

2018 Soybean Management Yield Potential

Alison Vogel and Fred E. Below

Crop Physiology Laboratory, Department of Crop Sciences, University of Illinois

RESEARCH APPROACH:

Understanding soybean yield responses to foliar protection and increased fertility may help producers better position soybean varieties. The objective of this study is to identify ‘Offensive’ soybean varieties, or varieties with adaptability to high yield environments (i.e., responsive to crop management), and ‘Defensive’ soybean varieties, or varieties with acceptable yields in low yield environments (i.e., resilience to pests and diseases, and tolerance to nutrient deficiency). In our approach, ‘Offensive’ varieties are the genotypes that combine above-average yield increases from: (i) foliar protection [PROT, foliar protection (insecticide and fungicide) versus no-foliar protection], (ii) fertility [FERT, yield change between 0 and 187 lbs/acre of MicroEssentials S10 (N, P, & S)], and (iii) yield performance under the combination of both treatments (BOTH, yield with additional fertility and foliar protection). Conversely, varieties with high yield performance under no additional fertilizer or foliar protection (Control) and low yield response to foliar protection (low PROT) were considered ‘Defensive’ varieties.

The 2018 trial evaluated 61 soybean varieties from six different brands, and maturity groups ranging from 2.1 to 4.8 (Table 1). Thirty-six varieties were evaluated at Yorkville, Champaign, and Harrisburg. The trial was planted using a precision plot planter (SeedPro 360, ALMACO, Nevada, IA) at Harrisburg, IL (2 May 2018), Champaign, IL (16 May 2018), and Yorkville, IL (19 May 2018). Plots were 16 feet in length with 30-inch row spacing and two rows in width to achieve a final population of approximately 160,000 plants acre⁻¹. The foliar protection treatment was applied using a tractor mounted sprayer and consisted of an insecticide (Endigo® ZC; Lambda-cyhalothrin + Thiamethoxam) and fungicide (Trivapro™; Benzovindiflupyr + Azoxystrobin + Propiconazole) application at the R3 stage at a rate of 3.8 and 13.7 oz per acre, respectively. Application dates for foliar protection were 2 July 2018 (Harrisburg), 17 July 2018 (Champaign), and 25 July 2018 (Yorkville). The fertility treatment consisted of a premium MAP-based phosphorus fertilizer that also contained S, MicroEssentials S10 (MES10, 12-40-0-10S; The Mosaic Company, Plymouth, MN), applied at 187 lbs acre⁻¹ in a subsurface band 4 to 6 inches deep immediately prior to planting using a research-scale fertilizer toolbar to provide 22 lbs N, 75 lbs P₂O₅, and 18 lbs S per acre.

Plots were arranged in a split-plot RCB design with four replications. The main plot was fertility (n=2) and the split-plot was foliar protection (n= 2) and variety (n=36) randomly assigned within each treatment block. Data were analyzed using analysis of variance with the PROC MIXED procedure of SAS (Version 8, SAS Institute, Cary, NC) and means were separated using Fisher’s protected LSD test at the 0.10 level of significance. Variety, fertility, and foliar protection were considered fixed effects, while block and interactions with blocks were considered random effects. At maturity, yield (bu acre⁻¹) was measured with a plot combine and adjusted to constant moisture (i.e., 13% grain moisture concentration).

Table 1. The evaluation distribution of 61 soybean varieties at Yorkville, Champaign, and Harrisburg, IL in 2018. Varieties are arranged by brand name and maturity group.

Variety	Brand	Maturity Group	Yorkville	Champaign	Harrisburg
AG24X7	Asgrow	2.4	X		
AG24X9	Asgrow	2.4	X		
AG25X9	Asgrow	2.5	X		
AG27X7	Asgrow	2.7	X		
AG27X9	Asgrow	2.7	X		
AG28X9	Asgrow	2.8	X		
AG30X9	Asgrow	3.0	X	X	
AG32X8	Asgrow	3.2	X	X	
AG33X8	Asgrow	3.3	X	X	
AG34X6	Asgrow	3.4	X	X	
AG34X9	Asgrow	3.4	X	X	
AG36X6	Asgrow	3.6	X	X	X
AG37X9	Asgrow	3.7	X	X	X
AG39X7	Asgrow	3.9		X	X
AG41X8	Asgrow	4.1		X	X
AG42X6	Asgrow	4.2			X
AG42X9	Asgrow	4.2			X
AG44X6	Asgrow	4.4			X
AG46X6	Asgrow	4.6			X
AG48X9	Asgrow	4.8			X
R2C2674	Croplan	2.6	X		
RX3337	Croplan	3.3	X	X	
RX3556	Croplan	3.5	X	X	X
RX3896	Croplan	3.8	X	X	X
R2C4000	Croplan	4.0		X	X
RX4217s	Croplan	4.2		X	X
RX4316s	Croplan	4.3			X
S34XT69	Dyna-Gro	3.4	X	X	
S35XT97	Dyna-Gro	3.5	X	X	X
S36XT09	Dyna-Gro	3.6	X	X	X
S37XT28	Dyna-Gro	3.7	X	X	X
S37XS89	Dyna-Gro	3.7	X	X	X
S39XT68	Dyna-Gro	3.9		X	X
S41XS98	Dyna-Gro	4.1		X	X
S43XS27	Dyna-Gro	4.3			X
S44XS68	Dyna-Gro	4.4			X
S46XS87	Dyna-Gro	4.6			X
GH2537X	Golden Harvest	2.5	X		
GH2788X	Golden Harvest	2.7	X	X	
GH2981X	Golden Harvest	2.9	X		
GH3088X	Golden Harvest	3.0	X	X	
GH3195X	Golden Harvest	3.1	X	X	
GH3546X	Golden Harvest	3.5	X	X	X
GH3761X	Golden Harvest	3.7	X	X	X
GH3982X	Golden Harvest	3.9		X	X
GH4142X	Golden Harvest	4.1		X	X
GH4240XS	Golden Harvest	4.2		X	X
GH4307X	Golden Harvest	4.3			X
GH4524XS	Golden Harvest	4.5			X
NK21W8X	NK	2.1	X		
NK33D7X	NK	3.3	X	X	
NK34T2X	NK	3.4	X	X	
NK45J3X	NK	4.5			X
P24A80X	Pioneer	2.4	X		
P28T71X	Pioneer	2.8	X		
P31A22X	Pioneer	3.1	X	X	
P36A18X	Pioneer	3.6	X	X	X
P38A98X	Pioneer	3.8		X	X
P40A47X	Pioneer	4.0		X	X
P42A52X	Pioneer	4.2		X	X
P46A93X	Pioneer	4.6			X

Table 2. Pre-plant soil properties and Mehlich 3-extraction-based mineral test results from the 6 inch level for the Soybean Management Yield Potential trial conducted at Yorkville, Champaign, and Harrisburg IL in 2018.

Location	OM†	pH	CEC	P	K	Ca	Mg	S
	%		Meq/100g			ppm		
Yorkville	5.3	6	25.7	47	235	3144	550	10
Champaign	3	6	20	44	157	2448	453	10
Harrisburg	2.7	6.5	21.6	46	232	3021	426	6

† OM, Organic Matter; CEC, Cation Exchange Capacity.

Table 3. Precipitation and temperature during the production season at Yorkville, Champaign, and Harrisburg, IL in 2018 compared to the 30-year average (Avg.). Values were obtained from Illinois State Water Survey.

Month	Yorkville, IL				Champaign, IL				Harrisburg, IL			
	Precip. (in)		Temp. (°F)		Precip. (in)		Temp. (°F)		Precip. (in)		Temp. (°F)	
	2018	Avg.	2018	Avg.	2018	Avg.	2018	Avg.	2018	Avg.	2018	Avg.
May	6.5	4.3	67	61	4.2	4.9	72	63	5.0	5.1	73	66
June	7.1	4.3	71	70	7.3	4.3	75	72	6.1	4.5	78	75
July	1.9	4.7	72	74	3.2	4.7	75	75	3.1	3.8	78	78
August	2.8	4.1	71	72	4.0	3.9	75	73	5.0	3.0	76	77
Sept.	2.4	3.1	66	65	4.7	3.1	71	66	7.8	3.1	72	69

Table 4. Tests of fixed sources of variation on soybean grain yield conducted at Yorkville, Champaign, and Harrisburg, IL during 2018.

Source of variation	Yorkville	Champaign	Harrisburg
	<i>P > F</i>		
Genotype	<.0001	<.0001	<.0001
Fertility	0.0002	0.0492	0.5574
Geno. x Fert	0.0037	0.0001	0.0187
Foliar Protection	0.1763	<.0001	<.0001
Geno. x Foliar	0.0442	0.1188	0.8757
Fert. x Foliar	0.4112	0.8099	0.0037
Geno. x Fert. x Foliar	0.9752	0.1609	0.3064

YIELD RESULTS:

Soil pH, organic matter, and fertility levels were relatively adequate, allowing for growing conditions generally conducive to favorable grain yields (Table 2). The 2018 crop growing season experienced excessive rainfall in June across the state (Table 3). During the remainder of the growing season rainfall was similar to the 30-year average. Throughout the growing season temperatures were fairly consistent with the 30-year average, with the exception of May being relatively hot across locations and September in Champaign.

Location significantly affected grain yields (Table 4), with average yields of 90.6, 86.8, and 79.0 bu acre⁻¹ for Yorkville, Champaign, and Harrisburg, respectively (Tables 5 to 19). Foliar protection increased soybean yield at Champaign and Harrisburg, but did not increase yield at Yorkville due to dry conditions during July and August, and low disease and insect pressure. Unlike foliar protection, additional fertility increased grain yield in Yorkville. On average, foliar protection increased yield by +0.7, +6.9 and +3.5 bu acre⁻¹ at Yorkville, Champaign, and Harrisburg, respectively, while fertility additions altered yield by +1.6, -0.8, and +0.2 bu acre⁻¹ at these same sites (Figures 1 to 3). Additional fertility in combination with foliar protection generated the largest yield responses at Yorkville (+2.3 bu acre⁻¹) and Harrisburg (+3.7 bu acre⁻¹) compared to fertility or foliar protection alone. At Champaign, foliar protection alone resulted in the largest response at +6.9 bu acre⁻¹.

Across all three locations, varieties had significantly different grain yields. With standard management (no fertility additions or foliar protection) there was a yield range of 25, 28, and 20 bu acre⁻¹ from highest to lowest yielding varieties at Yorkville, Champaign, and Harrisburg, respectively. The greatest range in yield response among from varieties was from foliar protection at Harrisburg (36 bu acre⁻¹).

The highest yields recorded were 107.8, 103.4, and 91.7 bu acre⁻¹ at Yorkville, Champaign, and Harrisburg, respectively (varieties AG36X6, S41XS98, and AG42X6 and P46A93X, respectively). In Yorkville, the top five yields were from the following varieties (without repeating a variety): AG36X6 (107.8 bu acre⁻¹), RX3896 (104.9 bu acre⁻¹), AG32X8 (101.9 bu acre⁻¹), S34XT69 (101.9 bu acre⁻¹), AG37X9 (101.3 bu acre⁻¹), RX3337 (101.3 bu acre⁻¹), and S37XT28 (100.2 bu acre⁻¹). Moving down the state of Illinois, the top five yields at Champaign were achieved by the following varieties: S41XS98 (103.4 bu acre⁻¹), S39XT68 (100.5 bu acre⁻¹), AG37X9 (100.4 bu acre⁻¹), AG36X6 (100.4 bu acre⁻¹), GH3546X (99.7 bu acre⁻¹), AG32X8 (98.6 bu acre⁻¹), AG36X6 (98.6 bu acre⁻¹), and S36XT09 (97.7 bu acre⁻¹). Harrisburg had the highest overall yields achieved by: AG42X6 (91.7 bu acre⁻¹), P46A93X (91.7 bu acre⁻¹), AG42X6 (91.4 bu acre⁻¹), AG41X8 (90.7 bu acre⁻¹), S39XT68 (88.4 bu acre⁻¹), S44XS68 (88.4 bu acre⁻¹), and S37XS89 (88.0 bu acre⁻¹).

Yield responses to additional fertility among individual varieties compared to the untreated control at all locations ranged from -11.8 to +11.7 bu acre⁻¹ indicating different genetic sensitivity to soil nutrient availability. Foliar protection application yield-responses ranged from -12.5 to +19.7 bu acre⁻¹ and when applied in combination with additional fertility the yield changes ranged from -13.9 to +14.3 bu acre⁻¹.

The differences observed in yield performance among varieties and their interaction with agronomic management across environments highlights the importance of soybean genetic characterization in response to different agronomic management factors. These characterizations are summarized in the second half of this report.

Table 5. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and no foliar protection application (**Control**) at **Yorkville, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	RX3337	101.3	19	P28T71X	90.5
2	AG36X6	100.2	20	P36A18X	89.1
3	S37XS89	99.8	21	NK34T2X	89.0
4	AG32X8	98.3	22	GH3195X	88.9
5	S37XT28	97.9	23	R2C2674	88.1
6	AG34X6	97.8	24	P24A80X	86.5
7	S34XT69	97.1	25	GH3088X	86.1
8	AG33X8	97.0	26	AG28X9	85.9
9	P31A22X	96.9	27	NK33D7X	85.6
10	S36XT09	96.0	28	AG27X9	85.3
11	RX3896	94.4	29	GH3761X	81.0
12	RX3556	94.3	30	GH2537X	79.2
13	S35XT97	93.7	31	AG27X7	78.5
14	AG37X9	93.6	32	GH2788X	78.2
15	AG30X9	93.1	33	NK21W8X	78.1
16	GH3546X	92.4	34	AG24X7	77.0
17	AG34X9	92.0	35	AG25X9	76.5
18	GH2981X	91.8	36	AG24X9	75.6
Overall Mean		89.6	LSD ($P \leq 0.10$)		10.2

Table 6. Ranked grain yield of 36 commercial soybean varieties when grown with 187 lbs acre⁻¹ of MicroEssentials S10 and no foliar protection application at **Yorkville, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	AG36X6	107.8	19	NK34T2X	92.3
2	S34XT69	101.9	20	P28T71X	90.8
3	AG32X8	99.3	21	P36A18X	90.6
4	S37XS89	98.4	22	NK33D7X	90.3
5	S37XT28	97.6	23	GH2981X	90.0
6	S35XT97	97.4	24	R2C2674	89.1
7	S36XT09	97.3	25	GH3088X	86.7
8	AG34X9	96.8	26	P24A80X	86.4
9	AG33X8	96.7	27	AG25X9	86.2
10	AG30X9	95.9	28	AG24X9	84.7
11	RX3556	95.7	29	GH2788X	84.5
12	RX3896	95.4	30	GH3546X	84.5
13	RX3337	94.8	31	GH3761X	82.1
14	AG37X9	94.0	32	AG27X9	81.5
15	P31A22X	93.7	33	NK21W8X	80.2
16	GH3195X	93.6	34	GH2537X	76.9
17	AG34X6	93.4	35	AG24X7	75.8
18	AG28X9	92.9	36	AG27X7	75.6
Overall Mean		90.9	LSD ($P \leq 0.10$)		9

Table 7. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Yorkville, IL** in 2018.

Rank	Variety	Grain yield	Rank	Variety	Grain yield
		bu acre ⁻¹			bu acre ⁻¹
1	AG36X6	102.6	19	S36XT09	90.2
2	RX3896	102.5	20	GH3546X	89.8
3	AG37X9	100.9	21	P28T71X	89.7
4	S37XT28	100.2	22	GH3088X	88.4
5	AG32X8	98.4	23	NK34T2X	88.3
6	AG34X6	98.2	24	R2C2674	87.4
7	RX3337	97.1	25	P24A80X	86.6
8	AG30X9	96.5	26	AG27X9	86.2
9	RX3556	95.1	27	P31A22X	84.4
10	AG33X8	94.1	28	GH3195X	83.8
11	S37XS89	94.1	29	GH2537X	83.7
12	NK33D7X	93.3	30	AG28X9	83.7
13	S34XT69	93.0	31	GH2788X	81.2
14	P36A18X	92.4	32	AG27X7	80.6
15	AG34X9	92.0	33	AG24X9	79.8
16	S35XT97	91.9	34	NK21W8X	79.7
17	GH3761X	91.8	35	AG24X7	76.7
18	GH2981X	91.7	36	AG25X9	75.5
Overall Mean		90.0	LSD ($P \leq 0.10$)		10.6

Table 8. Ranked grain yield of 36 commercial soybean varieties when grown at 187 lbs acre⁻¹ of MicroEssentials S10 and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Yorkville, IL** in 2018.

Rank	Variety	Grain yield	Rank	Variety	Grain yield
		bu acre ⁻¹			bu acre ⁻¹
1	RX3896	104.9	19	S36XT09	92.0
2	AG32X8	101.9	20	P24A80X	91.5
3	S34XT69	101.7	21	NK34T2X	90.8
4	AG37X9	101.3	22	P28T71X	90.5
5	AG36X6	101.2	23	GH3088X	90.2
6	AG34X6	99.8	24	AG28X9	89.1
7	S37XT28	99.4	25	AG27X9	88.3
8	AG34X9	98.7	26	R2C2674	88.0
9	RX3337	96.6	27	GH2537X	87.3
10	AG30X9	95.6	28	AG24X9	87.2
11	S37XS89	94.6	29	AG25X9	86.4
12	S35XT97	94.5	30	GH3761X	86.4
13	P36A18X	94.2	31	P31A22X	83.0
14	RX3556	94.1	32	GH3546X	82.7
15	AG33X8	93.6	33	AG24X7	81.6
16	GH2981X	93.6	34	AG27X7	81.5
17	GH3195X	93.3	35	GH2788X	81.1
18	NK33D7X	92.6	36	NK21W8X	80.9
Overall Mean		91.9	LSD ($P \leq 0.10$)		9.7

Table 9. Grain yield of 36 commercial soybean varieties in response to fertilizer and foliar protection at **Yorkville, IL** in 2018. Within a seed brand, varieties are sorted by maturity group.

Variety	Foliar Protection			
	Without		With	
	Fertilizer (lbs acre ⁻¹)			
	0	187	0	187
Asgrow	bushels/acre			
AG24X7	77.0	75.8	76.7	81.6
AG24X9	75.6	84.7	79.8	87.2
AG25X9	76.5	86.2	75.5	86.4
AG27X7	78.5	75.6	80.6	81.5
AG27X9	85.3	81.5	86.2	88.3
AG28X9	85.9	92.9	83.7	89.1
AG30X9	93.1	95.9	96.5	95.6
AG32X8	98.3	99.3	98.4	101.9
AG33X8	97.0	96.7	94.1	93.6
AG34X6	97.8	93.4	98.2	99.8
AG34X9	92.0	96.8	92.0	98.7
AG36X6	100.2	107.8	102.6	101.2
AG37X9	93.6	94.0	100.9	101.3
Croplan				
R2C2674	88.1	89.1	87.4	88.0
RX3337	101.3	94.8	97.1	96.6
RX3556	94.3	95.7	95.1	94.1
RX3896	94.4	95.4	102.5	104.9
Dyna-Gro				
S34XT69	97.1	101.9	93.0	101.7
S35XT97	93.7	97.4	91.9	94.5
S36XT09	96.0	97.3	90.2	92.0
S37XS89	99.8	98.4	94.1	94.6
S37XT28	97.9	97.6	100.2	99.4
Golden Harvest				
GH2537X	79.2	76.9	83.7	87.3
GH2788X	78.2	84.5	81.2	81.1
GH2981X	91.8	90.0	91.7	93.6
GH3088X	86.1	86.7	88.4	90.2
GH3195X	88.9	93.6	83.8	93.3
GH3546X	92.4	84.5	89.8	82.7
GH3761X	81.0	82.1	91.8	86.4
NK				
NK21W8X	78.1	80.2	79.7	80.9
NK33D7X	85.6	90.3	93.3	92.6
NK34T2X	89.0	92.3	88.3	90.8
Pioneer				
P24A80X	86.5	86.4	86.6	91.5
P28T71X	90.5	90.8	89.7	90.5
P31A22X	96.9	93.7	84.4	83.0
P36A18X	89.1	90.6	92.4	94.2
Overall Mean	89.6	90.9	90.0	91.8
Range	76-101	76-108	76-103	81-105
LSD ($P \leq 0.10$)	10.2	9.0	10.6	9.7

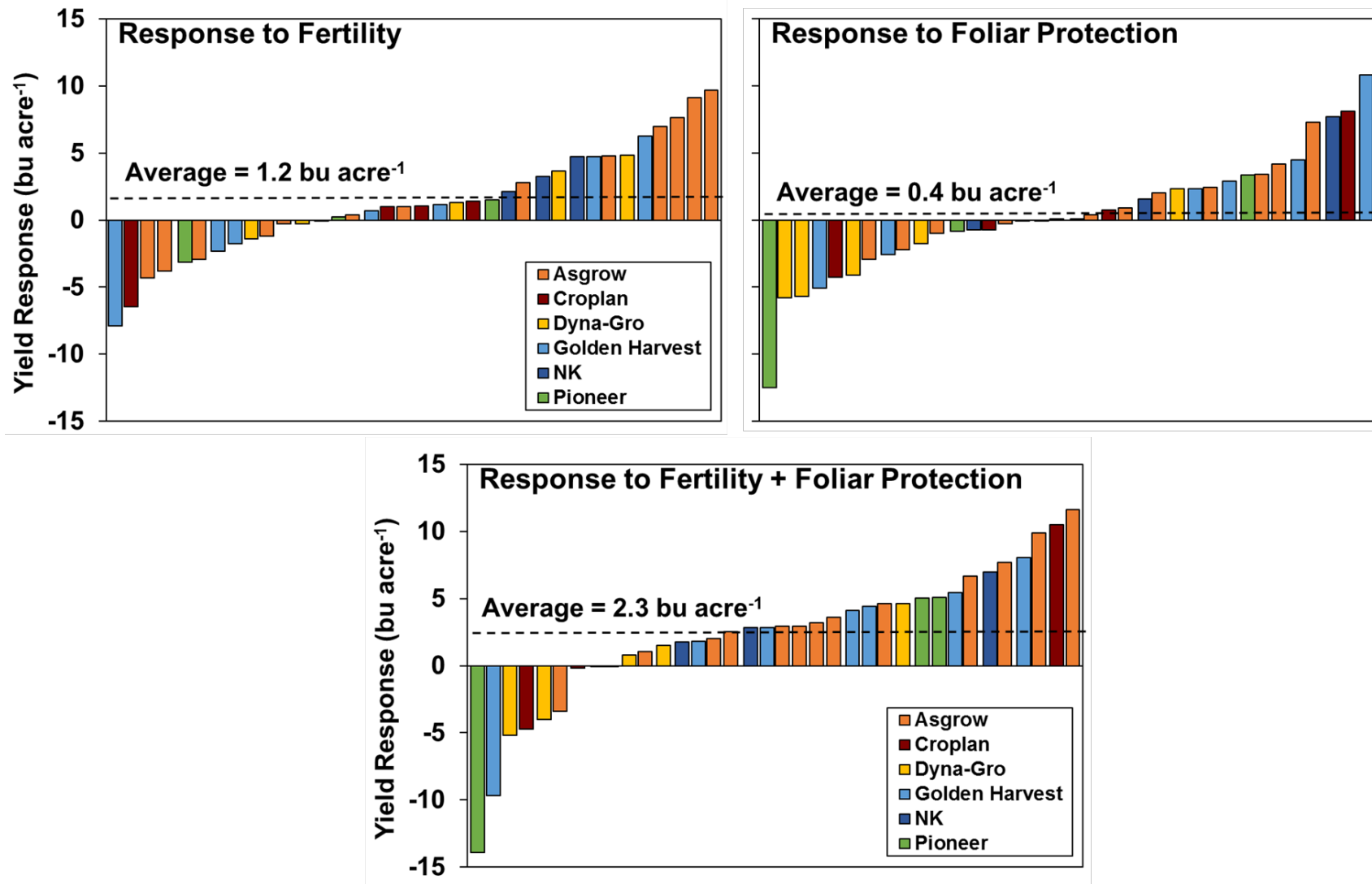


Figure 1. Yield response to fertility (yield difference between 187 and 0 lbs acre⁻¹ of MES10), foliar protection [yield difference between foliar protection (insecticide and fungicide) and no-foliar protection], and the combination of fertility and foliar protection (yield difference between 187 lbs acre⁻¹ of MES10 with foliar protection and control) for soybean grown at **Yorkville**, IL in 2018.

Table 10. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and no foliar protection application (**Control**) at **Champaign, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	AG36X6	93.8	19	GH3761X	84.2
2	S41XS98	91.0	20	AG34X9	83.3
3	S34XT69	90.9	21	GH4240XS	82.4
4	AG32X8	90.8	22	R2C4000	82.1
5	AG37X9	89.9	23	NK34T2X	82.1
6	RX3556	89.6	24	AG33X8	81.8
7	S35XT97	89.5	25	RX3896	81.6
8	S37XS89	89.2	26	GH3982X	81.1
9	NK33D7X	88.5	27	AG30X9	80.8
10	AG34X6	88.5	28	RX3337	80.7
11	S39XT68	88.1	29	GH3088X	80.4
12	S37XT28	87.9	30	P36A18X	79.4
13	S36XT09	87.0	31	P42A52X	77.1
14	P40A47X	86.7	32	GH4142X	77.0
15	GH3546X	86.5	33	GH2788X	74.7
16	P38A98X	86.1	34	RX4217s	73.5
17	AG41X8	85.2	35	GH3195X	72.5
18	AG39X7	84.4	36	P31A22X	66.0
Overall Mean		83.7	LSD ($P \leq 0.10$)		9.3

Table 11. Ranked grain yield of 36 commercial soybean varieties when grown with 187 lbs acre⁻¹ of MicroEssentials S10 and no foliar protection application at **Champaign, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	AG36X6	96.9	19	AG39X7	82.8
2	RX3556	92.4	20	S37XT28	82.7
3	RX3337	92.3	21	AG33X8	82.5
4	P38A98X	92.2	22	AG32X8	82.4
5	AG34X6	91.2	23	GH3761X	81.9
6	S35XT97	90.8	24	AG41X8	81.9
7	GH4240XS	89.6	25	GH4142X	80.2
8	S41XS98	89.5	26	GH3982X	79.0
9	S37XS89	88.1	27	P42A52X	78.4
10	S39XT68	87.7	28	R2C4000	78.0
11	AG37X9	86.3	29	NK33D7X	76.7
12	S36XT09	86.1	30	NK34T2X	76.7
13	P40A47X	84.7	31	AG30X9	76.0
14	AG34X9	84.2	32	P36A18X	75.1
15	S34XT69	84.2	33	RX4217s	72.8
16	GH3088X	84.0	34	GH3195X	72.7
17	GH3546X	84.0	35	GH2788X	70.2
18	RX3896	83.4	36	P31A22X	65.4
Overall Mean		82.9	LSD ($P \leq 0.10$)		9.1

Table 12. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Champaign, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	GH3546X	98.9	19	GH3982X	91.0
2	AG32X8	98.6	20	S35XT97	89.8
3	AG36X6	98.6	21	GH4240XS	89.3
4	S41XS98	98.6	22	RX3896	89.0
5	S39XT68	97.6	23	GH3088X	88.9
6	AG37X9	96.7	24	S37XT28	88.2
7	RX3556	95.8	25	AG34X6	87.8
8	AG41X8	95.6	26	AG34X9	87.8
9	S37XS89	95.0	27	NK33D7X	87.2
10	S36XT09	94.6	28	R2C4000	86.9
11	NK34T2X	93.7	29	P31A22X	85.7
12	S34XT69	93.0	30	AG30X9	84.0
13	RX3337	92.3	31	GH4142X	84.0
14	P40A47X	92.3	32	RX4217s	83.9
15	P38A98X	92.3	33	P42A52X	83.9
16	AG39X7	92.0	34	GH3195X	83.2
17	P36A18X	91.9	35	GH3761X	82.3
18	AG33X8	91.3	36	GH2788X	81.8
Overall Mean		90.7	LSD ($P \leq 0.10$)		8.1

Table 13. Ranked grain yield of 36 commercial soybean varieties when grown at 187 lbs acre⁻¹ of MicroEssentials S10 and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Champaign, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	S41XS98	103.4	19	AG39X7	90.7
2	S39XT68	100.5	20	RX3896	90.4
3	AG37X9	100.4	21	S37XT28	89.8
4	AG36X6	100.4	22	P36A18X	87.2
5	GH3546X	99.7	23	GH3088X	86.0
6	S36XT09	97.7	24	NK33D7X	85.7
7	RX3556	97.6	25	GH3761X	85.6
8	S35XT97	97.0	26	NK34T2X	85.5
9	AG33X8	96.0	27	AG34X9	84.9
10	AG32X8	96.0	28	S34XT69	84.4
11	GH4240XS	96.0	29	AG30X9	82.7
12	P40A47X	94.8	30	P42A52X	81.9
13	P38A98X	94.1	31	R2C4000	81.9
14	S37XS89	93.6	32	GH2788X	81.2
15	RX3337	91.7	33	GH4142X	81.0
16	GH3982X	91.7	34	RX4217s	80.8
17	AG41X8	90.9	35	GH3195X	74.8
18	AG34X6	90.9	36	P31A22X	72.2
Overall Mean		90.0	LSD ($P \leq 0.10$)		10.6

Table 14. Grain yield of 36 commercial soybean varieties in response to fertilizer and foliar protection at **Champaign, IL** in 2018. Within a seed brand, varieties are sorted by maturity group.

Variety	Foliar Protection			
	Without		With	
	Fertilizer (lbs acre ⁻¹)			
	0	187	0	187
Asgrow	bushels/acre			
AG30X9	80.8	76.0	84.0	82.7
AG32X8	90.8	82.4	98.6	96.0
AG33X8	81.8	82.5	91.3	96.0
AG34X6	88.5	91.2	87.8	90.9
AG34X9	83.3	84.2	87.8	84.9
AG36X6	93.8	96.9	98.6	100.4
AG37X9	89.9	86.3	96.7	100.4
AG39X7	84.4	82.8	92.0	90.7
AG41X8	85.2	81.9	95.6	90.9
Croplan				
RX3337	80.7	92.3	92.3	91.7
RX3556	89.6	92.4	95.8	97.6
RX3896	81.6	83.4	89.0	90.4
R2C4000	82.1	78.0	86.9	81.9
RX4217s	73.5	72.8	83.9	80.8
Dyna-Gro				
S34XT69	90.9	84.2	93.0	84.4
S35XT97	89.5	90.8	89.8	97.0
S36XT09	87.0	86.1	94.6	97.7
S37XT28	87.9	82.7	88.2	89.8
S37XS89	89.2	88.1	95.0	93.6
S39XT68	88.1	87.7	97.6	100.5
S41XS98	91.0	89.5	98.6	103.4
Golden Harvest				
GH2788X	74.7	70.2	81.8	81.2
GH3088X	80.4	84.0	88.9	86.0
GH3195X	72.5	72.7	83.2	74.8
GH3546X	86.5	84.0	98.9	99.7
GH3761X	84.2	81.9	82.3	85.6
GH3982X	81.1	79.0	91.0	91.7
GH4142X	77.0	80.2	84.0	81.0
GH4240XS	82.4	89.6	89.3	96.0
NK				
NK33D7X	88.5	76.7	87.2	85.7
NK34T2X	82.1	76.7	93.7	85.5
Pioneer				
P31A22X	66.0	65.4	85.7	72.2
P36A18X	79.4	75.1	91.9	87.2
P38A98X	86.1	92.2	92.3	94.1
P40A47X	86.7	84.7	92.3	94.8
P42A52X	77.1	78.4	83.9	81.9
Overall Mean	83.7	82.9	90.7	90.0
Range	66-94	65-97	82-99	72-103
LSD ($P \leq 0.10$)	9.3	9.1	8.1	10.6

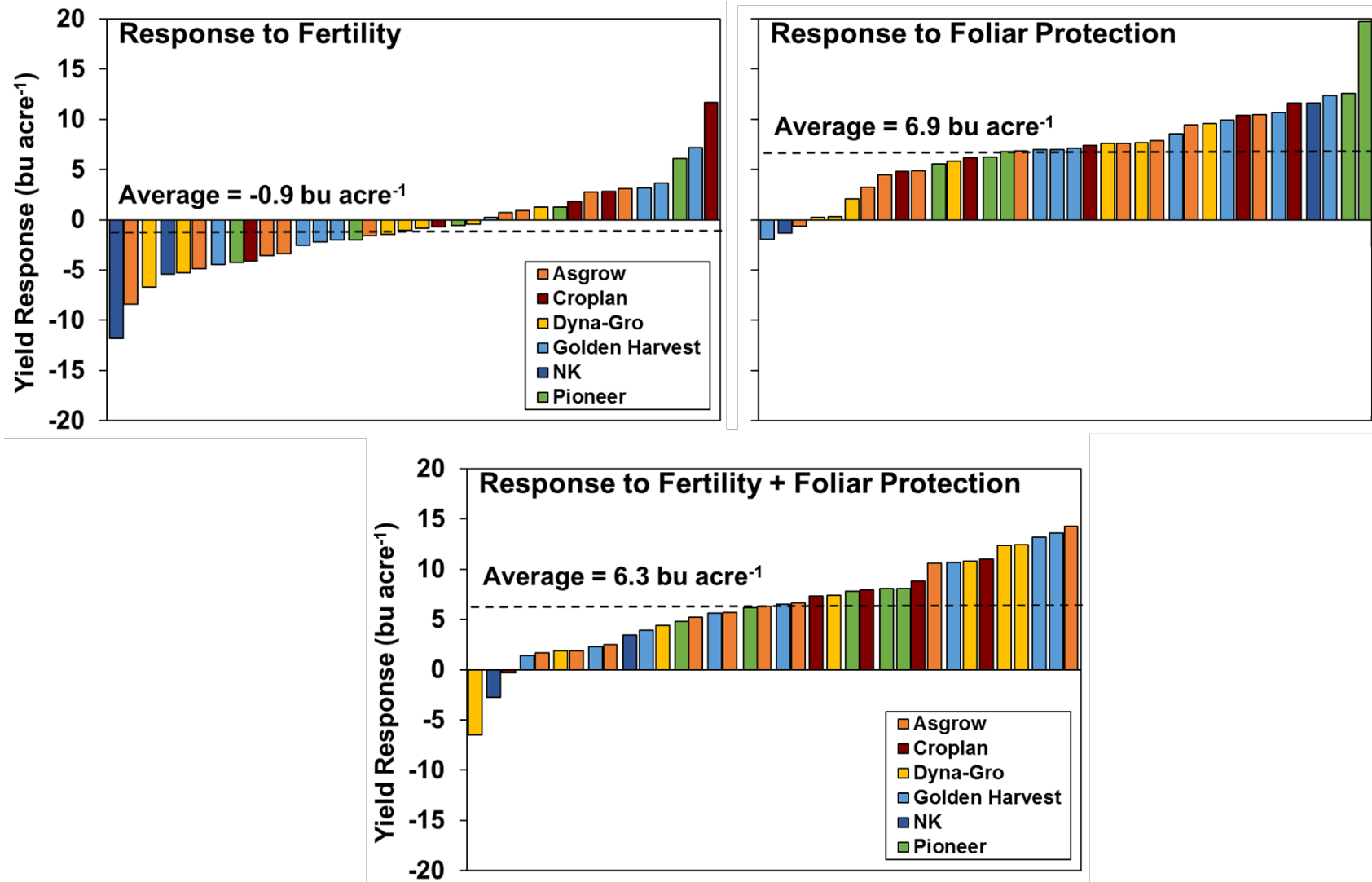


Figure 2. Yield response to fertility (yield difference between 187 and 0 lbs acre⁻¹ of MES10), foliar protection [yield difference between foliar protection (insecticide and fungicide) and no-foliar protection], and the combination of fertility and foliar protection (yield difference between 187 lbs acre⁻¹ of MES10 with foliar protection and control) for soybean grown at **Champaign, IL** in 2018.

Table 15. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and no foliar protection application (**Control**) at **Harrisburg, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	P46A93X	86.3	19	P40A47X	76.5
2	S37XS89	86.0	20	AG46X6	76.3
3	S41XS98	84.9	21	S46XS87	76.3
4	AG42X9	84.7	22	AG37X9	76.1
5	AG42X6	84.7	23	GH4307X	75.9
6	S43XS27	84.3	24	GH3546X	75.5
7	GH4524XS	83.8	25	AG48X9	74.5
8	AG41X8	83.4	26	RX4316s	74.1
9	S39XT68	82.4	27	GH3982X	74.0
10	S44XS68	82.2	28	P36A18X	74.0
11	P42A52X	82.0	29	GH3761X	73.4
12	AG39X7	81.8	30	P38A98X	72.7
13	S36XT09	81.7	31	NK45J3X	71.3
14	AG44X6	81.2	32	GH4142X	70.9
15	GH4240XS	78.0	33	R2C4000	70.9
16	S37XT28	77.9	34	S35XT97	70.4
17	AG36X6	77.0	35	RX4217s	69.3
18	RX3896	76.6	36	RX3556	66.1
Overall Mean		77.7	LSD ($P \leq 0.10$)		8.3

Table 16. Ranked grain yield of 36 commercial soybean varieties when grown with 187 lbs acre⁻¹ of MicroEssentials S10 and no foliar protection application at **Harrisburg, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	AG48X9	85.5	19	GH4307X	77.0
2	AG41X8	85.2	20	GH3546X	76.4
3	S41XS98	83.9	21	S43XS27	76.3
4	AG39X7	83.3	22	AG46X6	76.1
5	S37XS89	82.9	23	AG37X9	76.1
6	P46A93X	82.6	24	RX3896	75.4
7	P40A47X	82.5	25	NK45J3X	74.9
8	P42A52X	82.2	26	RX4316s	74.7
9	AG42X6	82.1	27	AG36X6	74.1
10	S44XS68	80.2	28	P36A18X	74.0
11	S36XT09	79.8	29	RX4217s	72.9
12	S39XT68	79.1	30	GH3982X	72.9
13	AG42X9	78.1	31	GH3761X	71.6
14	S37XT28	78.0	32	S46XS87	70.8
15	P38A98X	77.5	33	R2C4000	69.7
16	GH4524XS	77.4	34	S35XT97	68.2
17	GH4240XS	77.1	35	GH4142X	67.4
18	AG44X6	77.1	36	RX3556	64.8
Overall Mean		76.9	LSD ($P \leq 0.10$)		7.9

Table 17. Ranked grain yield of 36 commercial soybean varieties when grown with no fertilizer and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Harrisburg, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	P46A93X	91.7	19	GH3546X	79.9
2	AG42X6	91.4	20	AG36X6	79.5
3	S44XS68	86.1	21	AG46X6	79.4
4	AG41X8	85.9	22	AG44X6	79.1
5	S39XT68	85.0	23	GH4307X	78.9
6	P40A47X	84.8	24	AG48X9	78.9
7	S36XT09	84.5	25	NK45J3X	78.7
8	S41XS98	84.4	26	GH3761X	78.6
9	S37XS89	84.3	27	RX3896	78.4
10	GH4240XS	83.3	28	GH3982X	78.2
11	RX4316s	83.2	29	P38A98X	77.4
12	GH4524XS	83.0	30	AG37X9	77.0
13	S43XS27	81.2	31	S35XT97	76.8
14	P42A52X	80.8	32	P36A18X	76.5
15	S37XT28	80.8	33	RX4217s	74.4
16	AG42X9	80.7	34	GH4142X	74.3
17	S46XS87	80.4	35	R2C4000	72.6
18	AG39X7	80.2	36	RX3556	56.4
Overall Mean		80.2	LSD ($P \leq 0.10$)		8.6

Table 18. Ranked grain yield of 36 commercial soybean varieties when grown at 187 lbs acre⁻¹ of MicroEssentials S10Z and one foliar protection application (fungicide and insecticide) at the R3 growth stage at **Harrisburg, IL** in 2018.

Rank	Variety	Grain yield bu acre ⁻¹	Rank	Variety	Grain yield bu acre ⁻¹
1	AG42X6	91.7	19	AG46X6	80.2
2	AG41X8	90.7	20	GH3982X	80.2
3	P46A93X	89.5	21	GH3546X	79.8
4	S39XT68	88.4	22	R2C4000	79.8
5	S44XS68	88.4	23	AG36X6	78.9
6	S37XS89	88.0	24	S46XS87	78.9
7	AG48X9	87.8	25	RX3896	78.7
8	GH4240XS	87.1	26	NK45J3X	78.3
9	P40A47X	86.6	27	AG44X6	78.3
10	GH4524XS	84.5	28	RX4217s	78.2
11	S36XT09	84.4	29	GH4307X	77.5
12	P42A52X	84.1	30	GH3761X	77.2
13	S37XT28	83.6	31	GH4142X	77.0
14	S41XS98	83.0	32	P38A98X	75.9
15	RX4316s	82.3	33	AG37X9	74.3
16	S43XS27	82.0	34	S35XT97	72.5
17	AG42X9	81.7	35	P36A18X	71.9
18	AG39X7	80.4	36	RX3556	69.2
Overall Mean		81.4	LSD ($P \leq 0.10$)		7.6

Table 19. Grain yield of 36 commercial soybean varieties in response to fertilizer and foliar protection at **Harrisburg, IL** in 2018. Within a seed brand, varieties are sorted by maturity group.

Variety	Foliar Protection			
	Without		With	
	Fertilizer (lbs acre ⁻¹)			
	0	187	0	187
Asgrow	bushels/acre			
AG36X6	77.0	74.1	79.5	78.9
AG37X9	76.1	76.1	77.0	74.3
AG39X7	81.8	83.3	80.2	80.4
AG41X8	83.4	85.2	85.9	90.7
AG42X6	84.7	82.1	91.4	91.7
AG42X9	84.7	78.1	80.7	81.7
AG44X6	81.2	77.1	79.1	78.3
AG46X6	76.3	76.1	79.4	80.2
AG48X9	74.5	85.5	78.9	87.8
Croplan				
RX3556	66.1	64.8	56.4	69.2
RX3896	76.6	75.4	78.4	78.7
R2C4000	70.9	69.7	72.6	79.8
RX4217s	69.3	72.9	74.4	78.2
RX4316s	74.1	74.7	83.2	82.3
Dyna-Gro				
S35XT97	70.4	68.2	76.8	72.5
S36XT09	81.7	79.8	84.5	84.4
S37XS89	86.0	82.9	84.3	88.0
S37XT28	77.9	78.0	80.8	83.6
S39XT68	82.4	79.1	85.0	88.4
S41XS98	84.9	83.9	84.4	83.0
S43XS27	84.3	76.3	81.2	82.0
S44XS68	82.2	80.2	86.1	88.4
S46XS87	76.3	70.8	80.4	78.9
Golden Harvest				
GH3546X	75.5	76.4	79.9	79.8
GH3761X	73.4	71.6	78.6	77.2
GH3982X	74.0	72.9	78.2	80.2
GH4142X	70.9	67.4	74.3	77.0
GH4240XS	78.0	77.1	83.3	87.1
GH4307X	75.9	77.0	78.9	77.5
GH4524XS	83.8	77.4	83.0	84.5
NK				
NK S45-J3X	71.3	74.9	78.7	78.3
Pioneer				
P36A18X	74.0	74.0	76.5	71.9
P38A98X	72.7	77.5	77.4	75.9
P40A47X	76.5	82.5	84.8	86.6
P42A52X	82.0	82.2	80.8	84.1
P46A93X	86.3	82.6	91.7	89.5
Overall Mean	77.7	76.9	80.2	81.4
Range	66-86	65-85	56-92	69-92
LSD ($P \leq 0.10$)	8.3	7.9	8.6	7.6

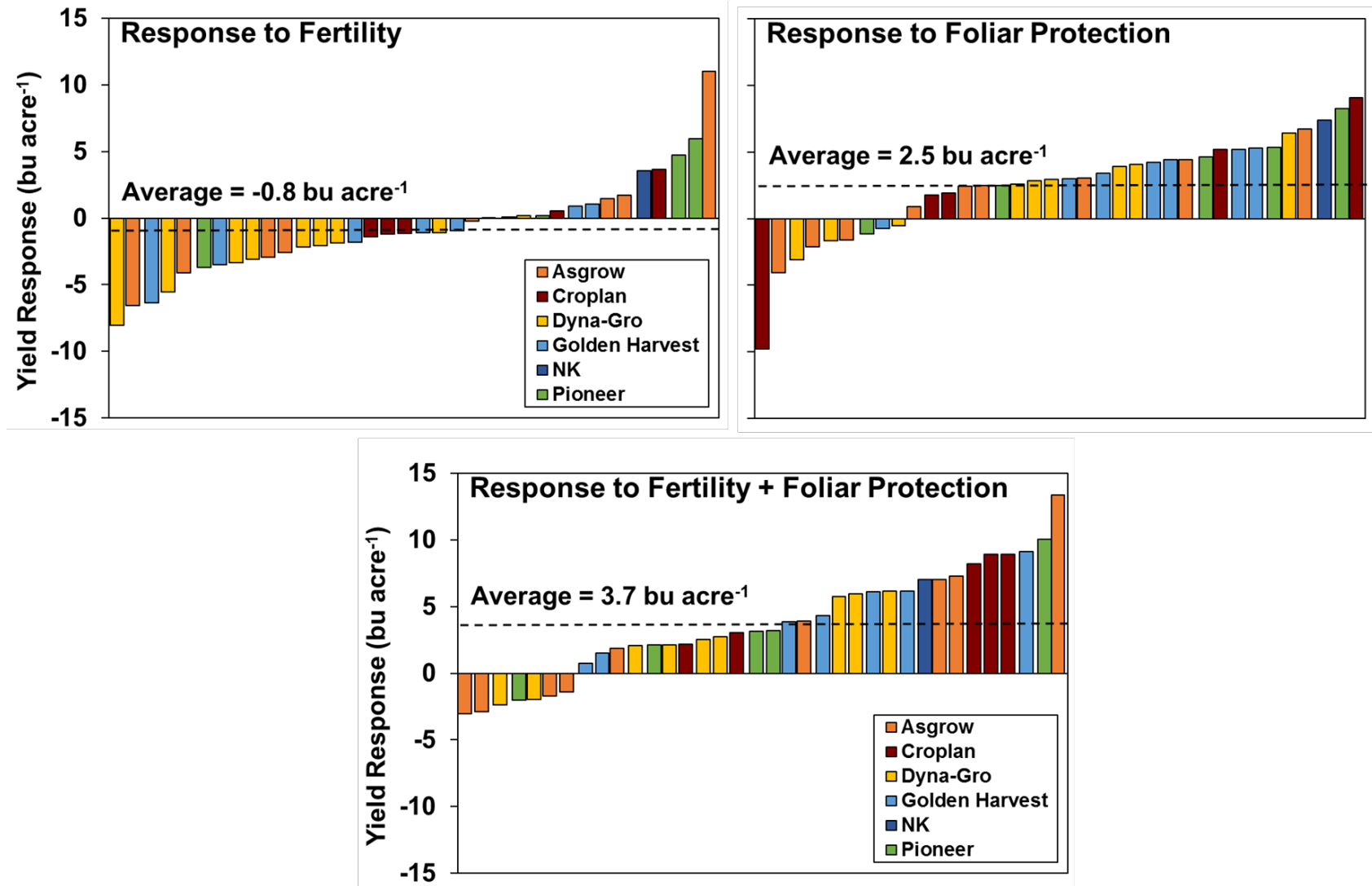


Figure 3. Yield response to fertility (yield difference between 187 and 0 lbs acre⁻¹ of MES10), foliar protection [yield difference between foliar protection (insecticide and fungicide) and no-foliar protection], and the combination of fertility and foliar protection (yield difference between 187 lbs acre⁻¹ of MES10 with foliar protection and control) for soybean grown at **Harrisburg**, IL in 2018.

CHARACTERIZATION OF VARIETIES IN RESPONSE TO MANAGEMENT:

The differences observed in yield performance among varieties and their interaction with agronomic management across environments highlights the opportunity of soybean genetic characterization in response to different agronomic management factors.

The objective of the Soybean MYP trial is to characterize elite soybean cultivars for their yield response to different agronomic management conditions. Variety decile ranks for yield performance under low agronomic management input (Yield Control), yield response to increased fertility (FERT), yield response to foliar protection (PROT), yield response to foliar protection combined with increased fertility compared to the control (PROT + FERT), and yield performance ranking compared to other varieties resulting from the combination of both treatments (Yield BOTH) across locations are presented in Table 20. Agronomists and farmers may use the score from each parameter to better position their soybean variety based on the agronomic performance and response to agronomic management at different locations. ‘Defensive’ varieties can be considered as ones having a high ranking for Yield Control and a low ranking for yield response to foliar protection (low PROT), while ‘Offensive’ varieties can be considered ones having a high ranking for Yield Both and high rankings for yield response to foliar protection (high PROT) and increased fertility (high FERT).

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Physiology

Table 20. Decile scores for yield (compared to other varieties) with no additional fertilizer or foliar protection (Control), and yield with additional fertilizer and foliar protection (BOTH), and the yield responses (compared to the untreated control) to increased fertility (FERT), foliar protection (PROT), and the combination of both treatments (PROT+FERT). Varieties are sorted by brand and maturity group. Scores range from 1 indicating the lowest yield (or yield increase) and 10 indicating the greatest yield (or yield increase).

	Yorkville					Champaign					Harrisburg				
	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH
Asgrow															
AG24X7	1	4	4	8	2	-	-	-	-	-	-	-	-	-	-
AG24X9	1	9	10	10	3	-	-	-	-	-	-	-	-	-	-
AG25X9	1	3	10	10	3	-	-	-	-	-	-	-	-	-	-
AG27X7	2	6	2	6	1	-	-	-	-	-	-	-	-	-	-
AG27X9	3	6	2	6	4	-	-	-	-	-	-	-	-	-	-
AG28X9	4	3	10	7	5	-	-	-	-	-	-	-	-	-	-
AG30X9	7	8	8	5	8	4	2	2	3	3	-	-	-	-	-
AG32X8	10	5	6	7	10	10	6	1	5	8	-	-	-	-	-
AG33X8	9	2	4	2	7	5	7	7	10	8	-	-	-	-	-
AG34X6	9	5	1	5	9	8	1	9	3	6	-	-	-	-	-
AG34X9	6	4	9	9	9	6	2	8	2	4	-	-	-	-	-
AG36X6	10	7	10	4	9	10	3	9	6	10	6	4	4	4	5
AG37X9	7	9	5	9	10	9	4	4	8	10	5	3	7	2	2
AG39X7	-	-	-	-	-	6	6	5	6	6	8	2	9	3	6
AG41X8	-	-	-	-	-	6	8	4	5	6	9	4	9	9	10
AG42X6	-	-	-	-	-	-	-	-	-	-	9	9	4	9	10
AG42X9	-	-	-	-	-	-	-	-	-	-	10	1	1	1	6
AG44X6	-	-	-	-	-	-	-	-	-	-	7	1	2	1	4
AG46X6	-	-	-	-	-	-	-	-	-	-	6	5	7	7	6
AG48X9	-	-	-	-	-	-	-	-	-	-	4	7	10	10	9
Croplan															
R2C2674	5	4	6	3	4	-	-	-	-	-	-	-	-	-	-
RX3337	10	2	1	2	8	3	9	10	9	7	-	-	-	-	-
RX3556	8	6	7	3	7	9	4	9	7	9	1	1	5	6	1
RX3896	8	10	6	10	10	4	5	8	8	6	6	3	6	5	4
R2C4000	-	-	-	-	-	5	3	3	1	2	2	3	6	10	5
RX4217s	-	-	-	-	-	1	8	6	7	1	1	8	10	9	3
RX4316s	-	-	-	-	-	-	-	-	-	-	4	10	8	9	7

Table 20 (cont.). Decile scores for yield (compared to other varieties) with no additional fertilizer or foliar protection (Control), and yield with additional fertilizer and foliar protection (BOTH), and the yield responses (compared to the untreated control) to increased fertility (FERT), foliar protection (PROT), and the combination of both treatments (PROT+FERT). Varieties are sorted by brand and maturity group. Scores range from 1 indicating the lowest yield (or yield increase) and 10 indicating the greatest yield (or yield increase).

	Yorkville					Champaign					Harrisburg				
	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH	Yield Control	PROT	FERT	PROT +FERT	Yield BOTH
Dyna-Gro															
S34XT69	9	2	9	8	10	10	2	1	1	3	-	-	-	-	-
S35XT97	7	3	8	4	8	9	1	8	7	9	1	9	4	5	1
S36XT09	8	1	7	2	6	7	6	6	9	9	7	5	5	5	8
S37XT28	10	1	3	1	8	9	3	6	4	7	10	2	3	4	9
S37XS89	9	7	4	4	9	8	2	2	2	5	7	5	8	7	7
S39XT68	-	-	-	-	-	8	7	7	10	10	8	4	3	7	10
S41XS98	-	-	-	-	-	10	6	6	9	10	10	3	6	2	7
S43XS27	-	-	-	-	-	-	-	-	-	-	9	1	1	1	7
S44XS68	-	-	-	-	-	-	-	-	-	-	8	6	5	8	9
S46XS87	-	-	-	-	-	-	-	-	-	-	5	6	2	5	5
Golden Harvest															
GH2537X	3	9	3	10	4	-	-	-	-	-	-	-	-	-	-
GH2788X	2	8	9	6	1	2	5	3	6	2	-	-	-	-	-
GH2981X	6	5	3	5	7	-	-	-	-	-	-	-	-	-	-
GH3088X	4	7	5	7	5	3	7	10	5	5	-	-	-	-	-
GH3195X	5	1	9	7	6	1	9	7	3	1	-	-	-	-	-
GH3546X	7	2	1	1	2	7	10	4	10	9	5	7	8	7	5
GH3761X	3	10	6	9	3	6	1	5	2	4	3	8	5	6	3
GH3982X	-	-	-	-	-	4	8	5	9	7	4	6	6	8	6
GH4142X	-	-	-	-	-	2	5	9	4	2	2	6	3	8	2
GH4240XS	-	-	-	-	-	5	5	10	10	8	7	8	7	10	9
GH4307X	-	-	-	-	-	-	-	-	-	-	5	5	9	3	3
GH4524XS	-	-	-	-	-	-	-	-	-	-	9	2	1	3	8
NK															
NK21W8X	2	6	7	6	1	-	-	-	-	-	-	-	-	-	-
NK33D7X	4	10	8	9	6	8	1	1	1	5	-	-	-	-	-
NK34T2X	5	4	8	5	5	5	9	2	4	4	-	-	-	-	-
NK45J3X	-	-	-	-	-	-	-	-	-	-	2	10	9	8	4
Pioneer															
P24A80X	5	5	5	8	6	-	-	-	-	-	-	-	-	-	-
P28T71X	6	3	5	3	5	-	-	-	-	-	-	-	-	-	-
P31A22X	8	1	2	1	2	1	10	7	6	1	-	-	-	-	-
P36A18X	6	8	7	8	7	3	10	3	7	5	3	4	7	2	1
P38A98X	-	-	-	-	-	7	4	10	8	7	3	7	10	6	2
P40A47X	-	-	-	-	-	7	3	5	8	8	6	10	10	10	8
P42A52X	-	-	-	-	-	2	4	8	5	3	8	2	8	4	8
P46A93X	-	-	-	-	-	-	-	-	-	-	10	9	2	6	10

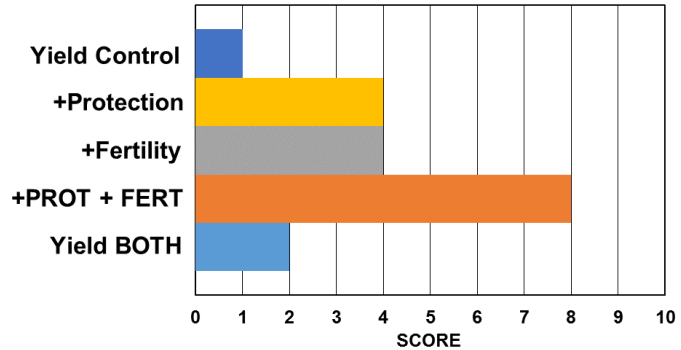
VARIETY CHARACTERIZATIONS:

This section presents a brief summary for each variety performance in response to foliar protection and/ or added fertility. Decile yield response scores for each variety (bar-graph figures) were averaged across locations when applicable. Varieties received scores ranging from 1 indicating the lowest yield (or yield increase) and 10 indicating the greatest yield (or yield increase), and average yield (yield increase) indicated with 5.

Asgrow

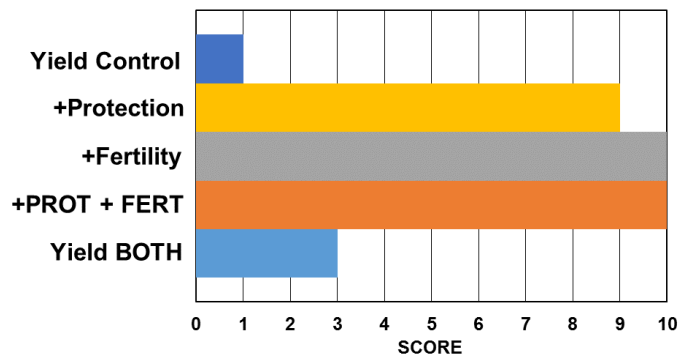
AG24X7

Moderate responses to foliar protection and fertility alone and a high response to foliar protection in combination with additional fertility.



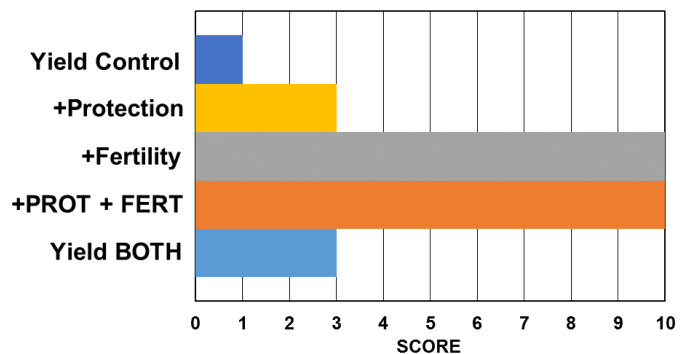
AG24X9

Highly responsive to all management factors. Largest response to foliar protection in combination with fertility at northern IL location. Would be considered an “Offensive” variety.



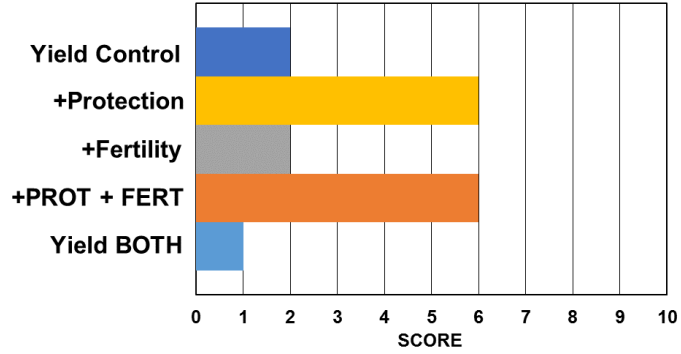
AG25X9

High response to additional fertility with or without foliar protection.



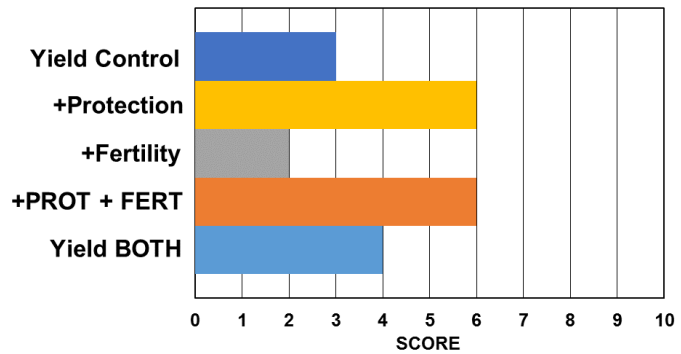
AG27X7

Above average response to foliar protection alone and foliar protection in combination with fertility.



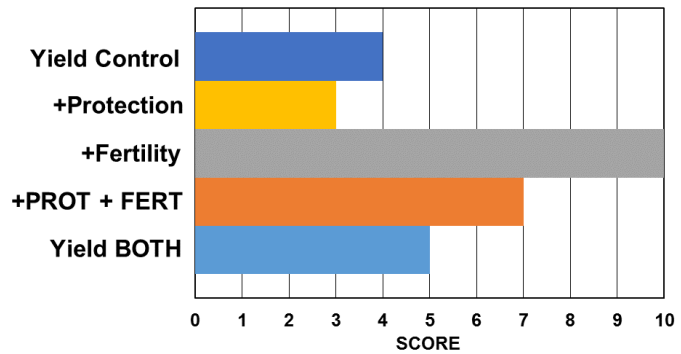
AG27X9

Moderate yield under BOTH conditions. Above average response to foliar protection alone and foliar protection in combination with fertility.



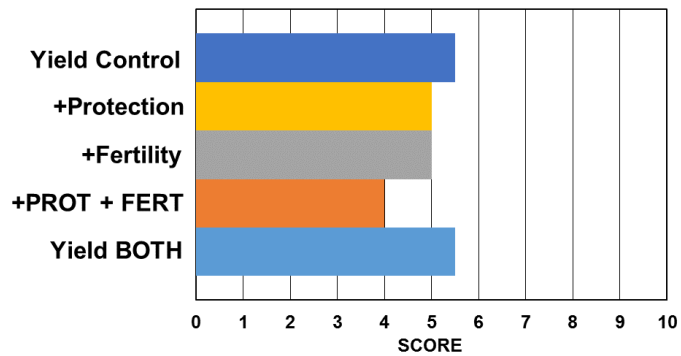
AG28X9

Moderate yield under Control conditions and average yield under BOTH conditions. High response to fertility alone, and above average response to fertility with foliar protection.



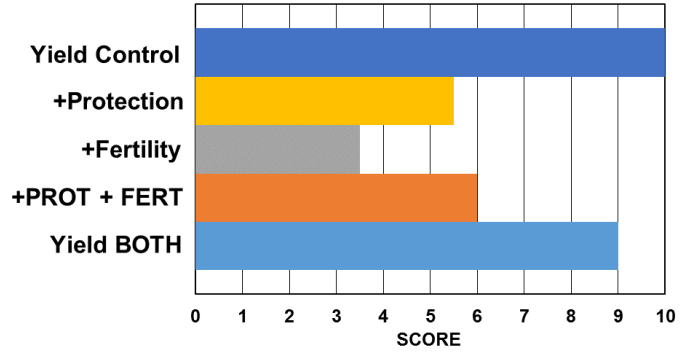
AG30X9

Slightly above average yield under Control and BOTH conditions. Average response to foliar protection and additional fertility alone.



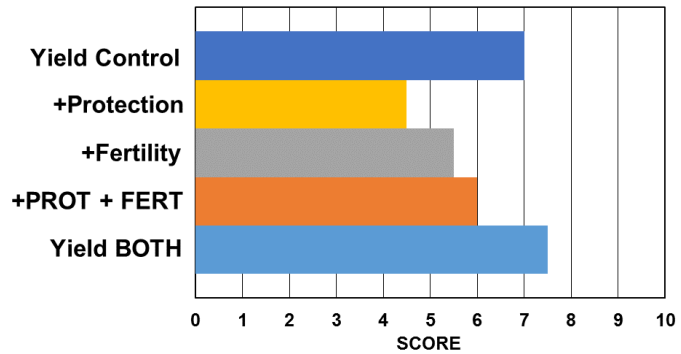
AG32X8

High yield under Control and BOTH conditions. Slightly above average response to foliar protection with or without additional fertility.



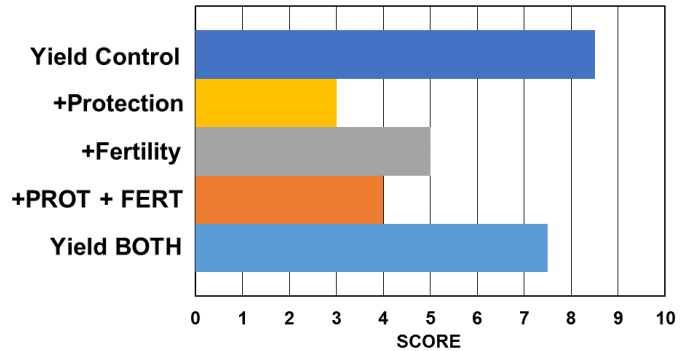
AG33X8

Above average yield levels under Control and BOTH conditions. Slightly above average response to additional fertility alone or in combination with foliar protection. Largest response to foliar protection combined with additional fertility at the central IL location.



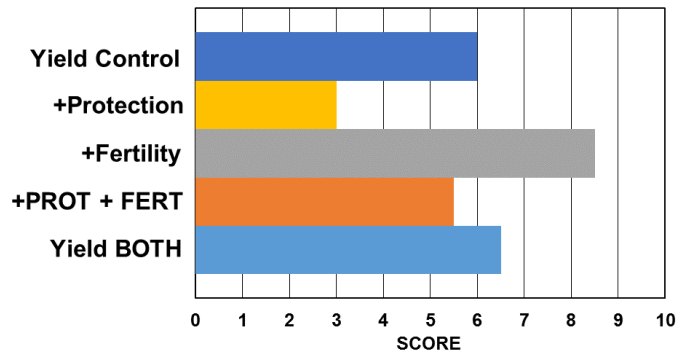
AG34X6

Above average yield levels under Control and BOTH conditions. Additional fertility alone resulted in an average yield response.



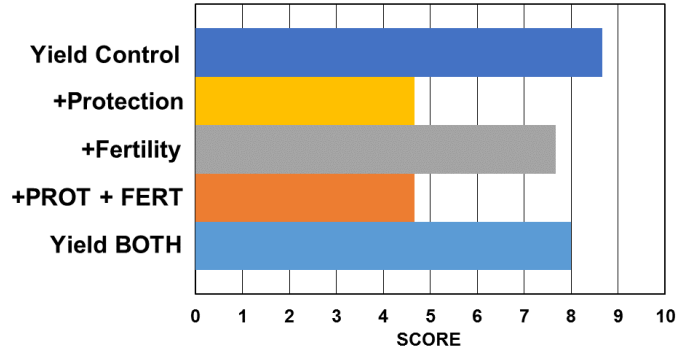
AG34X9

Above average yield levels under Control and BOTH conditions. Additional fertility alone resulted in a high yield response and slightly above average response when combined with foliar protection.



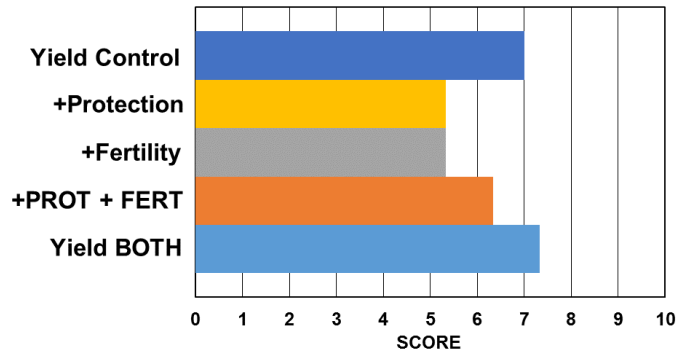
AG36X6

High yield levels under Control and BOTH conditions. When comparing yield under fertility or foliar protection alone conditions, this variety achieved the highest yield across sites. Additional fertility alone resulted in a high yield response.



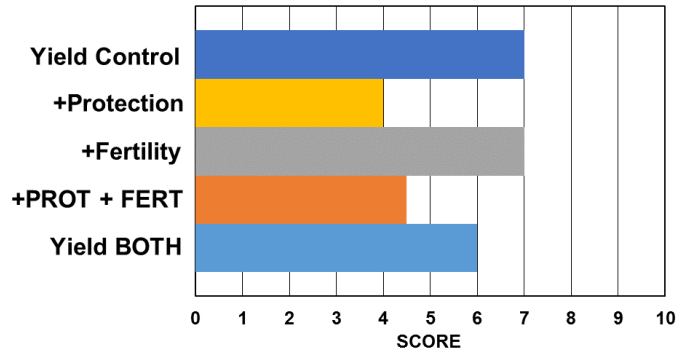
AG37X9

Above average yield levels under Control and BOTH conditions. Slightly above average response to management.



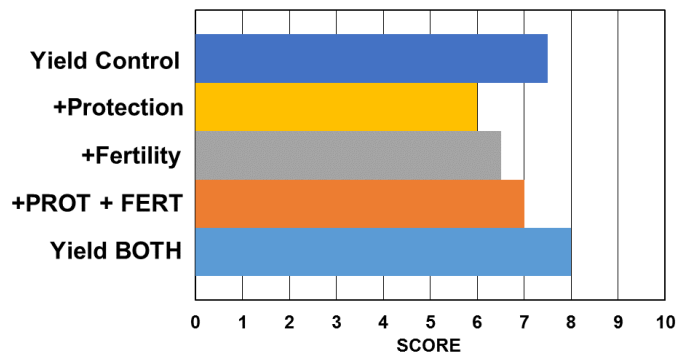
AG39X7

Above average yield under Control and BOTH conditions. Above average response to additional fertility alone.



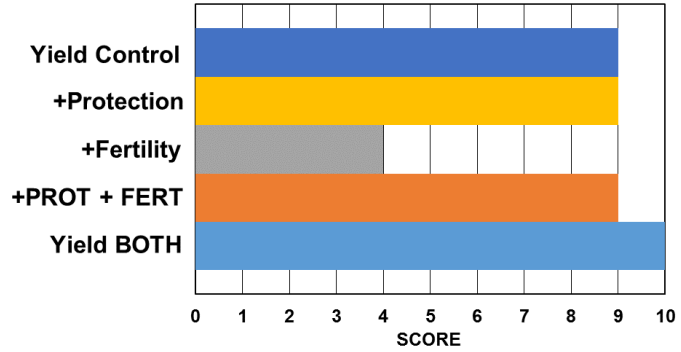
AG41X8

Above average yield levels under Control and BOTH conditions. Above average response to management.



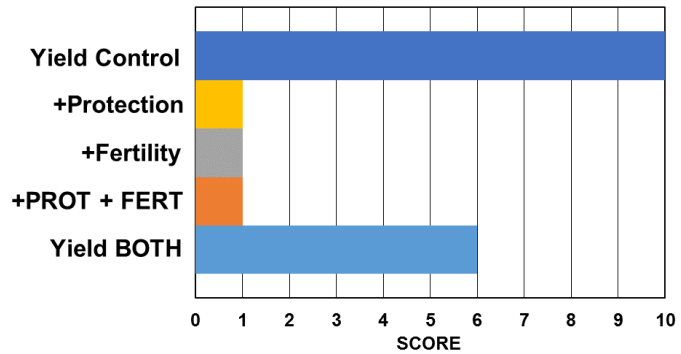
AG42X6

High yield under Control and BOTH conditions. High response to foliar protection alone and in combination with additional fertility.



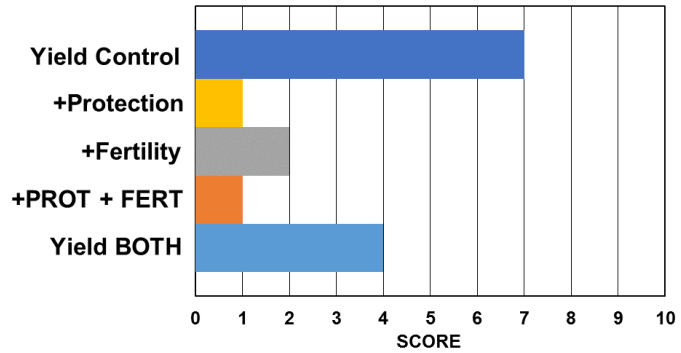
AG42X9

High yield under Control conditions and above average yield under BOTH conditions. Below average yield response to management. Would be considered a “Defensive” variety.



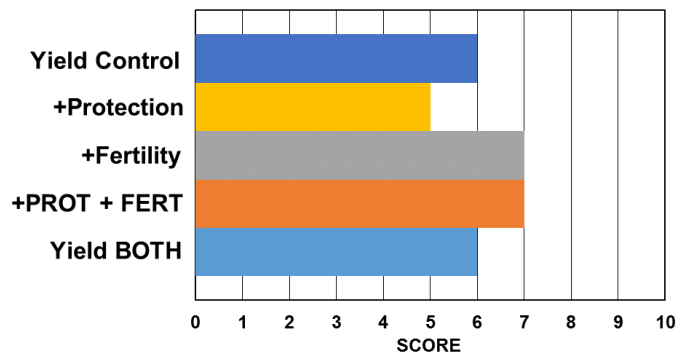
AG44X6

Above average yield under Control conditions. Below average yield response to management. Would be considered a “Defensive” variety.



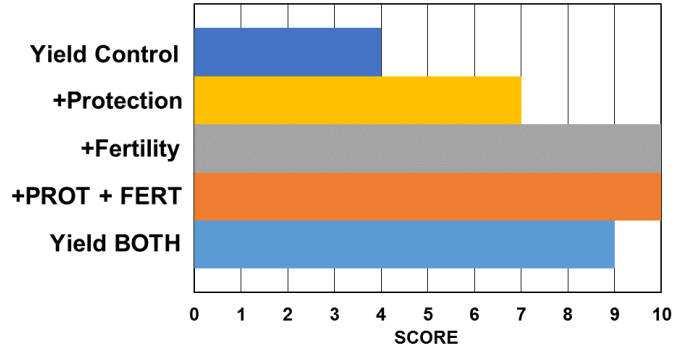
AG46X6

Above average yield under Control and BOTH conditions. Average or above average yield response to management.



AG48X9

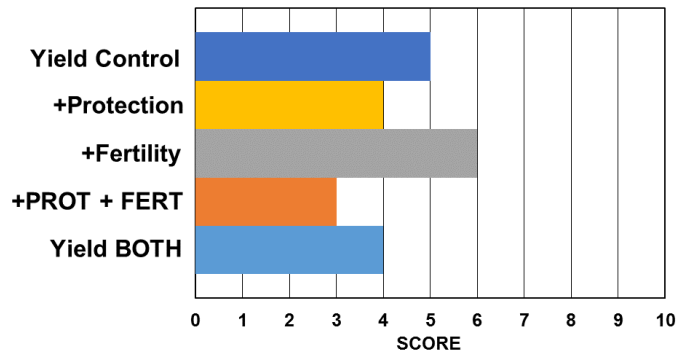
Moderate yield under Control conditions and high yield under BOTH conditions. High response to all management. Largest response to foliar protection in combination with additional fertility at southern IL location. Would be considered an “Offensive” variety.



Croplan

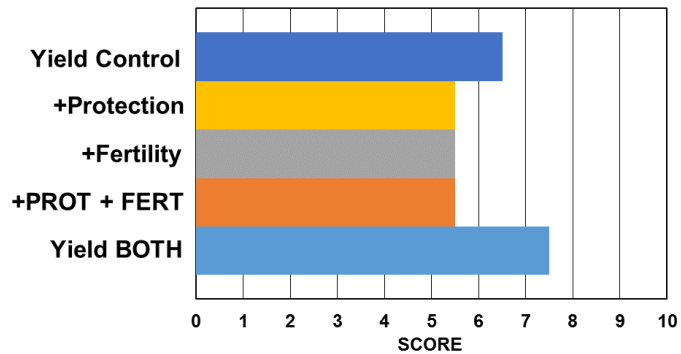
R2C2674

Average yield under Control conditions. Above average response to fertility alone.



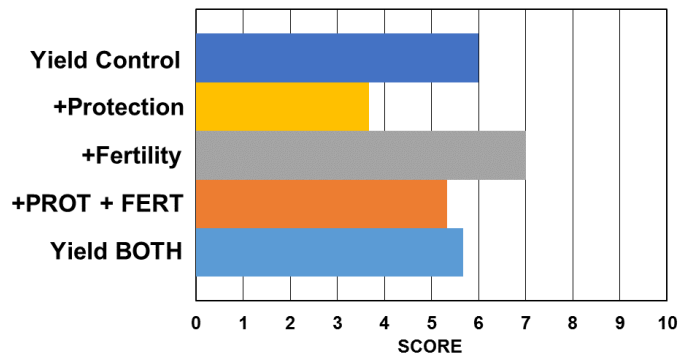
RX3337

Above average yield under Control and BOTH conditions. When comparing yield under Control conditions, this variety achieved the highest yield overall. Above average response to all management.



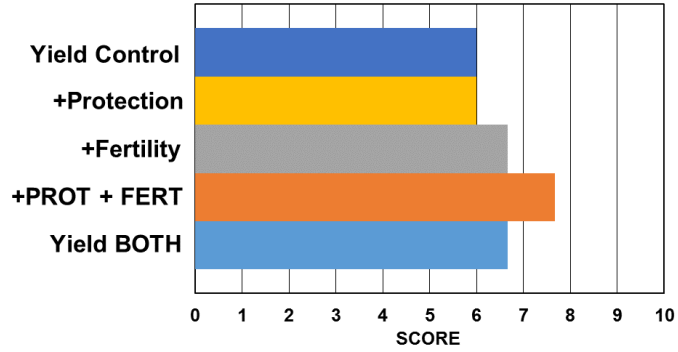
RX3556

Above average yield under Control and BOTH conditions. Above average response to fertility alone and slightly above average in combination with foliar protection.



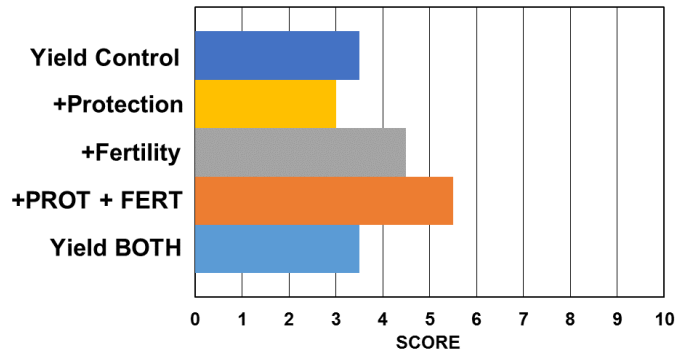
RX3896

Above average yield under Control and BOTH conditions. When comparing yields under BOTH conditions, this variety achieved the highest yield overall. Above average response to all management.



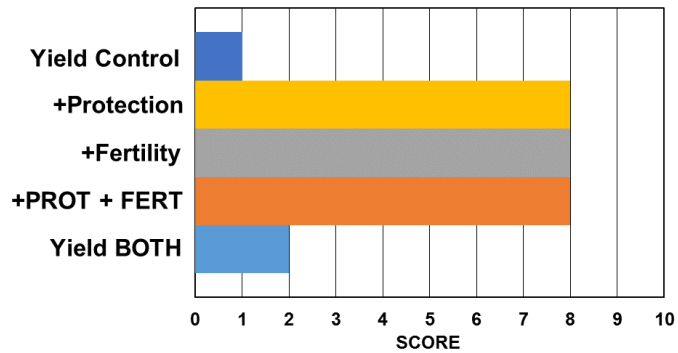
R2C4000

Moderate response to fertility alone and slightly above average response to fertility in combination with foliar protection.



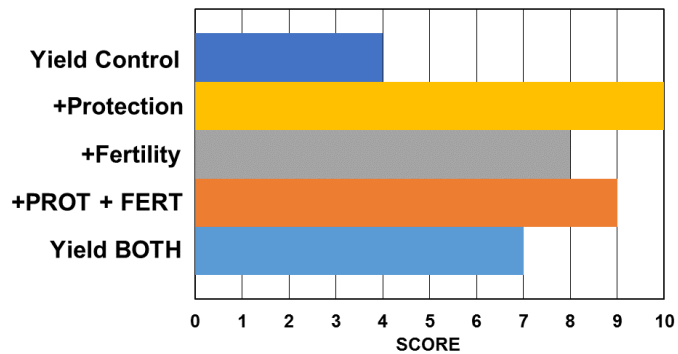
RX4217s

High response to management. Below average yield under Control and BOTH conditions.



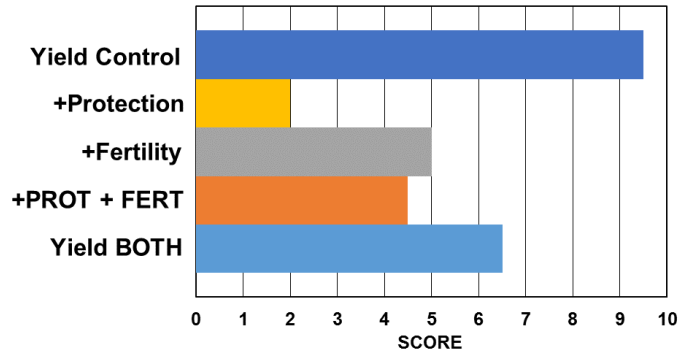
RX4316s

Above average yield under BOTH conditions. High response to all management. Would be considered an “Offensive” variety.



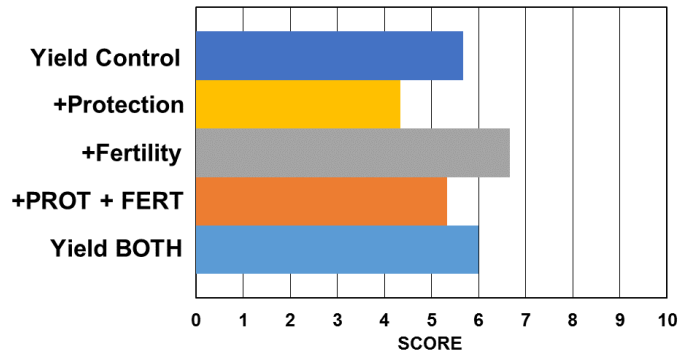
S34XT69

High yield under Control conditions and above average yield under BOTH conditions. Moderate response to fertility with or without foliar protection.



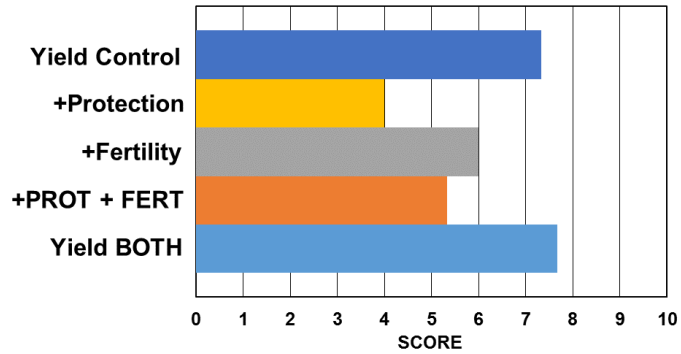
S35XT97

Slightly above average yield under Control and BOTH conditions. Above average response to fertility alone and slightly above average response with foliar protection.



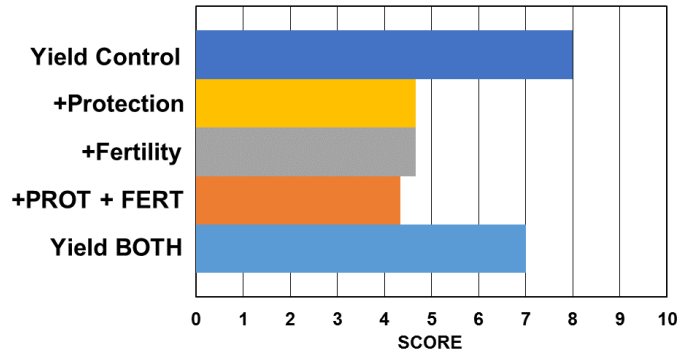
S36XT09

Above average yield under Control and BOTH conditions. Above average response to fertility alone and slightly above average response with foliar protection.



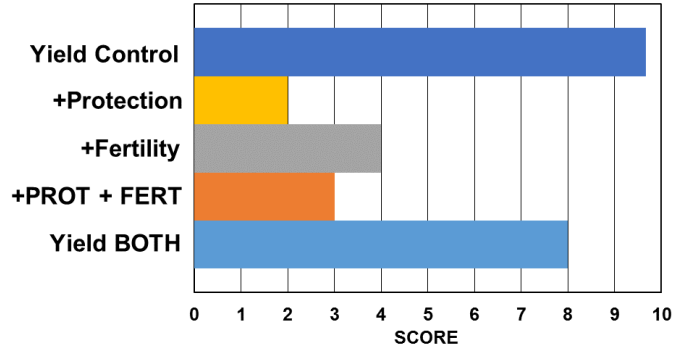
S37XT28

High and above average yield under Control and BOTH conditions, respectively. Moderate response to management.



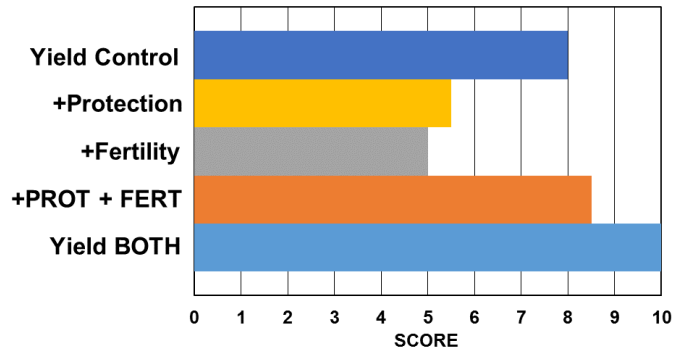
S37XS89

High yield under Control and BOTH conditions. Moderate response to fertility alone.



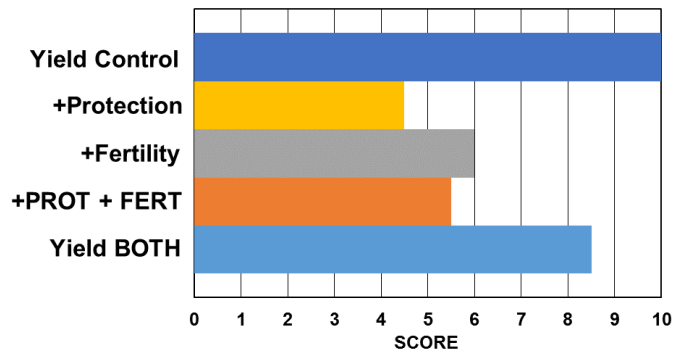
S39XT68

High yield under Control and BOTH conditions. Average response to additional fertility alone, slightly above average response to foliar protection alone, and high response to both combined.



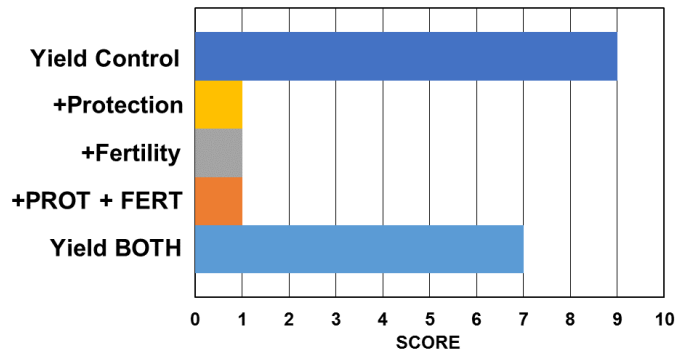
S41XS98

High yield under Control and BOTH conditions. When comparing yield under BOTH conditions, this variety achieved the highest yield at the central IL location. Above average response to fertility alone and slightly above average response with foliar protection.



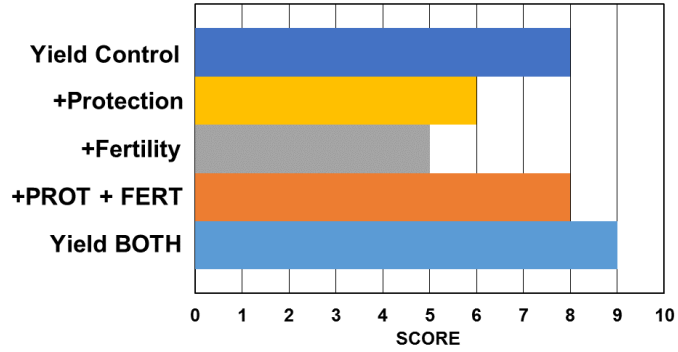
S43XS27

High yield under Control conditions and above average yield under BOTH conditions. Below average yield response to management. Would be considered a “Defensive” variety.



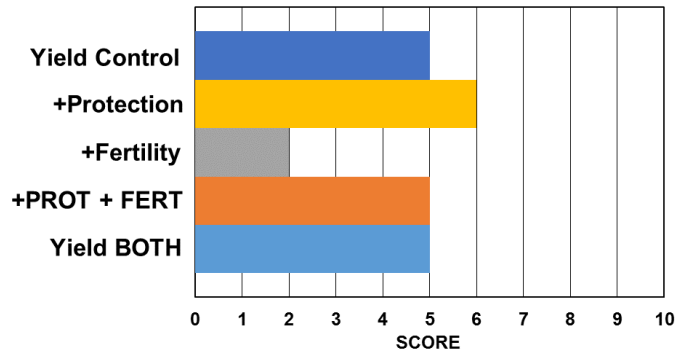
S44XS68

High yield under Control and BOTH conditions. Average response to fertility alone, above average response to foliar protection, and high response to the combination of foliar protection and fertility.



S46XS87

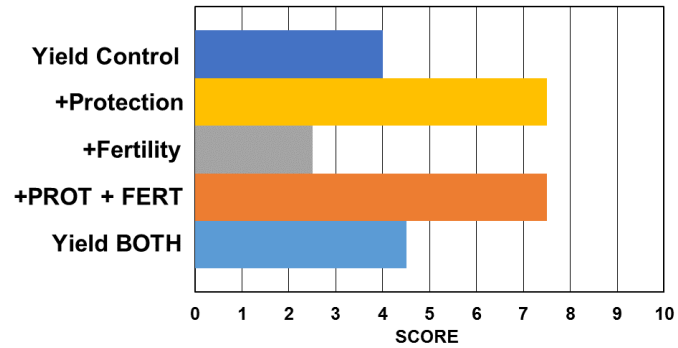
Average yield under Control and BOTH conditions. Average response to foliar protection in combination with fertility, and above average response with foliar protection alone.



Golden Harvest

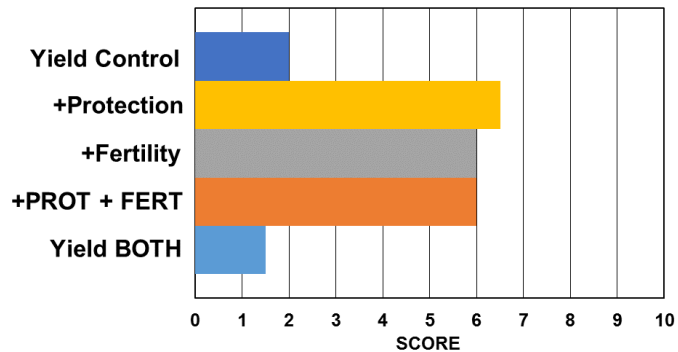
GH2537X

Above average response to foliar protection with or without fertility.



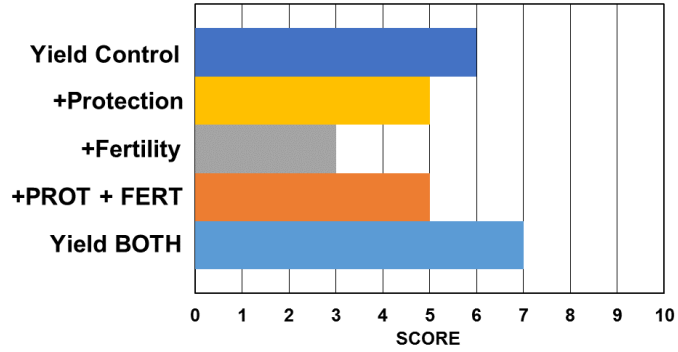
GH2788X

Above average response to all management.



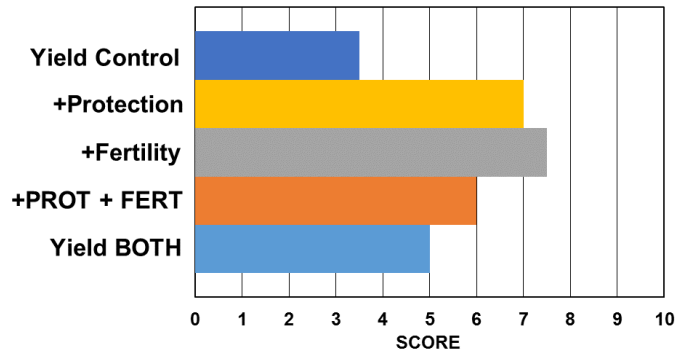
GH2981X

Above average yield under Control and BOTH conditions. Average response to foliar protection alone and in combination to fertility.



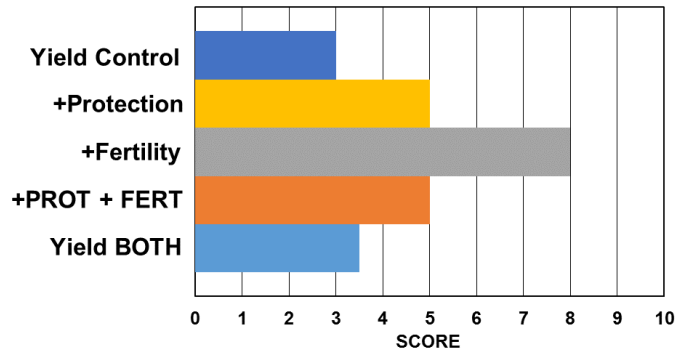
GH3088X

Average yield under BOTH conditions. Above average response to management.



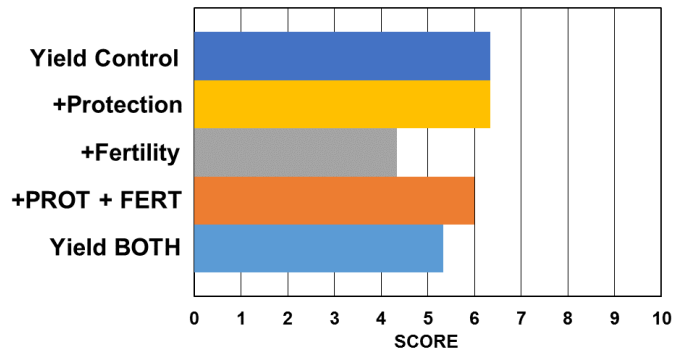
GH3195X

High response to fertility alone and average response to foliar protection with or without additional fertility.



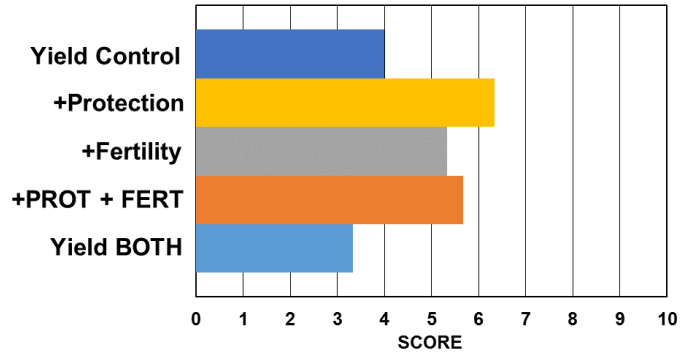
GH3546X

Above average yield under Control and slightly above average yield under BOTH conditions. Above average response to foliar protection alone or in combination with fertility.



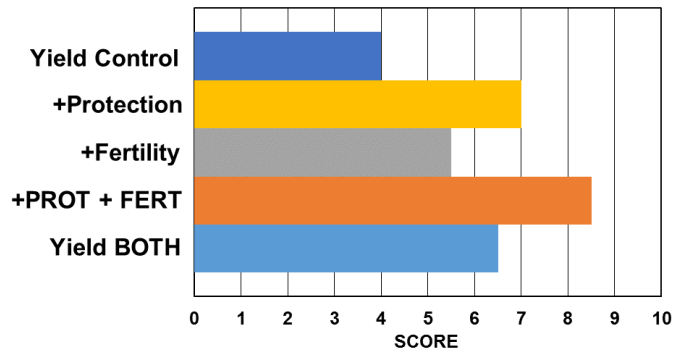
GH3761X

Moderate yield under Control conditions. Average and above average response to management.



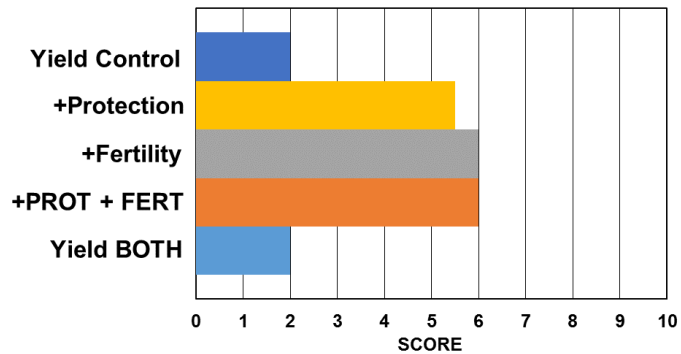
GH3982X

Above average yield under BOTH conditions. Slightly above average response to fertility alone, above average response to foliar protection alone, and high response to both combined.



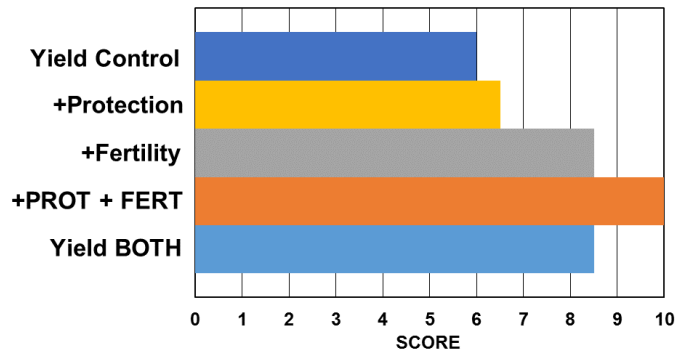
GH4142X

Slightly above average response to all management.



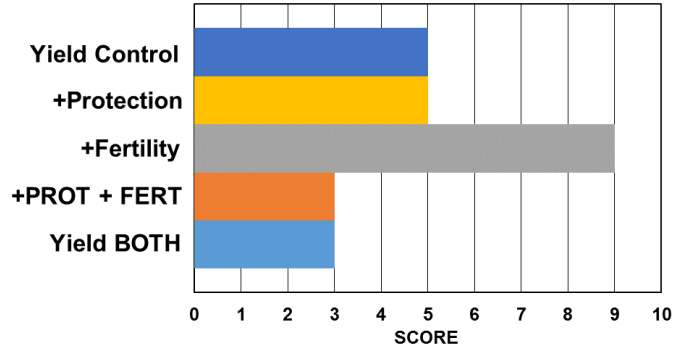
GH4240XS

Above average yield under Control conditions and high yield under BOTH conditions. Above average response to foliar protection alone and high response to fertility alone and in combination with foliar protection. Would be considered an “Offensive” variety.



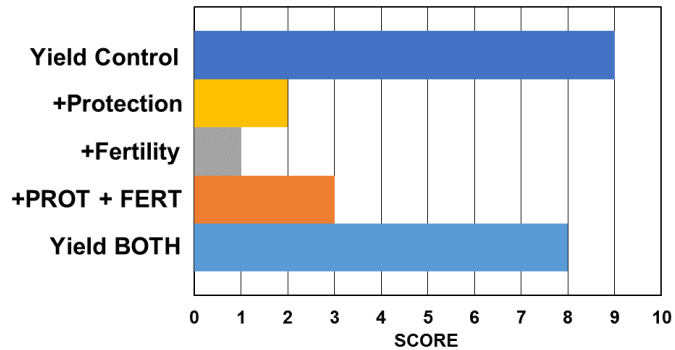
GH4307X

Average yield under Control conditions. Average response with foliar protection alone and high response with additional fertility alone.



GH4524XS

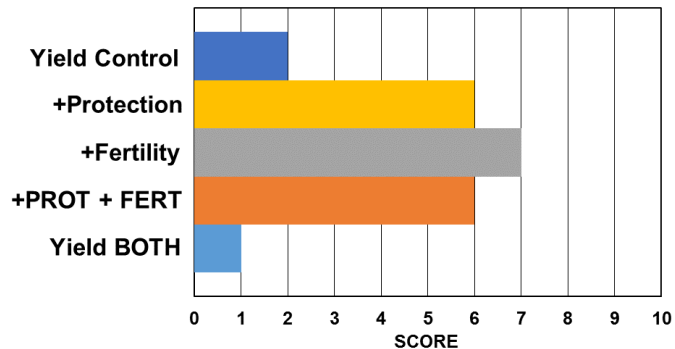
High yield under Control and BOTH conditions. Below average response to management. Would be considered a “Defensive” variety.



NK

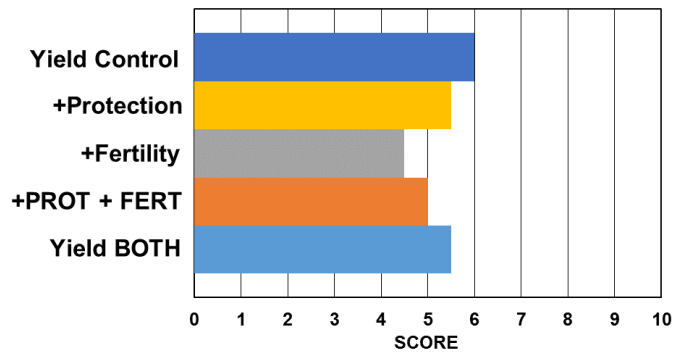
NK21W8X

Above average response to all management.



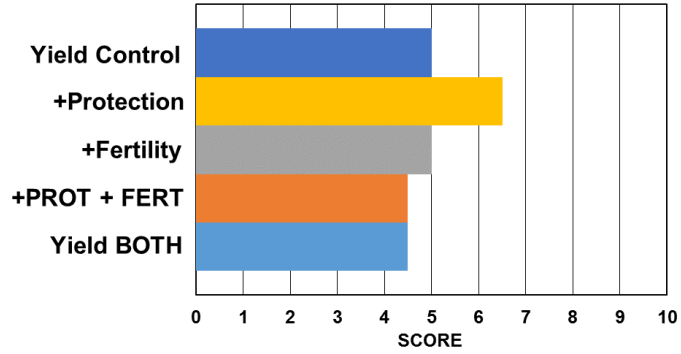
NK33D7X

Above average yield under Control and BOTH conditions. Slightly above average response to foliar protection alone and average response to foliar protection when combined with fertility.



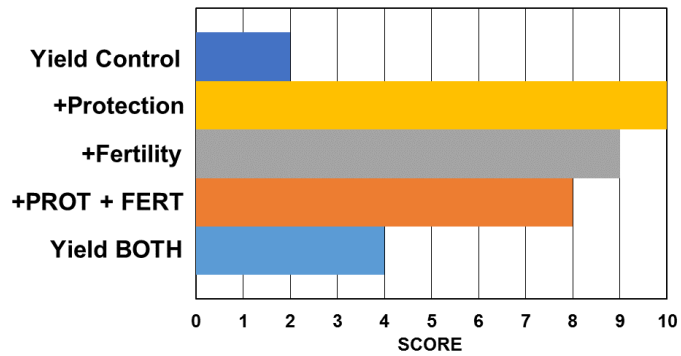
NK34T2X

Average yield under Control conditions. Above average response to foliar protection alone and average response to fertility alone.



NK45J3X

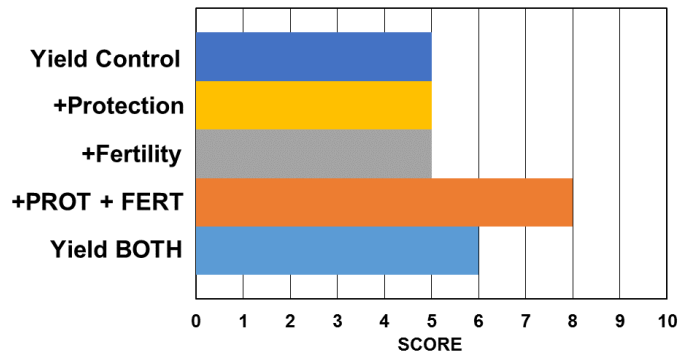
High response to all management.



Pioneer

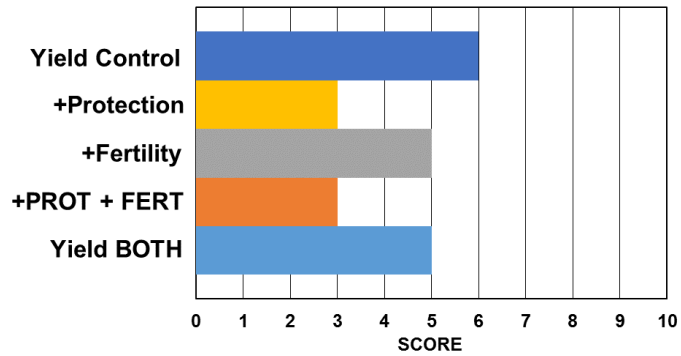
P24A80X

Average yield under Control conditions and above average yield under BOTH conditions. Average response to foliar protection and additional fertility alone and high response to both combined.



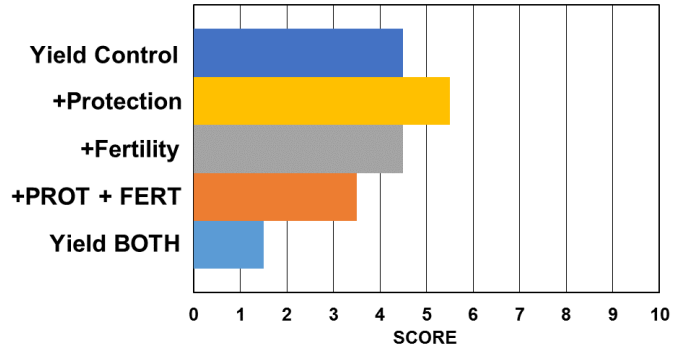
P28T71X

Above average yield under control conditions and average yield under BOTH conditions. Average response to fertility alone.



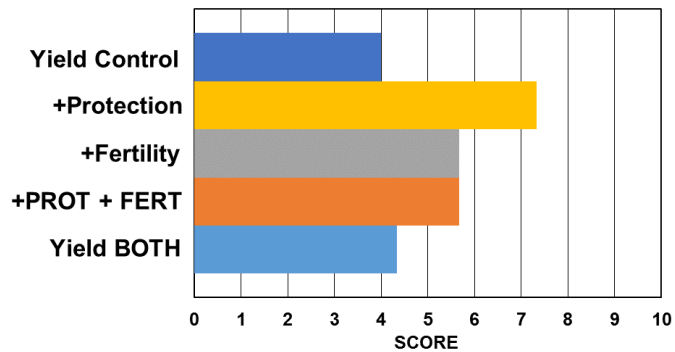
P31A22X

Moderate yield under control conditions. Slightly above average response to foliar protection alone. Largest response to foliar protection alone at central IL location.



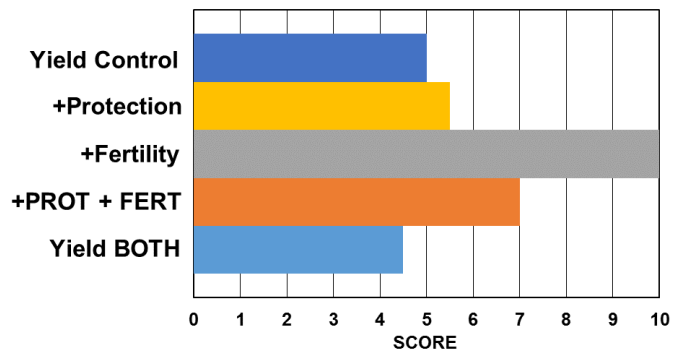
P36A18X

Slightly above average and above average response to all management.



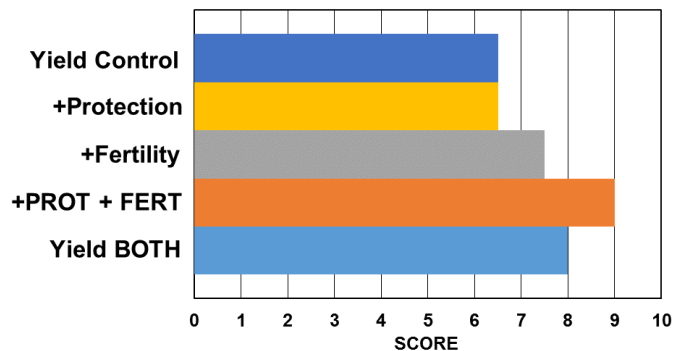
P38A98X

Average yield under Control conditions. High response to fertility alone and slightly above average response to foliar protection and above average response to foliar protection in combination with fertility.



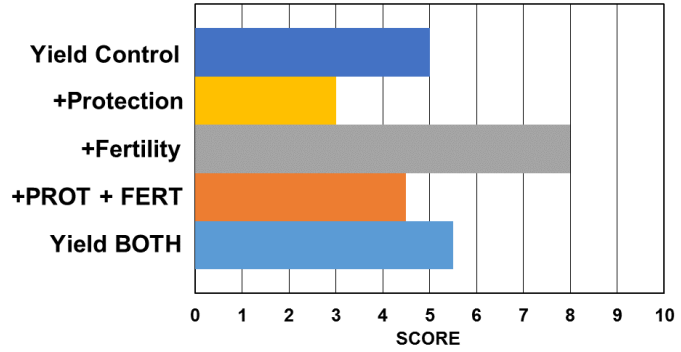
P40A47X

Above average yield under Control and BOTH conditions. High response to foliar protection in combination with fertility and above average response to foliar protection and fertility alone.



P42A52X

Average and slightly above average yield under Control and BOTH conditions, respectively. When comparing yield under BOTH conditions, this variety was the highest yielding at southern IL location. High response to additional fertility alone.



P46A93X

High yield under Control and BOTH conditions. High response to foliar protection alone and above average response to foliar protection when combined with fertility.

