

Ewing Demonstration Center Annual Report - 2020

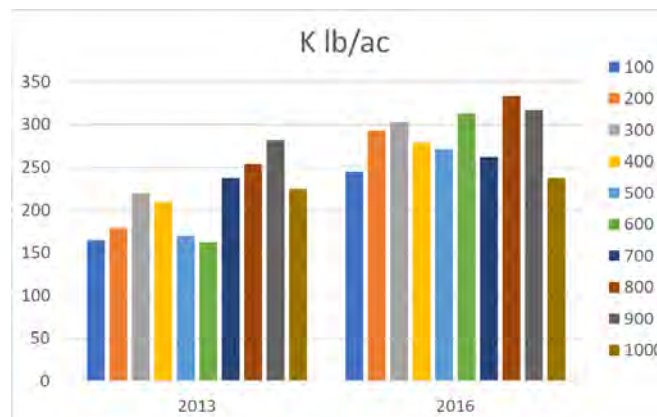
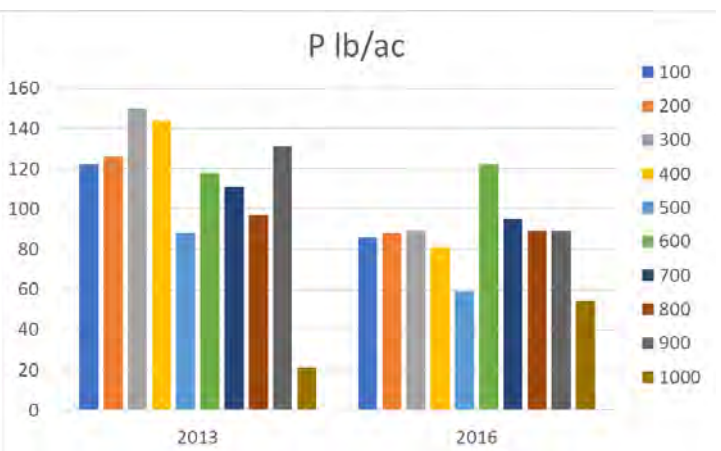
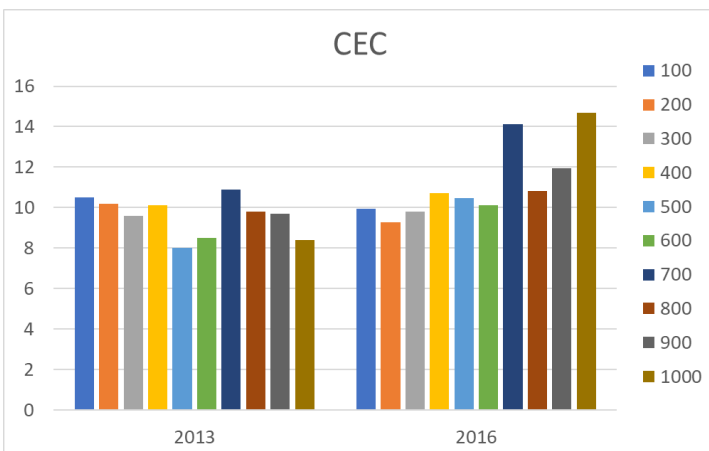
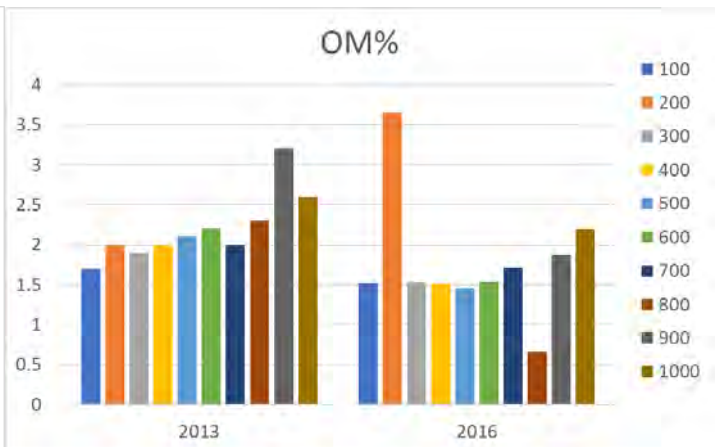
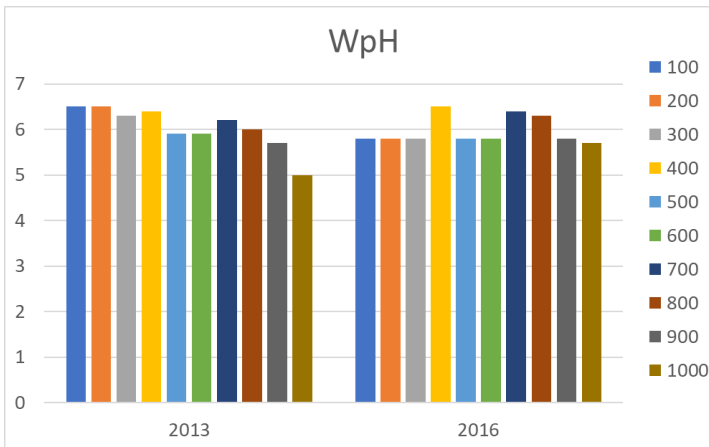


Illinois Extension

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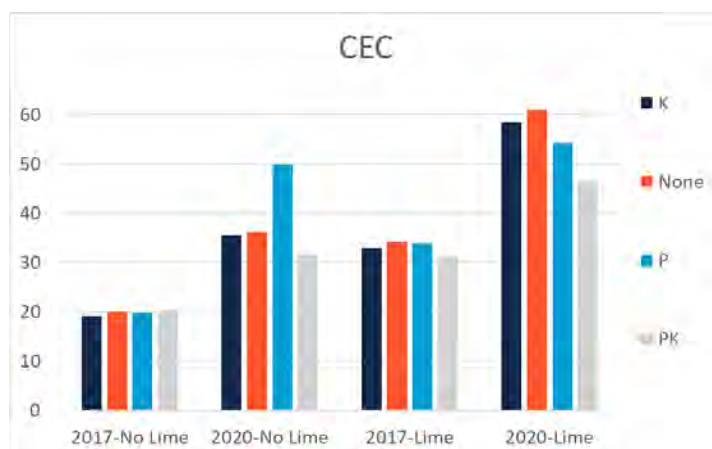
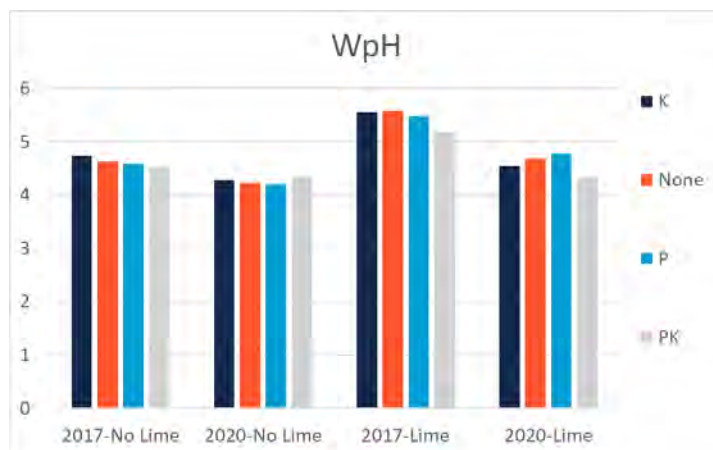
Main Series Soil Analysis

Series	WpH		OM%		CEC		P lbs/ac		K lbs/ac		Ca lbs/ac		Mg lbs/ac		S lbs/ac
	2013	2016	2013	2016	2013	2016	2013	2016	2013	2016	2013	2016	2013	2016	
100	6.5	5.8	1.7	1.5	10.5	9.9	122	86	164	245	3,401	2,864	142	113	25
200	6.5	5.8	2.0	3.7	10.2	9.3	126	88	178	293	3,253	2,765	140	98	25
300	6.3	5.8	1.9	1.5	9.6	9.8	150	89	219	302	2,884	2,923	146	121	24
400	6.4	6.5	2.0	1.5	10.1	10.7	144	81	209	278	3,087	3,476	170	116	22
500	5.9	5.8	2.1	1.5	8.0	10.5	88	59	170	271	2,126	3,163	150	152	19
600	5.9	5.8	2.2	1.5	8.5	10.1	118	122	162	313	2,318	2,832	164	158	27
700	6.2	6.4	2.0	1.7	10.9	14.1	111	95	237	262	3,172	4,369	258	304	22
800	6.0	6.3	2.3	0.7	9.8	10.8	97	89	253	333	2,693	3,371	220	186	55
900	5.7	5.8	3.2	1.9	9.7	11.9	131	89	281	317	2,516	3,431	206	230	32
1000	5.0	5.7	2.6	2.2	8.4	14.7	21	54	225	237	1,699	4,318	264	288	40

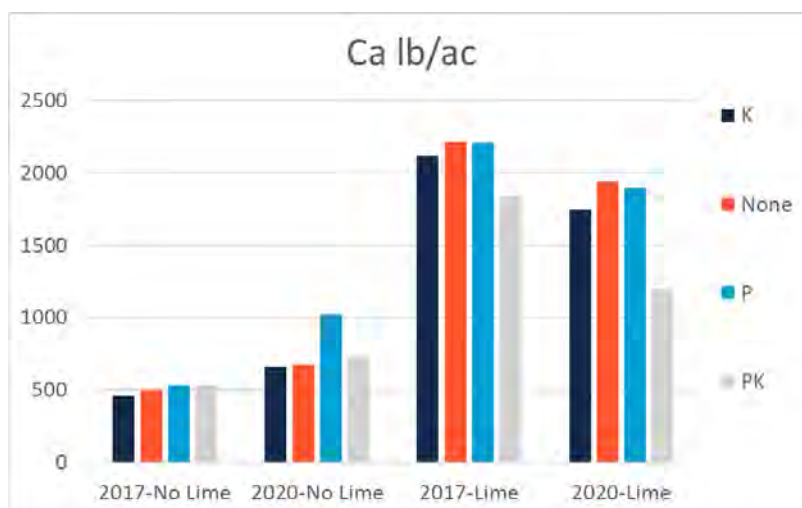
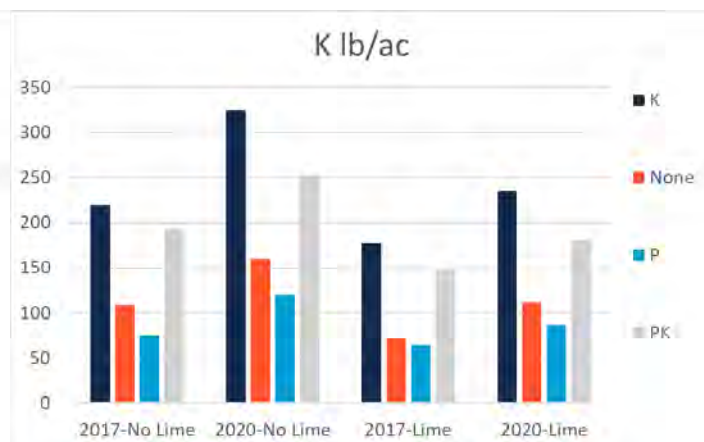
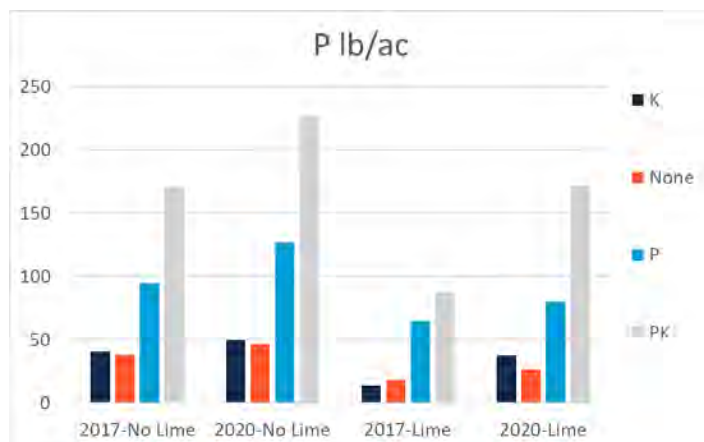


Fertility Plot Soil Analysis

	WpH				OM%				CEC			
	Lime		No Lime		Lime		No Lime		Lime		No Lime	
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
100 Series												
K	5.6	4.4	4.9	4.2	1.2	1.2	1.2	1.2	8.3	17.5	4.8	11.5
None	5.6	4.2	4.8	4.3	1.0	1.4	1.0	1.2	8.6	19.1	4.9	9.3
P	5.5	4.9	4.8	4.1	1.0	1.2	1.0	1.2	8.3	11.4	4.8	9.1
PK	5.1	4.4	4.6	5.0	1.2	1.5	1.2	1.5	8.1	12.6	5.4	9.0
200 Series												
K	5.3	5.0	4.7	4.2	1.2	1.3	1.0	1.1	8.2	13.7	4.4	7.4
None	5.6	4.5	4.5	3.8	1.2	1.3	1.0	1.1	8.5	15.1	4.9	9.1
P	5.2	4.3	4.3	4.0	1.0	1.5	1.2	1.4	8.8	16.1	4.9	9.8
PK	4.9	4.1	4.3	3.9	1.4	1.3	1.0	1.3	7.5	12.5	5.0	7.0
300 Series												
K	6.1	4.9	4.7	4.2	1.4	1.3	1.2	1.2	8.0	11.1	4.6	7.5
None	6.2	5.8	4.7	4.5	1.8	1.1	1.0	1.3	8.7	12.4	4.7	8.3
P	6.0	5.1	4.7	4.3	1.9	1.5	1.2	1.5	9.1	14.2	4.7	22.7
PK	5.7	4.6	4.6	4.1	1.4	1.5	1.2	1.4	7.8	10.4	4.9	6.5
400 Series												
K	5.2	3.9	4.6	4.5	1.2	1.4	1.9	1.7	8.4	16.1	5.4	9.2
None	4.9	4.2	4.5	4.3	1.5	1.1	1.2	1.2	8.4	14.4	5.6	9.4
P	5.2	4.8	4.5	4.4	1.8	1.6	1.2	1.3	7.6	12.7	5.4	8.3
PK	5.0	4.2	4.6	4.4	1.7	1.4	1.2	1.5	7.8	11.0	5.1	9.2

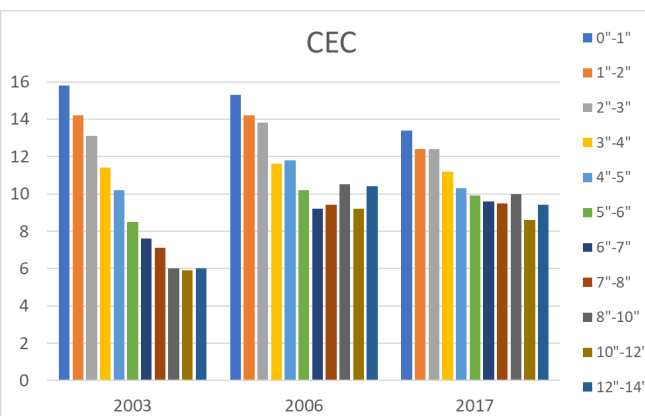
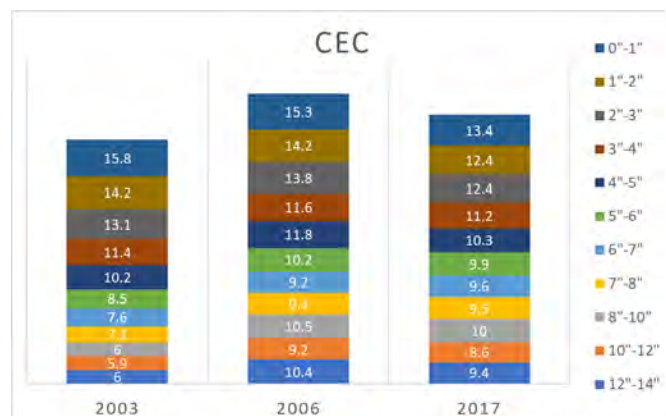
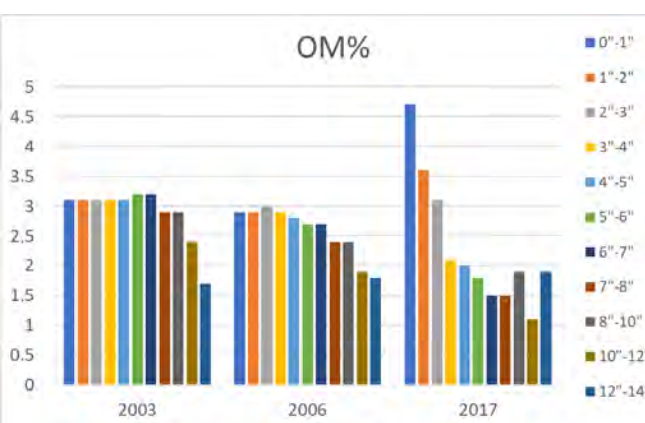
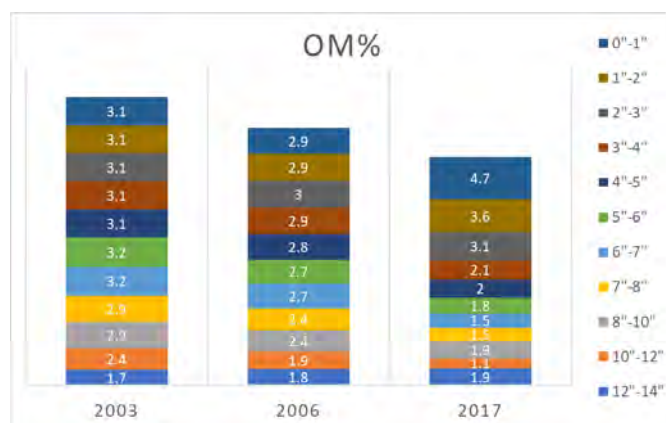
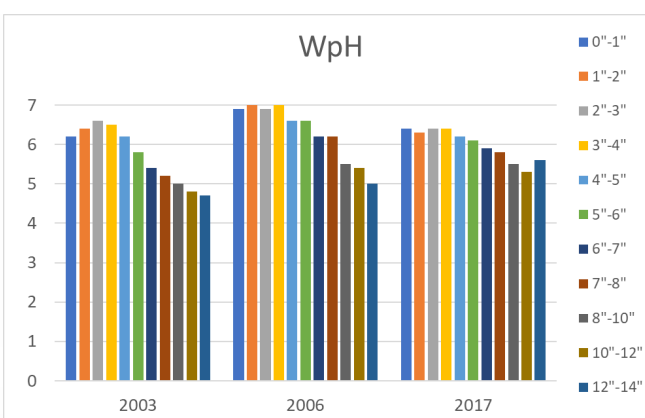


	P lb/ac				K lb/ac				Ca lb/ac			
	Lime		No Lime		Lime		No Lime		Lime		No Lime	
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
100 Series												
K	14	22	29	50	288	290	291	560	2,099	1,950	485	738
None	14	18	30	38	82	118	127	150	2,339	1,884	516	764
P	72	70	108	204	58	72	82	116	2,272	1,782	560	658
PK	68	76	114	214	198	184	280	386	1,915	1,394	599	1,174
200 Series												
K	14	26	36	44	171	264	221	300	2,034	2,136	355	534
None	12	24	40	48	64	116	115	250	2,302	1,748	446	502
P	57	60	96	210	62	82	72	144	2,295	1,650	434	666
PK	90	212	205	228	137	214	183	292	1,660	1,058	458	400
300 Series												
K	14	28	55	60	103	150	166	236	2,343	1,672	431	556
None	12	12	45	50	54	72	103	114	2,493	2,882	452	760
P	37	42	84	2	54	106	84	106	2,539	2,406	508	1,974
PK	72	104	135	244	109	136	146	166	2,080	1,330	512	482
400 Series												
K	16	74	44	44	147	234	200	202	1,992	1,220	573	820
None	36	50	37	52	84	140	91	124	1,715	1,238	575	688
P	92	148	92	92	82	86	63	112	1,731	1,742	634	786
PK	121	296	226	222	149	190	164	168	1,712	988	564	856

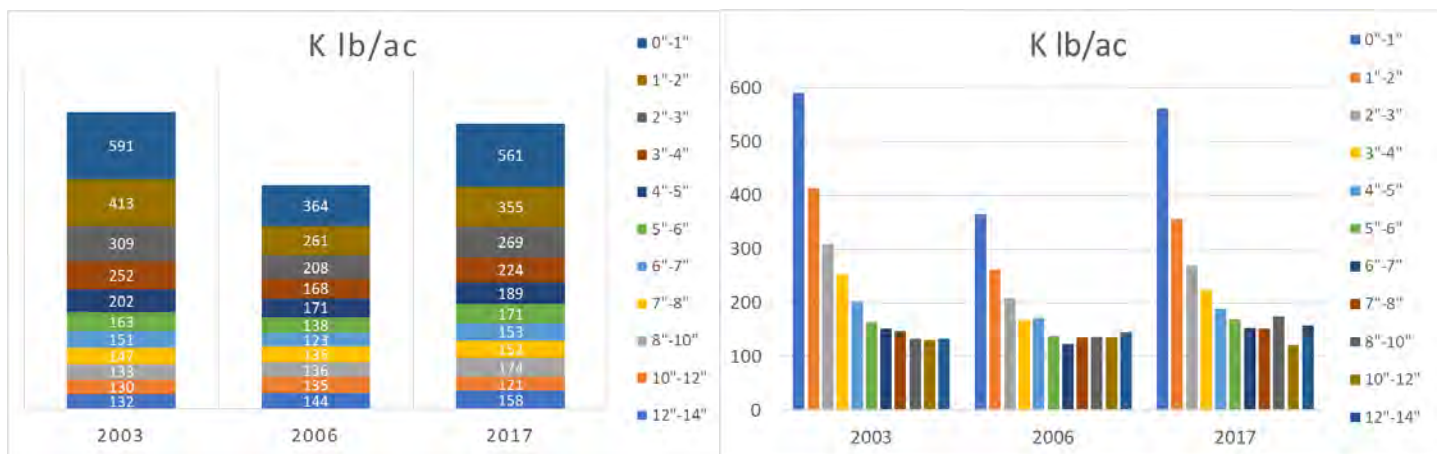
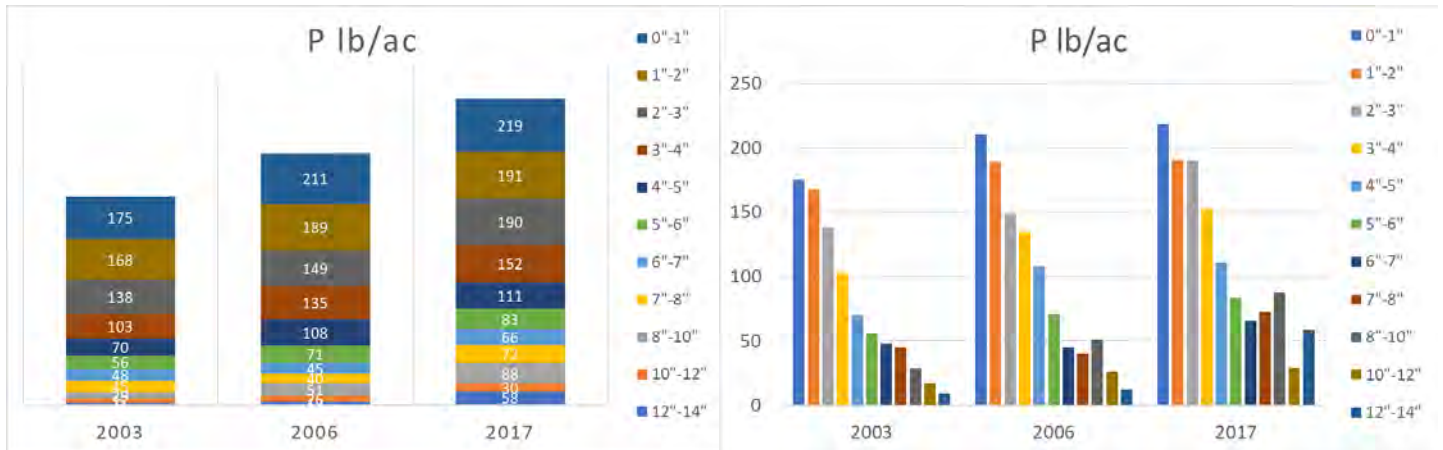


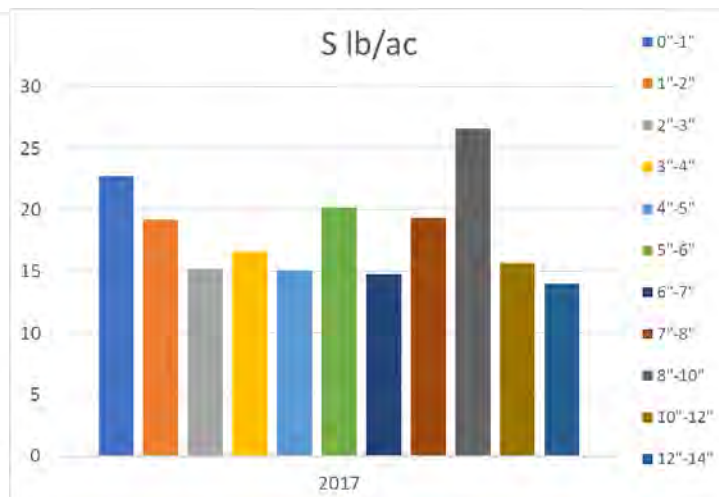
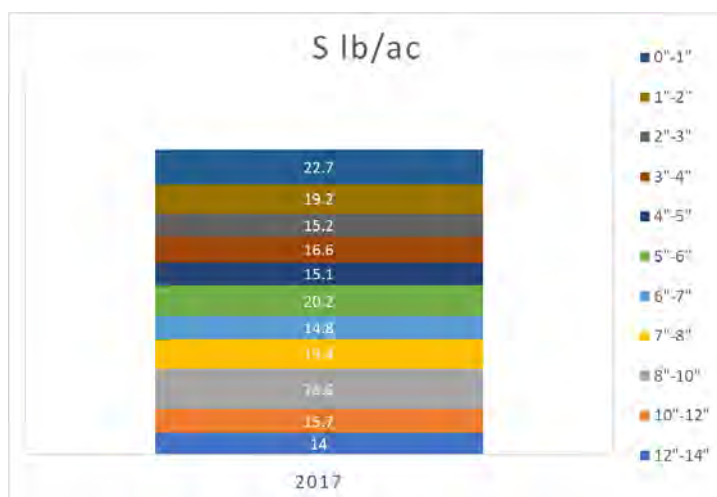
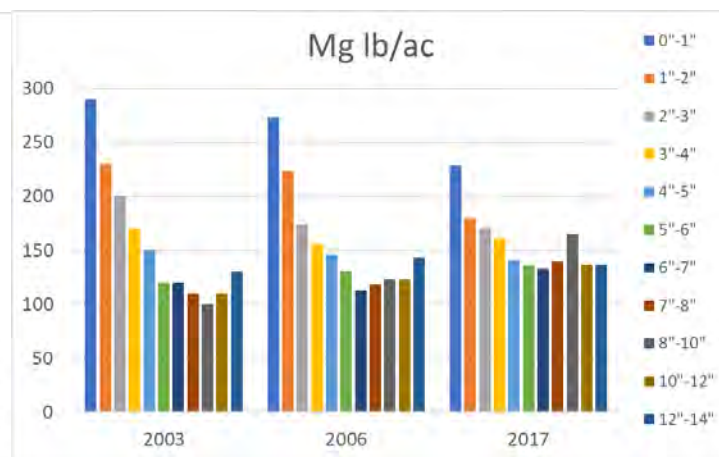
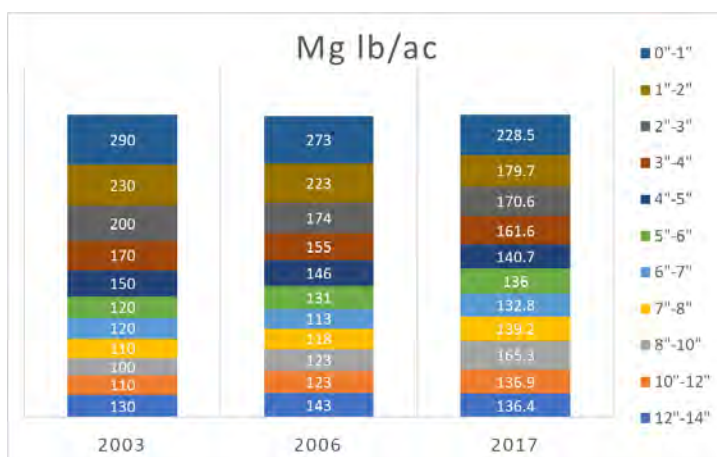
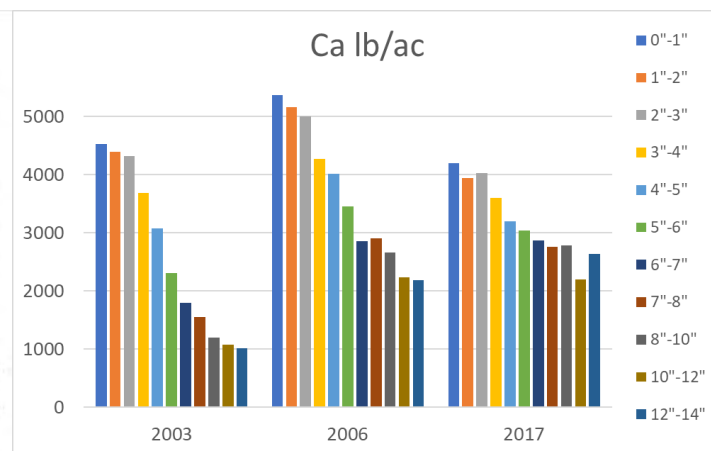
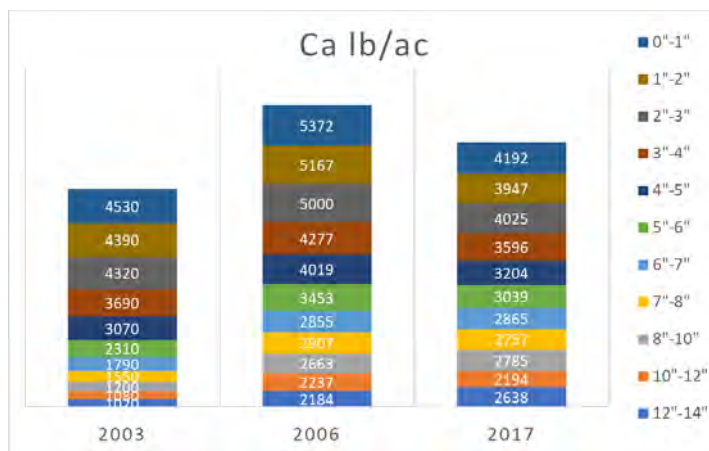
Long-Term Continuous No-Till Soil Analysis – By Depth

Depth (in.)	WpH			OM %			CEC		
	2003	2006	2017	2003	2006	2017	2003	2006	2017
0"-1"	6.2	6.9	6.4	3.1	2.9	4.7	15.8	15.3	13.4
1"-2"	6.4	7	6.3	3.1	2.9	3.6	14.2	14.2	12.4
2"-3"	6.6	6.9	6.4	3.1	3	3.1	13.1	13.8	12.4
3"-4"	6.5	7	6.4	3.1	2.9	2.1	11.4	11.6	11.2
4"-5"	6.2	6.6	6.2	3.1	2.8	2	10.2	11.8	10.3
5"-6"	5.8	6.6	6.1	3.2	2.7	1.8	8.5	10.2	9.9
6"-7"	5.4	6.2	5.9	3.2	2.7	1.5	7.6	9.2	9.6
7"-8"	5.2	6.2	5.8	2.9	2.4	1.5	7.1	9.4	9.5
8"-10"	5	5.5	5.5	2.9	2.4	1.9	6	10.5	10
10"-12"	4.8	5.4	5.3	2.4	1.9	1.1	5.9	9.2	8.6
12"-14"	4.7	5	5.6	1.7	1.8	1.9	6	10.4	9.4



Depth (in.)	P (lbs/ac)			K (lbs/ac)			Ca (lbs/ac)			Mg (lbs/ac)			S (lbs/ac)
	2003	2006	2017	2003	2006	2017	2003	2006	2017	2003	2006	2017	
0"-1"	175	211	219	591	364	561	4,530	5,372	4,192	290	273	229	22.7
1"-2"	168	189	191	413	261	355	4,390	5,167	3,947	230	223	180	19.2
2"-3"	138	149	190	309	208	269	4,320	5,000	4,025	200	174	171	15.2
3"-4"	103	135	152	252	168	224	3,690	4,277	3,596	170	155	162	16.6
4"-5"	70	108	111	202	171	189	3,070	4,019	3,204	150	146	141	15.1
5"-6"	56	71	83	163	138	171	2,310	3,453	3,038	120	131	136	20.2
6"-7"	48	45	66	151	123	153	1,790	2,855	2,865	120	113	133	14.8
7"-8"	45	40	72	147	135	152	1,550	2,907	2,757	110	118	139	19.4
8"-10"	29	51	88	133	136	174	1,200	2,663	2,785	100	123	165	26.6
10"-12"	17	26	30	130	135	121	1,080	2,237	2,194	110	123	137	15.7
12"-14"	9	12	58	132	144	158	1,020	2,184	2,638	130	143	136	14





Long-Term Continuous No-Till Yield Data

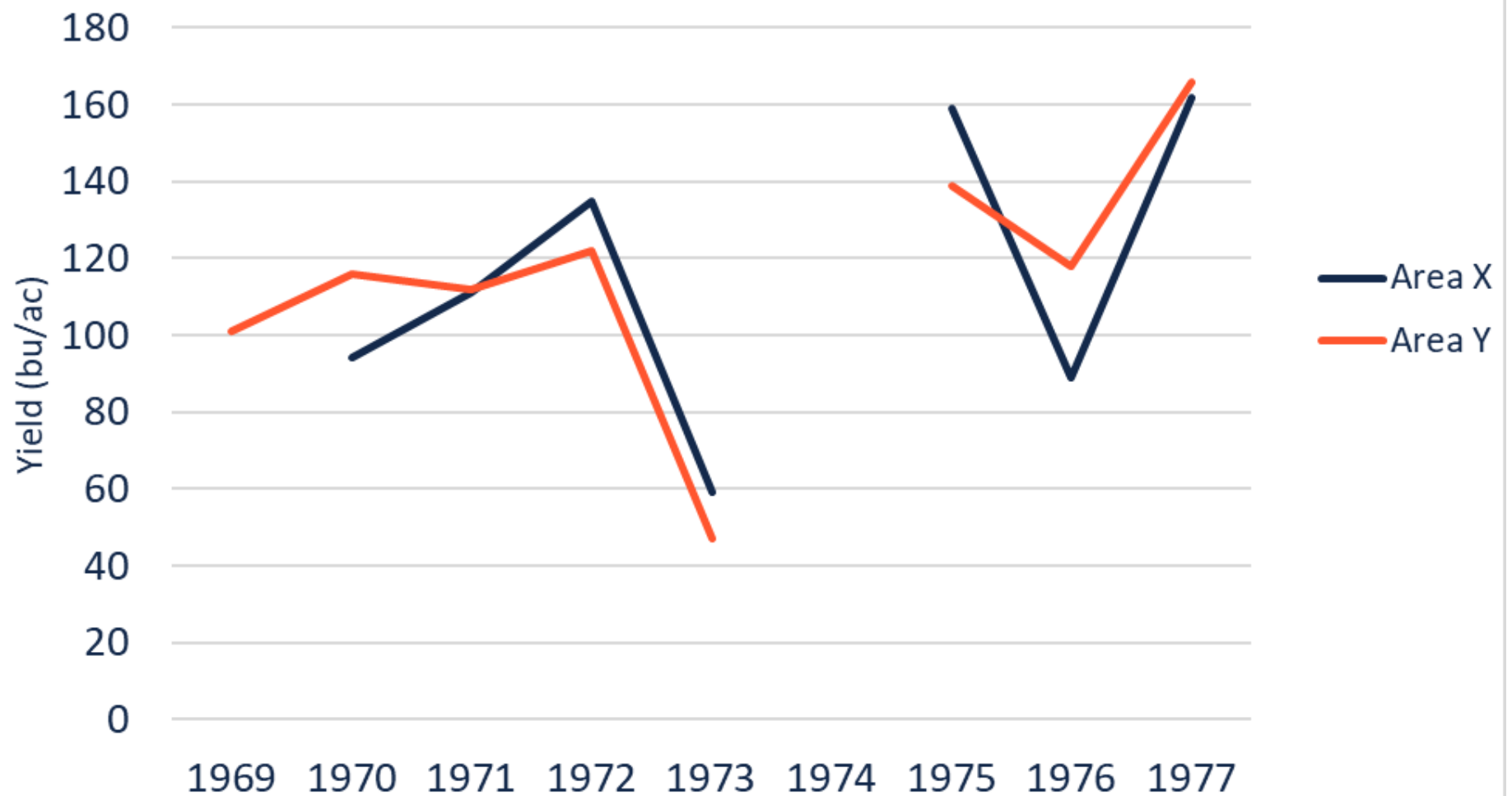
Year	X Area		Y Area	
	Crop	Yield (bu/A)	Crop	Yield (bu/A)
1969			Corn	101
1970	Corn	94	Corn	116
1971	Corn	111	Corn	112
1972	Corn	135	Corn	122
1973	Corn	59	Corn	47
1974	Harvested Jan. '75, no yield			
1975	Corn	159	Corn	139
1976	Corn	89	Corn	118
1977	Corn	162	Corn	166
1978	Corn	30.5	Soybean	22
1979	Soybean	25	Corn	149
1980	Corn	38.9	Soybean	40.3
1981	Soybean	22.5	Corn	102
1982	Corn	168	Soybean	33.5
1983	Soybean	22	Corn	30.5
1984	Corn	96	Soybean	26.1
1985	Soybean	19.3	Corn	57
1986	Corn	126	Soybean	27.3
1987	Soybean	20.5	Corn	153.3
1988	Corn	108	Soybean	29.5
1989	Soybean	56.9	Corn	158.7
1990	Corn	102	Soybean	27.2
1991	Soybean	24.6	Corn	49.7
1992	Corn	118.4	Soybean	27.1
1993	Soybean	44.8	Corn	130.5

*From 1969 to 1993, the 900 Series was divided into an X Area and Y Area.

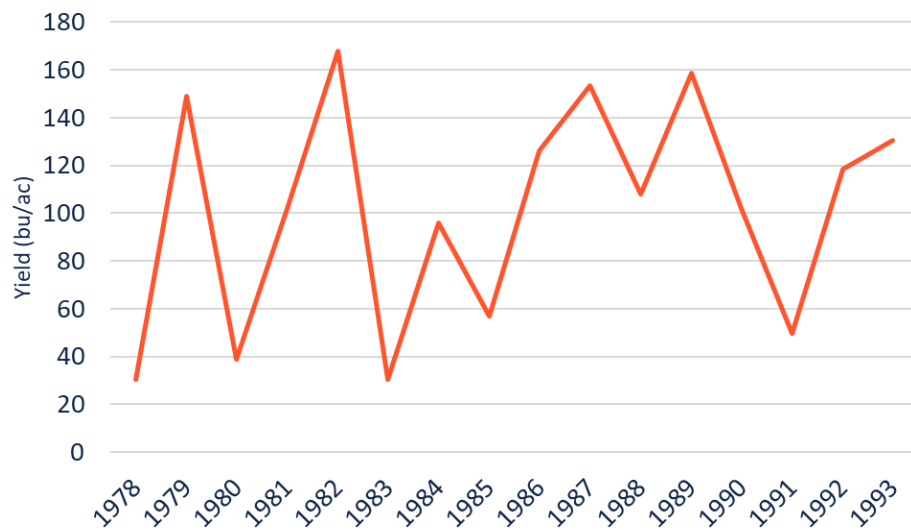
Year	Crop	Yield (bu/A)	County Avg (bu/ac)	Δ (%)
1994	Corn	142.7	113	26%
1995	Soybean	34.4	28.5	21%
1996	Corn	118.1	99	19%
1997	Soybean	47.3	36.5	30%
1998	Corn	147.3	88	67%
1999	Soybean	49	21	133%
2000	Corn	138.7	123	13%
2001	Soybean	44.7	40	12%
2002	Corn	116.9	49	139%
2003	Soybean	29.2	28	4%
2004	Corn	204.4	138	48%
2005	Soybean	51	42	21%
2006	Corn	141.9	130	9%
2007	Soybean	39.9	25	60%
2008	Corn	194.5	142	37%
2009	Soybean	51.9	39	33%
2010	Corn	208.2	111.4	87%
2011	Soybean	27.2	31.8	-14%
2012	Corn	4.5	30.1	-85%
2013	Soybean	54.3	41.4	31%
2014	Corn	144.4	160.3	-10%
2015	Soybean	44.8	45.9	-2%
2016	Corn	53.9	115.6	-53%
2017	Soybean	56.4	46.4	22%
2018	Corn	198.1	155.5	27%
2019	Soybean	47.9	38.9	23%
2020	Corn	185.2	164.5	13%

* From 1994 to present, the entire area was cropped the same.

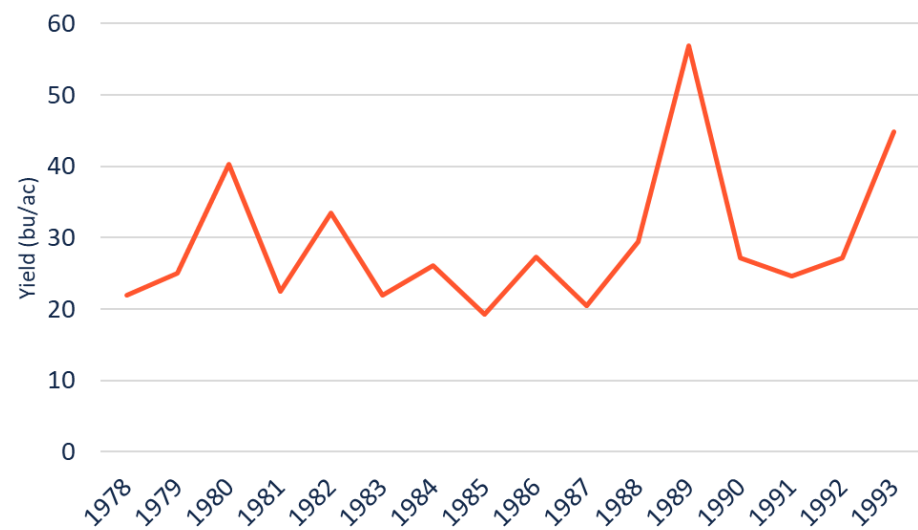
1969-1977 Continous Corn Yields



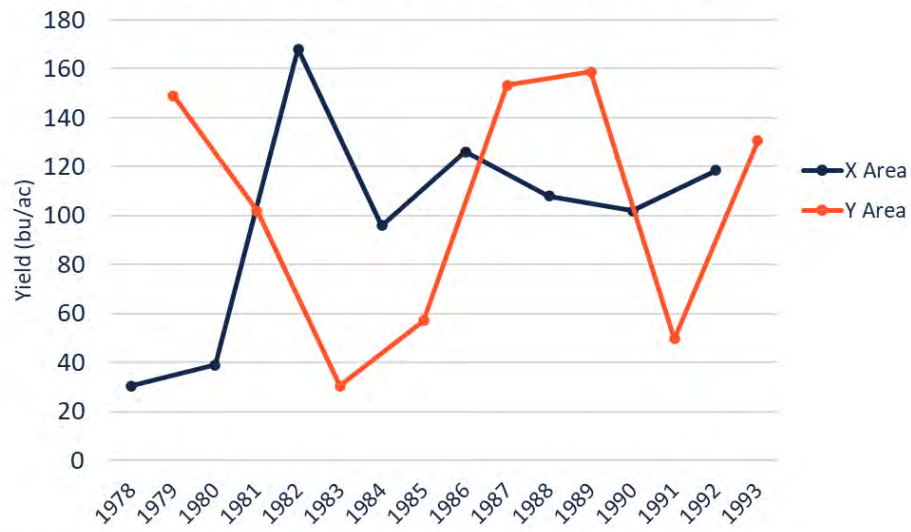
1978-1993 Corn Yields



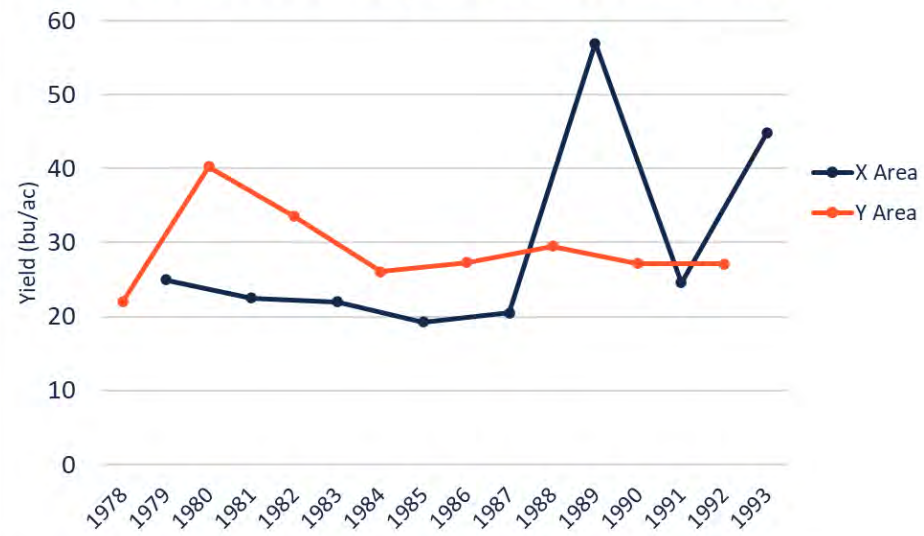
1978-1993 Soybean Yields



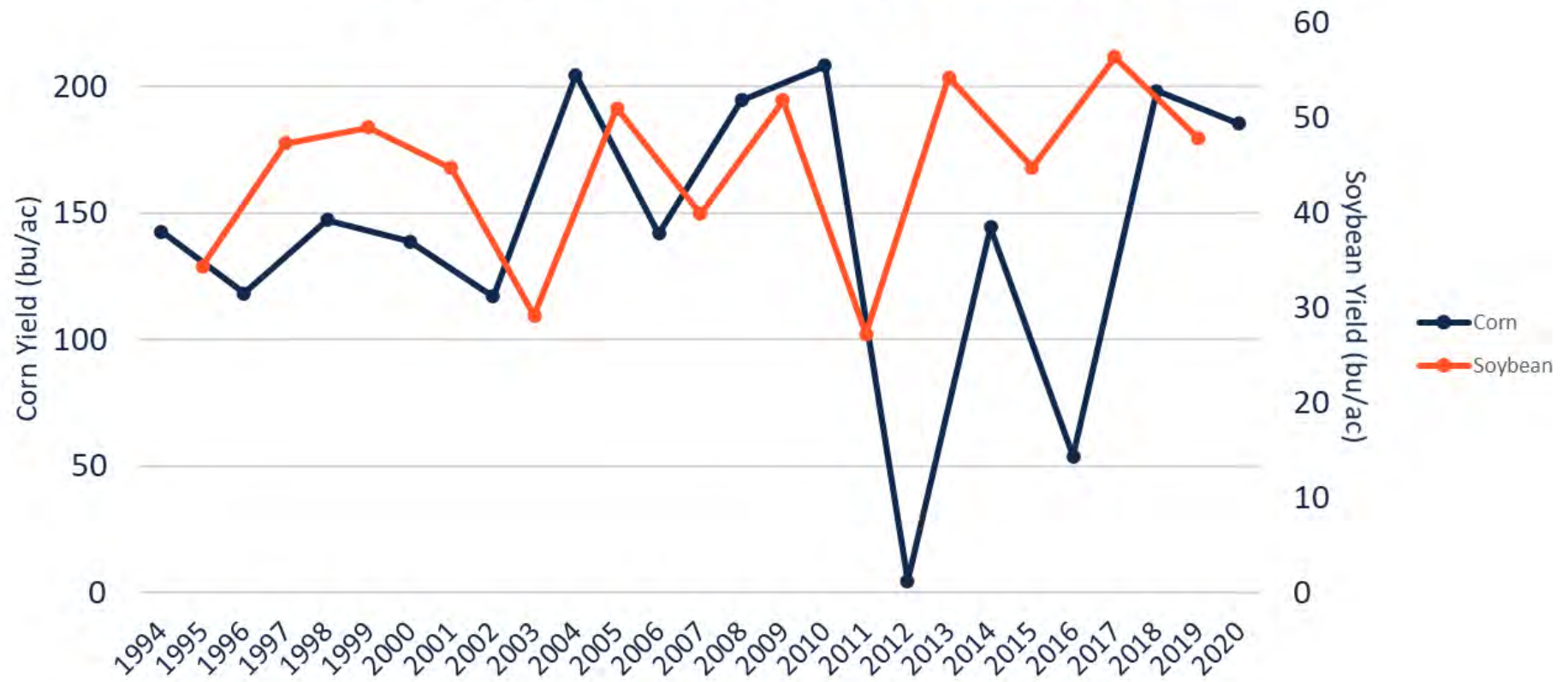
1978-1993 Corn Yields by Area



1978-1993 Soybean Yields by Area

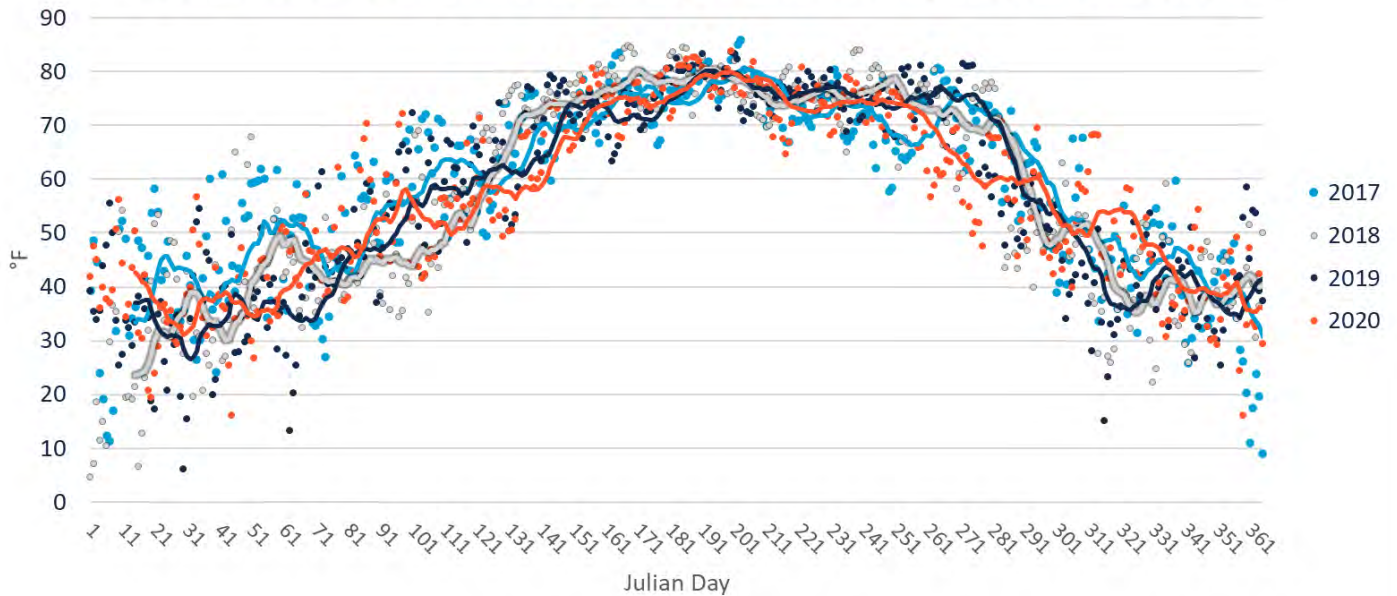


1994-2020 Corn & Soybean Yields

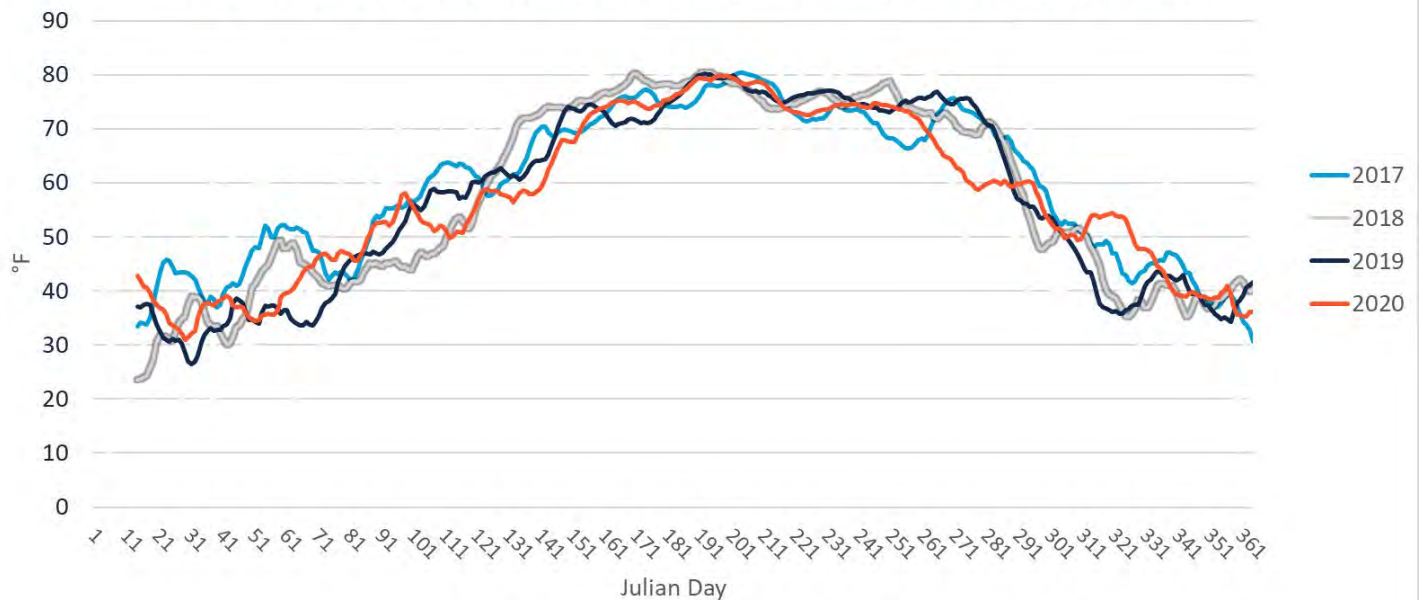


2017-2020 Weather Data

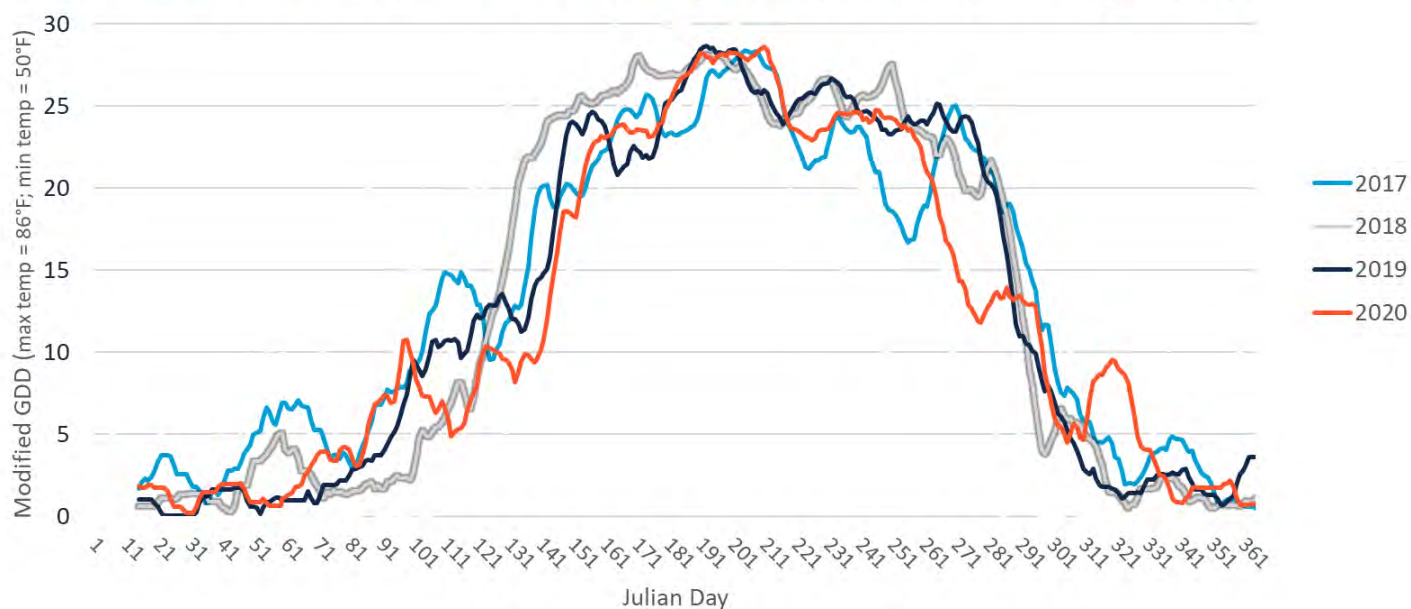
2017-2020 Daily Average Temp. with 15-Day Moving Average



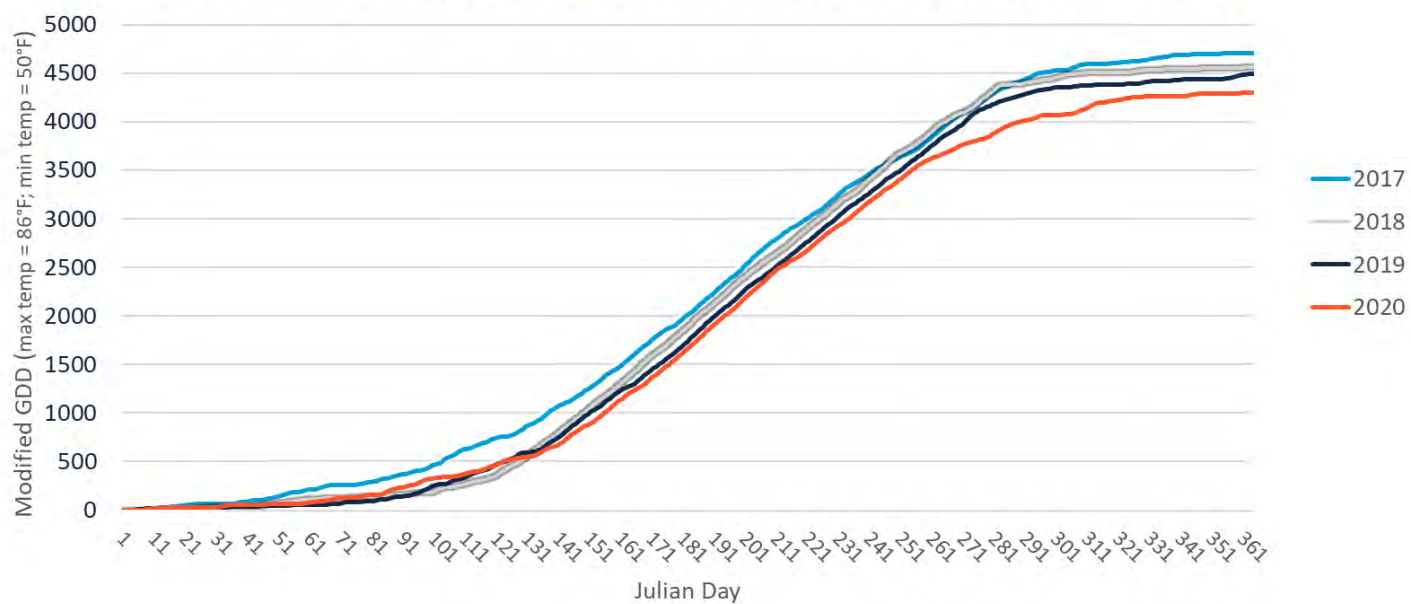
2017-2020 Daily Average Temp. 15-Day Moving Average



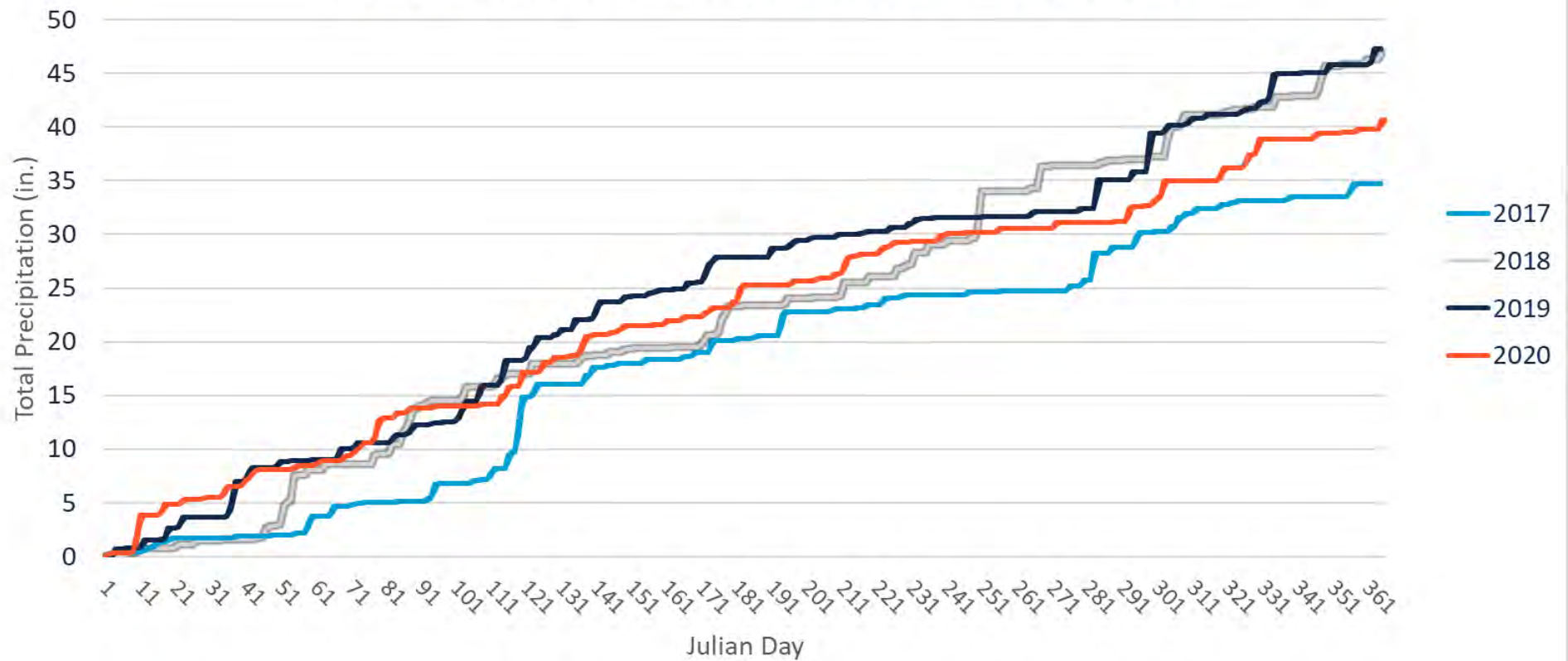
2017-2020 Modified Growing Degree Days 15-Day Moving Average



2017-2020 Total Accumulated Modified Growing Degree Days



2017-2020 Total Accumulated Precipitation



Soybean Herbicide System x Variety Trial

Location: EDC 100

Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker

Plot Size: 10ft x 290ft

Reps: 3

CROP INFORMATION

Cover Crop: N/A (winter annual grass weeds)

Crop: Soybean

Variety/Hybrid: *see treatment list*

Seed Treatment: *see treatment list*

Planting Date: 6/12/2020

Planting Method: No-till Planter - 30" rows / 1" depth

Seeding Rate: approx.143,000 s/ac

Soil Conditions (planting): Slightly wet

Previous Crop: Corn|Sorghum

Harvest Date: 11/4/2020

Harvest Area: 2620 ft²

FIELD INFORMATION

Soil Type: Cisne silt loam (60%); Hoyleton silt loam (40%)

pH: 5.8 (2016)

OM%: 1.52 (2016)

P (lbs/ac): 86 (2016)

K (lbs/ac): 245 (2016)

Ca (lbs/ac): 2864 (2016)

Mg (lbs/ac): 113 (2016)

S (lbs/ac): 25 (2016)

CEC: 9.94 (2016)

Notes:

LumiGEN + ILevo: xathiapiprolin[f], metalaxyl[f], penflufen[f], prothioconazole[f], *Bacillus amyloliquefaciens* -strain MBI 600[f], *Bacillus pumilus* -strain BU F-33[f], imidacloprid[i], fluopyram[n/f]

Acceleron Standard: pyraclostrobin[f], metalaxyl[f], fluxapyroxad[f], imidacloprid[i]

TREATMENTS

Variety	RM	Seed Treatment	Plot Numbers
P39A45X	3.9	LumiGEN + ILevo	X-101 X-202 X-302
AG43X0	4.3	Acceleron Standard	X-102 X-201 X-303
AG31X0	3.1	Acceleron Standard	X-103 X-203 X-301
P37A63L	3.7	LumiGEN + ILevo	L-101 L-201 L-303
P38A49L	3.8	LumiGEN + ILevo	L-102 L-203 L-302
P44A37L	4.4	LumiGEN + ILevo	L-103 L-202 L-301
P34T21SE	3.4	LumiGEN + ILevo	E-101 E-201 E-302
P35T01SE	3.5	LumiGEN + ILevo	E-102 E-203 E-303
P38T76E	3.8	LumiGEN + ILevo	E-103 E-202 E-301

see notes for active ingredients

PEST MANAGEMENT

Date	Application Timing	Product(s)	Rate
6/12/2020	Pre-Emergence	Gramoxone	48 oz/ac
6/12/2020	Pre-Emergence	Authority First	6.5 oz/ac
6/12/2020	Pre-Emergence	NIS	16 oz/100 gal
6/12/2020	Pre-Emergence	AMS (21-0-0-24S)	17 lbs/100 gal

Xtend Plots

7/13/2020	Post-Emergence	Roundup PowerMAX	44 oz/ac
7/13/2020	Post-Emergence	AMS (21-0-0-24S)	17 lbs/100 gal

Enlist Plots

7/13/2020	Post-Emergence	Enlist Duo	64 oz/ac
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Liberty Plots

7/13/2020	Post-Emergence	Liberty	40 oz/ac
7/13/2020	Post-Emergence	AMS (21-0-0-24S)	2 lbs/ac

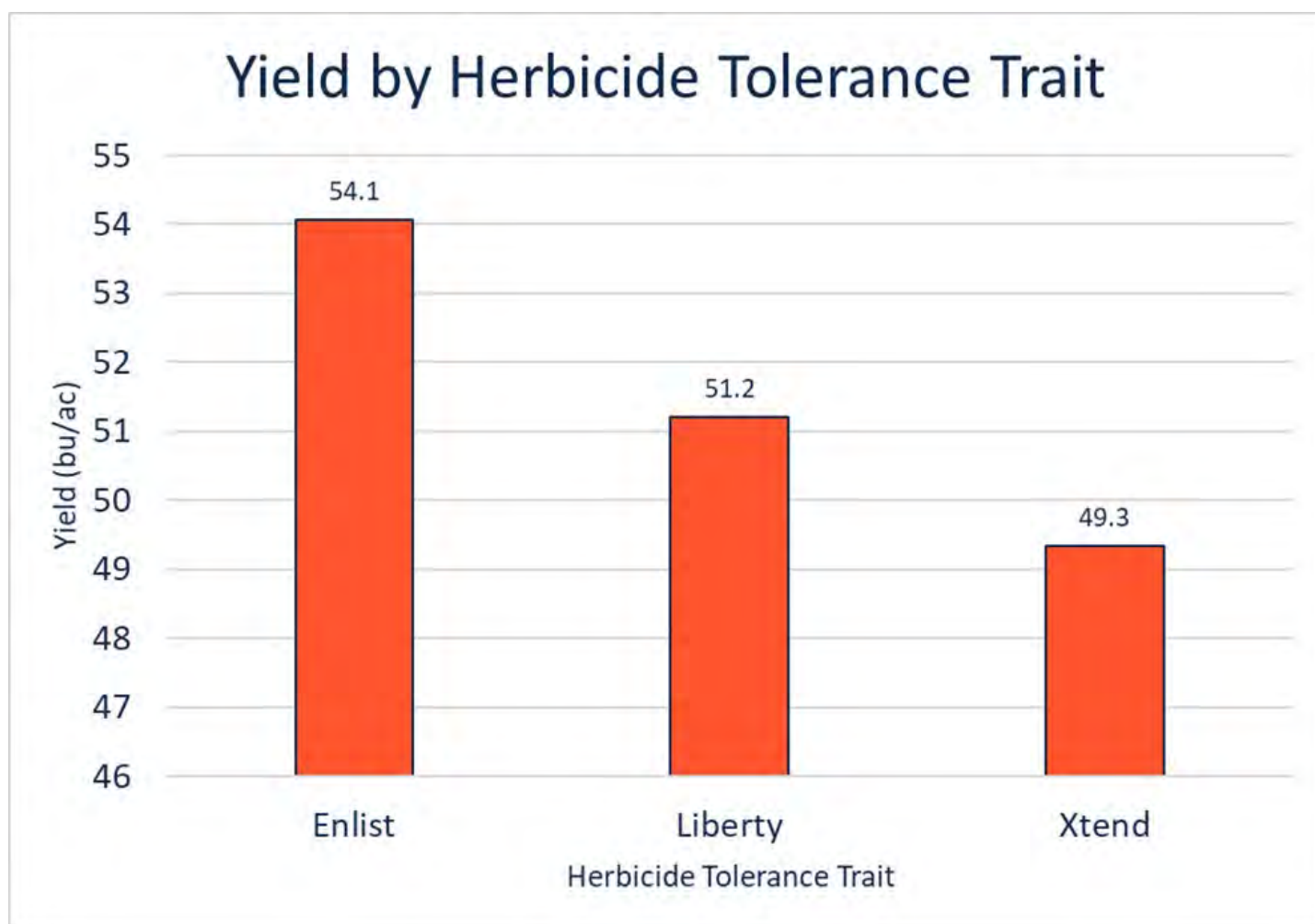
SOIL FERTILITY

Date	Application Timing	Product(s)	Rate

HERB. TOLERANCE TRAIT	EST. POP. (plants/ac)	MST (%)	TW (lb/bu)	YIELD (bu/ac) ^a
Enlist	104,389 B ^b	12.0 A	53.9 A	54.1 A
Liberty	108,500 B	11.7 B	53.9 A	51.2 A
Xtend	118,722 A	11.3 C	54.1 A	49.3 A

^a Reported yields adjusted to 13% moisture

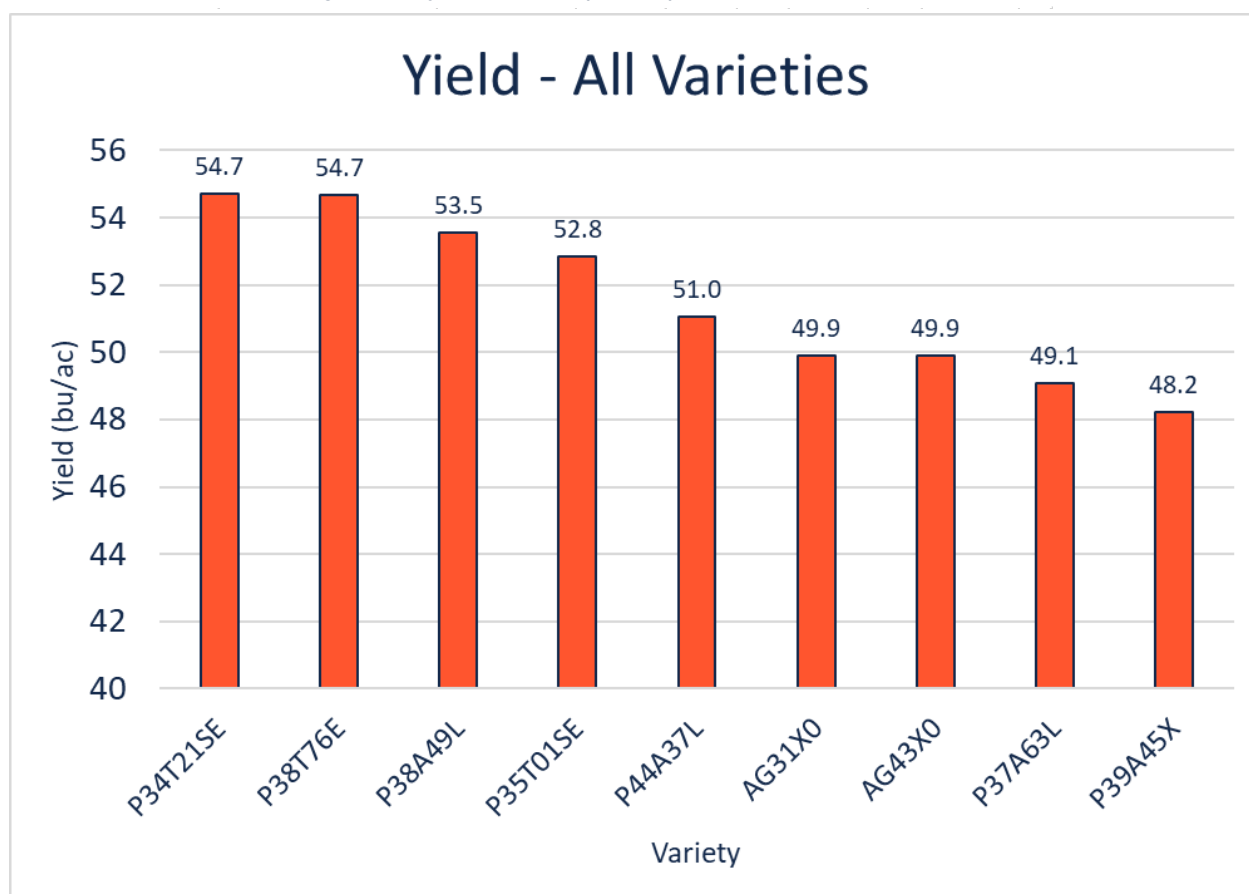
^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)



VARIETY	EST. POP. (plants/ac)	MST (%)	TW (lb/bu)	YIELD (bu/ac) ^a
P34T21SE	106,000 BCD ^b	12.1 A	54.1 A	54.7 A
P38T76E	107,667 BCD	11.8 AB	54.7 A	54.7 A
P38A49L	96,000 D	11.5 AB	53.8 A	53.5 A
P35T01SE	99,500 D	12.1 A	53.0 A	52.8 A
P44A37L	108,333 BCD	11.6 AB	54.3 A	51.0 A
AG31X0	129,333 A	11.3 B	54.8 A	49.9 A
AG43X0	124,500 AB	11.3 B	53.3 A	49.9 A
P37A63L	121,167 ABC	11.8 AB	53.6 A	49.1 A
P39A45X	102,333 CD	11.3 B	54.3 A	48.2 A

^a Reported yields adjusted to 13% moisture

^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)



TAKEAWAYS:

- No statistically significant difference in yield between herbicide tolerance technology groups or among individual varieties.
 - Since experiment was organized in blocks for each herbicide technology to allow for mechanized spray applications, micro-environmental influences could be responsible for some yield differences between herbicide technology groups.
- The two varieties with the lowest estimated plant populations had the 3rd and 4th ranked yields.
 - Holds true that final plant populations >90,000 is all that is necessary for good soybean yields.

Corn v. Sorghum N Rate Trial

Location: EDC 200
Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker
Plot Size: 10ft x 270ft
Reps: 3

CROP INFORMATION

Cover Crop: None
Crop: Corn | Sorghum
Variety/Hybrid: DKC65-95RIB | DKS38-16
Seed Treatment: FALH2Q (94%) FALH1 (5%) | MXSH (Concep III & Poncho)
Planting Date: 6/8/2020
Planting Method: No-till Planter - 30" rows / 1" deep | 0.5" deep
Seeding Rate: Corn - approx. 30,000 s/A | Sorghum - approx. 82,000 s/A
Soil Conditions @ Planting: Slightly Wet
Previous Crop: Winter Wheat / Soybeans
Harvest Date: 11/17/2020 - Corn | 11/18/2020 - Sorghum
Harvest Area: 675 ft²

FIELD INFORMATION

Soil Type: Cisne silt loam
pH: 5.8 (2016)
OM%: 3.65 (2016)
P (lbs/ac): 88 (2016)
K (lbs/ac): 293 (2016)
Ca (lbs/ac): 2765 (2016)
Mg (lbs/ac): 98 (2016)
S (lbs/ac): 25 (2016)
CEC: 9.29 (2016)

Notes:

Sorghum Planter Setting: Driver=16|Driven=26

TREATMENTS

Treatment	Plot Numbers					
	Sorghum	Corn	Sorghum	Corn	Sorghum	Corn
0 lbs N/ac	S-109	C-110	S-204	C-208	S-301	C-301
50 lbs N/ac @emerge	S-102	C-106	S-209	C-202	S-302	C-302
100 lbs N/ac @emerge	S-106	C-102	S-207	C-207	S-303	C-303
150 lbs N/ac @emerge	S-110	C-107	S-202	C-201	S-304	C-304
200 lbs N/ac @emerge	S-107	C-101	S-208	C-209	S-305	C-305
250 lbs N/ac @emerge	S-105	C-108	S-205	C-203	S-306	C-306
50 lbs N/ac @emerge + 50 SD	S-108	C-104	S-203	C-205	S-307	C-307
50 lbs N/ac @emerge + 100 SD	S-101	C-103	S-210	C-210	S-308	C-308
100 lbs N/ac @emerge + 50 SD	S-103	C-105	S-201	C-206	S-309	C-309
0 lbs N/ac @emerge + 150 SD	S-104	C-109	S-206	C-204	S-310	C-310

PEST MANAGEMENT

Date	Application Timing	Product(s)	Rate
4/2/20	Burndown	Roundup PowerMAX	38 oz/ac
4/2/20	Burndown	2,4-D LV4	16 oz/ac
4/2/20	Burndown	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal
6/5/20	Pre-plant	Gramoxone	48 oz/ac
6/5/20	Pre-plant	Aatrex	64 oz/ac
6/5/20	Pre-plant	Dual II Magnum	32 oz/ac
6/5/20	Pre-plant	Non-Ionic Surfactant	16 oz/100 gal

SOIL FERTILITY

Date	Application Timing	Product(s)	Rate
6/18/20	VE/V1 Sidedress	UAN 32%	See Treatment List
7/13/20	V6/7 Sidedress	UAN 32%	See Treatment List



(85')				10'			
NL PK	NL K	NL No PK	NL P	L PK	L K	L No PK	L P
FILL				FILL			
FILL				FILL			
FILL				FILL			
S-101	S-110	50 lbs N/ac @ emerge + 100SD	50 lbs N/ac @ emerge + 100SD	S-101	S-110	50 lbs N/ac @ emerge + 100SD	50 lbs N/ac @ emerge + 100SD
S-102	S-109	50 lbs N/ac	50 lbs N/ac	S-102	S-109	50 lbs N/ac	50 lbs N/ac
S-103	S-108	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD	S-103	S-108	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD
S-104	S-107	0 lbs N/ac @ emerge + 150 SD	0 lbs N/ac @ emerge + 150 SD	S-104	S-107	0 lbs N/ac @ emerge + 150 SD	0 lbs N/ac @ emerge + 150 SD
S-105	S-106	250 lbs N/ac	250 lbs N/ac	S-105	S-106	250 lbs N/ac	250 lbs N/ac
C-101	C-110	200 lbs N/ac	200 lbs N/ac	C-101	C-110	200 lbs N/ac	200 lbs N/ac
C-102	C-109	100 lbs N/ac	100 lbs N/ac	C-102	C-109	100 lbs N/ac	100 lbs N/ac
C-103	C-108	50 lbs N/ac @ emerge + 100SD	50 lbs N/ac @ emerge + 100SD	C-103	C-108	50 lbs N/ac @ emerge + 100SD	50 lbs N/ac @ emerge + 100SD
C-104	C-107	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD	C-104	C-107	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD
C-105	C-106	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD	C-105	C-106	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD
S-201	S-210	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD	S-201	S-210	100 lbs N/ac @ emerge + 50 SD	100 lbs N/ac @ emerge + 50 SD
S-202	S-209	150 lbs N/ac	150 lbs N/ac	S-202	S-209	150 lbs N/ac	150 lbs N/ac
S-203	S-208	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD	S-203	S-208	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD
S-204	S-207	0 lbs N/ac	0 lbs N/ac	S-204	S-207	0 lbs N/ac	0 lbs N/ac
S-205	S-206	250 lbs N/ac	250 lbs N/ac	S-205	S-206	250 lbs N/ac	250 lbs N/ac
C-201	C-210	150 lbs N/ac	150 lbs N/ac	C-201	C-210	150 lbs N/ac	150 lbs N/ac
C-202	C-209	50 lbs N/ac	50 lbs N/ac	C-202	C-209	50 lbs N/ac	50 lbs N/ac
C-203	C-208	250 lbs N/ac	250 lbs N/ac	C-203	C-208	250 lbs N/ac	250 lbs N/ac
C-204	C-207	0 lbs N/ac @ emerge + 150 SD	0 lbs N/ac @ emerge + 150 SD	C-204	C-207	0 lbs N/ac @ emerge + 150 SD	0 lbs N/ac @ emerge + 150 SD
C-205	C-206	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD	C-205	C-206	50 lbs N/ac @ emerge + 50SD	50 lbs N/ac @ emerge + 50SD
S-301	S-310	0 lbs N/ac	0 lbs N/ac	S-301	S-310	0 lbs N/ac	0 lbs N/ac
S-302	S-309	50 lbs N/ac	50 lbs N/ac	S-302	S-309	50 lbs N/ac	50 lbs N/ac
S-303	S-308	100 lbs N/ac	100 lbs N/ac	S-303	S-308	100 lbs N/ac	100 lbs N/ac
S-304	S-307	150 lbs N/ac	150 lbs N/ac	S-304	S-307	150 lbs N/ac	150 lbs N/ac
S-305	S-306	200 lbs N/ac	200 lbs N/ac	S-305	S-306	200 lbs N/ac	200 lbs N/ac
C-301	C-310	0 lbs N/ac	0 lbs N/ac	C-301	C-310	0 lbs N/ac	0 lbs N/ac
C-302	C-309	50 lbs N/ac	50 lbs N/ac	C-302	C-309	50 lbs N/ac	50 lbs N/ac
C-303	C-308	100 lbs N/ac	100 lbs N/ac	C-303	C-308	100 lbs N/ac	100 lbs N/ac
C-304	C-307	150 lbs N/ac	150 lbs N/ac	C-304	C-307	150 lbs N/ac	150 lbs N/ac
C-305	C-306	200 lbs N/ac	200 lbs N/ac	C-305	C-306	200 lbs N/ac	200 lbs N/ac
FILL				FILL			

270



8/11/2020

CORN

TREATMENT	2019			2020			2019-20		
	EST. POP. (plants/ac)	MST (%)	YIELD (bu/ac) ^a	EST. POP. (plants/ac)	MST (%)	YIELD (bu/ac)	EST. POP. (plants/ac)	MST (%)	YIELD (bu/ac)
0 lbs N/ac	30,333 A ^b	13.0 A	29.0 B	32,817 A	15.1 ^c A	37.3 D	31,575 A	14.0 A	33.1 B
50 lbs N/ac @emerge	30,833 A	13.2 A	117.1 A	33,558 A	15.1 A	105.1 C	32,195 A	14.1 A	111.1 A
100 lbs N/ac @emerge	32,000 A	13.3 A	140.4 A	32,667 A	15.1 A	120.8 BC	32,333 A	14.2 A	130.6 A
150 lbs N/ac @emerge	30,083 A	13.4 A	141.8 A	32,667 A	15.1 A	135.9 ABC	31,375 A	14.2 A	138.8 A
200 lbs N/ac @emerge	31,000 A	13.4 A	146.2 A	33,817 A	15.1 A	138.4 ABC	32,409 A	14.3 A	142.3 A
250 lbs N/ac @emerge	30,833 A	13.7 A	145.0 A	33,000 A	15.1 A	156.6 A	31,917 A	14.4 A	150.8 A
50 lbs N/ac @emerge + 50 SD	31,833 A	13.5 A	103.2 AB	32,333 A	15.1 A	152.7 AB	32,083 A	14.3 A	128.0 A
0 lbs N/ac @emerge + 150 SD	31,297 A	13.4 A	102.6 AB	33,317 A	15.1 A	141.0 ABC	32,307 A	14.2 A	121.8 A
100 lbs N/ac @emerge + 50 SD	33,047 A	13.8 A	146.4 A	33,667 A	15.1 A	154.4 A	33,357 A	14.5 A	150.4 A
50 lbs N/ac @emerge + 100 SD	31,833 A	13.7 A	121.0 A	33,667 A	15.1 A	145.5 AB	32,750 A	14.4 A	133.3 A

^a Reported yields adjusted to 15% moisture

^b Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)

^c Reported moisture in 2020 is an average of two samples taken from combine hopper due to faulty moisture sensor in weigh hopper. Measurements taken with DICKEY-john mini GAC.

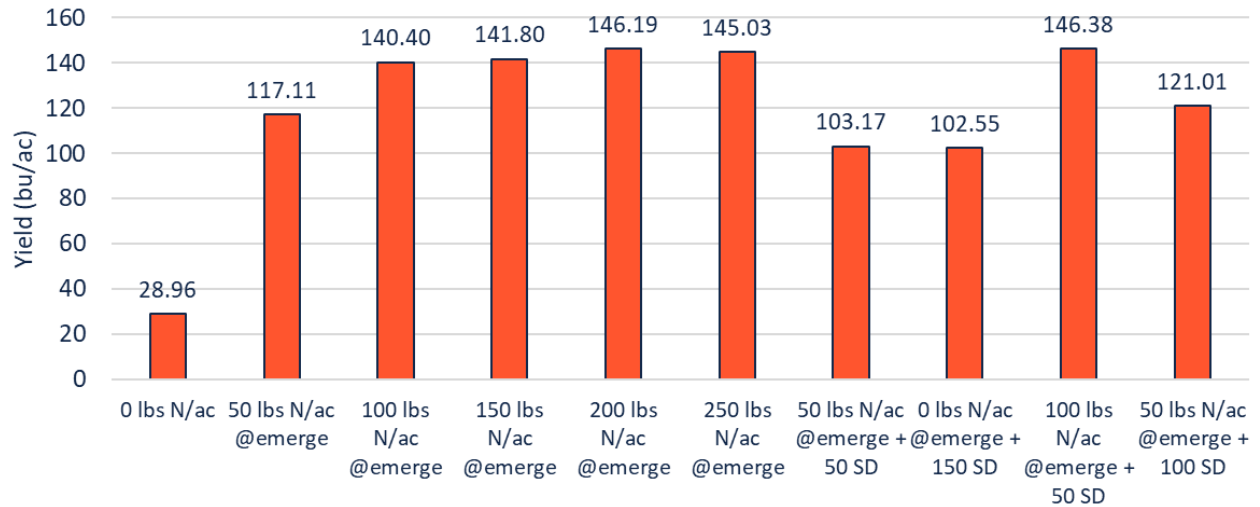
SORGHUM / MILO

TREATMENT	2019					2020				2019-20			
	EST. POP. (plants/ac)	MST (%)	YIELD (56 lb/bu) ^a	YIELD (cwt) ^a		EST. POP. (plants/ac)	MST (%)	YIELD (56 lb/bu)	YIELD (cwt)	EST. POP. (plants/ac)	MST (%)	YIELD (56 lb/bu)	YIELD (cwt)
0 lbs N/ac	45,000 A ^b	16.3 A	91.1 C	51.0 C		71,667 A	15.4 A	66.3 B	37.1 B	57,167 A	15.9 A	78.7 C	44.1 C
50 lbs N/ac @emerge	52,000 A	16.5 A	121.8 B	68.2 B		63,333 A	15.4 A	116.3 A	65.2 A	61,833 A	15.9 A	119.1 AB	66.7 AB
100 lbs N/ac @emerge	46,167 A	16.3 A	133.8 AB	74.9 AB		70,667 A	15.3 A	99.3 AB	55.6 AB	58,417 A	15.8 A	116.5 B	65.3 B
150 lbs N/ac @emerge	46,833 A	16.3 A	149.1 A	83.5 A		69,333 A	15.3 A	130.3 A	73.0 A	58,750 A	15.8 A	139.7 A	78.2 A
200 lbs N/ac @emerge	47,333 A	16.4 A	145.3 AB	81.4 AB		67,333 A	15.4 A	128.2 A	71.8 A	54,833 A	15.9 A	136.8 AB	76.6 AB
250 lbs N/ac @emerge	53,333 A	16.1 A	140.7 AB	78.8 AB		66,000 A	15.4 A	116.3 A	65.1 A	60,333 A	15.8 A	128.5 AB	72.0 AB
50 lbs N/ac @emerge + 50 SD	51,000 A	16.2 A	136.2 AB	76.3 AB		62,000 A	15.5 A	111.6 A	62.5 A	60,500 A	15.9 A	123.9 AB	69.4 AB
0 lbs N/ac @emerge + 150 SD	48,833 A	16.0 A	137.9 AB	77.2 AB		70,667 A	15.5 A	121.2 A	67.9 A	56,083 A	15.8 A	129.5 AB	72.5 AB
100 lbs N/ac @emerge + 50 SD	54,500 A	16.5 A	140.3 AB	78.6 AB		70,000 A	15.2 A	121.3 A	67.9 A	60,250 A	15.9 A	130.8 AB	73.2 AB
50 lbs N/ac @emerge + 100 SD	60,833 A	16.0 A	140.2 AB	78.5 AB		62,333 A	15.3 A	116.2 A	65.1 A	61,417 A	15.6 A	128.2 AB	71.8 AB

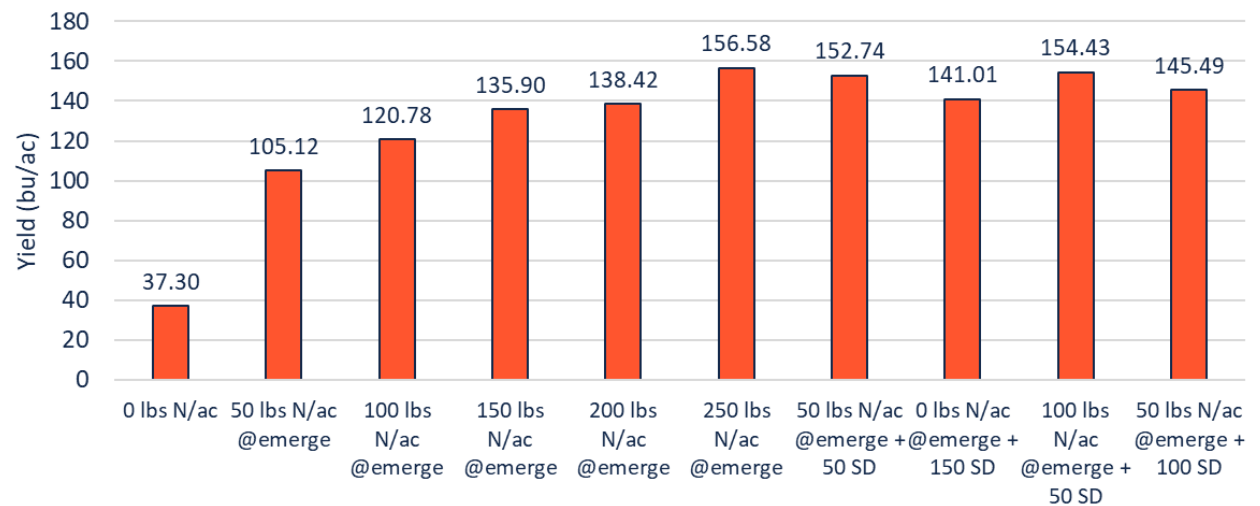
^a Reported yields adjusted to 14% moisture

^b Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)

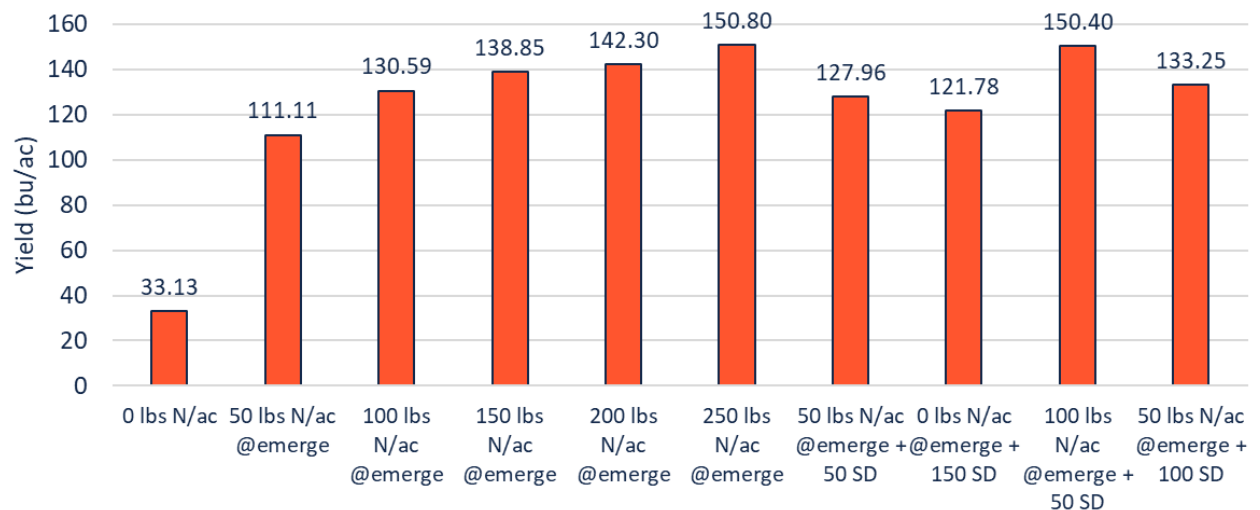
CORN YIELD - 2019



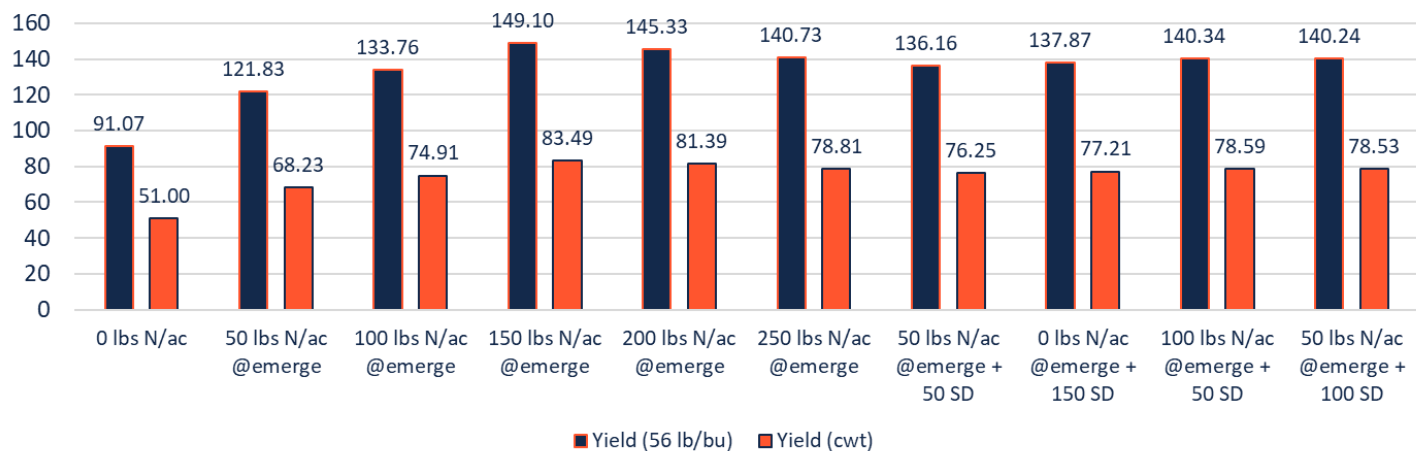
CORN YIELD - 2020



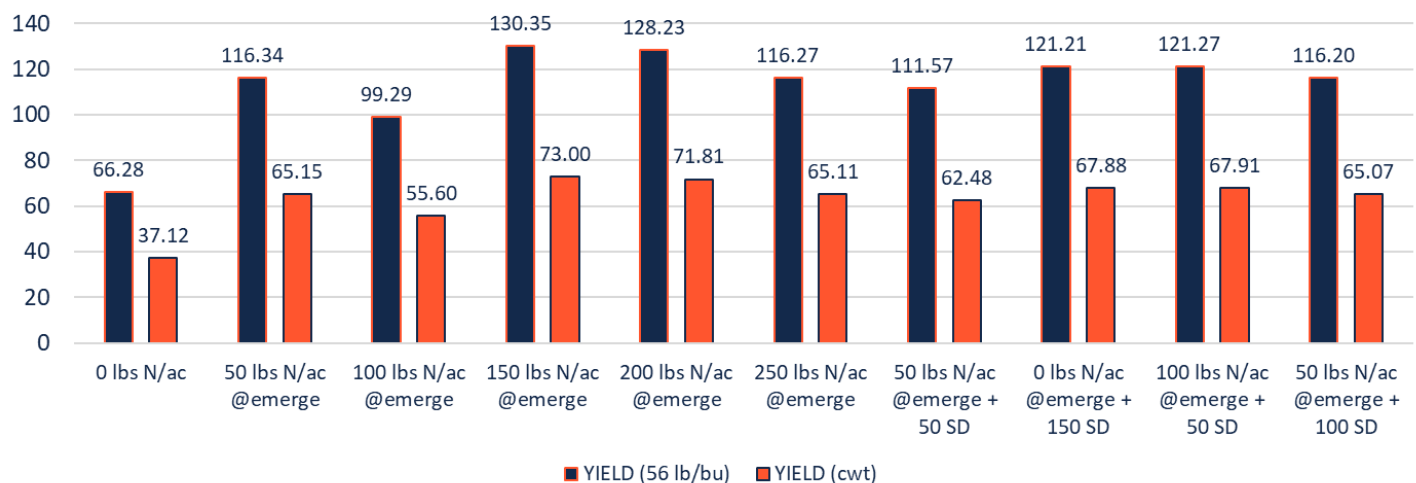
CORN YIELD - 2019-20



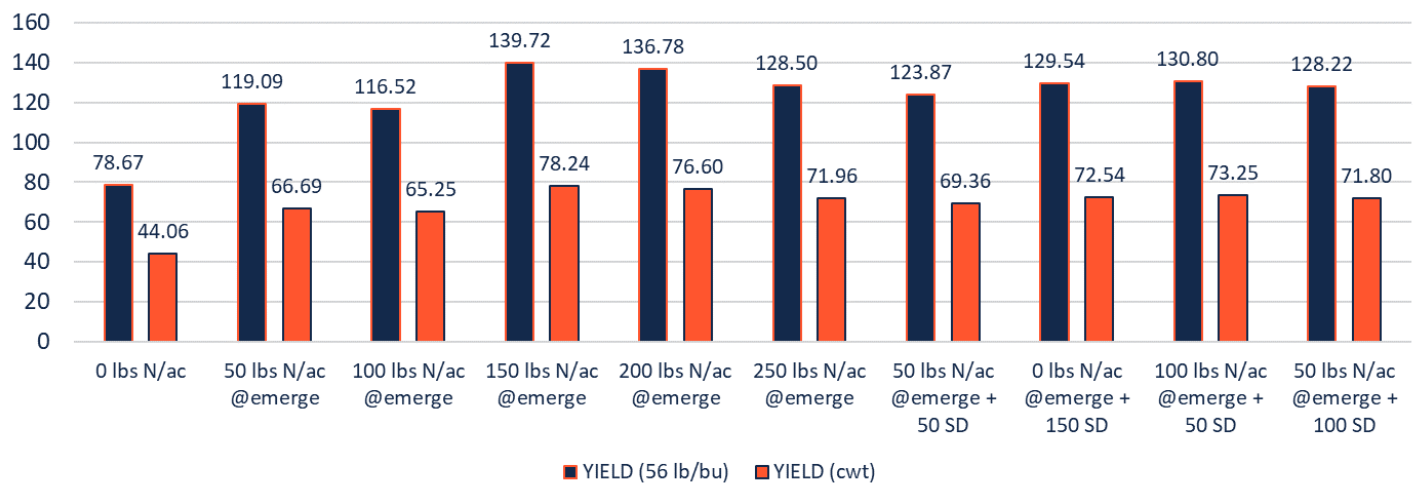
SORGHUM YIELD - 2019



SORGHUM YIELD - 2020

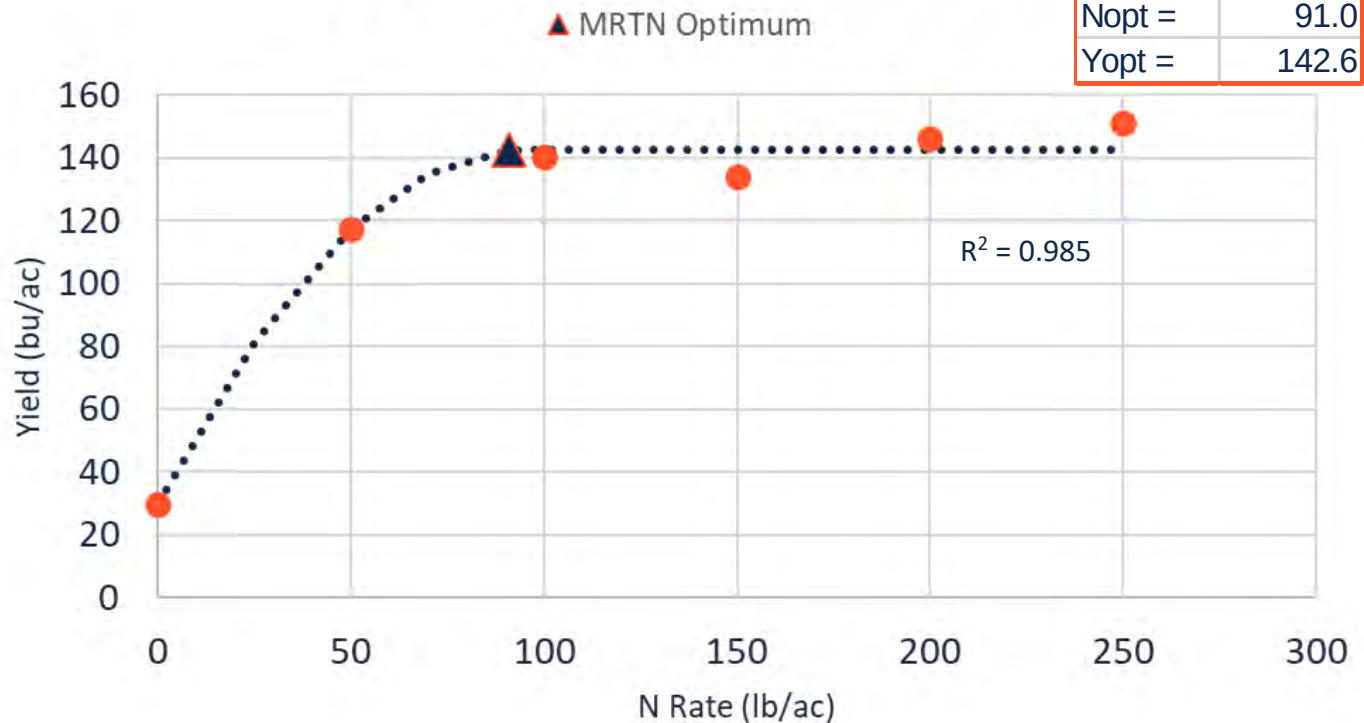


SORGHUM YIELD - 2019-20



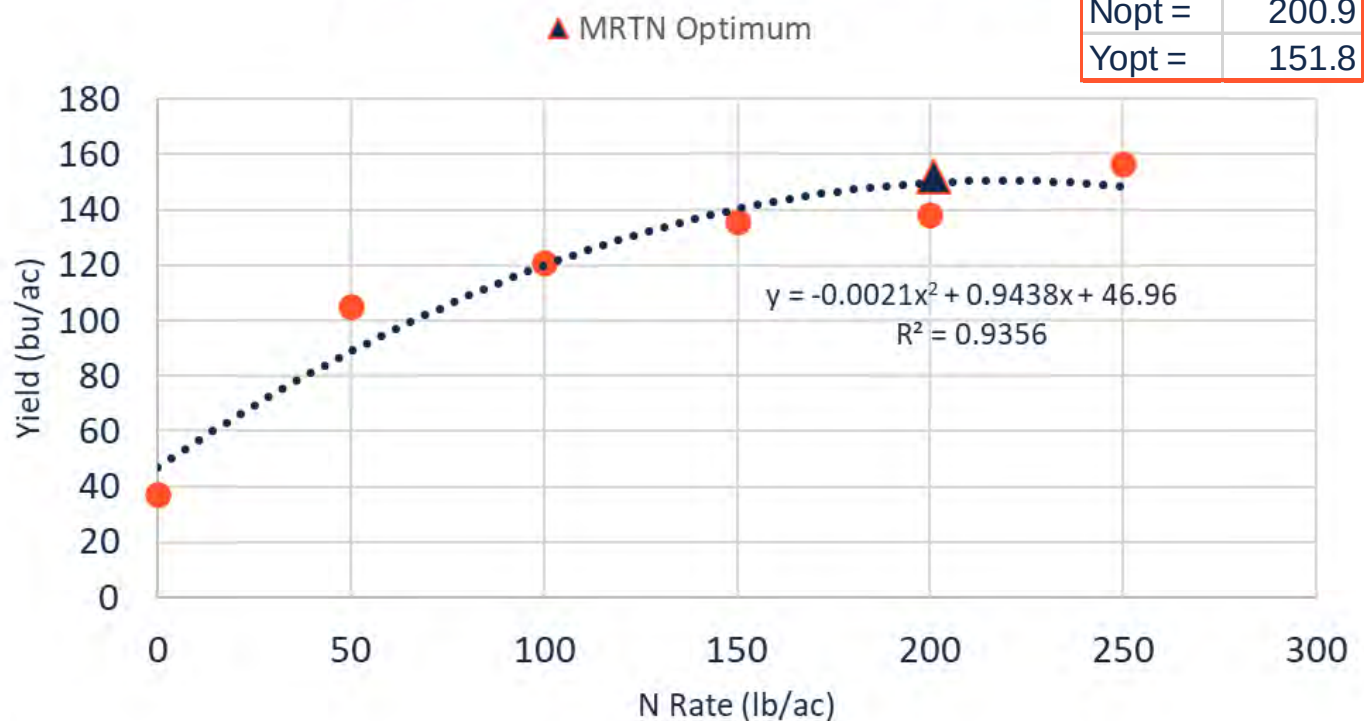
2019 Corn Yield by N Rate

Nmax =	95.0
Ymax =	142.8
Nopt =	91.0
Yopt =	142.6



2020 Corn Yield by N Rate

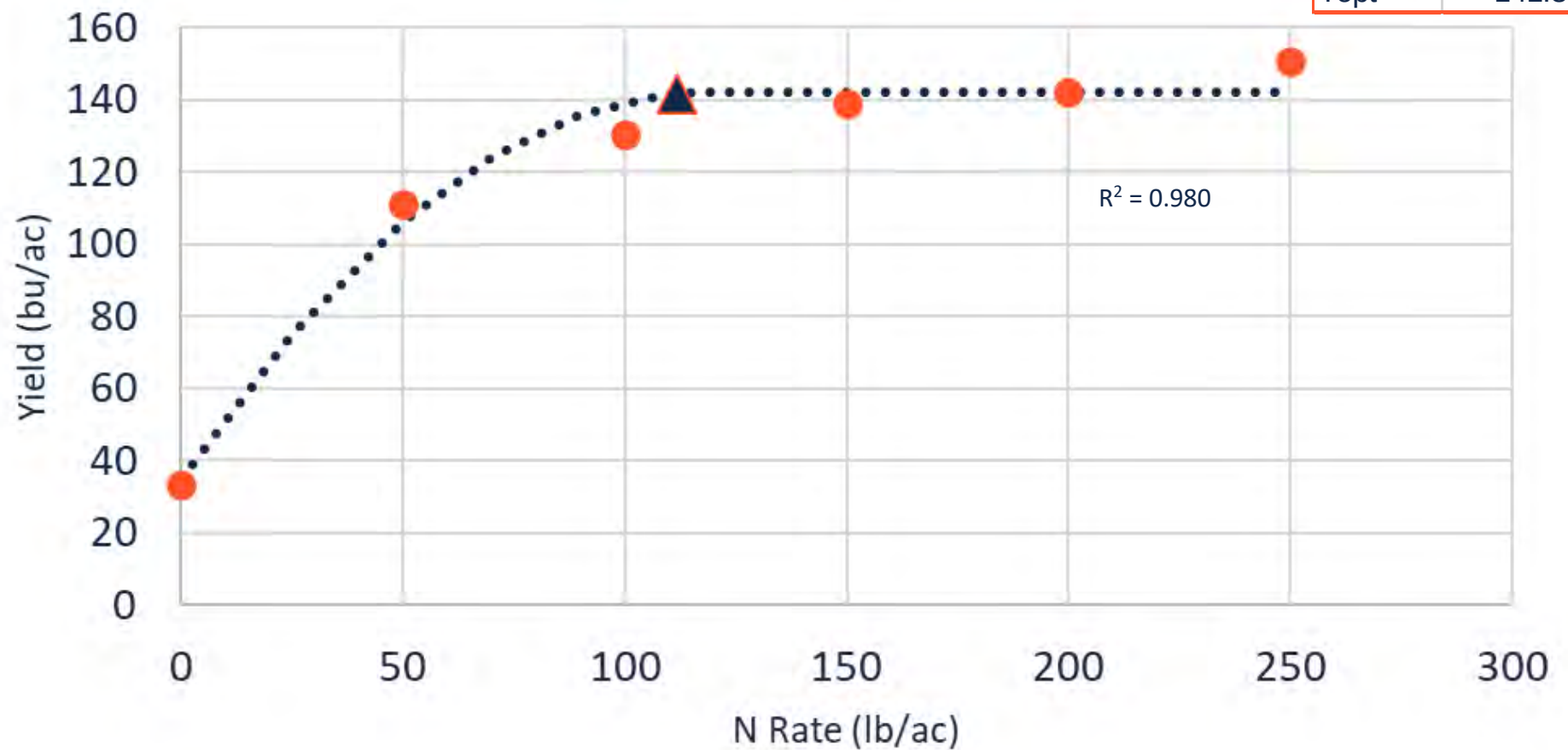
Nmax =	224.7
Ymax =	153.0
Nopt =	200.9
Yopt =	151.8



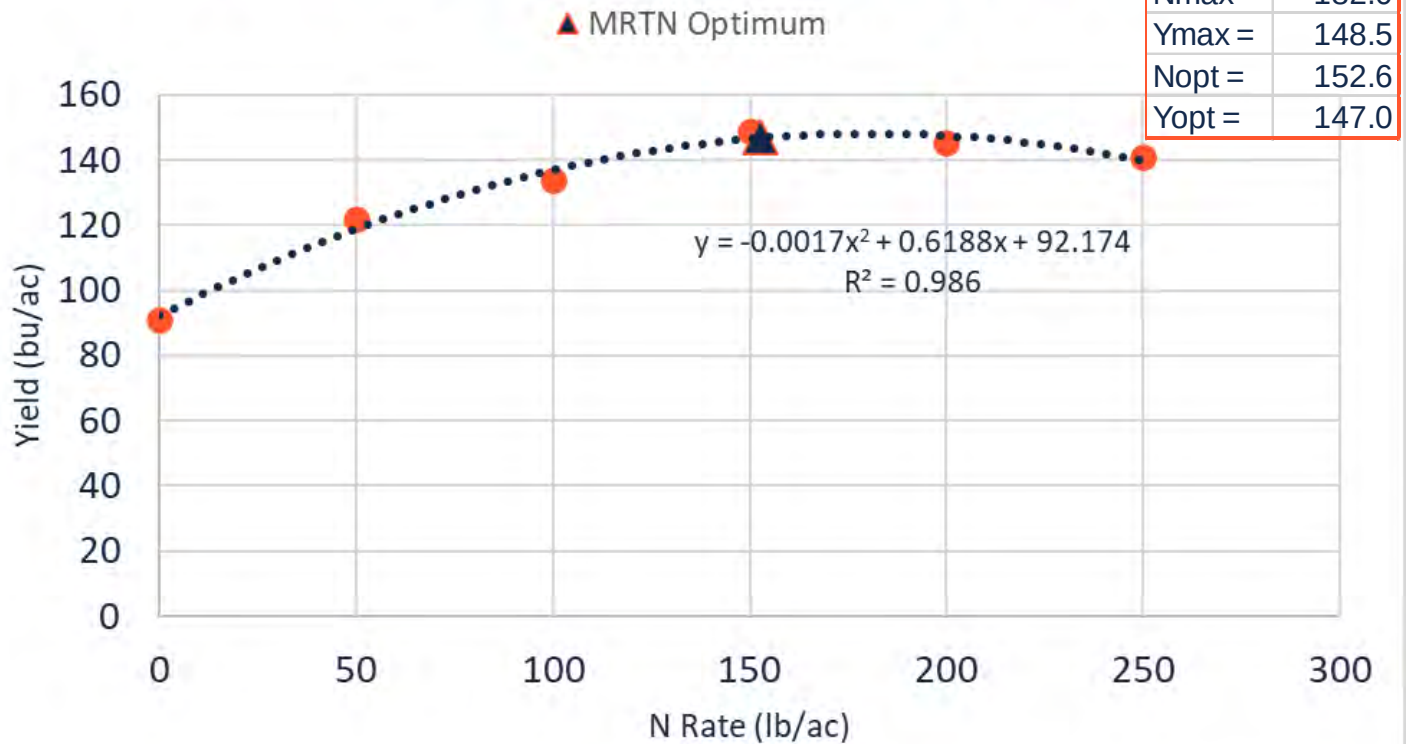
2019-2020 Corn Yield by N Rate

Nmax =	118.1
Ymax =	142.1
Nopt =	111.6
Yopt =	141.8

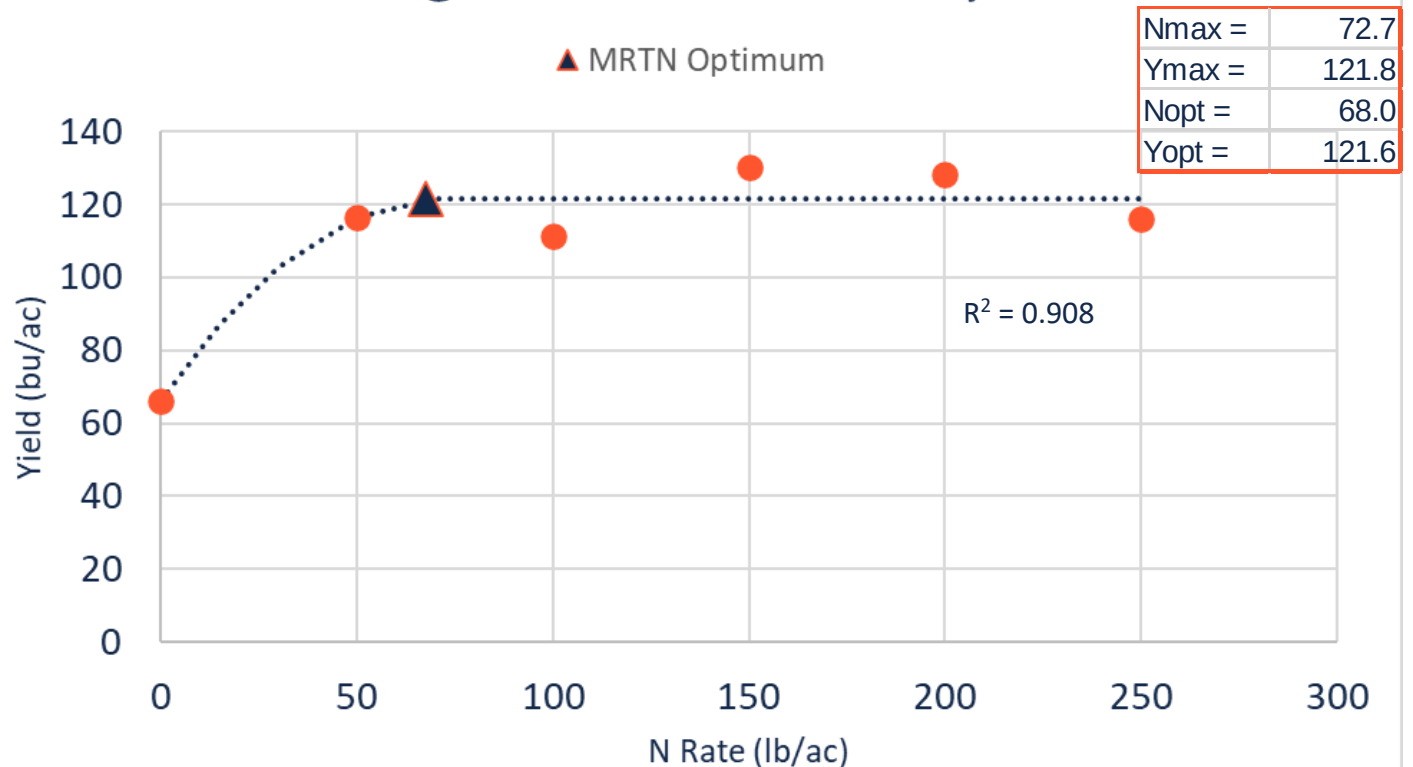
▲ MRTN Optimum



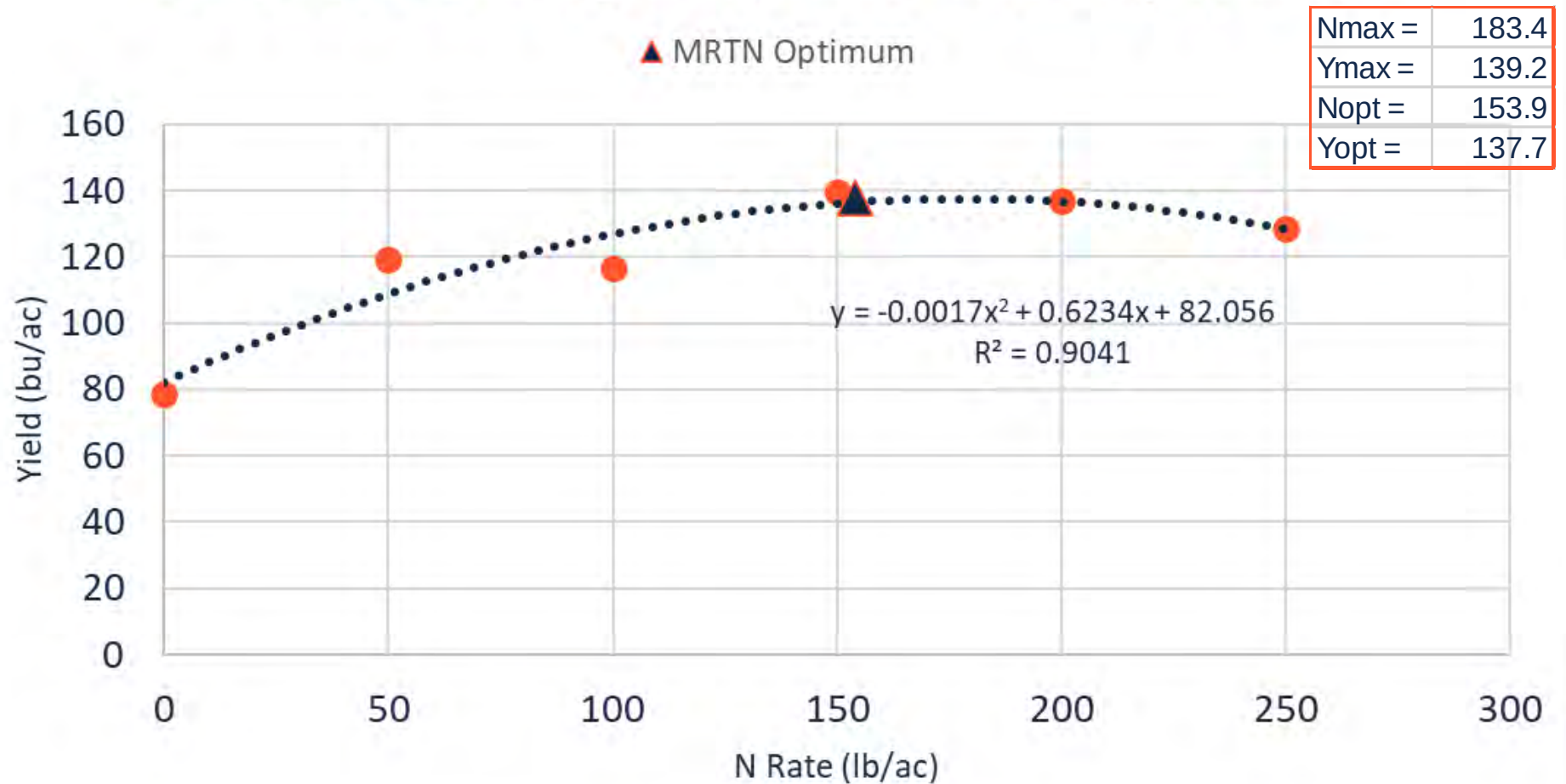
2019 Sorghum/Milo Yield by N Rate



2020 Sorghum/Milo Yield by N Rate



2019-2020 Sorghum/Milo Yield by N Rate



TAKEAWAYS:

- No statistically significant difference in yield between N treatments in corn except for 0N.
 - Indicative of underlying variability, some of which is due to deer damage, particularly in lower N plots.
 - Tend to see less damage and subsequent variation in sorghum/milo.
- Split N treatments do not appear to have a benefit, with the possible exception of 100N+50N in corn.
 - Lack of early-season N may be limiting in other treatments.
 - Will repeat same protocol in 2021, but may revise split treatments in 2022.
- Use of “quadratic” or “quadratic + plateau” curve will greatly influence MRTN Optimum (i.e. EONR – Economic Optimum Return to Nitrogen)
 - Higher MRTN Optimum is generally seen for quadratic curves
 - Curve chosen is selected on “best fit” based on R^2 value
 - R^2 calculated in Excel for quadratic curves and manually for “quadratic + plateau” curves by dividing model sum of squares by the total sum of squares (SAS University – PROC NLIN).

Wheat Variety Trial - 2019/2020

Location: EDC 300

Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker

Plot Size: 10ft x 270ft

Reps: 2

CROP INFORMATION

Cover Crop: N/A

Crop: Wheat

Variety/Hybrid: *see treatment list*

Seed Treatment: *see treatment list*

Planting Date: 10/24/2019

Planting Method: No-till Drill 8" rows 3/4" deep

Seeding Rate: 120 lbs/ac

Soil Conditions (planting): Ideal

Previous Crop: Soybean

Harvest Date: 7/6/2020

Harvest Area: 2570 ft²

FIELD INFORMATION

Soil Type: Cisne silt loam (88%); Hoyleton Silt Loam (12%)

pH: 5.8 (2016)

OM%: 1.53 (2016)

P (lbs/ac): 89 (2016)

K (lbs/ac): 302 (2016)

Ca (lbs/ac): 2923 (2016)

Mg (lbs/ac): 121 (2016)

S (lbs/ac): 24 (2016)

CEC: 9.79 (2016)

TREATMENTS

Variety	Seed Treatment	Plot Numbers	
Pioneer 25R61	difenoconazole, mefenoxam, fluidioxonil, sedaxane, thiamethoxam	101	201
Stone 41W04	difenoconazole, mefenoxam, sedaxane, thiamethoxam	102	202
AgriMAXX 495	sedaxane, difenoconazole, mefenoxam, thiamethoxam	103	203
Merschman Julie 10	metalaxyl, imidacloprid, thiabendazole, ipconazole, citric acid, glutamate, proline	104	204
Diener D498W	sedaxane, difenoconazole, mefenoxam, imidacloprid	105	205
Pioneer 25R74	difenoconazole, mefenoxam, fluidioxonil, sedaxane, thiamethoxam	106	206
Diener D497W	sedaxane, difenoconazole, mefenoxam, imidacloprid	107	207
AgriMAXX 475	sedaxane, difenoconazole, mefenoxam, thiamethoxam	108	208
Stone 21W15	thiamethoxam, sedaxane, mefenoxam, difenoconazole	109	209
Diener X1903	sedaxane, difenoconazole, mefenoxam, imidacloprid	110	210
Stone 41W10	mefenoxam, difenoconazole, sedaxane, imidacloprid	111	211
FS 599	chlorpyrifos-methyl, deltamethrin, sedaxane	112	212
AgriMAXX 496	sedaxane, difenoconazole, mefenoxam, thiamethoxam, zinc	113	213
Stone 31W16	thiamethoxam, sedaxane, mefenoxam, difenoconazole	114	214
Merschman Millie 7	metalaxyl, imidacloprid, thiabendazole, ipconazole, citric acid, glutamate, proline	115	215
AgriMAXX 473	sedaxane, difenoconazole, mefenoxam, thiamethoxam	116	216

PEST MANAGEMENT

Date	Application Timing	Product(s)	Rate
10/18/2019	Pre-plant Burndown	Roundup PowerMax	40 oz/A
10/18/2019	Pre-plant Burndown	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal

SOIL FERTILITY

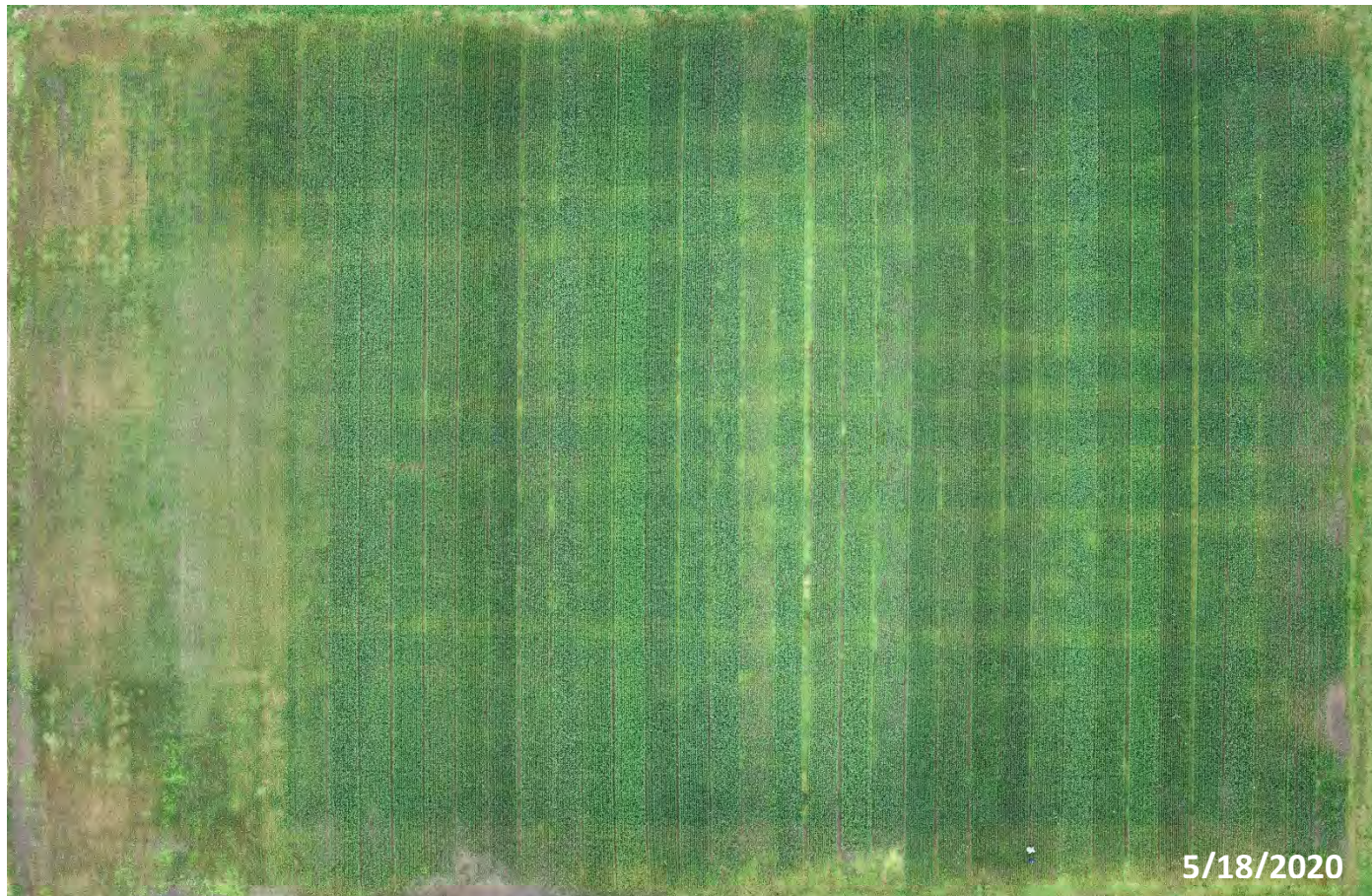
Date	Application Timing	Product(s)	Rate
4/2/2020	Feekes 3-4	Urea (46-0-0)	100 lbs N/ac

Notes:



(85')				10'
NL PK	NL K	NL No PK	L PK	
				Fill
				Pioneer 25R61
				Stone 41W04
				AgriMAXX 495
				Merschman Julie 10
				Diener D498W
				Pioneer 25R74
				Diener D497W
				AgriMAXX 475
				Stone 21W15
				Diener X1903
				Stone 41W10
				FS 599
				AgriMAXX 496
				Stone 31W16
				Merschman Millie 7
				AgriMAXX 473
				Pioneer 25R61
				Stone 41W04
				AgriMAXX 495
				Merschman Julie 10
				Diener D498W
				Pioneer 25R74
				Diener D497W
				AgriMAXX 475
				Stone 21W15
				Diener X1903
				Stone 41W10
				FS 599
				AgriMAXX 496
				Stone 31W16
				Merschman Millie 7
				AgriMAXX 473
				Fill

270



5/18/2020

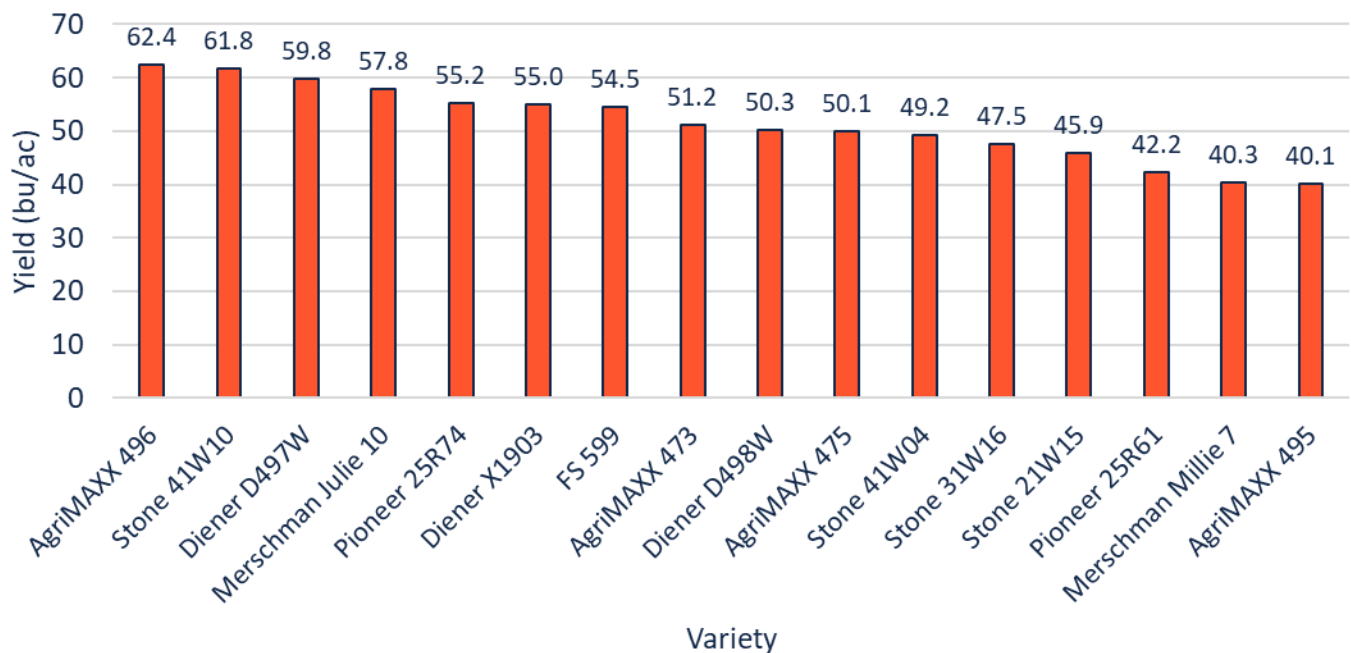
VARIETY	PLANT HT. (in.)	DAYS TO FLOWER ^a	MST (%)	TW (lbs/bu)	YIELD (bu/ac) ^b
AgriMAXX 496	31.0 AB ^c	202.0 C	13.5 AB	50.5 A	62.4 A
Stone 41W10	32.3 AB	207.0 B	13.2 AB	52.8 A	61.8 A
Diener D497W	31.8 AB	203.0 C	12.5 B	53.2 A	59.8 AB
Merschman Julie 10	32.3 AB	207.0 B	12.8 AB	53.4 A	57.8 AB
Pioneer 25R74	30.5 BC	207.0 B	12.5 B	51.9 A	55.2 AB
Diener X1903	33.0 AB	201.5 C	12.8 AB	52.5 A	55.0 AB
FS 599	30.1 BC	211.0 A	12.6 B	54.9 A	54.5 AB
AgriMAXX 473	31.5 AB	207.0 B	14.8 AB	50.7 A	51.2 AB
Diener D498W	31.3 AB	207.0 B	13.1 AB	52.6 A	50.3 AB
AgriMAXX 475	29.9 BC	208.0 B	13.5 AB	50.0 A	50.1 AB
Stone 41W04	32.5 AB	207.0 B	13.9 AB	51.2 A	49.2 AB
Stone 31W16	32.3 AB	207.5 B	13.4 AB	54.5 A	47.5 AB
Stone 21W15	34.6 A	207.0 B	13.4 AB	51.3 A	45.9 AB
Pioneer 25R61	30.5 ABC	207.0 B	13.9 AB	53.8 A	42.2 AB
Merschman Millie 7	26.5 C	195.0 D	16.2 A	49.1 A	40.3 B
AgriMAXX 495	30.4 BC	207.0 B	13.6 AB	51.0 A	40.1 B

^a Based on 50% anther dehiscence for a given plot

^b Reported yields adjusted to 13.5% moisture

^c Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)

Wheat Yield - 2020



Variety	2020 Yield	2020 Rank	2019 Yield	2019 Rank	2018 Yield	2018 Rank	2017 Yield	2017 Rank	2017-18 Average	2018-19 Average	2019-20 Average	2017-19 Average	2018-20 Average
AgriMAXX 444			41.0	8	45.7	4	93.9	2	43.4	69.8		60.2	
AgriMAXX 463			22.9	12	25.6	12	92.4	3	24.3	59.0		47.0	
AgriMAXX 473	51.2	8	47.9	4							49.6		
AgriMAXX 475	50.1	10											
AgriMAXX 495	40.1	16	31.9	10							36.0		
AgriMAXX 496	62.4	1											
AgriPro SY 007					40.8	7	81.7	9	61.3				
AgriPro SY 100							87.2	5					
Biotown D496W					30.1	11							
Diener D497W	59.8	3	44.7	6							52.2		
Diener D498W	50.3	9	46.6	5							48.4		
Diener D510W					37.2	8							
Diener X1903	55.0	6											
FS 599	54.5	7											
FS 604					34.6	10	78.1	11	56.4				
FS 622					50.9	2	86.8	6	68.9				
Growmark FS622			30.1	11									
Hoffman H7W15			49.8	3	40.9	6	91.5	4	45.3	66.2		60.7	
Hoffman H7W16					20.8	13							
Hoffman H7W17							84.2	8					
Hoffman H7W28			55.1	1									
Hoffman LCS var. AMMO (*UT)					45.0	5							
L Brand L168							78.8	10					
Merschman Barbie 12							95.4	1					
Merschman Julie 9					36.0	9							
Merschman Julie 10	57.8	4	54.8	2							56.3		
Merschman Millie 5							69.3	14					
Merschman Millie 6					62.2	1							
Merschman Millie 7	40.3	15	18.2	13							29.2		
Pioneer 25R46							73.7	13					
Pioneer 25R61	45.6	14	41.8	7	48.1	3				44.9	43.7		45.1
Pioneer 25R74	55.2	5											
Pioneer 25R77			32.1	9			85.5	7				58.8	
Stone 21W15	45.9	13											
Stone 31W04							75.5	12					
Stone 31W16	47.5	12											
Stone 41W04	49.2	11											
Stone 41W10	61.8	2											
MEAN	51.7		39.8		39.8		83.9						
MEDIAN	50.7		41.8		40.8		84.9						
MAX	62.4		55.1		62.2		95.4						
MIN	40.1		18.2		20.8		69.3						
RANGE	22.3		37.0		41.4		26.1						

TAKEAWAYS:

- In general, 2020 yields were better than 2019 and 2018, but nowhere near as good as 2017.
 - o 22.3 bushel difference between best and worst performing variety, compared to 37 bushels in 2019, 41.4 in 2018, and 26.1 in 2017.
- Seeding rate increased to 130 lb/ac for 2021-harvested wheat variety trial
 - o Also, 30 lb N/ac and 5 lb S/ac applied pre-plant.
 - o Additional 100 lb N/ac will be applied at green-up in the spring of 2021

Double-Crop Soybean Maturity Trial

Location: EDC 300
Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker
Plot Size: 10ft x 270ft
Replications: 3

CROP INFORMATION

Cover Crop: N/A
Crop: Soybean
Variety/Hybrid: See Treatment List
Seed Treatment: See Treatment List
Relative Maturity: See Treatment List
Planting Date: 7/7/2020
Planting Method: No-till Planter - 15" rows / 3/4" deep
Seeding Rate: approx.143,000 s/ac
Soil Conditions @ Planting: Ideal
Previous Crop: Wheat
Harvest Date: 11/5/2020
Harvest Area: 2420 ft²

FIELD INFORMATION

Soil Type: Cisne silt loam (88%); Hoyleton Silt Loam (12%)
pH: 5.8 (2016)
OM%: 1.53 (2016)
P (lbs/ac): 89 (2016)
K (lbs/ac): 302 (2016)
Ca (lbs/ac): 2923 (2016)
Mg (lbs/ac): 121 (2016)
S (lbs/ac): 24 (2016)
CEC: 9.79 (2016)

Notes:

LumiGEN + ILevo: xathiapiprolin[f], metalaxyl[f], penflufen[f], prothioconazole[f], *Bacillus amyloliquefaciens* -strain MBI 600[f], *Bacillus pumilus* -strain BU F-33[f], imidacloprid[i], fluopyram[n/f]

Acceleron Standard: pyraclostrobin[f], metalaxyl[f], fluxapyroxad[f], imidacloprid[i]

TREATMENTS

Variety	RM	Seed Treatment	Plot Numbers		
AG25X0	2.5	Acceleron Standard	109	207	301
AG31X0	3.1	Acceleron Standard	104	203	302
AG35X0	3.5	Acceleron Standard	101	208	303
AG39X0	3.9	Acceleron Standard	106	201	304
AG43X0	4.3	Acceleron Standard	103	202	305
AG45X8	4.5	Acceleron Standard	107	204	306
P40A47X	4.0	LumiGEN + ILevo	105	209	307
P42A96X	4.2	LumiGEN + ILevo	102	206	308
P45A02X	4.5	LumiGEN + ILevo	108	205	309

see notes for active ingredients

PEST MANAGEMENT

Date	Application Timing	Product	Rate
7/7/2020	Pre-Emergence	Gramoxone	48 oz/ac
7/7/2020	Pre-Emergence	Fierce	3 oz/ac
7/7/2020	Pre-Emergence	Non-Ionic Surfactant	16 oz/100 gal
7/29/2020	Post-Emergence	Roundup PowerMAX	40 oz/ac
7/29/2020	Post-Emergence	Warrant	48 oz/ac
7/29/2020	Post-Emergence	Flexstar	12 oz/ac
7/29/2020	Post-Emergence	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal
7/29/2020	Post-Emergence	Non-Ionic Surfactant	16 oz/100 gal

SOIL FERTILITY

Date	Application Timing	Product	Rate
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(85')		10'	(335')	
NL PK	L PK			
NL K	L K			
NL No PK	L No PK			
NL P	L P			
		FILL		
		FILL		
		FILL		
		FILL		
		FILL		
		FILL		
		AG35X0		
		P42A96X		
		AG43X0		
		AG31X0		
		P40A47X		
		AG39X0		
		AG45X8		
		P45A02X		
		AG25X0		
		AG39X0		
		AG43X0		
		AG31X0		
		AG45X8		
		P45A02X		
		P42A96X		
		AG25X0		
		AG35X0		
		P40A47X		
		AG25X0		
		AG31X0		
		AG35X0		
		AG39X0		
		AG43X0		
		AG45X8		
		P40A47X		
		P42A96X		
		P45A02X		
		FILL		

101
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20'

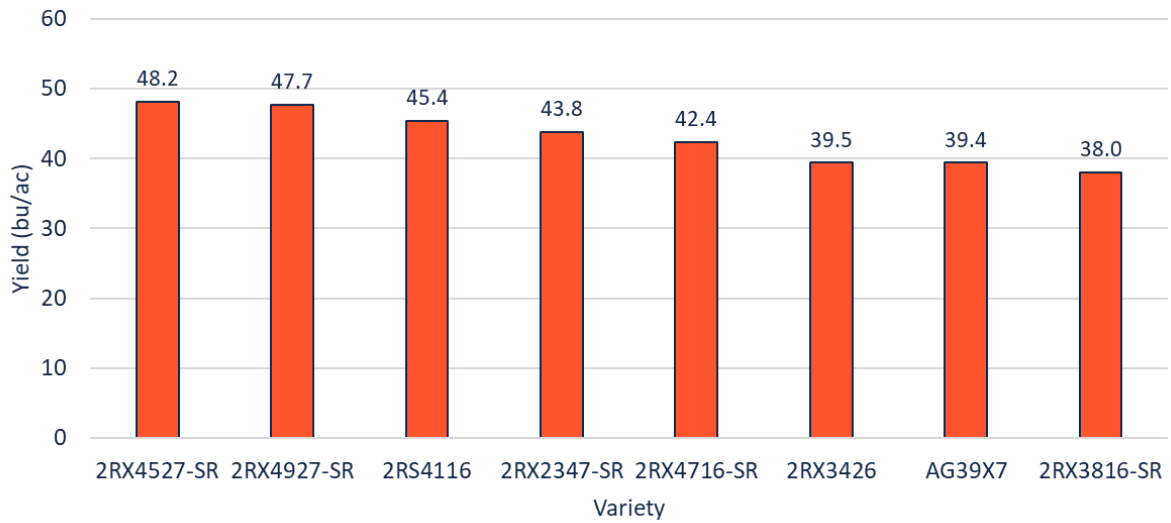


VARIETY	MST (%)	TW (lb/bu)	YIELD (bu/ac) ^a
<u>2017</u>			
2RX4527-SR	12.3 A ^b	54.5 A	48.2 A
2RX4927-SR	13.3 A	50.6 A	47.7 A
2RS4116	11.6 A	62.0 A	45.4 AB
2RX2347-SR	12.0 A	54.2 A	43.8 AB
2RX4716-SR	11.7 A	58.2 A	42.4 AB
2RX3426	12.4 A	55.7 A	39.5 AB
AG39X7	12.1 A	57.0 A	39.4 AB
2RX3816-SR	12.8 A	51.3 A	38.0 B
<u>2019</u>			
AG39X7	16.2 A	50.0 A	34.4 A
AG45X8	17.2 A	45.9 A	33.6 A
AG41X8	15.6 A	53.6 A	33.5 A
AG49X9	16.5 A	48.9 A	33.2 A
AG42X9	15.6 A	51.9 A	32.5 A
AG47X8	16.4 A	50.3 A	31.2 A
AG38X8	16.8 A	47.3 A	29.2 AB
AG34X6	16.4 A	48.3 A	23.9 B
AG23X8	16.4 A	48.7 A	22.5 B
<u>2020</u>			
AG39X0	10.7 B	55.2 A	42.7 A
AG35X0	10.8 AB	54.3 A	40.8 AB
AG43X0	10.9 AB	54.2 A	40.4 AB
AG25X0	10.8 AB	53.6 A	37.9 ABC
AG31X0	10.8 AB	54.2 A	37.5 ABC
P40A47X	10.9 AB	54.2 A	36.6 ABC
AG45X8	10.8 AB	55.5 A	35.9 ABC
P42A96X	11.1 AB	54.8 A	35.4 BC
P45A02X	11.1 A	53.7 A	33.1 C

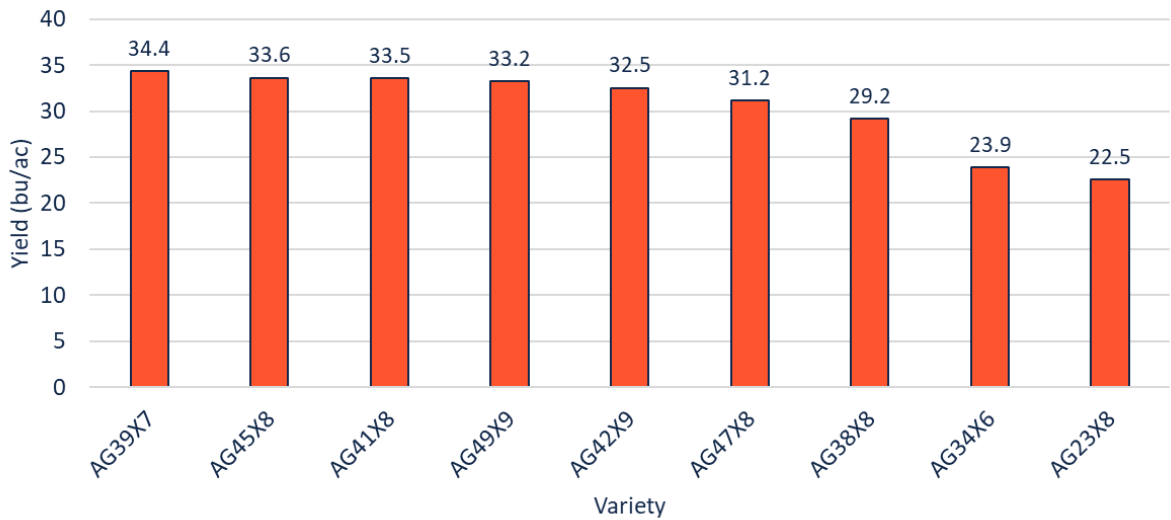
^a Reported yields adjusted to 13% moisture

^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)

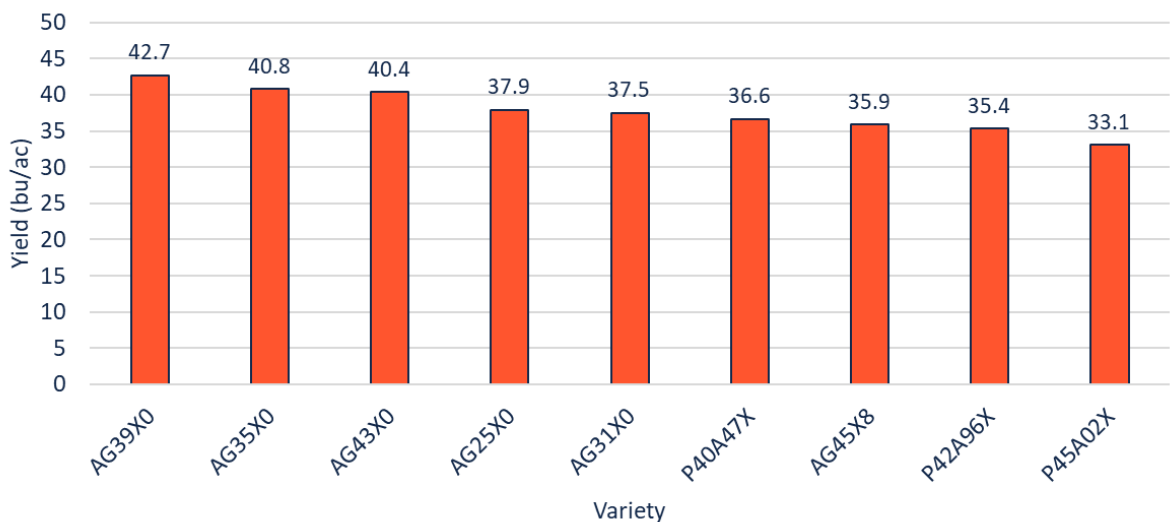
2017 Double-Crop Soybean Yield



2019 Double-Crop Soybean Yield



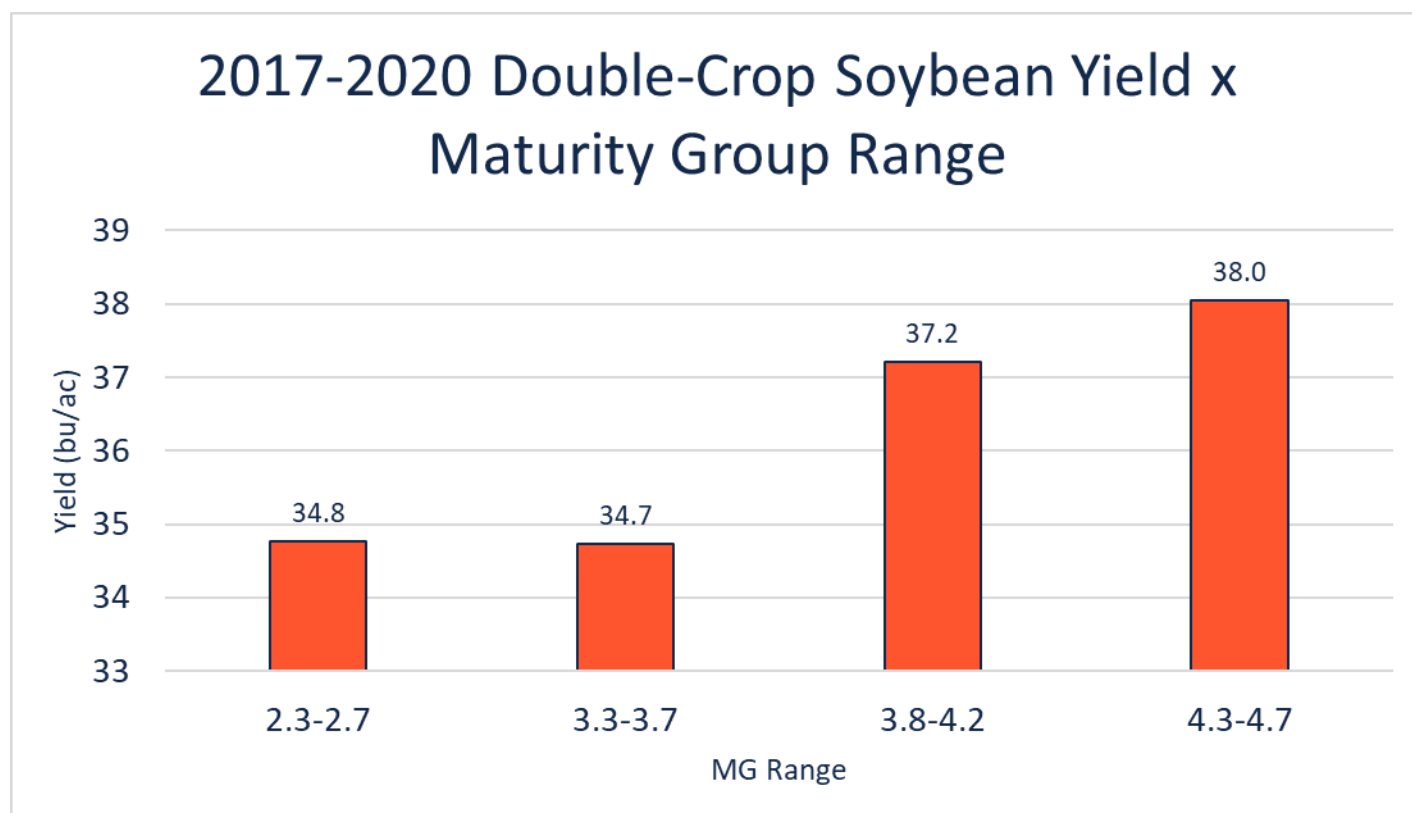
2020 Double-Crop Soybean Yield



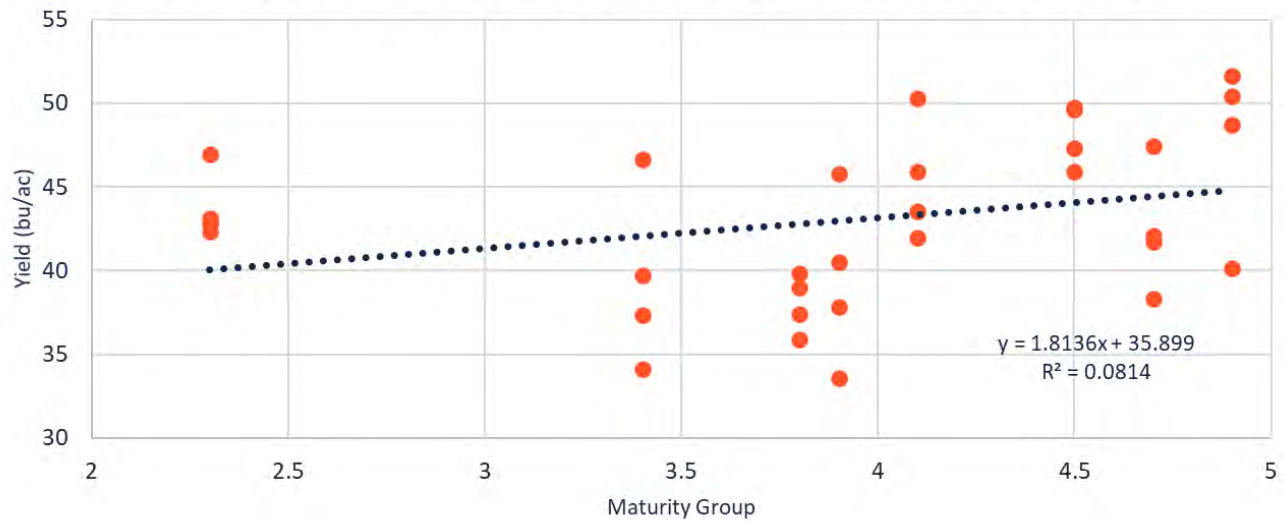
2017-2020			
MG RANGE	MST (%)	TW (lb/bu)	YIELD (bu/ac) ^a
4.3-4.7	13.2 A ^b	53.0 A	38.0 A
3.8-4.2	13.0 A	54.1 A	37.2 A
2.3-2.7	13.1 A	52.2 A	34.8 A
3.3-3.7	13.2 A	52.8 A	34.7 A

^a Reported yields adjusted to 13% moisture

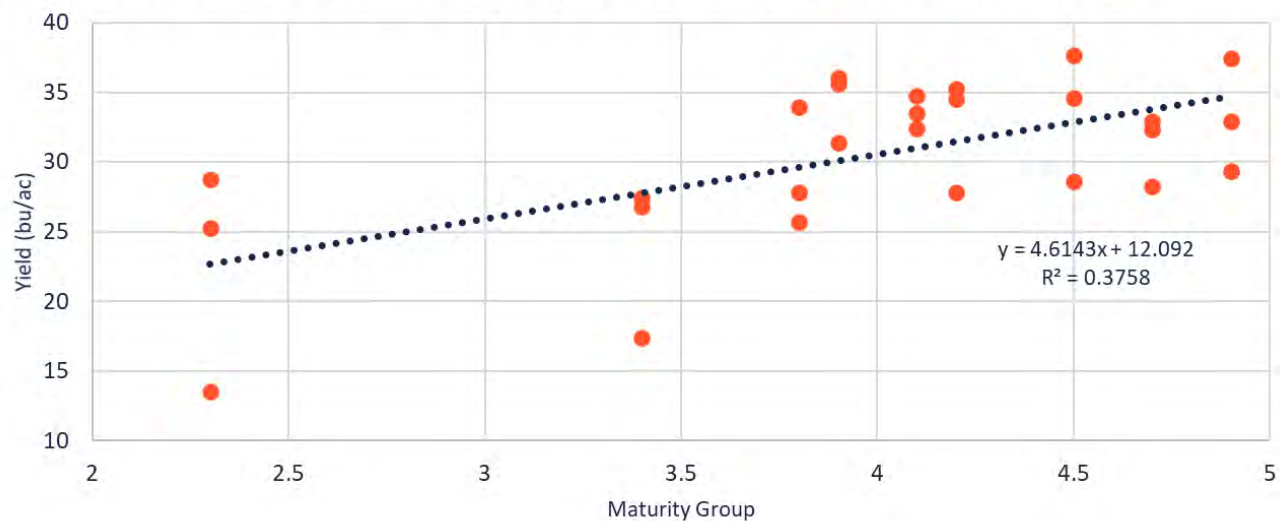
^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)



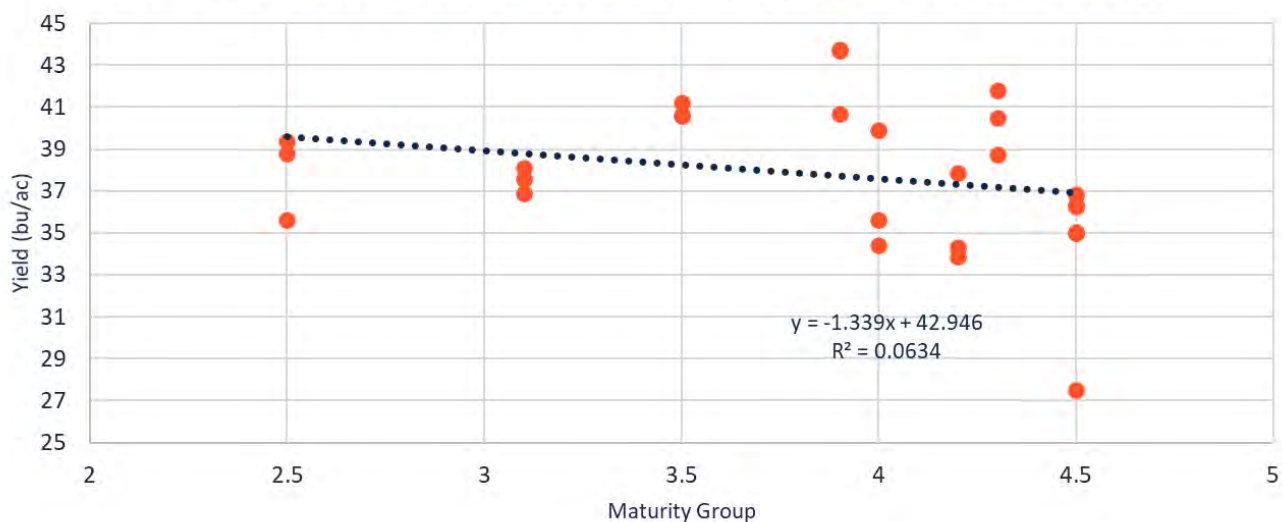
2017 Double-Crop Soybean Yield x Maturity Group



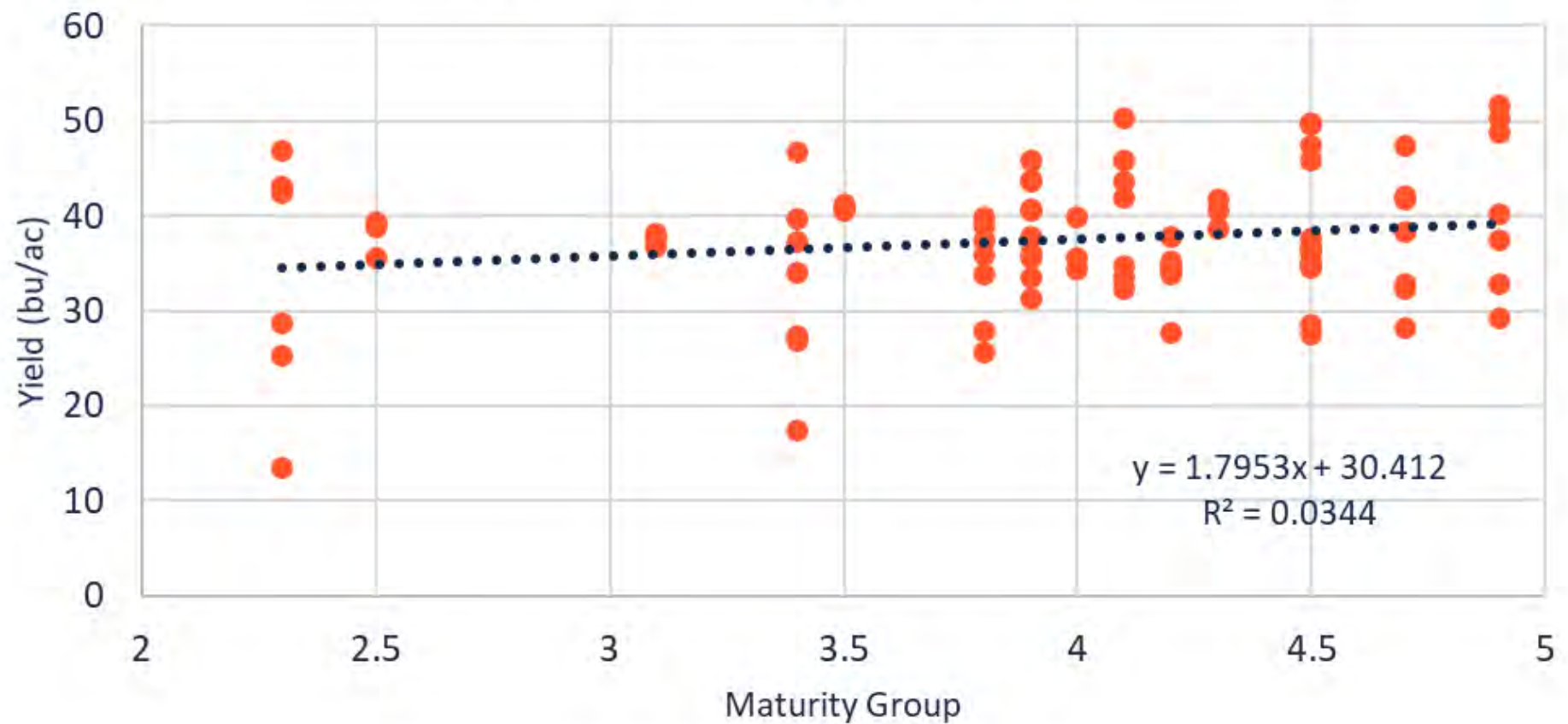
2019 Double-Crop Soybean Yield x Maturity Group



2020 Double-Crop Soybean Yield x Maturity Group



2017-2020 Double-Crop Soybean Yield x Maturity Group



TAKEAWAYS:

- In general, 2020 yields were better than 2019 but not as good as 2017.
 - Yield likely lost on longer maturity soybeans this season due to lower fall GDDs compared to last several years and relatively early damaging frost, which was followed a couple weeks later by a killing frost.
- Looking at “MG Classes” (i.e. ranges of MG ratings) on average for the three years of available data, choosing a “late maturity” soybean variety (i.e. MG 4.3-4.7) only showed a 0.8 bu yield advantage over soybean varieties with MGs of 3.8-4.2.
 - An early MG class (2.8-3.2) and the latest MG class (4.8-5.2) were removed from the calculation because varieties from those classes were not included in all three years of the trial
- Regression of the available data from all three years shows an average yield increase of 1.795 bushels per full MG unit increase (i.e. 3.0 to 4.0).
 - Depending on farm workflow and cover crop establishment goals, use of earlier-maturing soybeans (i.e. MG 3.5 +/- 0.2) in at least some double-crop acres may allow for improved temporal distribution of farm work as well as better cover crop establishment without sacrificing too much in yield

Phosphorus Run-off Trial

Location: EDC 700
Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker
Plot Size: 20 ft x 150 ft
Reps: 3

CROP INFORMATION

Cover Crop: *See Treatment List*
Crop: Corn
Variety/Hybrid: DKC62-53RIB
Seed Treatment: FALH2Q (94%) FALH1 (5%)
Planting Date: 6/1/2020
Planting Method: No-till Planter - 30" rows / 1" depth
Seeding Rate: approx. 29,900 s/ac
Soil Conditions (planting): slightly wet
Previous Crop: Soy
Harvest Date: 11/2/2020
Harvest Area: 1200 ft²

FIELD INFORMATION

Soil Type: Hoyleton Silt Loam (76%); Bluford Silt Loam (24%)
pH: 6.4 (2016)
OM%: 1.71 (2016)
P (lbs/ac): 95 (2016)
K (lbs/ac): 262 (2016)
Ca (lbs/ac): 4369 (2016)
Mg (lbs/ac): 304 (2016)
S (lbs/ac): 22 (2016)
CEC: 14.12 (2016)

TREATMENTS

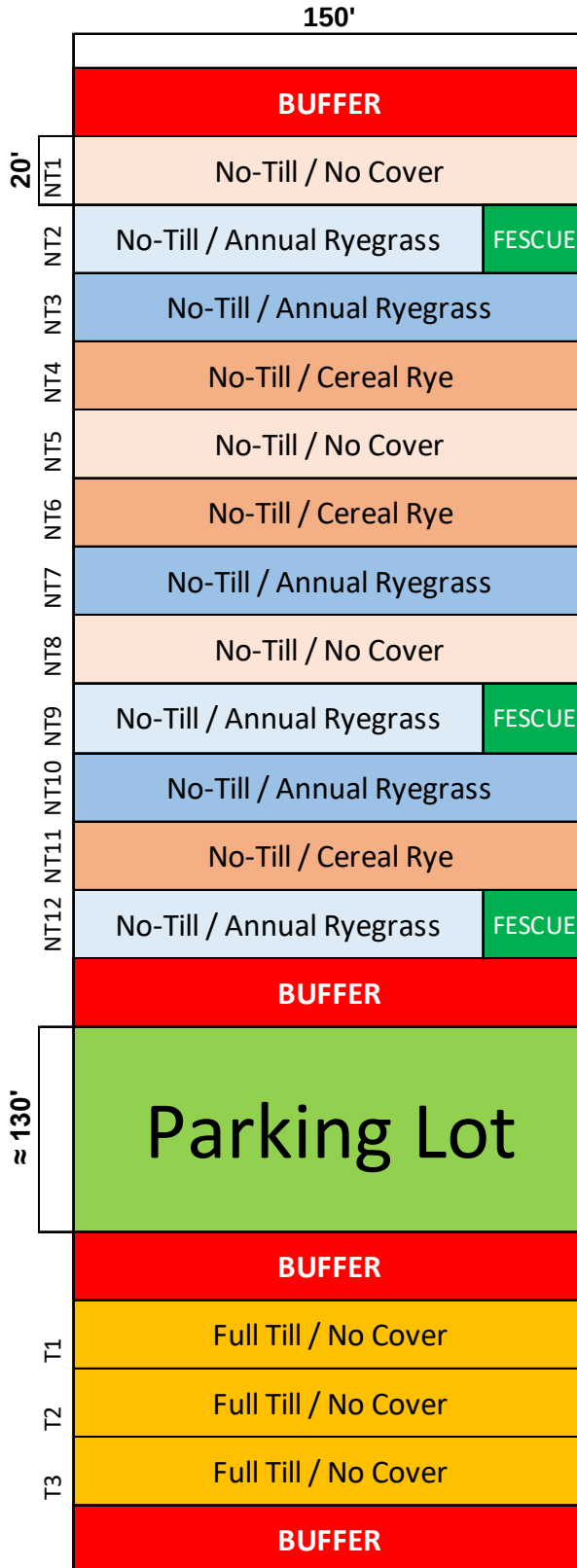
Treatment	Plot Numbers		
No-till/No Cover	NT1	NT5	NT8
No-till/Cereal Rye	NT4	NT6	NT11
No-till/Annual Ryegrass	NT3	NT7	NT10
No-till/Annual Ryegrass + Fescue Buffer	NT2	NT9	NT12
Full till(disc)/No Cover	T1	T2	T3

PEST MANAGEMENT

Date	Application Timing	Product(s)	Rate
6/1/2020	Pre-Emergence	Gramoxone	48 oz/ac
6/1/2020	Pre-Emergence	Aatrex	32 oz/ac
6/1/2020	Pre-Emergence	Non-Ionic Surfactant	16 oz/100 gal
6/16/2020	Post-Emergence	Roundup PowerMAX	32 oz/ac
6/16/2020	Post-Emergence	Acuron	80 oz/ac
6/16/2020	Post-Emergence	Non-Ionic Surfactant	16 oz/100 gal
6/16/2020	Post-Emergence	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal

SOIL FERTILITY

Date	Application Timing	Product(s)	Rate
6/3/2020	Pre-Emergence	Urea w/ Agrotain	185 lbs N/ac



8/24/2020



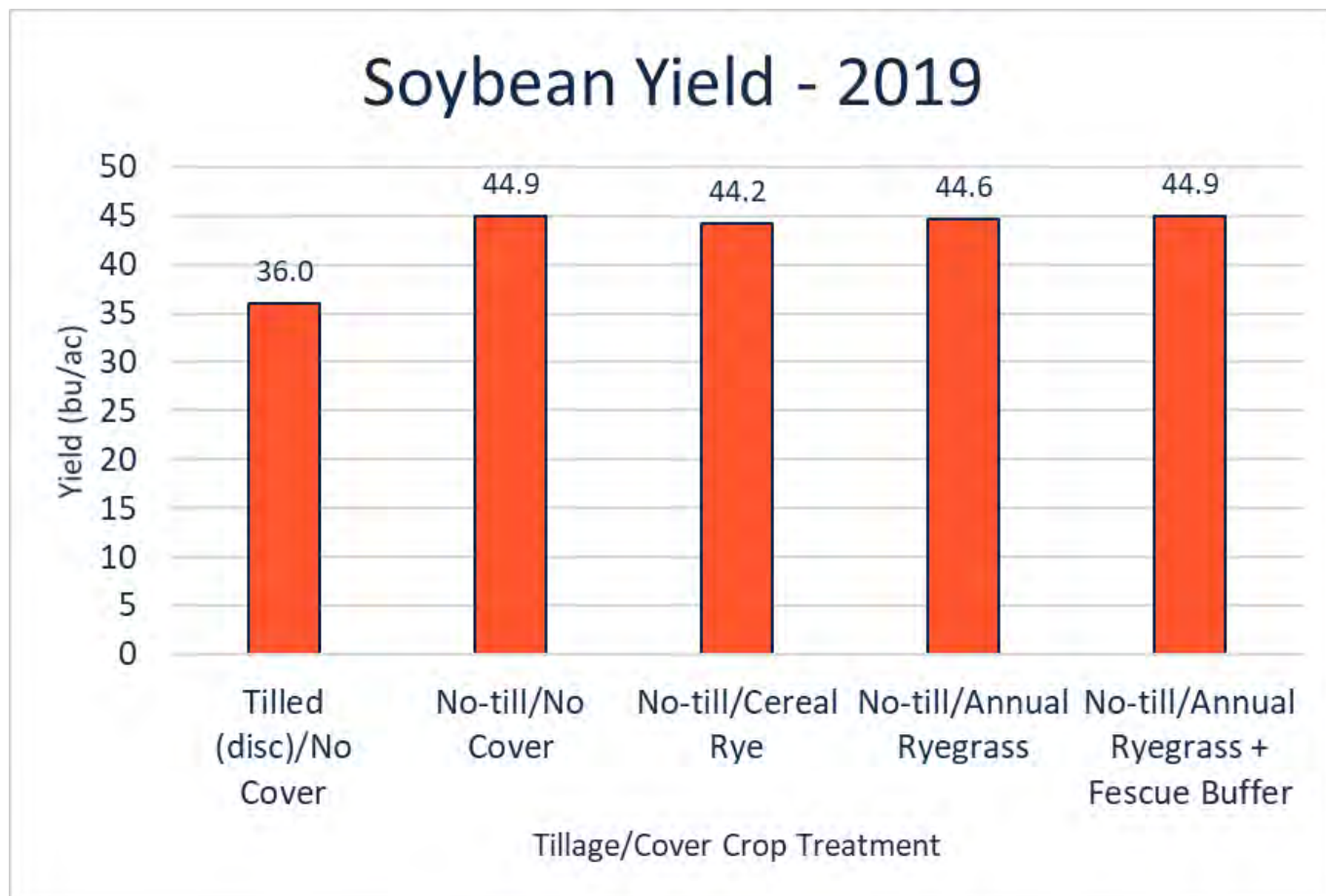
2019 - Soybean

TREATMENT	EST. POP. (plants/ac)	TW (lb/bu)	MST (%)	YIELD (bu/ac) ^a
No-till/Annual Ryegrass + Fescue Buffer	89,167 A ^b	49.7 A	13.5 A	44.9 A
No-till/No Cover	88,333 A	51.0 A	13.8 A	44.9 A
No-till/Annual Ryegrass	89,833 A	52.8 A	13.5 A	44.6 A
No-till/Cereal Rye	87,500 A	55.8 A	13.0 A	44.2 A
Tilled (disc)/No Cover	100,000 A	44.6 A	14.2 A	36.0 B

^a Reported yields adjusted to 13% moisture

^b Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)

Fred Below & Lab



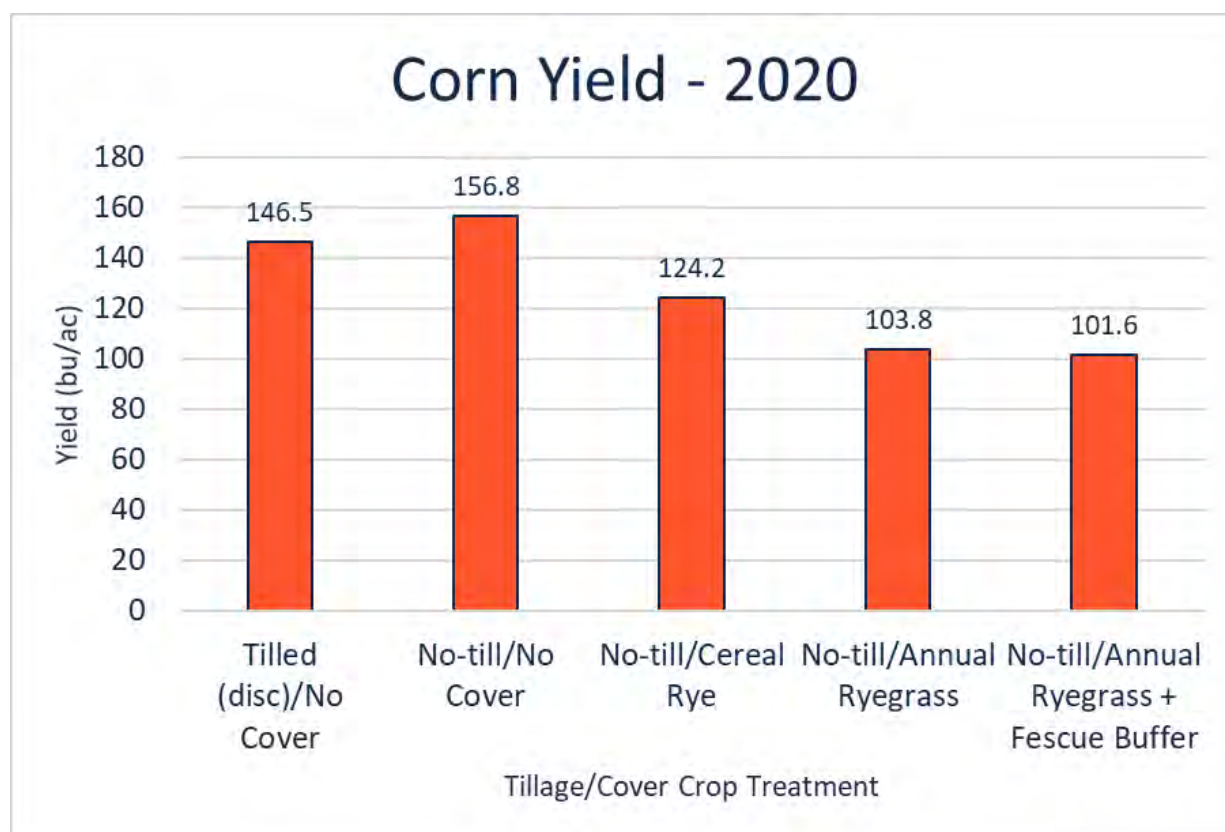
2020 - Corn

TREATMENT	EST. POP. (plants/ac)	TW (lb/bu) ^a	MST (%) ^a	YIELD (bu/ac) ^b
No-till/No Cover	34,167 A ^c	58.1 A	15.5 A	156.8 A
Tilled (disc)/No Cover	31,333 AB	58.1 A	15.5 A	146.5 A
No-till/Cereal Rye	31,167 B	58.1 A	15.5 A	124.2 B
No-till/Annual Ryegrass	31,500 AB	58.1 A	15.5 A	103.8 C
No-till/Annual Ryegrass + Fescue Buffer	32,000 AB	58.1 A	15.5 A	101.6 C

^a Reported moisture and test weight are averages from three samples taken from combine hopper due to faulty moisture sensor in weigh hopper. Measurements taken with DICKEY-john mini GAC.

^b Reported yields adjusted to 15% moisture

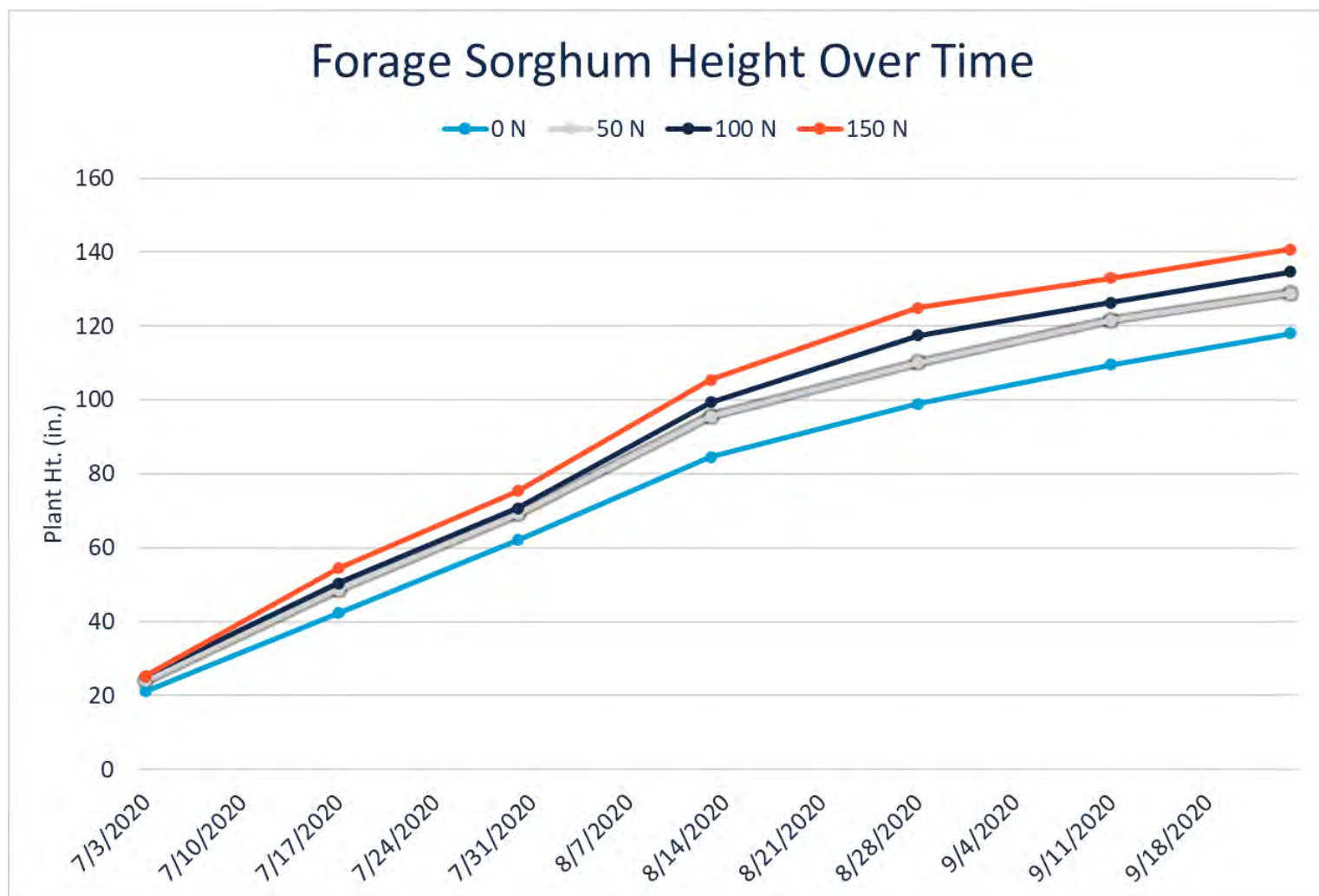
^c Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)



TAKEAWAYS:

- Delayed termination of cover crop (late boot/early head stage) had a large yield effect in 2020 corn yield, despite preplant application of full N rate.
 - Much of the yield decrease likely due to N immobilization by microbes during the decomposition of cover crop residue (high C:N)
 - Additional negative yield effect seen in annual ryegrass plots may be due to shading from cover crop residue, which tended to canopy more than the rigid cereal rye stalks
- Future work must be done to see if legumes included in a cover crop mix can mitigate the N tie-up effect on our soils. Front-loaded N application doesn't appear to be sufficient, at least not in every year.
- Grass cover crops before corn will be targeted for termination at <12" for the remainder of this trial protocol

Dr. DK Lee – Forage Sorghum



TAKEAWAYS:

- Forage sorghum appears to respond to additional N with increased plant height up to 150 lb N/ac
 - Still waiting on data analysis from campus to show effect on biomass and forage quality at this and two other locations
- This trial will be repeated in 2021 in collaboration with the lab of Dr. DK Lee.

Corteva Soybean Herbicide System x Variety Trial

Location: Clayton 20 - Zone 1
Investigators: Marc Lamczyk, Nathan Johanning, Katie Bell & Talon Becker
Plot Size: 10ft x 100ft
Reps: 3

CROP INFORMATION

Cover Crop: None (wild barley)
Crop: Soybean
Variety/Hybrid: see treatment list
Seed Treatment: LumiGEN + ILevo (oxathiapiprolin[f], metalaxyl[f], penflufen[f], prothioconazole[f], *Bacillus amyloliquefaciens*-strain MBI 600[f], *Bacillus pumilus*-strain BU F-33[f], imidacloprid[i], fluopyram[n/f])
Planting Date: 6/11/2020
Planting Method: No-till Planter - 30" rows / 1" depth
Seeding Rate: approx. 143,000 s/ac
Soil Conditions (planting): Slightly wet
Previous Crop: Soybean
Harvest Date: 11/12/2020
Harvest Area: 370 ft²

FIELD INFORMATION

Soil Type: Hoyleton silt loam
pH:
OM%:
P (lbs/ac):
K (lbs/ac):
Ca (lbs/ac):
Mg (lbs/ac):
S (lbs/ac):
CEC:

Notes:

TREATMENTS				
Variety	RM	Plot Numbers		
P39A45X	3.9	X-101	X-203	X-302
P40A47X	4	X-102	X-204	X-301
P42A96X	4.2	X-103	X-201	X-304
P45A02X	4.5	X-104	X-202	X-303
P34T21SE	3.4	E-101	E-207	E-309
P35T01SE	3.5	E-102	E-203	E-307
P38T05E	3.8	E-103	E-201	E-306
P38T76E	3.8	E-104	E-208	E-302
P41T07E	4.1	E-105	E-204	E-301
P42T31E	4.2	E-106	E-206	E-304
P44T04SE	4.4	E-107	E-202	E-303
P45T88E	4.5	E-108	E-209	E-305
P49T62E	4.9	E-109	E-205	E-308
P37A63L	3.7	L-101	L-204	L-302
P38A49L	3.8	L-102	L-201	L-304
P44A37L	4.4	L-103	L-203	L-301
P47A12L	4.7	L-104	L-202	L-303

PEST MANAGEMENT			
Date	Application Timing	Product(s)	Rate
6/12/2020	Pre-Emergence	Gramoxone	48 oz/ac
6/12/2020	Pre-Emergence	Authority First	6.5 oz/ac
6/12/2020	Pre-Emergence	NIS	16 oz/100 gal
6/12/2020	Pre-Emergence	AMS (21-0-0-24S)	17 lbs/100 gal

Xtend Plots

7/13/2020	Post-Emergence	Roundup PowerMAX	44 oz/ac
7/13/2020	Post-Emergence	AMS (21-0-0-24S)	17 lbs/100 gal

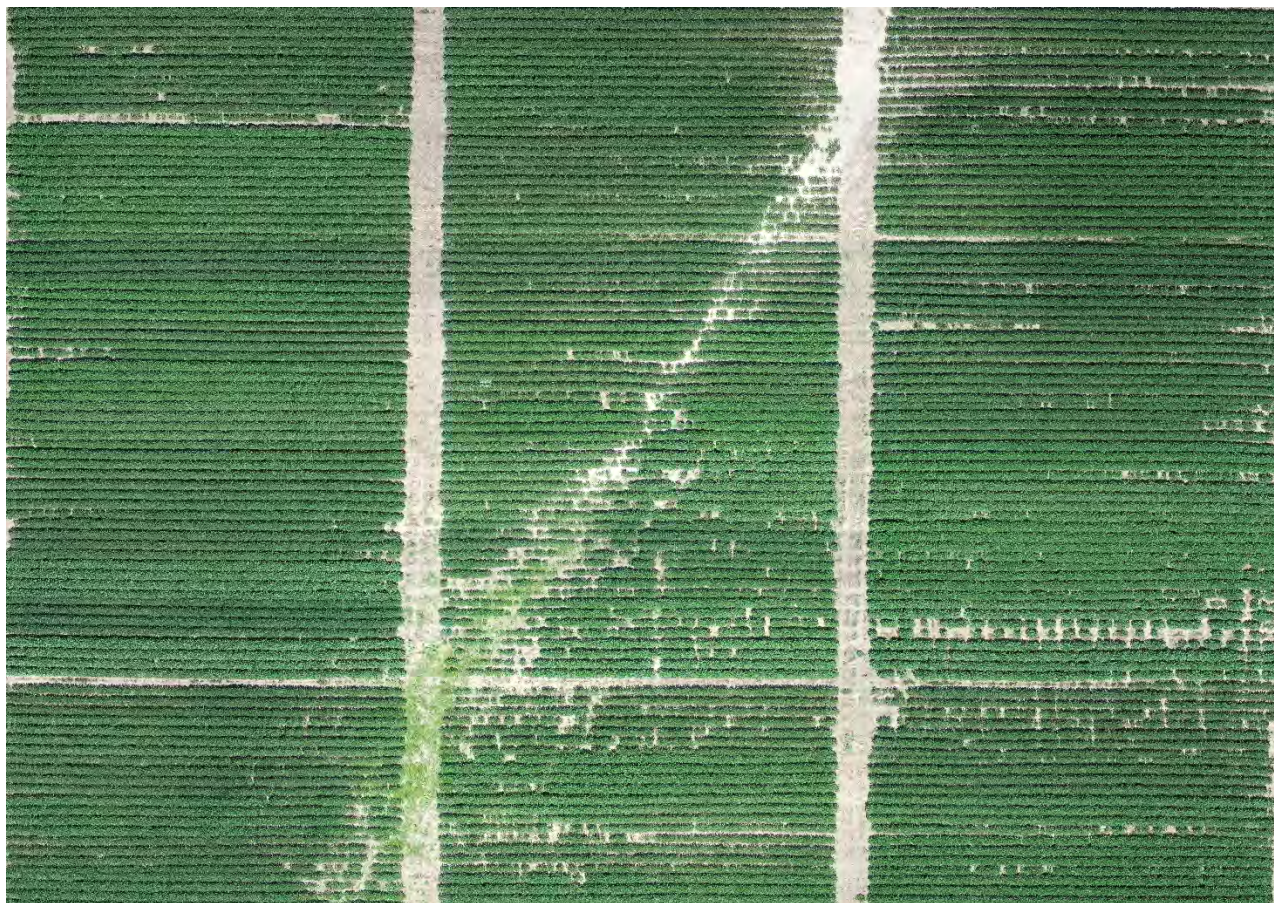
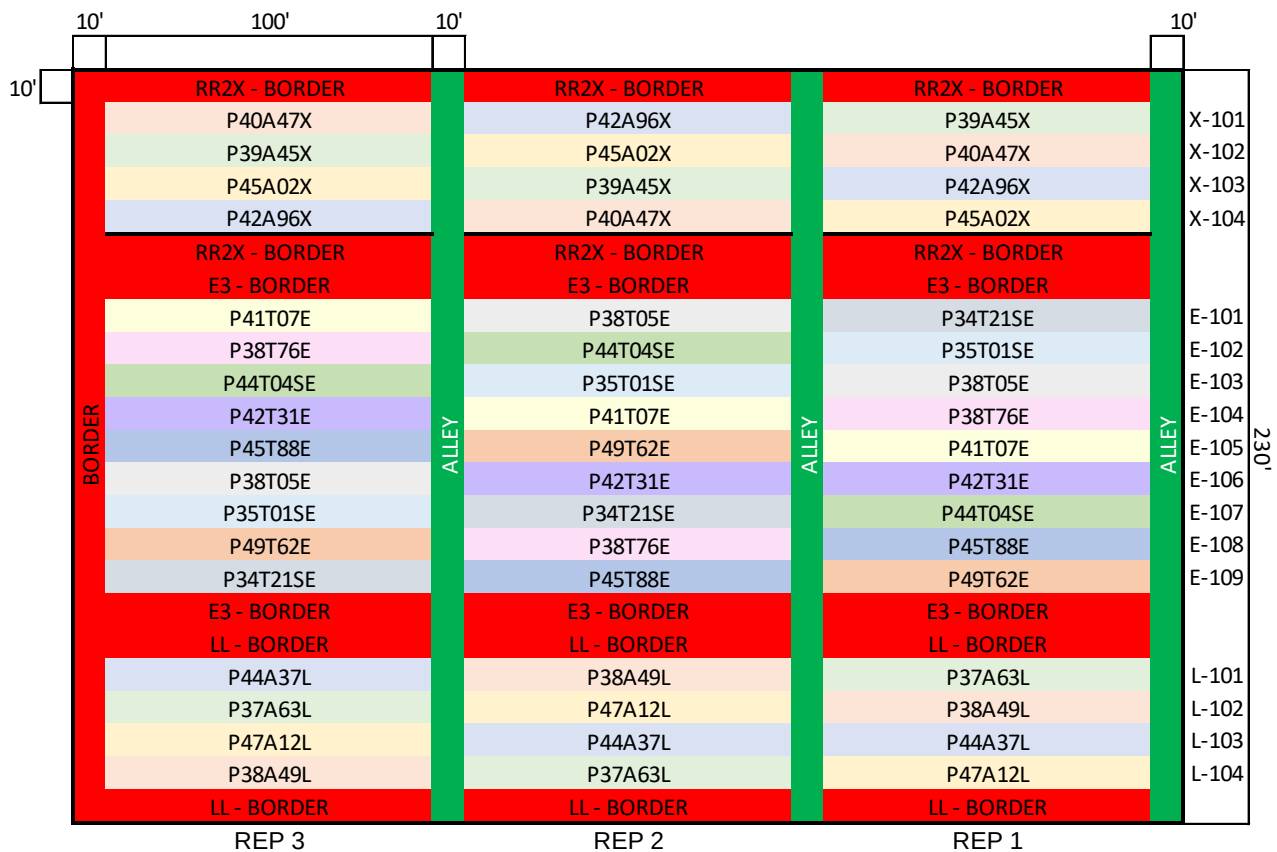
Enlist Plots

7/13/2020	Post-Emergence	Enlist Duo	64 oz/ac
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Liberty Plots

7/13/2020	Post-Emergence	Liberty	40 oz/ac
7/13/2020	Post-Emergence	AMS (21-0-0-24S)	2 lbs/ac

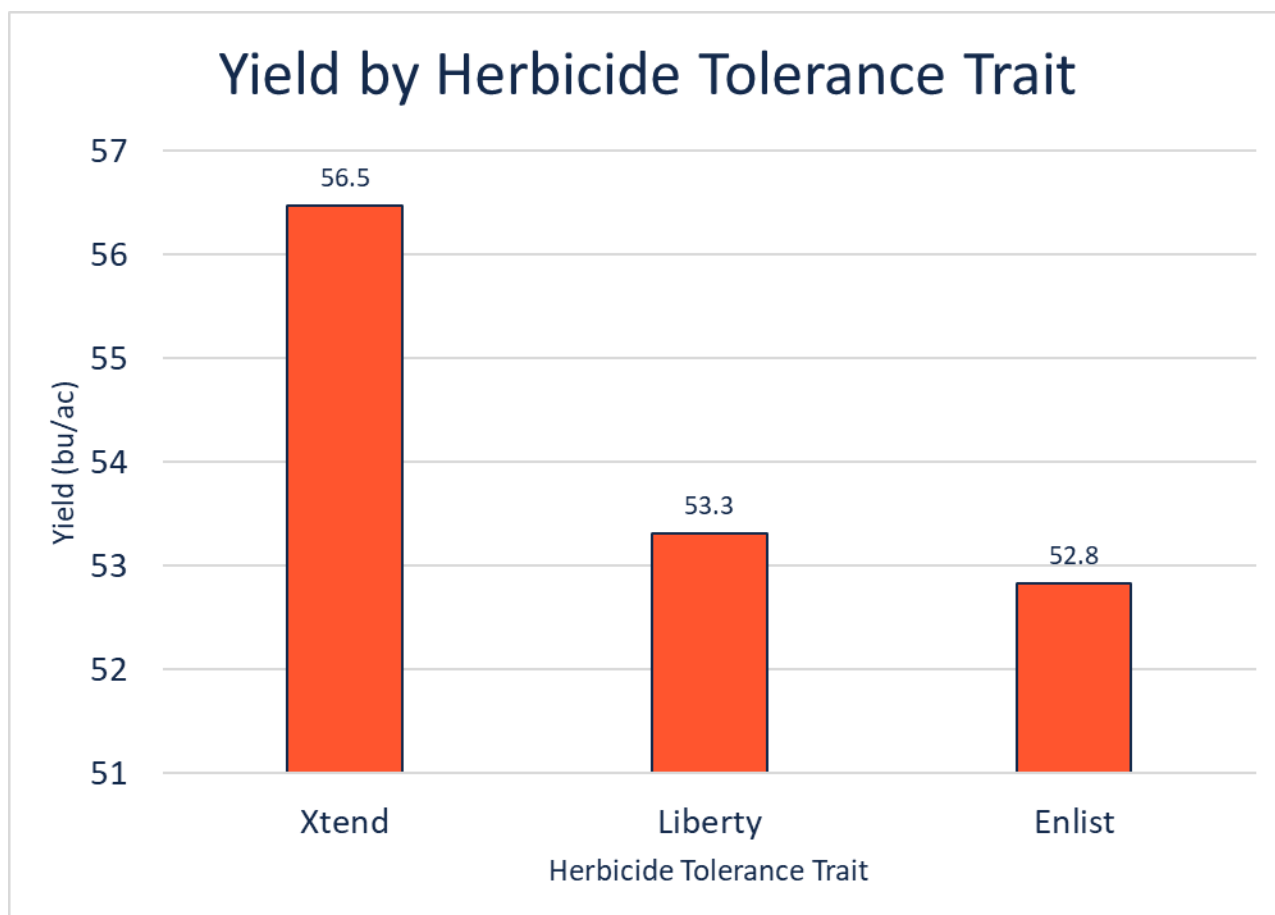
SOIL FERTILITY			
Date	Application Timing	Product(s)	Rate
4/8/2020	Pre-Plant	Potash (0-0-60)	90 lbs K ₂ O/ac



HERB. TOLERANCE TRAIT	EST. POP. (plants/ac)	MST (%)	YIELD (bu/ac) ^a
Xtend	90,417 A ^b	12.8 C	56.5 A
Liberty	96,417 A	15.0 A	53.3 A
Enlist	99,444 A	14.0 B	52.8 A

^a Reported yields adjusted to 13% moisture

^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)

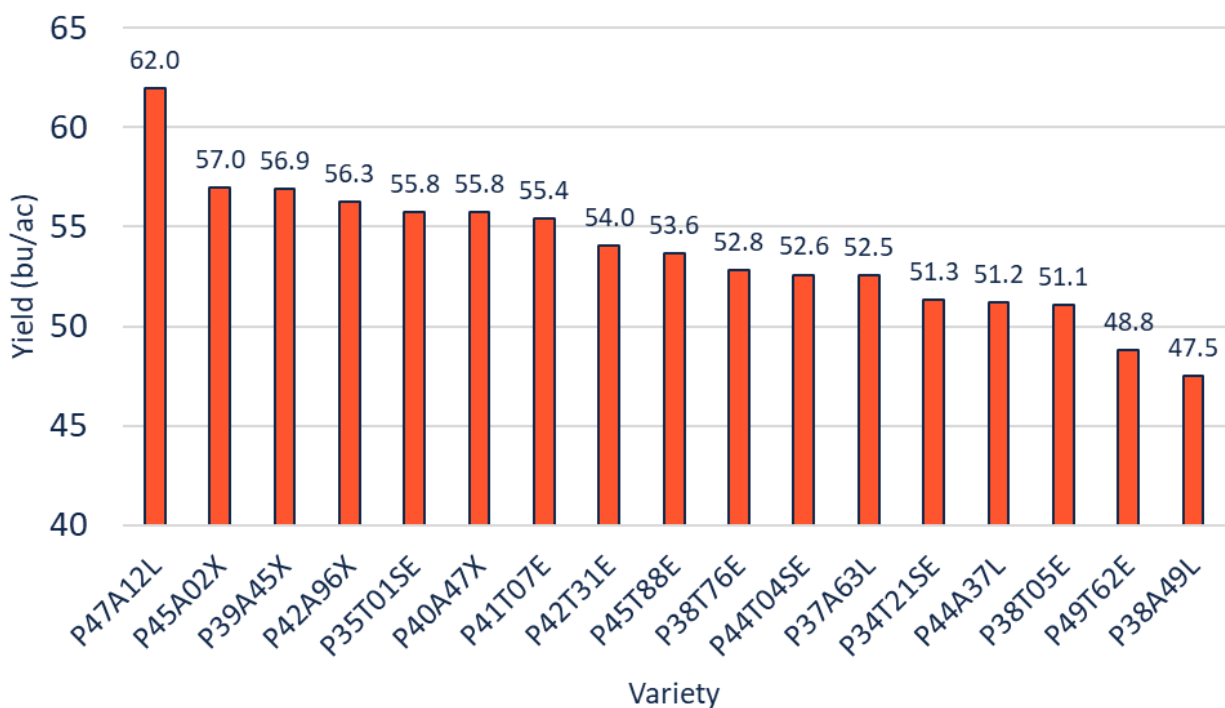


VARIETY	EST. POP. (plants/ac)	MST (%)	YIELD (bu/ac) ^a
P47A12L	103,000 AB ^b	14.8 A	62.0 A
P45A02X	119,667 A	13.0 A	57.0 A
P39A45X	95,000 ABC	12.6 A	56.9 A
P42A96X	90,667 ABC	12.9 A	56.3 A
P35T01SE	102,333 AB	13.1 A	55.8 A
P40A47X	56,333 C	12.9 A	55.8 A
P41T07E	108,667 AB	13.2 A	55.4 A
P42T31E	95,667 ABC	13.4 A	54.0 A
P45T88E	92,667 ABC	14.8 A	53.6 A
P38T76E	114,667 A	14.0 A	52.8 A
P44T04SE	90,667 ABC	14.6 A	52.6 A
P37A63L	95,333 ABC	15.2 A	52.5 A
P34T21SE	102,667 AB	14.8 A	51.3 A
P44A37L	92,333 ABC	14.9 A	51.2 A
P38T05E	117,667 A	13.6 A	51.1 A
P49T62E	70,000 BC	14.7 A	48.8 A
P38A49L	95,000 ABC	15.2 A	47.5 A

^a Reported yields adjusted to 13% moisture

^b Different capital letters indicate significant difference among varieties according to Tukey's HSD test ($\alpha=0.05$)

Yield - All Varieties



TAKEAWAYS:

- No statistically significant difference in yield between herbicide tolerance technology groups or among individual varieties.
 - Yield rank order was reversed from similar trial conducted on EDC 100, which underlines the importance of the next statement and the practice of using statistical significance, in general.
 - Since experiment was organized in blocks for each herbicide technology to allow for mechanized spray applications, micro-environmental influences could be responsible for some yield differences between herbicide technology groups.

Corteva E3 Corn Variety Trial

Location: Clayton 20 - Zone 2
Investigators: Talon Becker, Nathan Johanning, & Marc Lamczyk
Plot Size: 10ft x 80ft
Reps: 4

CROP INFORMATION

Cover Crop: None (wild barley)
Crop: Corn
Variety/Hybrid: see *treatment list*
Seed Treatment: LumiGEN Premium (azoxystrobin[f], fludioxonil[f], mefenoxam[f], thiabendazole[f], ipconazole[f], ethaboxam[f], *Bacillus amyloliquefaciens* -strain MBI 600[f], chlorantraniliprole[i], clothianidin[i], *Bacillus amyloliquefaciens* -strain PTA-4838[n])
Planting Date: 6/3/2020
Planting Method: No-till Planter - 30" rows / 1" deep
Seeding Rate: approx. 30,000 s/A
Soil Conditions @ Planting: Slightly wet
Previous Crop: Soybeans
Harvest Date:
Harvest Area:

FIELD INFORMATION

Soil Type: Bluford silt loam (74%), Hoyleton silt loam (26%)
pH:
OM%:
P (lbs/ac):
K (lbs/ac):
Ca (lbs/ac):
Mg (lbs/ac):
S (lbs/ac):
CEC:

Notes:

TREATMENTS

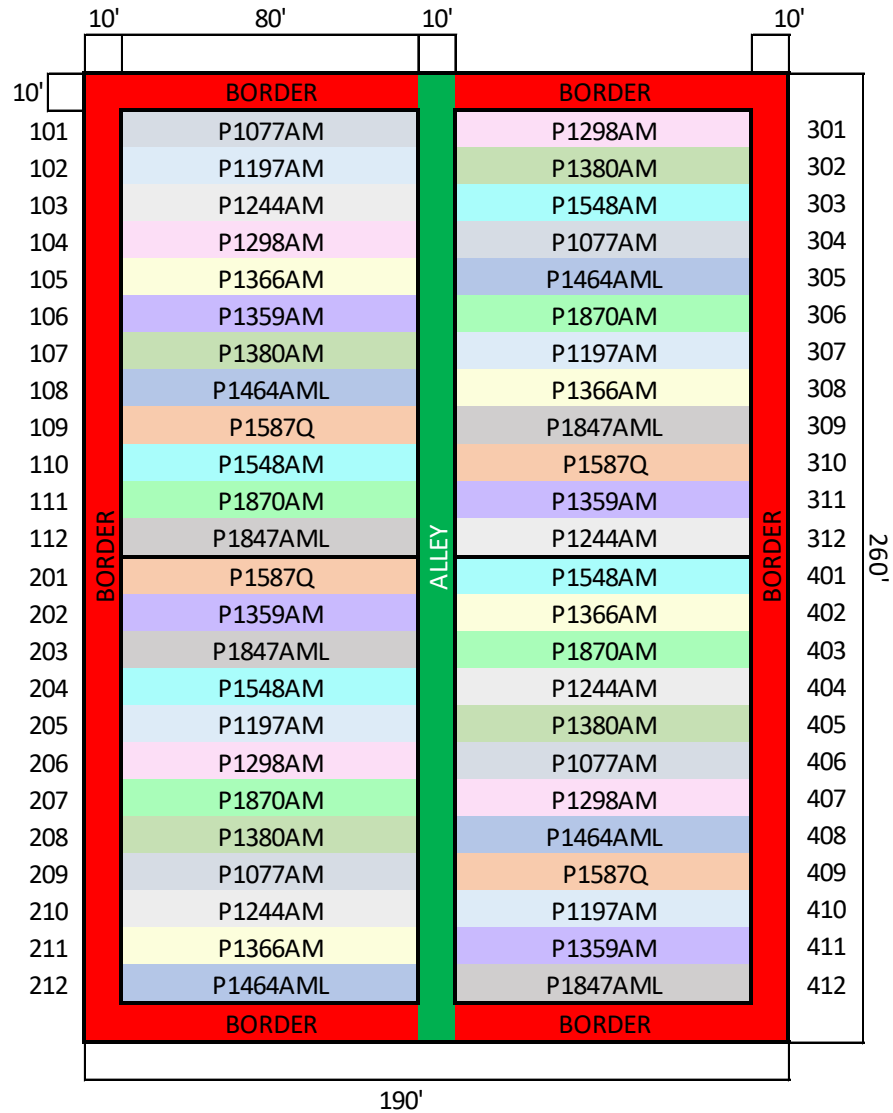
Hybrid	RM	Plot Numbers				
P1077AM	110	101	209	304	406	
P1197AM	111	102	205	307	410	
P1244AM	112	103	210	312	404	
P1298AM	112	104	206	301	407	
P1366AM	113	105	211	308	402	
P1359AM	113	106	202	311	411	
P1380AM	113	107	208	302	405	
P1464AML	114	108	212	305	408	
P1587Q	115	109	201	310	409	
P1548AM	115	110	204	303	401	
P1870AM	118	111	207	306	403	
P1847AML	118	112	203	309	412	

PEST MANAGEMENT

Date	Application Timing	Product(s)	Rate
4/16/20	Burndown	Roundup PowerMAX	38 oz/ac
4/16/20	Burndown	2,4-D	16 oz/ac
4/16/20	Burndown	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal
6/3/20	Pre-Emergence	Roundup PowerMAX	32 oz/ac
6/3/20	Pre-Emergence	Aatrex	32 oz/ac
6/3/20	Pre-Emergence	Acuron	80 oz/ac
6/3/20	Pre-Emergence	Ammonium Sulfate (21-0-0-24S)	17 lbs/100 gal

SOIL FERTILITY

Date	Application Timing	Product(s)	Rate
4/8/20	Pre-Plant	KCl (0-0-60)	90 lbs K ₂ O/ac
6/3/20	Pre-Emergence	Urea w/ Agrotain	180 lbs N/ac

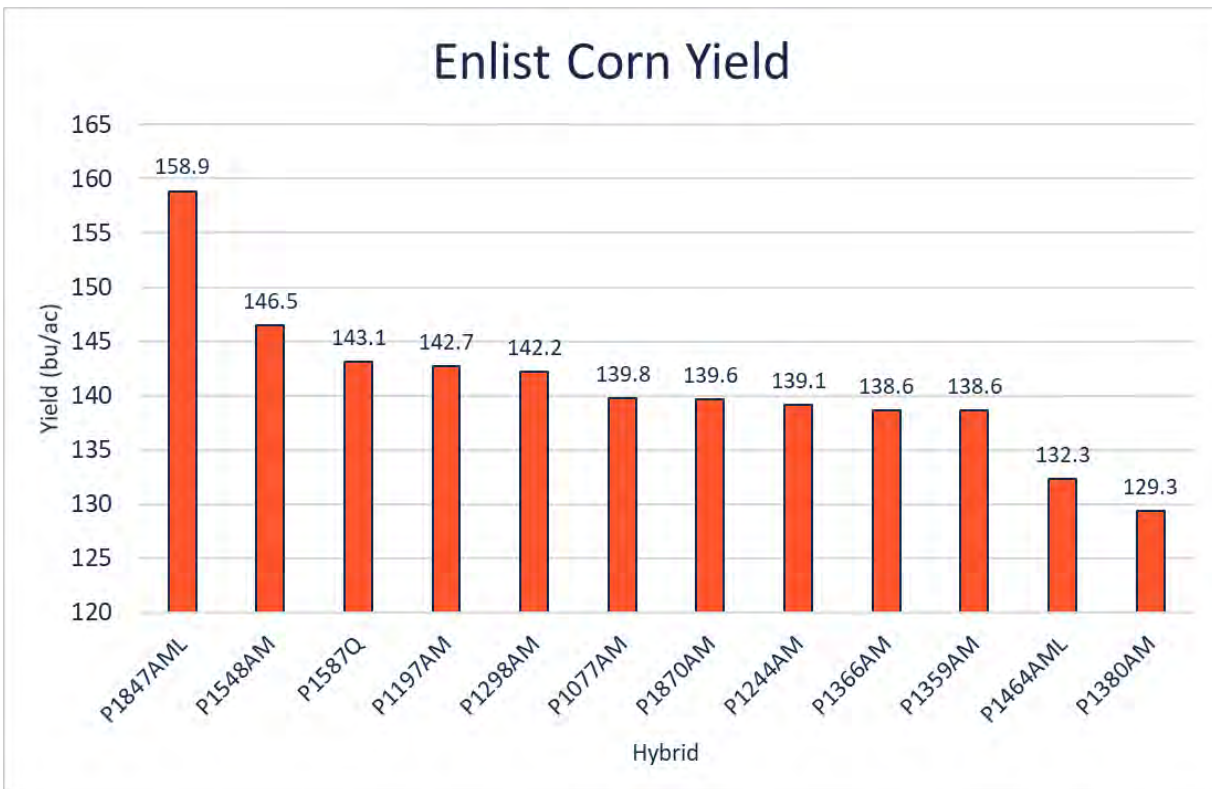


HYBRID	EST. POP.	TW (lb/bu) ^a	MST (%) ^a	YIELD (bu/ac) ^b
P1847AML	32,250 A ^c	58.6 A	15.2 A	158.9 A
P1548AM	33,250 A	58.6 A	15.2 A	146.5 AB
P1587Q	31,500 A	58.6 A	15.2 A	143.1 AB
P1197AM	31,750 A	58.6 A	15.2 A	142.7 AB
P1298AM	34,750 A	58.6 A	15.2 A	142.2 AB
P1077AM	32,750 A	58.6 A	15.2 A	139.8 B
P1870AM	31,750 A	58.6 A	15.2 A	139.6 B
P1244AM	31,250 A	58.6 A	15.2 A	139.1 B
P1366AM	31,250 A	58.6 A	15.2 A	138.6 B
P1359AM	32,750 A	58.6 A	15.2 A	138.6 B
P1464AML	32,750 A	58.6 A	15.2 A	132.3 B
P1380AM	31,750 A	58.6 A	15.2 A	129.3 B

^a Reported moisture and test weight are averages from three samples taken from combine hopper due to faulty moisture sensor in weigh hopper. Measurements taken with DICKEY-john mini GAC.

^b Reported yields adjusted to 15% moisture

^c Different capital letters indicate significant difference according to Tukey's HSD test ($\alpha=0.05$)



TAKEAWAYS:

- Later RM appeared to be beneficial for P1847AML, despite onset of southern rust later in the reproductive growth period (approximately R3).
 - Did not benefit P1870AM
 - Disease ratings were not performed due to lack of time/manpower at the appropriate time for rating.