.3	78	75
July	6.6	3.8	80	78
August	2.4	3.3	76	76
September	1.0	3.6	69	69
Total	21.2	25.1	-	-
		Champaign		
April	3.2	4.0	50	53
May	3.2	5.0	66	63
June	0.8	4.7	75	72
July	2.4	4.4	76	75
August	4.9	3.5	73	74
September	4.6	3.3	67	67
Total	19.1	24.9	-	-
		Yorkville		
April	4.3	3.2	45	49
May	4.1	4.1	63	60
June	2.4	4.0	71	70
July	3.1	3.4	72	72
August	8.3	3.6	70	70
September	2.0	3.2	63	63
Total	24.2	21.5	-	-

[1]Monthly total precipitation and average temperature during the production season at Nashville, Champaign, and Yorkville, IL in 2022 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 2022.

One or the Other, Fertility or Foliar Protection

Hybrids at all three sites resulted in positive responses to management of fertility or foliar protection, but when applied in combination there was no additive nor synergistic response to management at Nashville and Yorkville, with a minor additive response at Champaign (Tables 7, 9, and 11). Preplant soil tests at each site for P and K were on the thresholds of critical levels calling for fertility applications, and the average response to fertility in a 30-inch row was greatest at Nashville (+14.7 bushels) which had the lowest soil K (Table 2). The higher organic matter sites of Champaign and Yorkville resulted in average responses to fertility of 9.2 and 10.5 bushels per acre, respectively (Tables 9 and 11).

The Nashville site also resulted in the highest average response to foliar protection (+12.7 bushels), followed by Champaign (+6.8 bushels), and Yorkville (+5.3 bushels). The dry June at these sites reduced the infection and development of foliar diseases, resulting in extended late-season leaf health, and a below-average response to foliar protection (Figure 2).

With high fertilizer prices and reduced disease pressure, economic returns to fertilizer or foliar protection at these sites was dependent upon selection of a management-responsive hybrid.

Figure 2. Low foliar disease presence and extended plant health during grain-fill, resulting in high kernel set and heavy ear weights.

Minimal Response to Plant Population

Increasing planting density in a 30-inch row resulted in minimal influence on grain yields, with a range of -1 to +2 bushels per acre across the three locations (Tables 7, 9, and 11). There was a 10 bushel per acre increase in yield when planting density was higher in a 20-inch row at Champaign, but this response was not observed at Nashville or Yorkville. The drier weather across the state resulted in decreased water availability, where higher populations with more plants per land area were likely to be transpiring at greater rates, increasing their water use and resulting in no net yield gain to additional plants per row.

Narrowing the row from 30-inch to 20-inch increased yield at all three sites, with the average response to narrow rows increasing from the south to the north (Tables 7, 9, and 11).

The Primary Management Decision of 2022 was Hybrid Selection

Hybrid selection resulted in the greatest differences in grain yields across the state, with an average range of 61 bushels at Nashville (DKC66-06 highest average yield at 261 bushels per acre), 49 bushels at Champaign (214-78DGVT2PRIB highest average yield at 284 bushels per acre), and 40 bushels at Yorkville (212-52SSPRIB highest average yield at 274 bushels per acre).

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

			Hybrid Average[1]		Treatment Yields (bushels per acre)[2]									
					30-inch Row								20-inch Row	
Brand	RM	Hybrid	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	210-46VT2PRIB	12.7	232	226	235	237	236	221	227	226	220	253	235
Channel	114	214-78DGVT2PRIB	15.9	248	233	250	254	248	230	263	238	250	254	264
Channel	117	217-01VT2PRIB	15.4	253	240	240	240	244	246	258	264	254	264	276
Stone	111	1132TRE	11.8	233	230	236	229	226	220	213	226	226	256	266
Stone	114	1403TRE	15.4	236	238	227	239	234	231	225	246	236	247	236
Stone	118	1812DP	17.0	259	250	264	253	263	257	256	253	265	262	267
Dekalb	111	DKC111-35	13.8	245	241	245	253	239	221	238	259	251	254	250
Dekalb	112	DKC62-70	14.6	236	225	238	246	251	222	225	238	236	239	236
Dekalb	116	DKC66-06	15.9	261	244	286	279	268	232	272	264	253	261	252
Dekalb	117	DKC67-94	16.2	229	219	228	225	222	217	199	233	232	267	250
Golden Harvest	107	G07G73-5122	14.0	201	191	202	198	200	192	213	199	211	184	224
Golden Harvest	109	G09T26-3120	15.1	227	211	225	214	232	214	232	226	217	251	244
Golden Harvest	110	G10L16-5222A	13.7	228	223	237	234	234	213	217	228	225	233	236
Golden Harvest	110	G10D21-5332	13.2	218	207	219	216	235	198	214	204	221	226	241
Golden Harvest	111	G11V76-5122	14.1	217	191	224	205	234	196	234	208	235	228	215
Golden Harvest	112	G12S75-5122	14.4	223	200	215	217	243	208	249	235	213	230	218
Golden Harvest	113	G13P84-3120	15.2	222	203	216	223	227	205	237	215	217	241	237
Golden Harvest	115	G15J91-3220	17.5	229	207	244	220	252	201	234	232	224	256	223
Golden Harvest	116	G16Q82-3120A	16.4	228	223	226	227	228	219	238	236	232	220	228
Golden Harvest	117	G17A81-3220	16.1	219	207	225	213	226	218	228	226	210	218	224
		LSD ($P \leq 0.10$)	0.5	11	20	22	19	19	21	24	24	24	29	34
		Mean	14.9	232	220^{C}	234^{B}	231^{B}	237^{AB}	218^{C}	234^{B}	233^{B}	231^{B}	242^{A}	241^{A}
		Range	12-18	201-261	191-250	202-286	198-279	200-268	192-257	199-272	199-265	210-265	184-267	215-276

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

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]	- 1.7	+ 14.7*	+ 12.7*	+ 15.1*	+ 7.4*

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

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

			Hybrid Average[1]		Treatment Yields (bushels per acre)[2]									
					30-inch Row								20-inch Row	
Brand	RM	Hybrid	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	112	212-52SSPRIB	17.2	251	245	244	254	246	241	245	248	255	269	269
Channel	114	214-22STXRIB	20.2	247	236	246	238	246	225	241	246	243	272	275
Channel	114	214-78DGVT2PRIB	20.0	284	275	279	272	280	282	285	278	294	288	307
Stone	110	1103SS	18.7	254	244	257	248	251	246	262	257	259	259	258
Stone	111	1303SP	20.0	276	261	277	267	278	263	273	273	277	283	309
Stone	113	1332SS	19.4	267	259	267	255	265	259	266	263	272	284	284
Dekalb	111	DKC111-35	18.2	261	253	260	255	266	254	259	269	263	254	276
Dekalb	112	DKC62-70	18.6	259	244	254	253	263	255	245	263	260	290	267
Dekalb	116	DKC66-06	21.6	273	262	274	263	280	256	277	274	277	260	310
Dekalb	117	DKC67-94	20.8	264	250	265	255	267	247	266	258	266	279	291
Golden Harvest	107	G07G73-5122	17.1	235	226	226	225	232	225	237	234	242	241	260
Golden Harvest	109	G09T26-3120	16.9	244	233	245	239	244	228	238	242	249	254	270
Golden Harvest	110	G10L16-5222A	19.3	269	265	274	265	274	259	268	271	272	268	279
Golden Harvest	110	G10D21-5332	17.8	249	242	243	240	247	236	242	245	241	270	286
Golden Harvest	111	G11V76-5122	18.1	258	244	255	249	258	247	253	251	263	282	281
Golden Harvest	112	G12S75-5122	19.3	258	245	247	255	260	242	252	260	263	281	272
Golden Harvest	113	G13P84-3120	19.9	240	227	233	231	244	225	245	236	241	247	271
Golden Harvest	115	G15J91-3220	20.7	270	258	272	262	273	257	269	264	275	289	278
Golden Harvest	116	G16Q82-3120A	20.4	254	240	258	247	255	244	248	253	259	264	274
Golden Harvest	117	G17A81-3220	20.1	237	227	235	234	235	223	235	233	237	253	253
		LSD ($P \leq 0.10$)	0.5	5	12	12	11	12	14	14	14	15	17	19
		Mean	19.2	258	247^{G}	255^{E}	250^{F}	258^{CD}	246^{G}	255^{E}	256^{DE}	260^{C}	269^{B}	279^{A}
		Range	17-22	235-284	226-275	226-279	225-272	232-280	223-282	235-285	233-278	237-294	241-289	253-310

[1]Average moisture and yield across ten levels of agronomic management. Yields are adjusted to 15.5% moisture.
[2]Values 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]	+ 1.6*	+9.2*	+6.8*	+13.0*	+14.6*

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

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	106	206-16SSPRIB	20.0	244	233	250	231	238	239	242	242	236	264	268
Channel	112	212-52SSPRIB	21.0	274	268	282	274	266	269	282	268	272	279	282
Channel	114	214-22STXRIB	22.5	251	244	243	248	248	236	240	251	247	276	278
Stone	110	1103SS	21.4	261	243	265	243	261	253	257	267	261	272	287
Stone	113	1303SP	21.6	268	260	271	259	264	257	256	276	268	281	289
Stone	113	1332SS	21.0	253	240	255	239	254	246	251	248	254	281	263
Dekalb	105	DKC105-33	18.8	263	252	268	243	262	247	276	262	270	273	275
Dekalb	107	DKC107-33	20.2	255	244	249	246	251	241	248	258	254	270	285
Dekalb	111	DKC111-33	21.6	271	271	273	262	273	267	268	279	263	264	285
Dekalb	112	DKC62-69	21.9	250	243	254	232	254	242	248	253	250	257	268
Golden Harvest	106	G06A27-5122	20.2	234	226	237	219	237	217	235	218	231	259	257
Golden Harvest	107	G07G73-5122	19.7	257	250	252	241	261	255	256	256	253	269	279
Golden Harvest	108	G08R52-3220	20.2	239	228	238	234	240	225	232	238	235	261	261
Golden Harvest	109	G09T26-3120	20.8	239	230	245	225	241	224	232	240	248	258	251
Golden Harvest	110	G10L16-5222A	19.9	272	259	281	261	278	255	271	274	277	283	281
Golden Harvest	110	G10D21-5332	21.7	252	247	247	251	249	246	249	250	260	246	270
Golden Harvest	111	G11V76-5122	22.1	268	257	274	260	277	249	266	266	258	286	285
Golden Harvest	112	G12S75-5122	22.7	271	272	285	261	273	260	276	274	260	273	275
Golden Harvest	113	G13P84-3120	22.7	243	231	240	230	240	231	244	243	251	260	261
Golden Harvest	115	G15J91-3220	24.6	254	239	248	250	252	226	256	256	253	278	283
		LSD ($P \leq 0.10$)	0.3	10	19	16	17	18	21	19	18	17	20	NS
		Mean	21.1	256	247^{C}	258^{B}	246^{C}	256^{B}	244^{C}	254^{B}	256^{B}	255^{B}	269^{A}	274^{A}
		Range	19-25	234-274	226-271	237-285	219-274	237-278	217-269	232-282	218-279	231-277	246-286	251-289

[1]Average moisture and yield across ten levels of agronomic management. Yields are adjusted to 15.5% moisture.
[2]Values 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	+ 10.5*	+5.3*	+ 10.0*	+ 16.3*

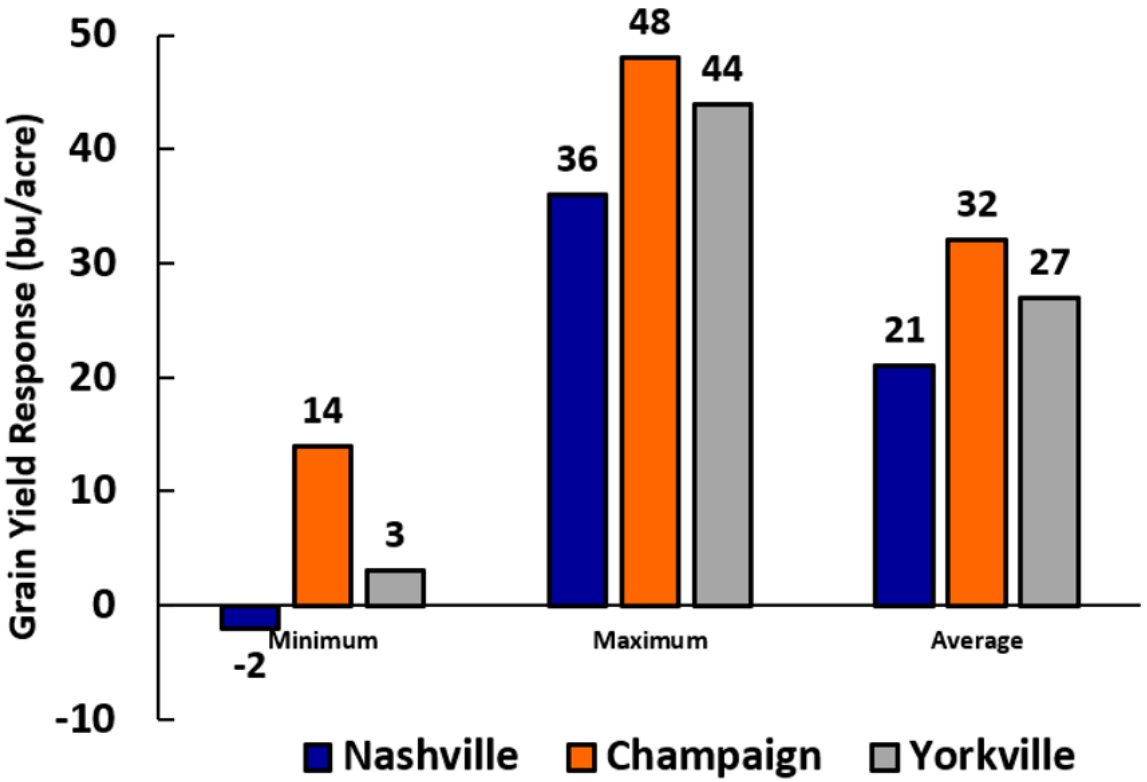
[1]Average yield response to management factor across twenty hybrids. Yields are adjusted to 15.5% moisture and presented values are the average of four replications.
[2]Averaged across all four management levels of none, fertility, foliar protection, and fertility + foliar protection in a 30-inch row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

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 2022. Grain yield is presented at 15.5% moisture. Presented data is averaged across the twenty hybrids evaluated.

Main Effect	Management Factor		Trial Location: Nashville (southern IL)	Trial Location: Champaign (east-central IL)	Trial Location: Yorkville (northern IL)	Three-Site Average
			bushels per acre †			
Population	34,000		231	253	252	248
	42,000		229	254	252	248
Fertility	None		226^{B}	250^{B}	248^{B}	244^{B}
	Broadcast P&K		234^{A}	257^{A}	256^{A}	252^{A}
Foliar Protection	None		227^{B}	251^{B}	251^{B}	246^{B}
	R1 Fung/Ins		233^{A}	256^{A}	253^{A}	250^{A}
	Pop.	**Fertility**				
Population x Fertility	34,000	None	226	249	246^{C}	243^{B}
	34,000	Broadcast P&K	236	257	257^{A}	253^{A}
	42,000	None	225	251	250^{B}	245^{B}
	42,000	Broadcast P&K	232	258	255^{A}	251^{A}
	Pop.	**Foliar Protection**				
Population x Foliar Protection	34,000	None	227	251^{C}	252^{AB}	246^{B}
	34,000	R1 Fung/Ins	234	254^{B}	251^{B}	249^{A}
	42,000	None	226	252^{C}	249^{B}	245^{B}
	42,000	R1 Fung/Ins	232	258^{A}	256^{A}	251^{A}
	FP	**Fertility**				
Fertility x Foliar Protection	None	None	219^{B}	246^{D}	246^{C}	240^{C}
	None	Broadcast P&K	234^{A}	255^{B}	256^{A}	251^{A}
	R1 FI	None	232^{A}	253^{C}	251^{B}	248^{B}
	R1 FI	Broadcast P&K	234^{A}	259^{A}	256^{A}	253^{A}
	Pop.	**FP**	**Fertility**			
Population x Fertility x Foliar Protection	34,000	None	None	221	247	247^{B}	241^{C}
	34,000	None	Brd. P&K	234	255	258^{A}	252^{A}
	34,000	R1 FI	None	231	250	246^{B}	245^{B}
	34,000	R1 FI	Brd. P&K	237	258	256^{A}	253^{A}
	42,000	None	None	218	246	244^{B}	239^{C}
	42,000	None	Brd. P&K	233	255	254^{A}	250^{A}
	42,000	R1 FI	None	233	256	256^{A}	251^{A}
	42,000	R1 FI	Brd. P&K	231	260	255^{A}	252^{A}

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

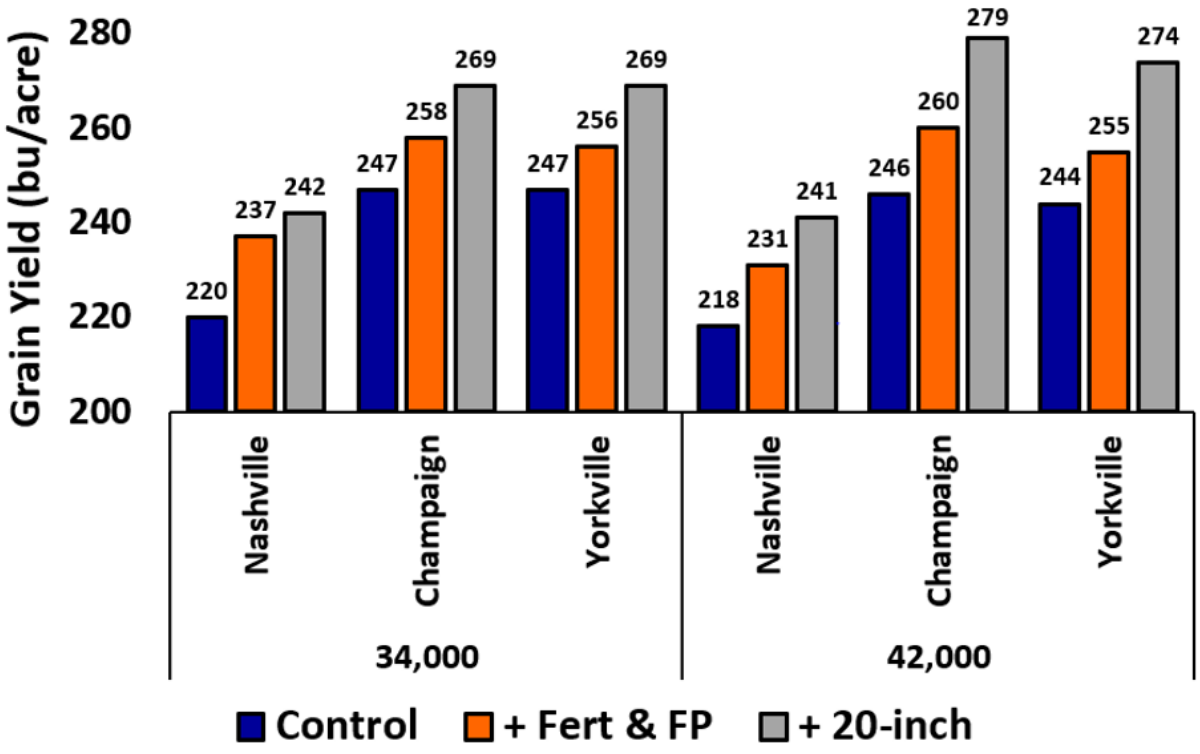
Standard vs. Progressive



- **Yorkville had greatest range in hybrid response (41 bu/acre min vs max)**
- **Champaign resulted in highest response to progressive management (min, max and average)**
- **Hybrid is the most important decision a grower must make**

Presented data is the yield difference of hybrids planted at 34,000 ppa in a 30-inch row with no management compared to 42,000 ppa in a 20-inch row with broadcast fertility and VT/R1 foliar protection

Low Pop for Narrow Rows?



- All sites responded to fertility and foliar protection
- Narrowing the row from 30-inch to 20-inch resulted in additional yield increases within respective planting population
- Narrow rows improve response to management (fertility)

Presented data is the average yields of 20 hybrids at each location