Ewing Advisory Committee Report 2018

ILLINOIS Extension

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES

Most Recent Soil Analysis Results (10/25/16)

Field	WpH	OM%	P lbs/A	K/lbs/A	Ca lbs/A	Mg lbs/A	S lbs/A	CEC
100 Series	5.8	1.52	86	245	2864	113	25	9.94
200 Series	5.8	3.65	88	293	2765	98	25	9.29
300 Series	5.8	1.53	89	302	2923	121	24	9.79
400 Series	6.5	1.51	81	278	3476	116	22	10.72
500 Series	5.8	1.46	59	271	3163	152	19	10.48
600 Series	5.8	1.54	122	313	2832	158	27	10.13
700 Series	6.4	1.71	95	262	4369	304	22	14.12
800 Series	6.3	0.66	89	333	3371	186	55	10.82
900 Series	5.8	1.87	89	317	3431	230	32	11.94
1000 Series	5.7	2.19	54	237	4318	288	40	14.69

Continuous No-Till Soil Analysis – By Depth

	pH			%OM			P (lbs/A)			K (lbs/A)			Ca (lbs/A)			Mg (lbs/A)			S (lbs/A)
Depth (in.)	2018	2006	2003	2018	2006	2003	2018	2006	2003	2018	2006	2003	2018	2006	2003	2018	2006	2003	2018
0-1	6.4	6.9	6.2	4.7	2.9	3.1	218.8	211	175	560.9	364	591	4192.4	5372	4530	228.5	273	290	22.7
1-2	6.3	7	6.4	3.6	2.9	3.1	190.8	189	168	355.2	261	413	3946.7	5167	4390	179.7	223	230	19.2
2-3	6.4	6.9	6.6	3.1	3	3.1	190.4	149	138	269	208	309	4025.2	5000	4320	170.6	174	200	15.2
3-4	6.4	7	6.5	2.1	2.9	3.1	152.3	135	103	223.8	168	252	3596.3	4277	3690	161.6	155	170	16.6
4-5	6.2	6.6	6.2	2	2.8	3.1	110.6	108	70	188.5	171	202	3203.7	4019	3070	140.7	146	150	15.1
5-6	6.1	6.6	5.8	1.8	2.7	3.2	83.4	71	56	170.7	138	163	3038.4	3453	2310	136	131	120	20.2
6-7	5.9	6.2	5.4	1.5	2.7	3.2	65.7	45	48	153.3	123	151	2865.4	2855	1790	132.8	113	120	14.8
7-8	5.8	6.2	5.2	1.5	2.4	2.9	72.2	40	45	151.9	135	147	2757	2907	1550	139.2	118	110	19.4
8-10	5.5	5.5	5	1.9	2.4	2.9	87.5	51	29	173.9	136	133	2785	2663	1200	165.3	123	100	26.6
10-12	5.3	5.4	4.8	1.1	1.9	2.4	29.5	26	17	120.6	135	130	2193.8	2237	1080	136.9	123	110	15.7
12-14	5.6	5	4.7	1.9	1.8	1.7	58.2	12	9	158.2	144	132	2638.2	2184	1020	136.4	143	130	14

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Ewing Demonstration Center

Soil Fertility Demonstration Plots
100, 200, 300, and 400 Series

The west portion (80') of the 100, 200, 300, and 400 Series has been dedicated as a long term soil fertility demonstration plot for pH, phosphorus (P), and potassium (K) fertility. The map below illustrates the layout of the plots which is the same on each of the Series. These plots have received no fertilizer amendments except those designated by the treatments below.

N↑

PK No Lime (NL)	PK Lime (L)
K No Lime	K Lime
No P or K No Lime	No P or K Lime
P No Lime	P Lime

* Nitrogen is applied uniformly across all areas in when the crop is corn and wheat. No nitrogen is applied when the crop is soybean.

In the fall of 2013 & 2017 soil samples were collected from the 400 Series Soil Fertility Plots. The results are below

400 Series Soil Fertility Plots
Soil Test Date: 12/10/2013

Treatment	WpH	OM %	OM lbs/A	P lbs/A	K lbs/A	Ca lbs/A	Mg lbs/A	CEC
PK	4.5	1.7	34	193	296	921	112	6.5
K	4.5	1.5	31	30	307	705	90	5.9
(No PK)	4.4	1.3	26	38	156	808	228	6.5
P	4.4	1.3	27	64	103	665	96	5.4
L PK	4.5	1.1	23	197	286	732	76	5.9
L K	4.6	0.9	18	36	311	840	126	6.3
L (No PK)	4.6	1.0	19	21	227	893	184	6.5
L P	4.7	1.5	31	94	157	829	125	5.8

100 Series Soil Fertility Plots
Soil Test Date: 12/13/2017

Treatment	pH	OM %	P lbs/A	K lbs/A	Ca lbs/A	Mg lbs/A	S lbs/A	CEC
PK	4.6	1.2	114.0	280.4	598.8	125.4	38.9	5.4
K	4.9	1.2	28.5	290.7	484.7	117.2	51.3	4.8
None	4.8	1	30.2	126.8	516.2	121.6	50.4	4.9
P	4.8	1	107.5	81.9	560.4	91.1	43	4.8
L PK	5.1	1.2	67.6	198.3	1914.9	126.9	20.7	8.1
L K	5.6	1.2	13.5	287.9	2098.5	150.2	16.3	8.3
L None	5.6	1	13.9	81.7	2339.4	137.8	17.6	8.6
L P	5.5	1	72.3	58.1	2271.7	103.3	19.3	8.3

200 Series Soil Fertility Plots
Soil Test Date: 12/13/2017

Treatment	pH	OM %	P lbs/A	K lbs/A	Ca lbs/A	Mg lbs/A	S lbs/A	CEC
PK	4.3	1.0	205.2	183.0	458.4	78.4	44.0	5.0
K	4.7	1.0	35.9	220.8	355.0	66.8	52.2	4.4
None	4.5	1.0	39.6	115.1	445.8	94.8	57.6	4.9
P	4.3	1.2	95.6	71.7	433.6	80.6	41.8	4.9
L PK	4.9	1.4	90.1	136.7	1660.3	101.7	20.3	7.5
L K	5.3	1.2	13.9	171.3	2033.8	115.5	13.4	8.2
L None	5.6	1.2	12.4	64.2	2302.1	120.3	22.2	8.5
L P	5.2	1.0	57.0	62.0	2295.0	116.2	17.9	8.8

300 Series Soil Fertility Plots
Soil Test Date: 12/13/2017

Treatment	pH	OM %	P lbs/A	K lbs/A	Ca lbs/A	Mg lbs/A	S lbs/A	CEC
PK	4.6	1.2	135.3	146.3	512.3	84.1	43.7	4.9
K	4.7	1.2	55.3	165.9	431.2	83.4	53.3	4.6
None	4.7	1.0	45.0	102.5	452.4	90.8	92.3	4.7
P	4.7	1.2	84.1	83.7	507.5	87.3	55.9	4.7
L PK	5.7	1.4	71.5	108.5	2079.5	101.2	19.7	7.8
L K	6.1	1.4	13.6	102.5	2343.0	104.9	20.4	8.0
L None	6.2	1.8	11.9	53.7	2492.9	123.8	99.4	8.7
L P	6.0	1.9	37.4	54.2	2538.8	121.3	111.3	9.1

400 Series Soil Fertility Plots
Soil Test Date: 12/13/2017

Treatment	pH	OM %	P lbs/A	K lbs/A	Ca lbs/A	Mg lbs/A	S lbs/A	CEC
PK	4.6	1.2	226.4	163.8	563.8	84.4	35.5	5.1
K	4.6	1.9	43.7	200.2	573.3	124.5	59.6	5.4
None	4.5	1.2	37.0	90.9	574.8	192.0	84.6	5.6
P	4.5	1.2	91.6	63.2	633.7	129.7	103.6	5.4
L PK	5.0	1.7	121.1	148.6	1712.2	109.4	48.7	7.8
L K	5.2	1.2	15.7	146.9	1992.3	149.9	46.2	8.4
L None	4.9	1.5	35.9	84.4	1715.2	263.1	55.3	8.4
L P	5.2	1.8	91.8	81.8	1731.0	155.1	42.4	7.6

Pumpkin Variety Review

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In 2018, the University of Illinois Extension conducted an observational pumpkin variety trial in southern Illinois at the University of Illinois Extension, Ewing Demonstration Center, located in Ewing, IL. The trial was conducted as a part of the 2018 Pumpkin Field Day hosted at the Center September 6, 2018. The trial was a single replication including 75 pumpkin, gourd, and winter squash varieties divided into 4 categories: Gourds, Pie-sized, Specialty, and Jack O'Lantern. Specialty Pumpkins included anything of "carving size" and colors other than orange (white, red, blue, warted, etc.). The Jack O'Lantern pumpkins were also grouped as Medium (under 30 lbs) and Large (over 30 lbs).

Pumpkins were grown in a no-till system, double cropped after winter wheat. Pumpkin transplants were seeded on June 6, 2018 into 72-cell plug trays. Transplants were planted with a no-till mechanical transplanter on June 30, July 1 & 2, 2018 into wheat stubble. Plants spacing was set based on the category with Gourds and Pie-sized planted at 2.5 ft x 6 ft (between plant x between row) (15 sq ft/plant), Specialty and Medium Jack O'Lanterns at 4 ft x 6 ft (24 sq ft/plant) and Large Jack O'Lanterns at 4 ft x 8 ft (32 sq ft/A). All plots were 2 rows wide and 40 ft long. Prior to planting pumpkins, a burndown application of Gramoxone 2 SL 4 pt/A, Sandea 0.5 oz/A, Reflex 1 pt/A, Dual Magnum 1.33 pt/A, plus Nonionic Surfactant at 0.5% v/v was applied. Based on soil test values no added Phosphorus or Potassium was needed and 60 lbs Nitrogen as ammonium nitrate was applied sidedress on August 1, 2018. Select Max was applied for grass control at 16 fl oz/A on August 1, 2018 with 0.25% v/v nonionic surfactant. Protectant fungicide and insecticide applications were made every 7-14 days throughout August and early September based on recommendation from the Midwest Vegetable Production Guide ID-56.

Observational harvest data (number of fruit, weight and notes on color, shape and other characteristics) were collected in late September by harvesting a subsample within the center of each plot, representing the area of 5 plants at the given plant spacing for that variety.

There are many factors, including yield, shape, size, and color to consider and most especially what would be marketable in you region through your marketing outlets.

This handout has been abbreviated for the sake of space. To see the full report including, pictures visit the Midwest Vegetable Variety Trial Report for 2018 at https://ag.purdue.edu/hla/fruitveg/Pages/MVVTRB.aspx

Many thanks to all of the seed companies listed for their seed donations for this trial and to my colleagues, Bronwyn Aly, Elizabeth Wahle, Julie Zakes, Marc Lamczyk, Katie Bell, Maggie Ray, Talon Becker, and Laurie George for all of their help in planting, maintenance, and harvest!

	Variety	Source	Average Fruit Weight (lbs)	Yield (No. fruit/plant)	Color
Gourds					
1	Apprentice	Harris Moran	1.0	9.6	Orange
2	Autumn Wings - Small	Seedway	0.4	11.8	Variegated
3	Crunchkin	Harris Moran	0.5	7.6	Orange
4	Daisy Gourds	Eckler's Produce Farms	0.4	11.0	Variegated
5	Galaxy of Stars	Rupp	0.3	14.6	Variegated
6	Gizmo	Rupp	1.6	6.6	Variegated
7	Gold Speck F1	Rupp	0.5	10.2	Orange
8	Munchkin	Harris Moran	0.4	13.2	Orange
9	WeeeeeOne	Rupp	0.5	11.2	Orange
Pie-Size					
10	Baby Bumps	Hybrid Seed Co.	3.5	3.2	Orange w/warts
11	Baby Wrinkles	Sakata	6.4	0.8	Orange
12	Bisbee Gold	Rupp	5.7	1.6	Dark Orange
13	Cannon Ball	Harris Moran	3.1	1.8	Dark Orange
14	Chucky	Hybrid Seed Co.	2.5	5.0	Orange
15	Darling	Abbott & Cobb	4.9	3.4	Dark Orange
16	Early Abundance	Abbott & Cobb	5.3	1.6	Dark Orange
17	Fall Splendor Plus	Sakata	4.8	2.0	Dark Orange
18	Field Trip	Harris Moran	3.1	2.0	Dark Orange
19	Jack Sprat	Sakata	2.3	3.4	Dark Orange
20	Miniwarts	Harris Moran	2.5	3.8	Orange/green warts
21	Mystic Plus	Harris Moran	4.5	1.2	Dark Orange
22	Pick-A-Pie	Rupp	4.3	2.6	Dark Orange
23	RPX 6880	Rupp	4.8	2.4	Dark Orange
24	Snowball	Hybrid Seed Co.	1.9	7.2	White
25	Sunlight	Hybrid Seed Co.	3.7	2.8	Yellow
26	Tiffany	Hybrid Seed Co.	3.0	3.8	Dark Orange
27	Toad	Sakata	1.6	5.4	Orange w/warts
28	Touch of Autumn	Rupp	2.2	4.0	Dark Orange
29	Warty Gnome	Harris Moran	2.8	3.6	Orange/cream variegated
Specialty Pumpkins					
30	Autumn Buckskin	Seedway	14.8	1.4	Tan
31	Blue Doll	Seedway	12.8	0.6	Blue
32	Cinderella	Seedway	16.4	2.0	Red
33	Fairytale	Seedway	22.9	1.0	Tan
34	HSC151	Hybrid Seed Co.	9.9	2.0	Green/orange (naked seed)
35	Knucklehead	Hybrid Seed Co.	13.2	2.4	Orange
36	Marina Di Chioggia	Seedway	7.6	0.6	Blue Warted
37	Moonshine	Hybrid Seed Co.	5.8	1.4	White
38	New England Cheddar	Rupp	12.2	2.0	Tan

	Variety	Source	Average Fruit Weight (lbs)	Yield (No. fruit/plant)	Color
39	One Too Many	Rupp	21.0	1.2	White w/ red/orange veins
40	RPX 6229	Rupp	10.2	3.4	Tan (Pepo Type)
41	RPX 6890	Rupp	10.5	2.6	Orange w/ green warts
42	RPX 6927	Rupp	7.3	1.2	White
43	Specter	Harris Moran	13.8	1.6	White w/some warts
44	Warty Goblin	Harris Moran	12.3	0.8	Orange w/green warts
45	White Flat Boer Ford	Sakata	11.9	0.8	White
Medium Jack O'Lantern (Under 30 lbs)					
46	Ares	Harris Moran	20.9	0.6	Dark Orange
47	Bayhorse Gold	Rupp	15.1	1.2	Dark Orange
48	Carrie	Hybrid Seed Co.	13.9	1.6	Dark Orange
49	Cracker Jack	Sakata	10.6	1.0	Dark Orange
50	Eagle City Gold	Rupp	14.6	2.2	Dark Orange
51	Early Prince	Abbott & Cobb	10.4	1.6	Dark Orange
52	Jason	Seedway	13.1	0.8	Orange
53	Kratos	Harris Moran	16.3	1.2	Dark Orange
54	Magic Wand	Harris Moran	13.9	1.6	Dark Orange
55	Orange Sunrise	Harris Moran	16.8	1.2	Orange
56	Rhea	Harris Moran	16.9	1.4	Dark Orange
57	RPX 5588	Rupp	13.1	0.8	Dark Orange
58	RPX 6208	Rupp	14.7	3.2	Dark Orange
59	RPX 6209	Rupp	14.0	1.6	Dark Orange
60	Secretariat	Seedway	14.8	1.4	Dark Orange
61	Spartan	Sakata	18.1	1.4	Dark Orange
62	Thor	Sakata	16.6	1.0	Dark Orange
63	Zeus	Harris Moran	13.9	1.2	Dark Orange
Large Jack O'Lantern (Over 30 lbs)					
64	Bellatrix	Rupp	16.3	1.2	Dark Orange
65	Big Doris	Hybrid Seed Co.	27.9	1.2	Dark Orange
66	Big Lorettta	Hybrid Seed Co.	35.3	0.6	Dark Orange
67	Cronus	Harris Moran	24.2	0.4	Dark Orange
68	Early Giant	Abbott & Cobb	32.8	1.0	Dark Orange
69	Early King	Abbott & Cobb	21.3	1.2	Dark Orange
70	Hulk	Sakata	24.8	1.0	Dark Orange
71	RPX 6851	Rupp	18.6	0.6	Dark Orange
72	RPX 6879	Rupp	25.6	1.0	Light Orange
73	RPX 6903	Rupp	26.3	1.4	Light Orange, some warts
74	SPU 13118	Sakata	28.3	0.6	Dark Orange
75	Tallon	Harris Moran	23.7	1.0	Dark Orange

Drilled Soybean (8") Population Trial - 2018

Location:	EDC 200
Investigators:	Talon Becker, Nathan Johanning, & Marc Lamczyk
Plot Size:	10ft x 100ft
Reps:	4

Treatment #	Treatment	Plot Numbers				Flag Color
1	75,000 seeds/A	101	202	304	405	red
2	100,000 seeds/A	103	205	302	404	yellow
3	125,000 seeds/A	105	204	305	403	green
4	150,000 seeds/A	104	203	301	402	white
5	175,000 seeds/A	102	201	303	401	orange

Crop Information

Cover Crop:	Cereal Rye (70 lbs/A)
Crop:	Soybean
Variety/Hybrid:	Pioneer P42A52X
Planting Date:	5/24/2018
Planting Method:	No-till Drill - 8" rows / 3/4" depth
Seeding Rate:	75k, 100k, 125k, 150k, & 175k seeds/A
Soil Conditions (planting):	Good | Planted into green cereal rye
Previous Crop:	Corn
Harvest Date:	10/22/2018

Pest Management

Date	Application Timing	Product(s)	Rate
5/24/18	Pre-emergence	Roundup PowerMax	32 oz/A
5/24/18	Pre-emergence	Fierce	3 oz/A
5/24/18	Pre-emergence	Ammonium Sulfate	17 lbs/100 gal
6/30/18	Post-emergence	Roundup WeatherMax	32 oz/A
6/30/18	Post-emergence	Flexstar	24 oz/A
6/30/18	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
6/30/18	Post-emergence	Aqualight NIS	0.5% v/v

Comments:

Estimated seed weight from 100 k (14.5g) = 31.9 lb/100,000 seed

Soil Fertility

Date	Application Timing	Product(s)	Rate

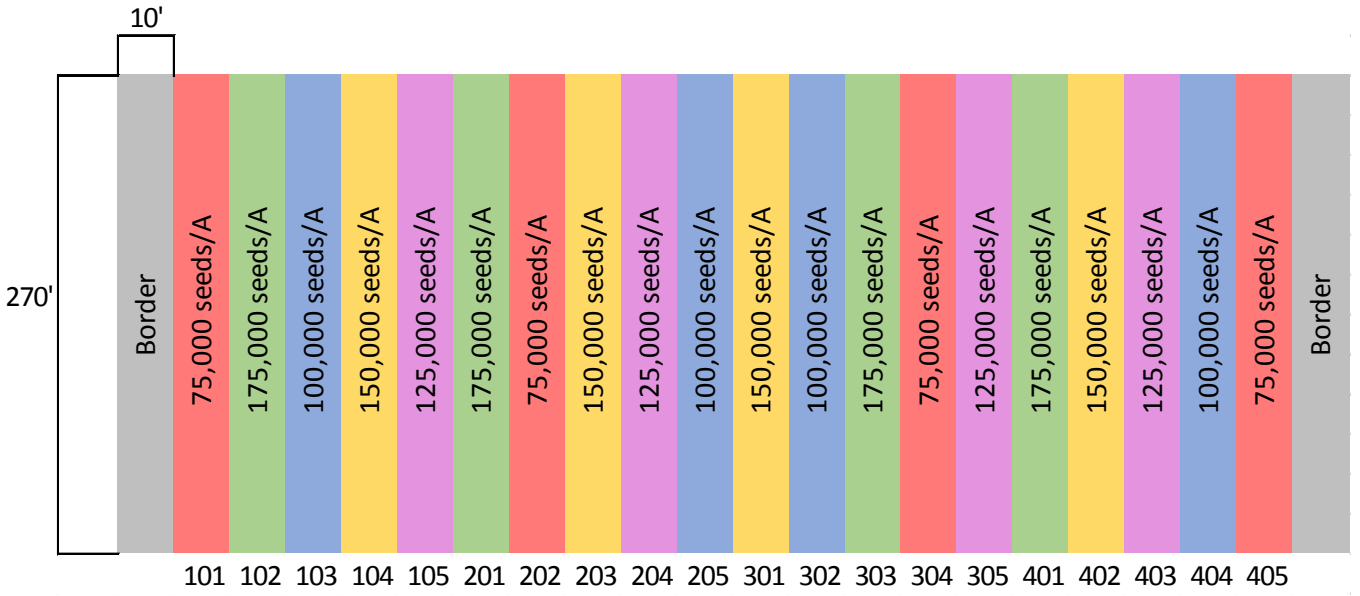
Data Collection:

Stand Count: Taken between V1 and V3. Two 8" drill rows counted (32'8" of two rows = 1/1000 A), four locations/plot

Summary:

Results of the preliminary analysis of the data from this trial showed a significant (α=0.1) effect of seeding rate and replicate on the yield of drilled soybeans. Further investigation by means separation with Waller groupings showed the significant (α=0.1) difference in yield between treatments to be only between 175,000 seeds/A (57.69 bu/A) and 100,000 seeds/A (49.32 bu/A; difference of 8.37 bu/A).

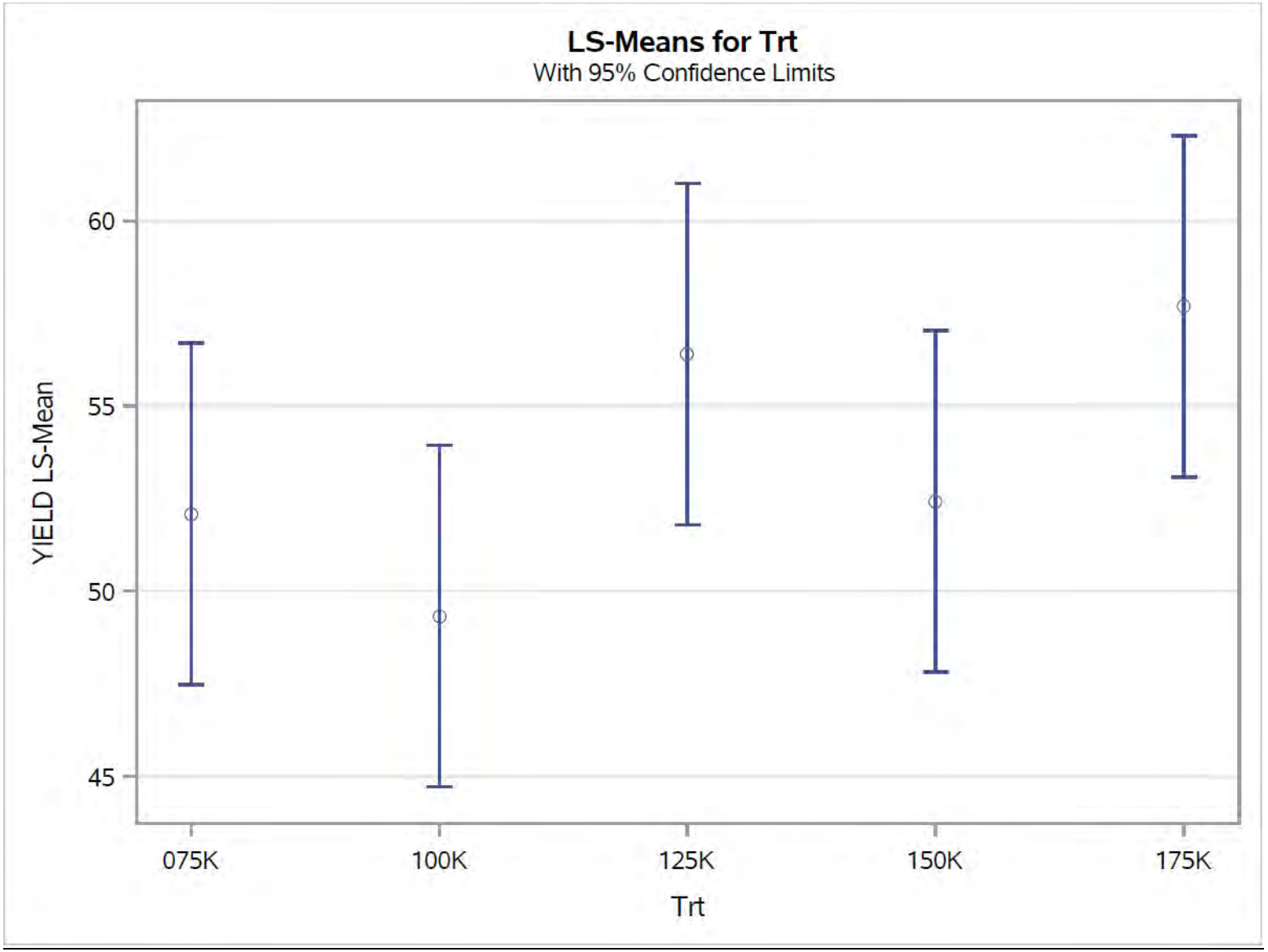
It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of this product in this geography. Further data would be needed to draw any reliable conclusions.



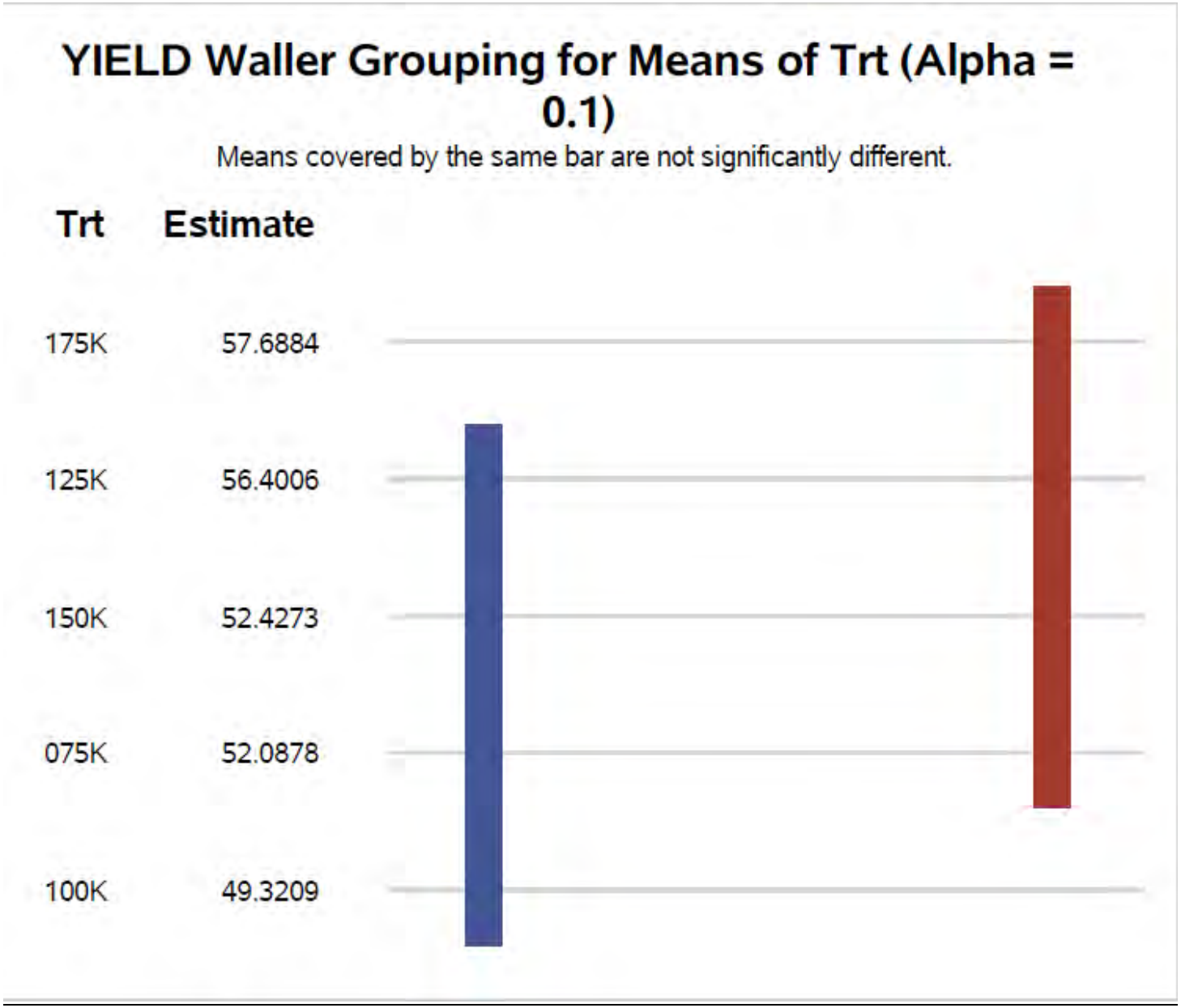
Analysis of Variance (ANOVA)

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	3	150.2516261	50.0838754	2.80	0.0856
Trt	4	186.1195832	46.5298958	2.60	0.0897

The analysis of variance results show similar contributions from replication and treatment (seeding rate) to observed variance in yield. Both replicate and seeding rate had significant (α=0.1) effects on yield.

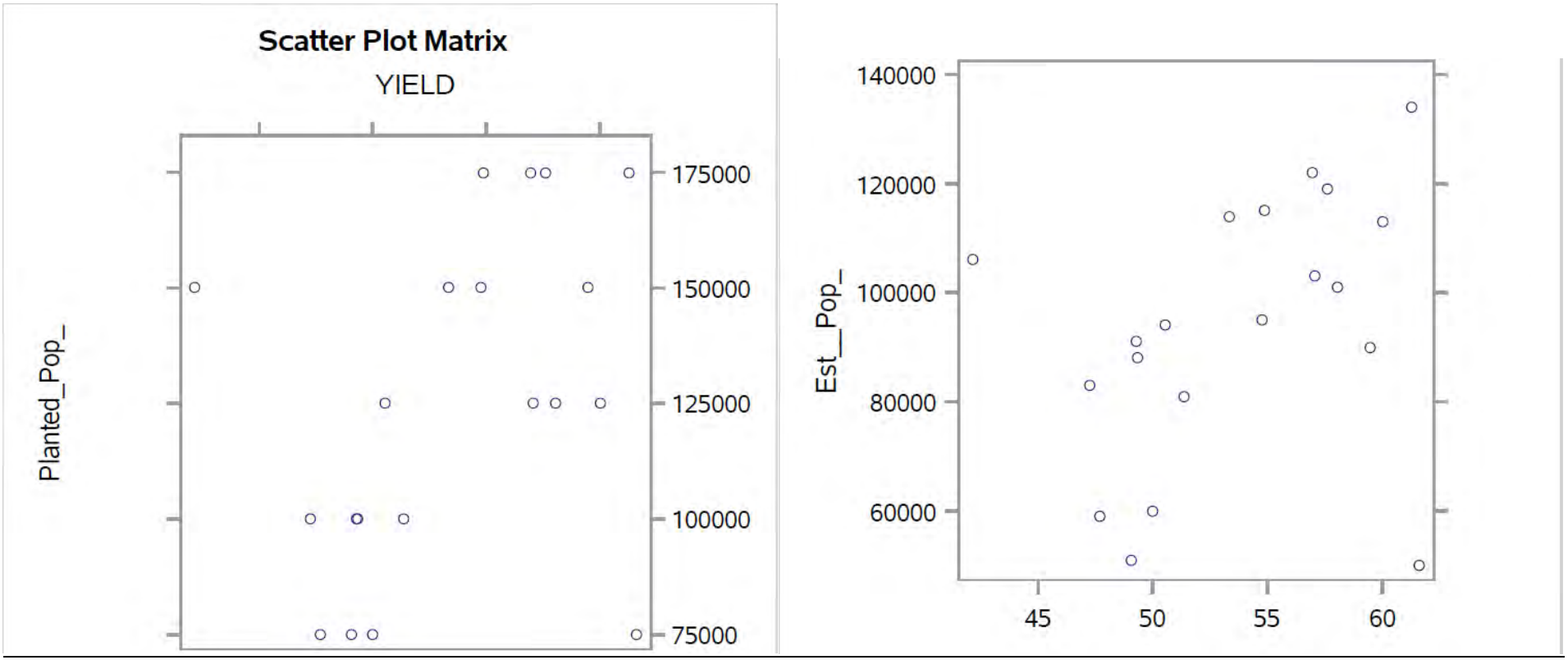


LS means of yield for the different seeding rate treatments show an upward yet weak trend with increasing seeding rate. Also, the large, overlapping confidence limits reflect the high degree of variation between replicates of a given seeding rate treatment.



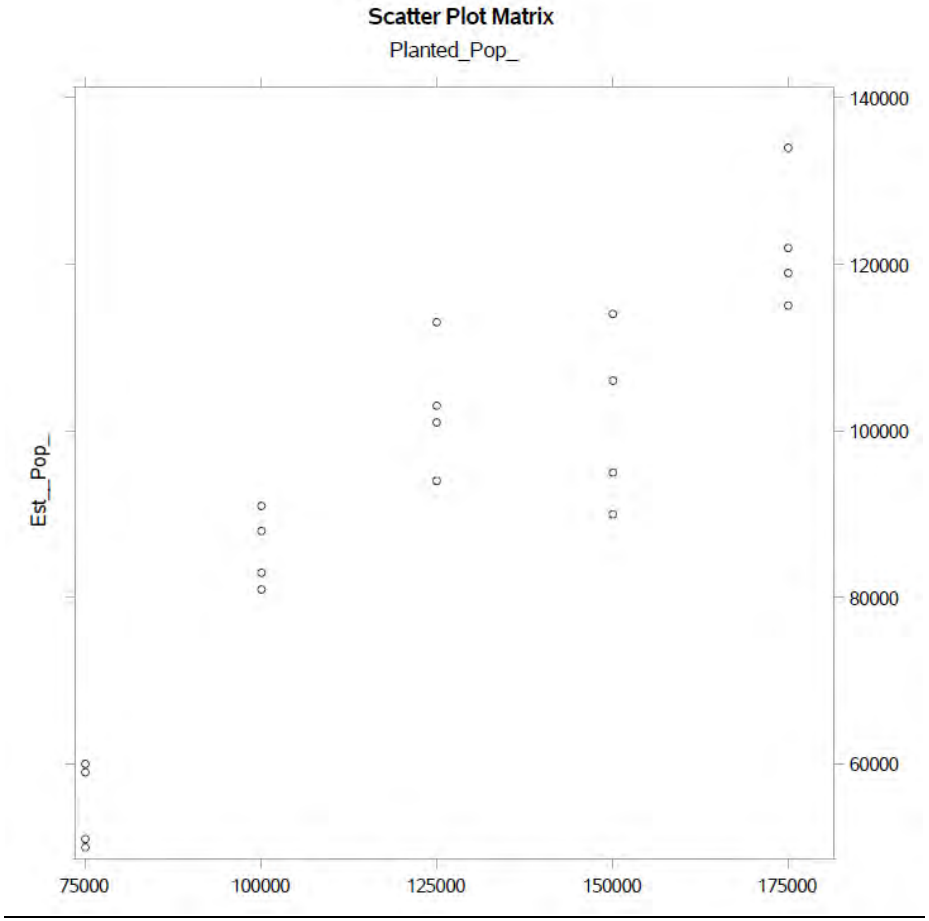
Mean separation by Waller groupings show the only significant (α=0.1) differences between treatments exists between the 175,000 seeds/A and 100,000 seeds/A seeding rates (difference of 8.3675 bu/A).

Pearson Correlation Coefficients, N = 20 Prob > |r| under H0: Rho=0	
Planted_Pop_ Planted Pop.	YIELD 0.38539 0.0933
Est__Pop_ Est. Pop.	YIELD 0.34768 0.1331



Although relatively weak, the correlation between yield and planted population (seeding rate/A) was significant at α=0.1, while the correlation between yield and estimated population (based on stand counts) was not.

Pearson Correlation Coefficients, N = 20 Prob > |r| under H0: Rho=0	
Est__Pop_ Est. Pop.	Planted_Pop_ 0.90767 <.0001



Although there was significant (α=0.1) variation in replicates of a given treatment according to ANOVA, the correlation between the planted population and the emerged population (estimated based on stand counts) was strong and highly significant at α=0.1.

Nitrogen Rate Trial for No-Till Corn

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

Treatment #	Treatment	Plot Numbers		
1	0 lbs N/A	101	205	303
2	50 lbs N/A	102	204	306
3	100 lbs N/A	103	206	301
4	150 lbs N/A	104	202	305
5	200 lbs N/A	105	203	302
6	250 lbs N/A	106	201	304

Crop Information

Cover Crop: Volunteer wheat
Crop: Corn
Variety/Hybrid: Pioneer P1197AM
Planting Date: 5/10/2018
Planting Method: No-till Planter - 30" rows/ 1" deep
Seeding Rate: 29,000 seeds/A
Soil Conditions (planting): Ideal
Previous Crop: Soybean
Harvest Date: 10/18/2018

Pest Management

Date	Application Timing	Product(s)	Rate
4/30/2018	Pre-plant Burndown	Roundup WeatherMax	32 oz/A
4/30/2018	Pre-plant Burndown	2,4-D	16 oz/A
4/30/2018	Pre-plant Burndown	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	Acuron	80 oz/A
5/30/2018	Post-emergence	Aatrex	32 oz/A
5/30/2018	Post-emergence	Roundup PowerMax	32 oz/A
5/30/2018	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	COC	0.25% v/v

Comments:

Harvest area = 1350 ft.^{2}

Soil Fertility

Date	Application Timing	Product(s)	Rate
5/30/18	V4	UAN 32%	By Treatment

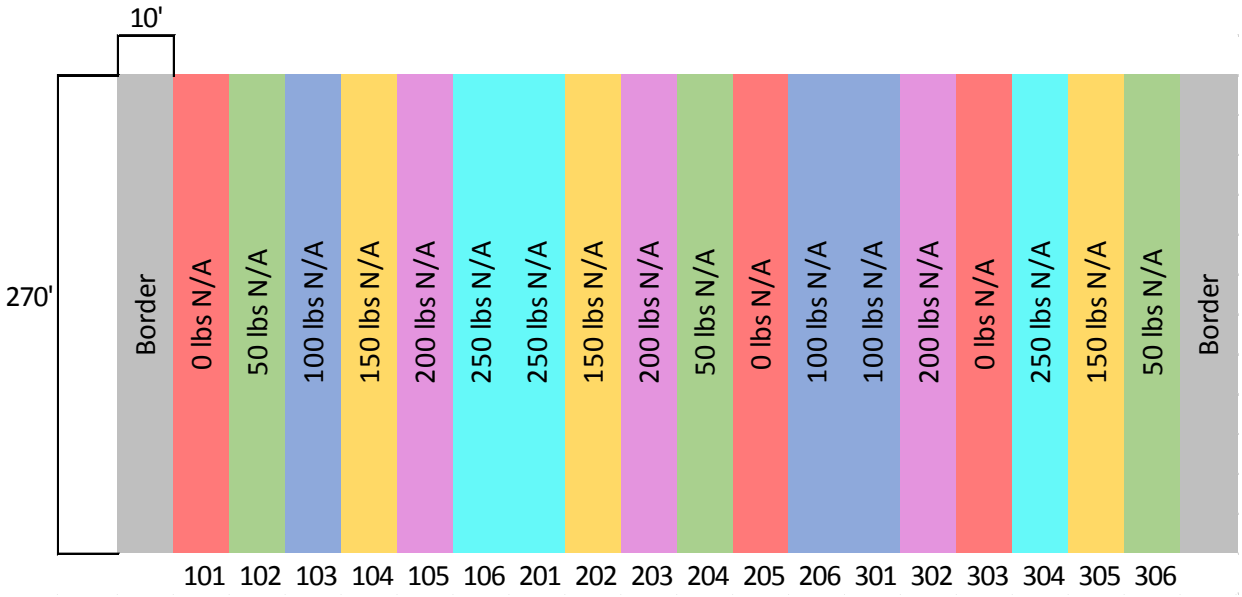
Data Collection:

1) Yield: lbs. grain per plot, moisture, test weight. Harvest center 2 rows.

Summary

While 2016 gave some unexpected results, the other two years showed expected trends in the response of yield to N application rate. It should be noted that in all three years, there was no significant (α=0.1) yield advantage from applying 250 lbs N/A compared to 200 lbs N/A.

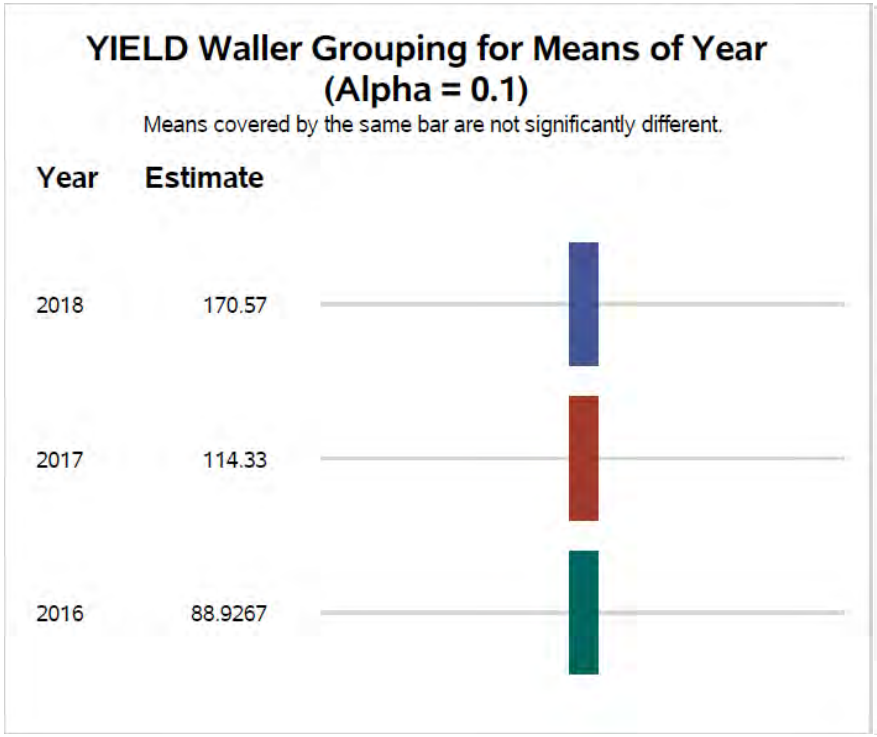
Repetition of this trial in the coming years will continue to improve our understanding of the interaction between growing season and the N requirement for peak yields. Additionally, this data will help to inform the MRTN calculator for the southern IL region.

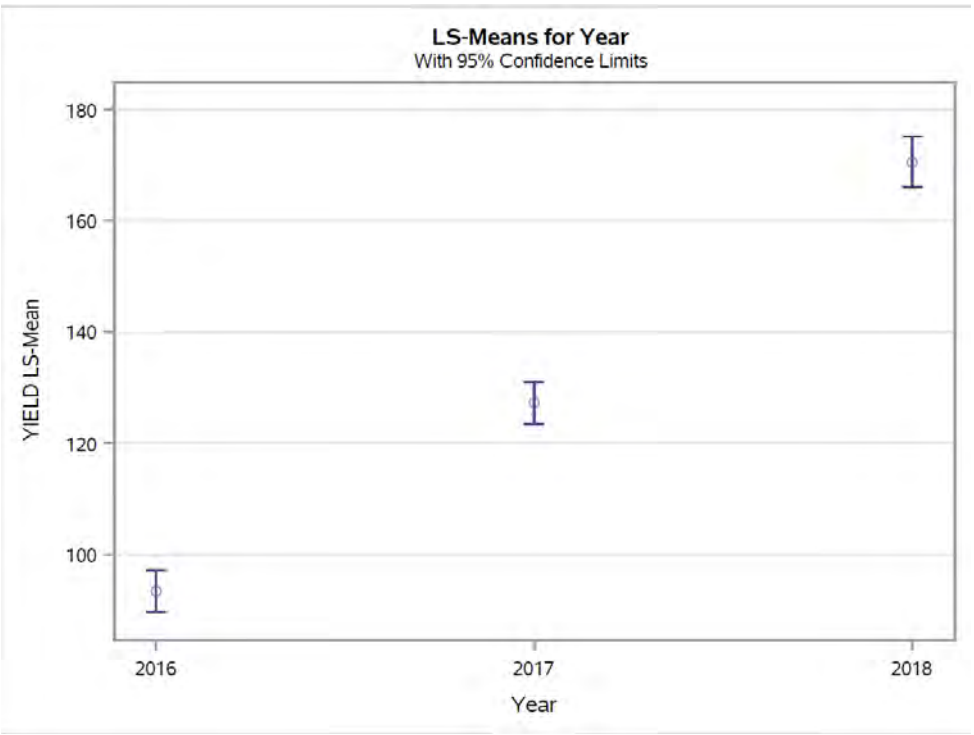


Analysis of Variance (ANOVA) – 2016-2018

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Year	2	63622.6377	31811.3188	348.35	<.0001
Year(Rep)	8	5243.3068	655.4133	7.18	<.0001
TRT	5	152683.1480	30536.6296	334.39	<.0001
Year*TRT	10	39433.3718	3943.3372	43.18	<.0001

Analysis of variance results show significant (α=0.1) variation in yield attributed to all factors in the model.





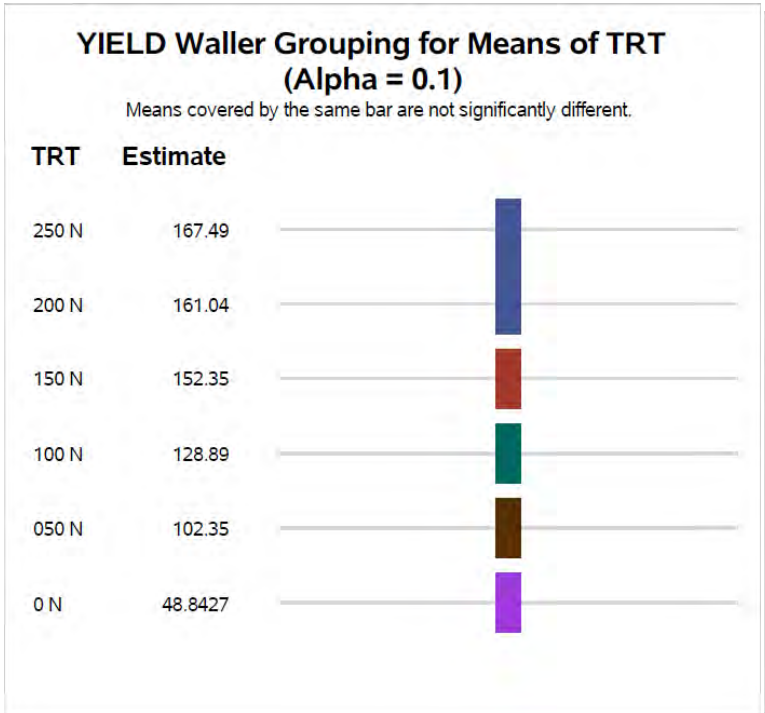
Year	YIELD LSMEAN	LSMEAN Number
2016	93.392651	1
2017	127.208962	2
2018	170.567326	3

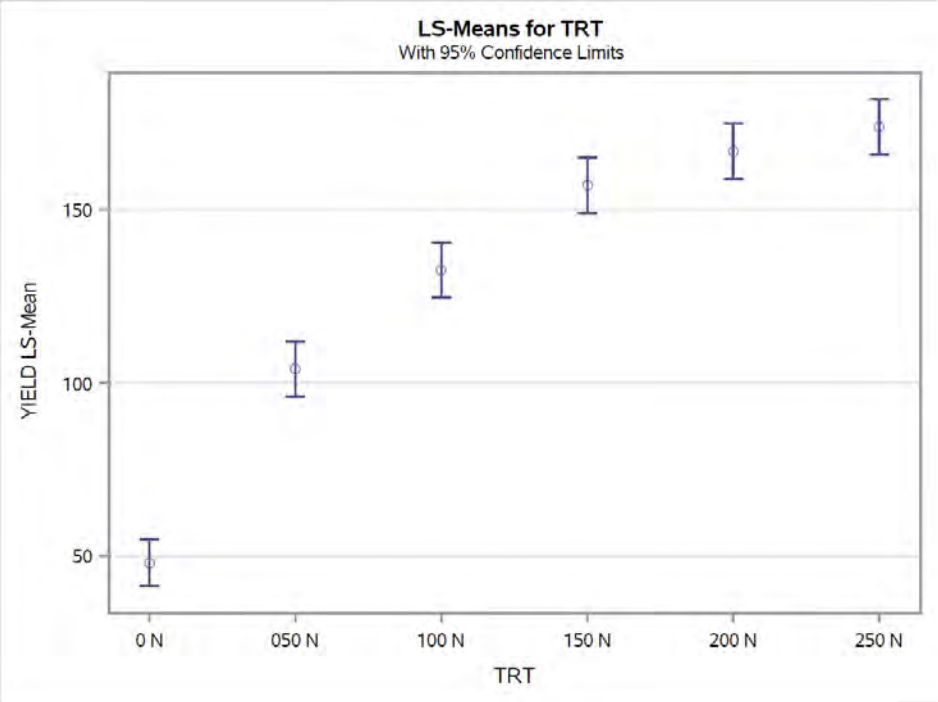
Least Squares Means for effect Year
Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: YIELD

i/j	1	2	3
1		<.0001	<.0001
2	<.0001		<.0001
3	<.0001	<.0001	

Mean separation with Waller groupings show the significant (α=0.1) difference between years in yields across all treatments reflected in the ANOVA. Although the calculation is slightly different, the comparison of LS means (with Tukey-Kramer adjustment) also reflect the significant (α=0.1) difference in average yields between the years.





TRT	YIELD LSMEAN	LSMEAN Number
0 N	48.006819	1
050 N	103.961987	2
100 N	132.575477	3
150 N	157.049163	4
200 N	166.873242	5
250 N	173.871188	6

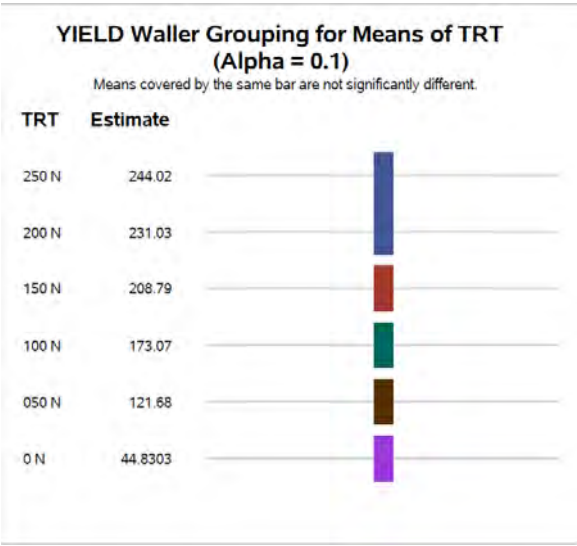
Least Squares Means for effect TRT
Pr > |t| for H0: LSMean(i)=LSMean(j)

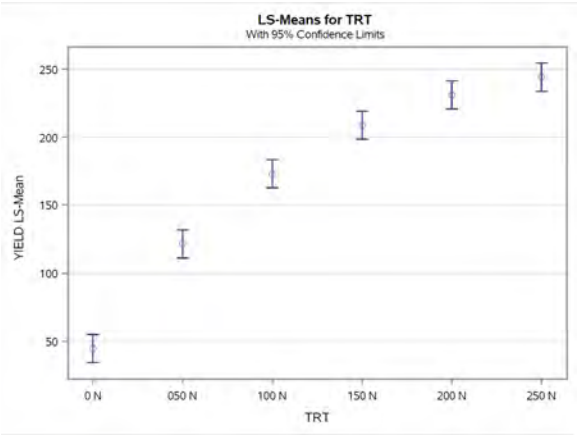
Dependent Variable: YIELD

i/j	1	2	3	4	5	6
1		<.0001	<.0001	<.0001	<.0001	<.0001
2	<.0001		<.0001	<.0001	<.0001	<.0001
3	<.0001	<.0001		0.0008	<.0001	<.0001
4	<.0001	<.0001	0.0008		0.5112	0.0463
5	<.0001	<.0001	<.0001	0.5112		0.8151
6	<.0001	<.0001	<.0001	0.0463	0.8151	

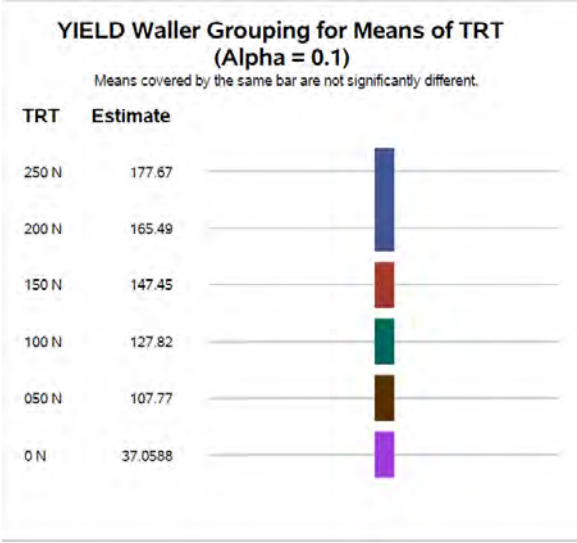
Mean separation with Waller groupings as well as Tukey-Kramer adjusted LS mean comparisons show a significant (α=0.1) difference in final yield between all N rate treatments besides 200 N and 250 N.

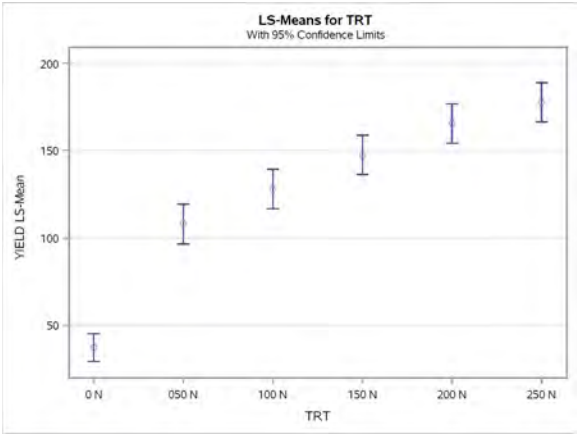
2018



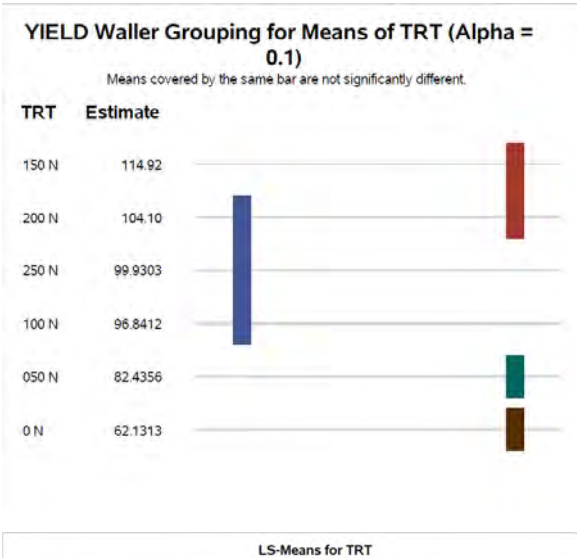


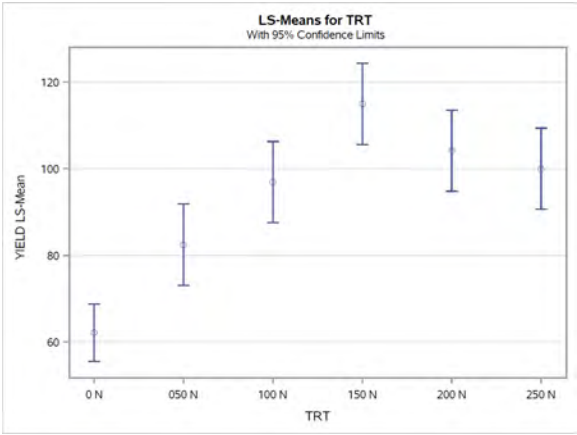
2017





2016





The reason behind the significant Year x TRT interaction in the ANOVA becomes apparent when the means separation is done by year. In 2016, 150 N had the highest overall yield, which was not the trend seen in the other two years.

Early Nitrogen Management for No-till Corn Production

Location: EDC 300W
Investigators: Nathan Johanning, Talon Becker, & Marc Lamczyk
Plot Size: 10ft x 130ft
Reps: 4

Treatment #	Treatment	Rate	Plot Numbers			
1	No Starter Fertilizer		101	202	304	405
2	Urea w/ Agrotain	50 lbs/A	103	205	302	404
3	Ammonium Sulfate	50 lbs/A	105	204	305	403
4	UAN 32% Broadcast	50 lbs/A	104	203	301	402
5	UAN 32% Banded beside row	50 lbs/A	102	201	303	401

Crop Information

Cover Crop: Volunteer wheat
Crop: Corn
Variety/Hybrid: Pioneer P1197AM
Planting Date: 5/10/2018
Planting Method: No-till Planter - 30" rows/ 1" deep
Seeding Rate: 29,000 seeds/A
Soil Conditions (planting): Ideal
Previous Crop: Soybean
Harvest Date: 10/18/2018

Comments:

Harvest area = 660 ft.^{2}

Data Collection:

1) Yield: lbs. grain per plot, moisture, test weight. Harvest center 2 rows.

Pest Management

Date	Application Timing	Product(s)	Rate
4/30/2018	Pre-plant Burndown	Roundup WeatherMax	32 oz/A
4/30/2018	Pre-plant Burndown	2,4-D	16 oz/A
4/30/2018	Pre-plant Burndown	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	Acuron	80 oz/A
5/30/2018	Post-emergence	Aatrex	32 oz/A
5/30/2018	Post-emergence	Roundup PowerMax	32 oz/A
5/30/2018	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	COC	0.25% v/v

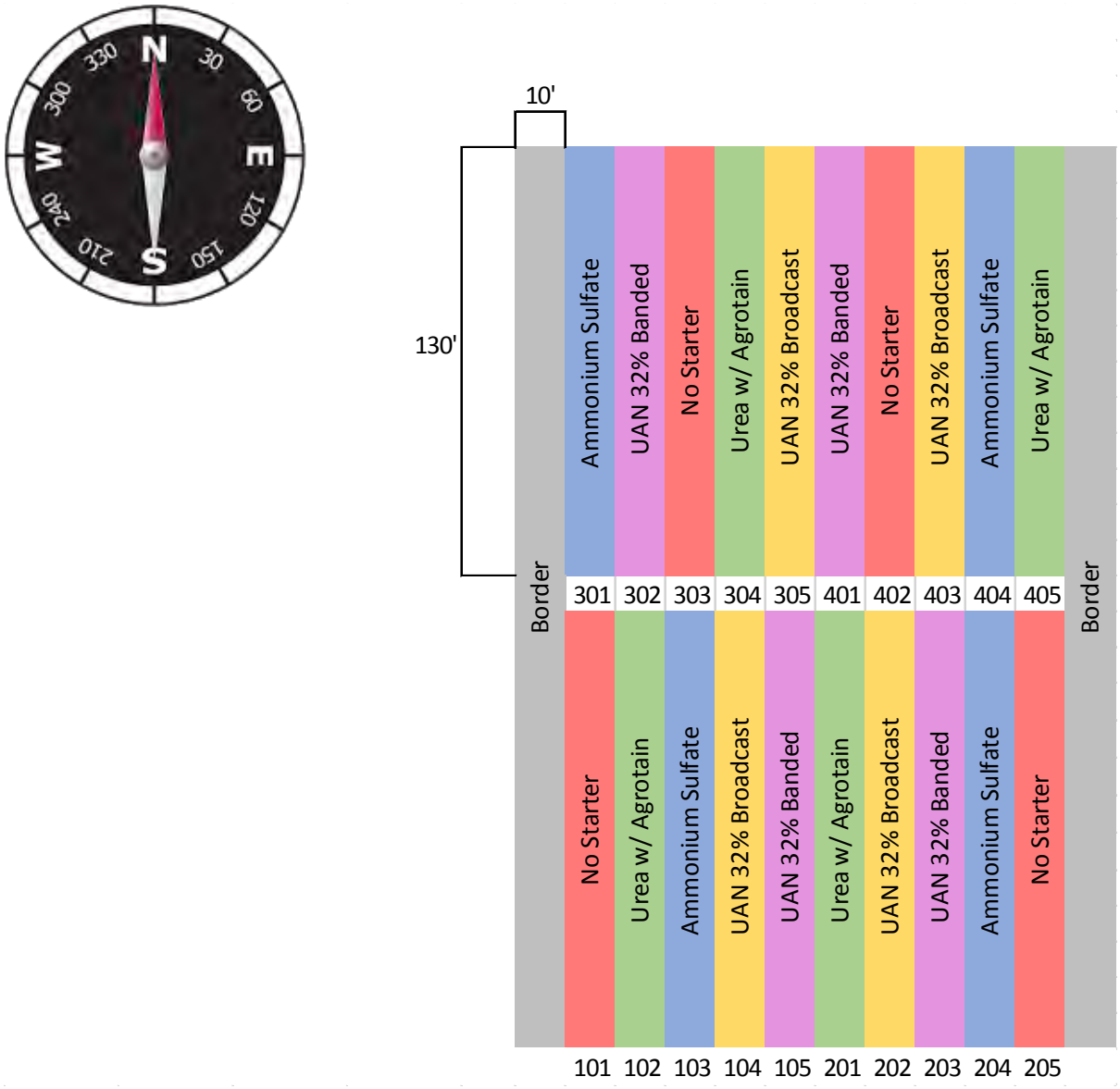
Soil Fertility

Date	Application Timing	Product(s)	Rate
5/30/18	V4	UAN 32%	180 lb N/A

Summary

No significant (α=0.1) difference in final yield attributable to the starter N treatments was seen in 2017 or 2018 alone, or the combined analysis.

It should be emphasized that these data represent only two site-years of a relatively small strip plot study. Results from this two year, single site trial may not be indicative of the overall effect of these practices in this geography. Further data would be needed to draw more reliable conclusions.

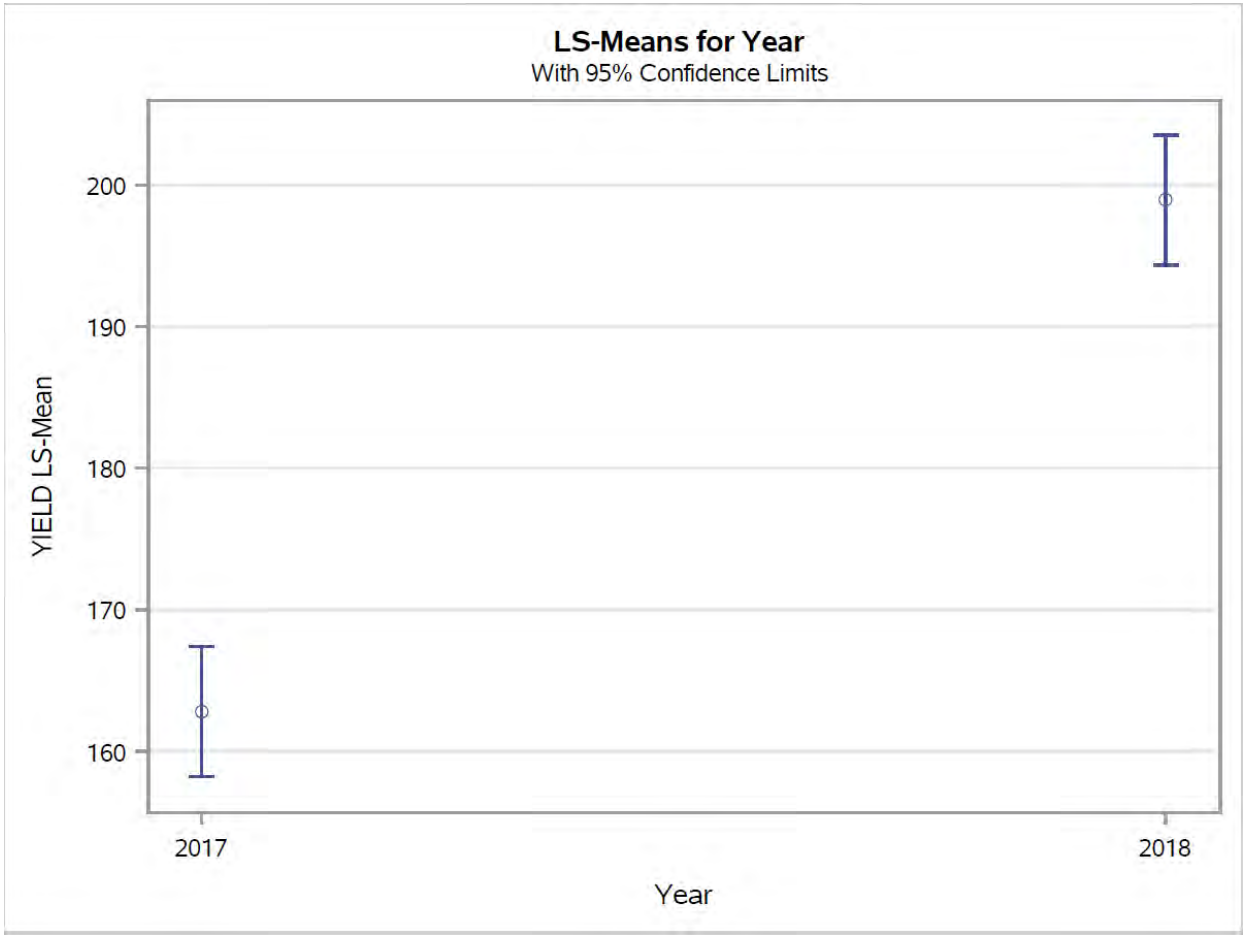


Analysis of Variance (ANOVA) – 2017 & 2018

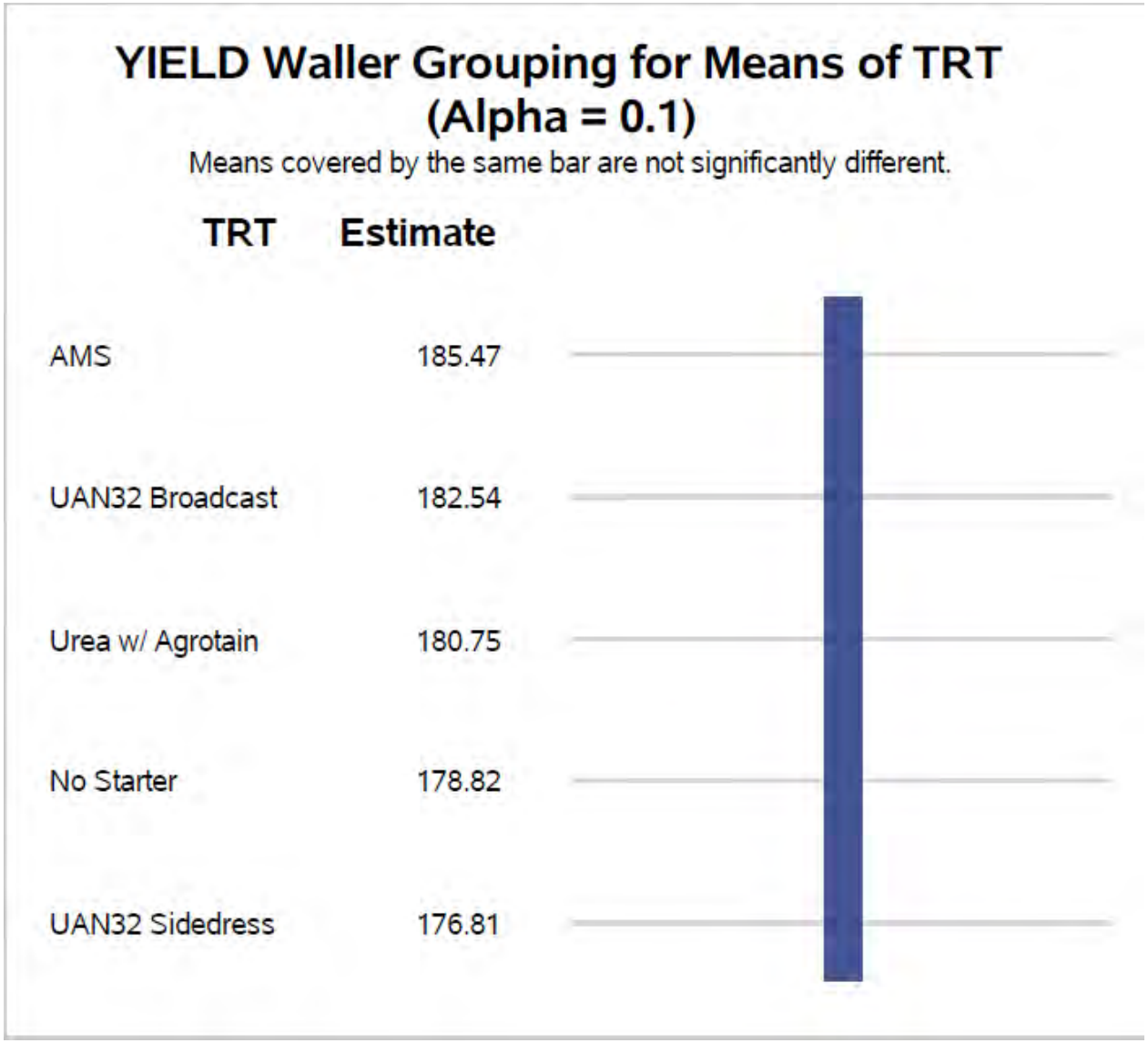
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Year	1	13043.20402	13043.20402	131.40	<.0001
Year(Rep)	6	1177.85347	196.30891	1.98	0.1089
TRT	4	357.12116	89.28029	0.90	0.4798
Year*TRT	4	116.80827	29.20207	0.29	0.8788

The analysis of variance results show a significant (α=0.1) effect of year on variance in yield. There was no significant (α=0.1) effect on yield variance attributed to replicate within year, the starter N treatment, or the interaction of year and treatment.

		H0:LSMean1=LSMean2	Least Squares Means for Effect Year				
Year	YIELD LSMEAN	Pr > |t|	i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
2017	162.821281	<.0001	1	2	-36.115376	-42.617930	-29.612823
2018	198.936657						



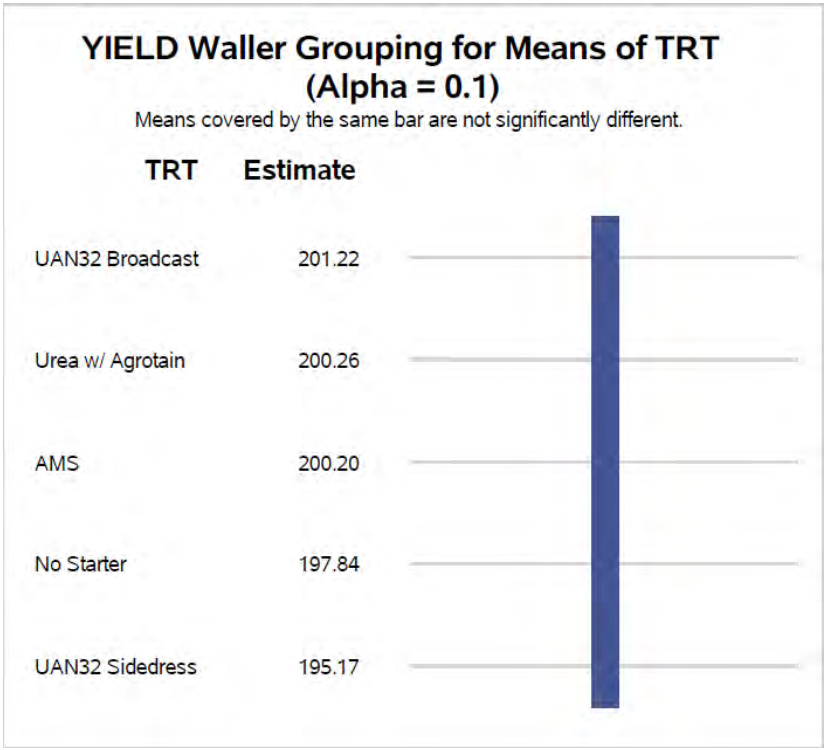
Comparison of LS means show an average increase of 36 bu/A across all treatments in 2018 compared to 2017.



Mean separation with Waller groupings reflect the null result seen in the ANOVA. Across both years, there is no significant (α=0.1) difference in final yield between starter N treatments.

2018

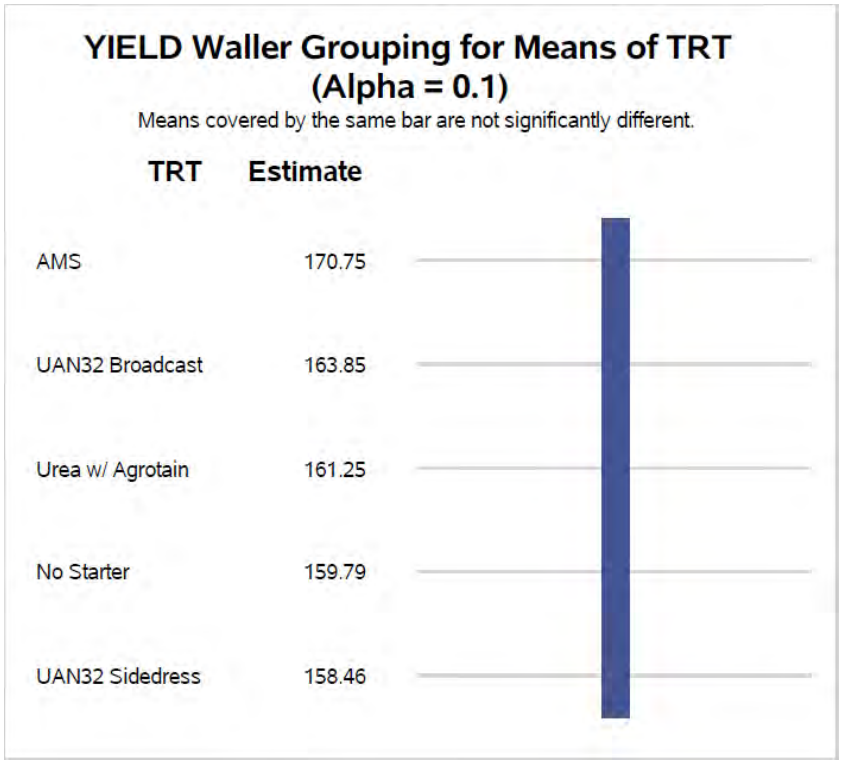
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	3	307.4198765	102.4732922	0.74	0.5501
TRT	4	95.8642882	23.9660720	0.17	0.9484



ANOVA and means separation for only 2018 data show a similar story with no significant (α=0.1) differences in final yield between starter N treatments.

2017

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	3	870.4335921	290.1445307	4.88	0.0191
TRT	4	378.0651447	94.5162862	1.59	0.2399



The lack of significant (α=0.1) difference in final yield between starter N treatments was also seen in 2017. In this season, there was more micro-environmental variation, with replicate contributing significantly (α=0.1) to the variation in yield. In general, there was a larger range in yield among the treatments in 2017 than 2018, perhaps due to less favorable growing conditions in 2017 compared to 2018.

Soybean Cereal Rye x Herbicide Regimen Trial

Location:	EDC 400E
Investigators:	Nathan Johanning, Talon Becker, & Marc Lamczyk
Plot Size:	10ft x 270ft
Reps:	3

Crop Information

Cover Crop:	Cereal rye/no cover (see treatment table)
Crop:	Soybean
Variety/Hybrid:	Agrow 45X6
Planting Date:	6/5/2018
Planting Method:	No-till Planter - 15" rows / 1" depth
Seeding Rate:	140,000 seeds/A
Soil Conditions (planting):	Good | Planted into green cereal rye
Previous Crop:	Corn
Harvest Date:	10/17/2018

Pest Management

Date	Application Timing	Product(s)	Rate
6/5/18	Pre-emergence	See Treatment Table	
6/30/18	Post-emergence	Roundup WeatherMax	32 oz/A
6/30/18	Post-emergence	Flexstar	24 oz/A
6/30/18	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
6/30/18	Post-emergence	Aqualight NIS	0.5% v/v

Soil Fertility

Date	Application Timing	Product(s)	Rate

Comments:

Harvest area = 2700 sq. ft.

Summary

Preliminary analysis of these data show a significantly (α=0.1) greater yield for treatments 3 and 5 compared to treatment 6. No other significant (α=0.1) differences between treatments were seen in this trial. The major difference between these treatment groups was the presence/absence of cereal rye (3 & 5 – CR; 6 – no cover). This might lead one to conclude that cereal rye resulted in a yield drag. However, yields for treatments 2 and 4, which both contained cereal rye as a cover crop, did not significantly (α=0.1) differ from treatment 6. These mixed results indicate the need for further testing.

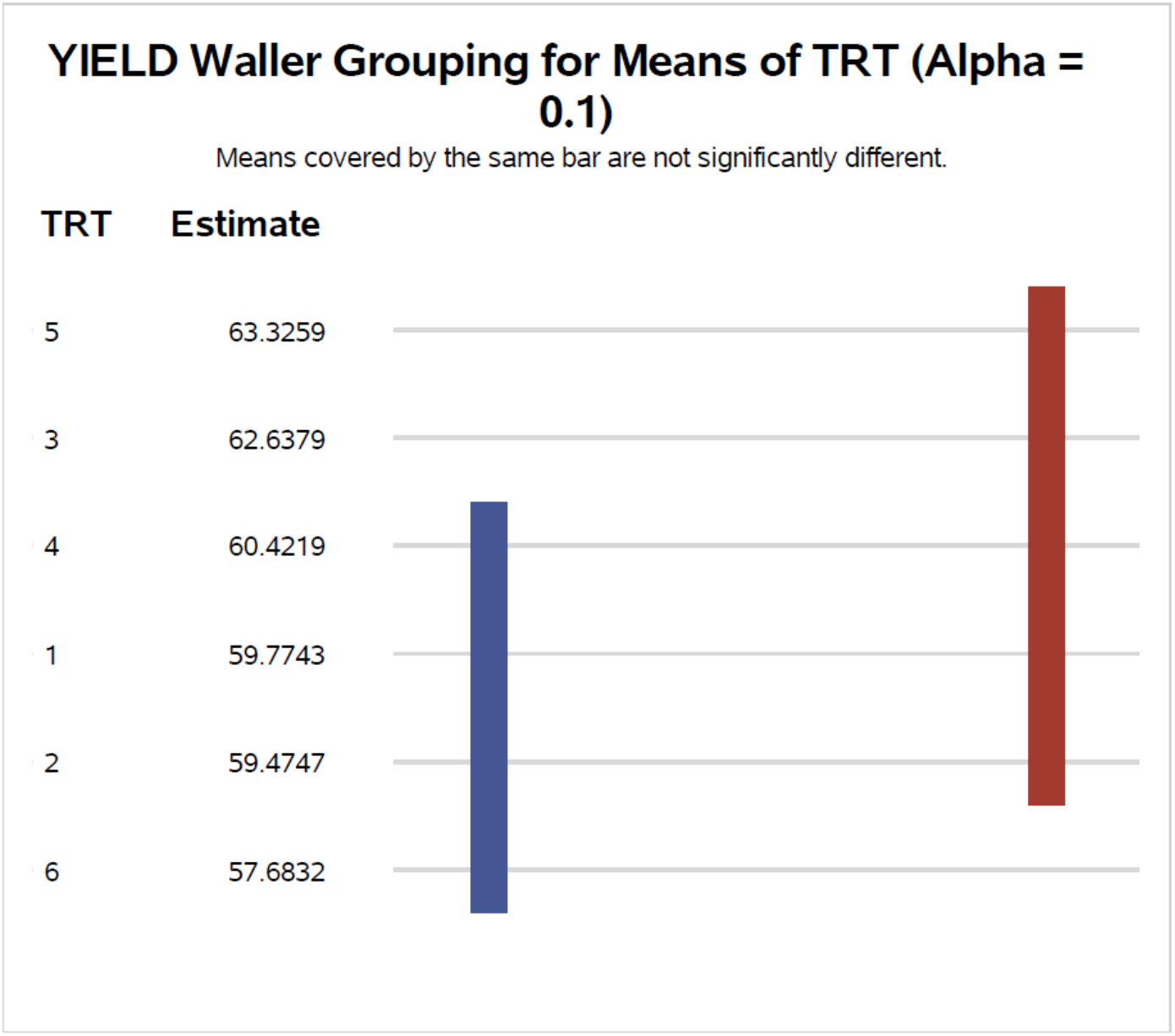
It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of these practices in this geography. Further data would be needed to draw any reliable conclusions.

Trt No.	Herbicide	Product Rate	Timing	Plot Numbers		
1	No Cover Crop Roundup Power Max Xtendimax Fierce NIS	 32 fl oz/A 44 fl oz/A 3 oz/A 0.25 gal/L	PRE/Burndown	101	203	305
2	Cereal Rye Roundup Power Max Xtendimax Fierce NIS	70 lbs/A 32 fl oz/A 44 fl oz/A 3 oz/A 0.25 gal/L	PRE/Burndown	102	204	306
3	No Cover Crop Gramoxone Fierce NIS	 4 pt/A 3 oz/A 0.5 gal/L	PRE/Burndown	103	205	301
4	Cereal Rye Gramoxone Fierce NIS	70 lbs/A 4 pt/A 3 oz/A 0.5 gal/L	PRE/Burndown	104	206	302
5	No Cover Crop Liberty Fierce AMS	 36 fl oz/A 3 oz/A 3 lbs/A	PRE/Burndown	105	201	303
6	Cereal Rye Liberty Fierce AMS	70 lbs/A 36 fl oz/A 3 oz/A 3 lbs/A	PRE/Burndown	106	202	304

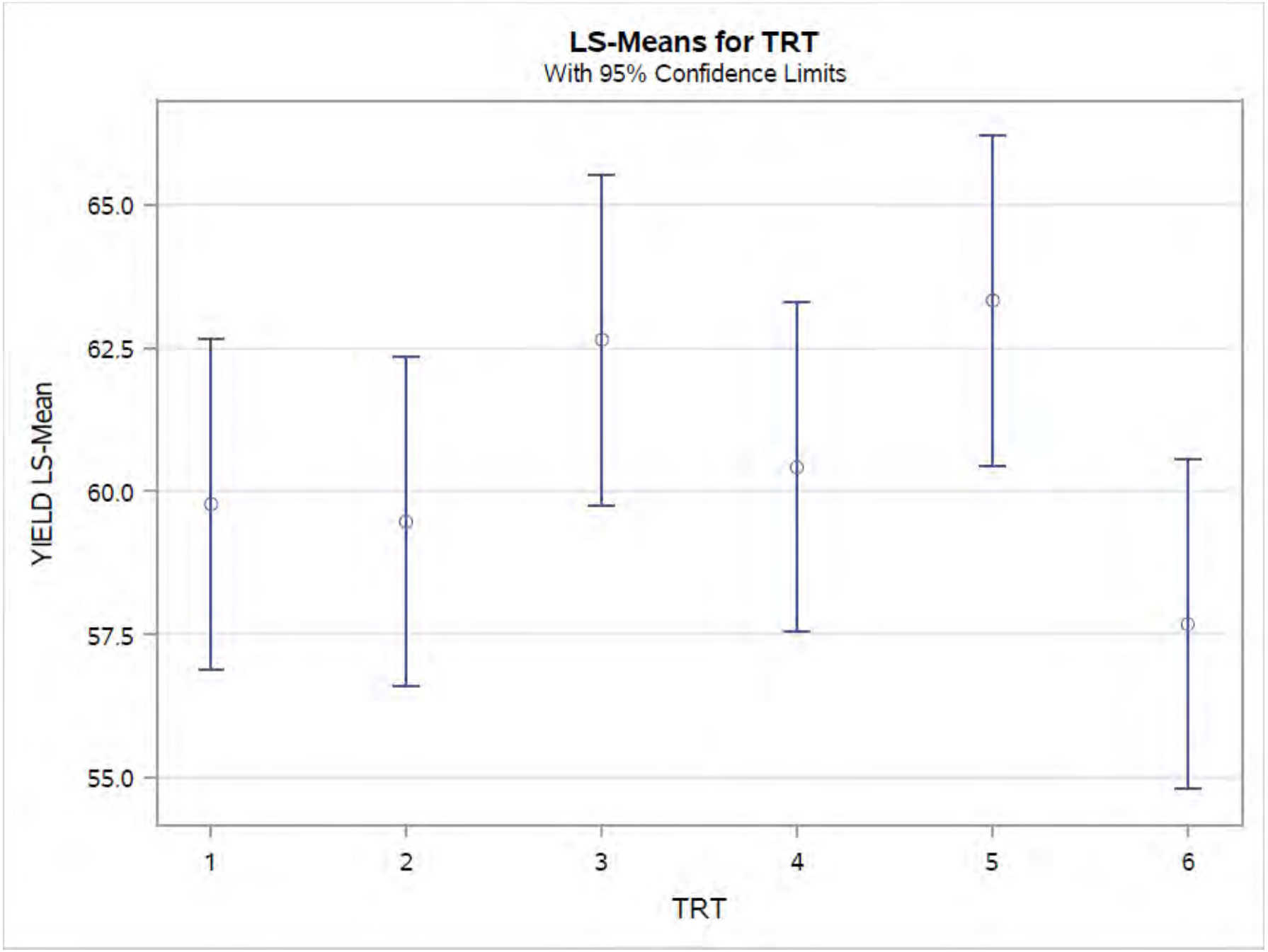
Analysis of Variance (ANOVA)

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	2	20.00129105	10.00064552	2.00	0.1862
TRT	5	66.17449346	13.23489869	2.64	0.0895

The analysis of variance results show a significant (α=0.1) effect on variation in yield attributed to the herbicide/cover crop treatment. Replicate was not shown to be a significant (α=0.1) source of variation in yield.



Mean separation with Waller groupings reveal the cause behind the significant treatment effect seen in the ANOVA. Treatments 5 and 3 were shown to have yields significantly (α=0.1) greater than that of treatment 6.


LS-Means for TRT
With 95% Confidence Limits
YIELD LS-Mean
65.0
62.5
60.0
57.5
55.0
1
2
3
4
5
6
TRT

Soybean Cereal Rye Weed Suppression Trial

Location:	EDC 400E
Investigators:	Nathan Johanning, Talon Becker, & Marc Lamczyk
Plot Size:	10ft x 270ft
Reps:	4

Crop Information

Cover Crop:	Cereal rye (70 lbs/A)/no cover
Crop:	Soybean
Variety/Hybrid:	Agrow 45X6
Planting Date:	6/5/2018
Planting Method:	No-till Planter - 15" rows / 1" depth
Seeding Rate:	140,000 seeds/A
Soil Conditions (planting):	Good | Planted into green cereal rye
Previous Crop:	Corn
Harvest Date:	10/17/2018

Pest Management

Date	Application Timing	Product(s)	Rate
6/5/18	Pre-emergence	Roundup PowerMax	32 oz/A
6/5/18	Pre-emergence	Fierce	3 oz/A
6/5/18	Pre-emergence	Ammonium Sulfate	17 lbs/100 gal
6/30/18	Post-emergence	Roundup WeatherMax	32 oz/A
6/30/18	Post-emergence	Flexstar	24 oz/A
6/30/18	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
6/30/18	Post-emergence	Aqualight NIS	0.5% v/v

Soil Fertility

Date	Application Timing	Product(s)	Rate

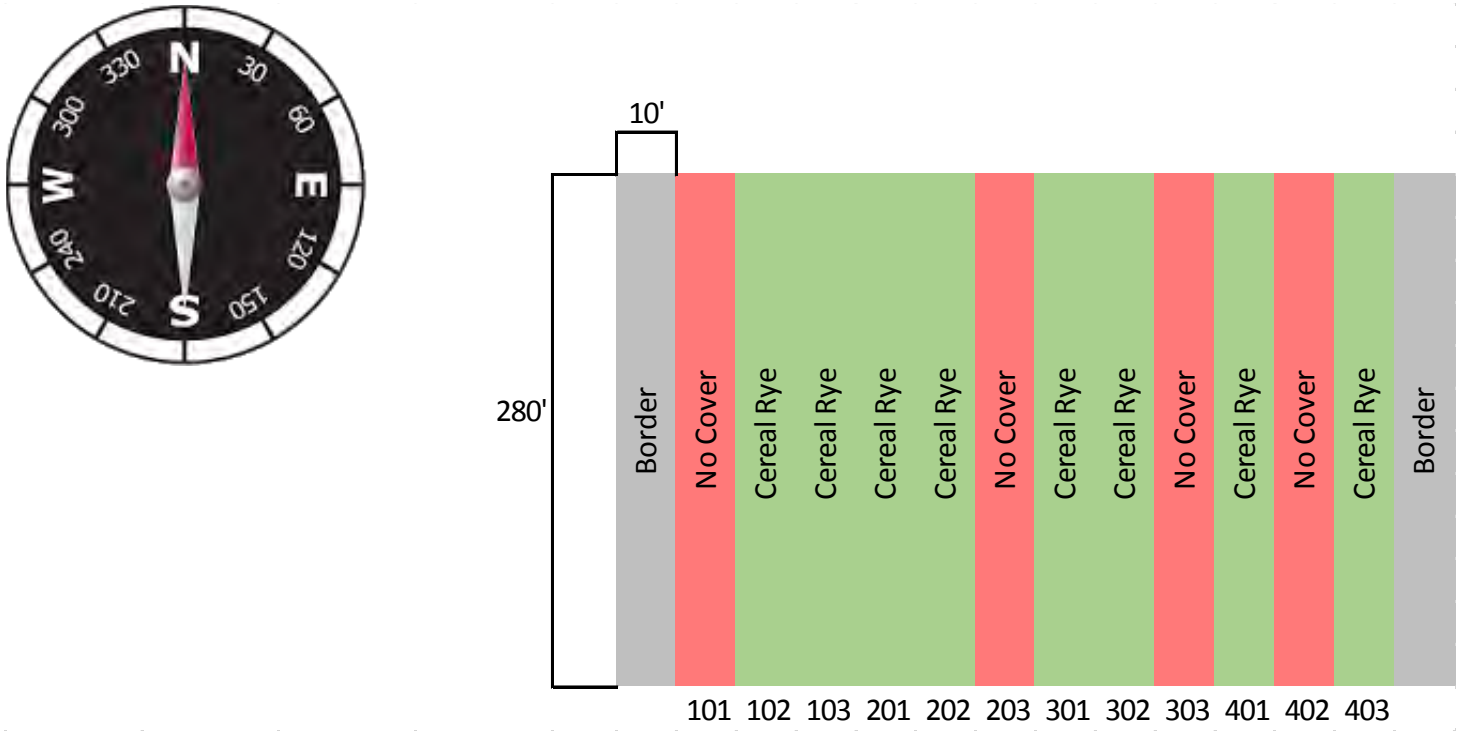
Comments:

Harvest area = 2700 sq. ft.

Summary

No effect was seen on soybean yield from the use of cereal rye as a cover crop in this trial. A lack of weed pressure in 2018 in general perhaps contributed to this null result. Weed pressure was low in both cover and no cover plots.

It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of these practices in this geography. Further data would be needed to draw any reliable conclusions.



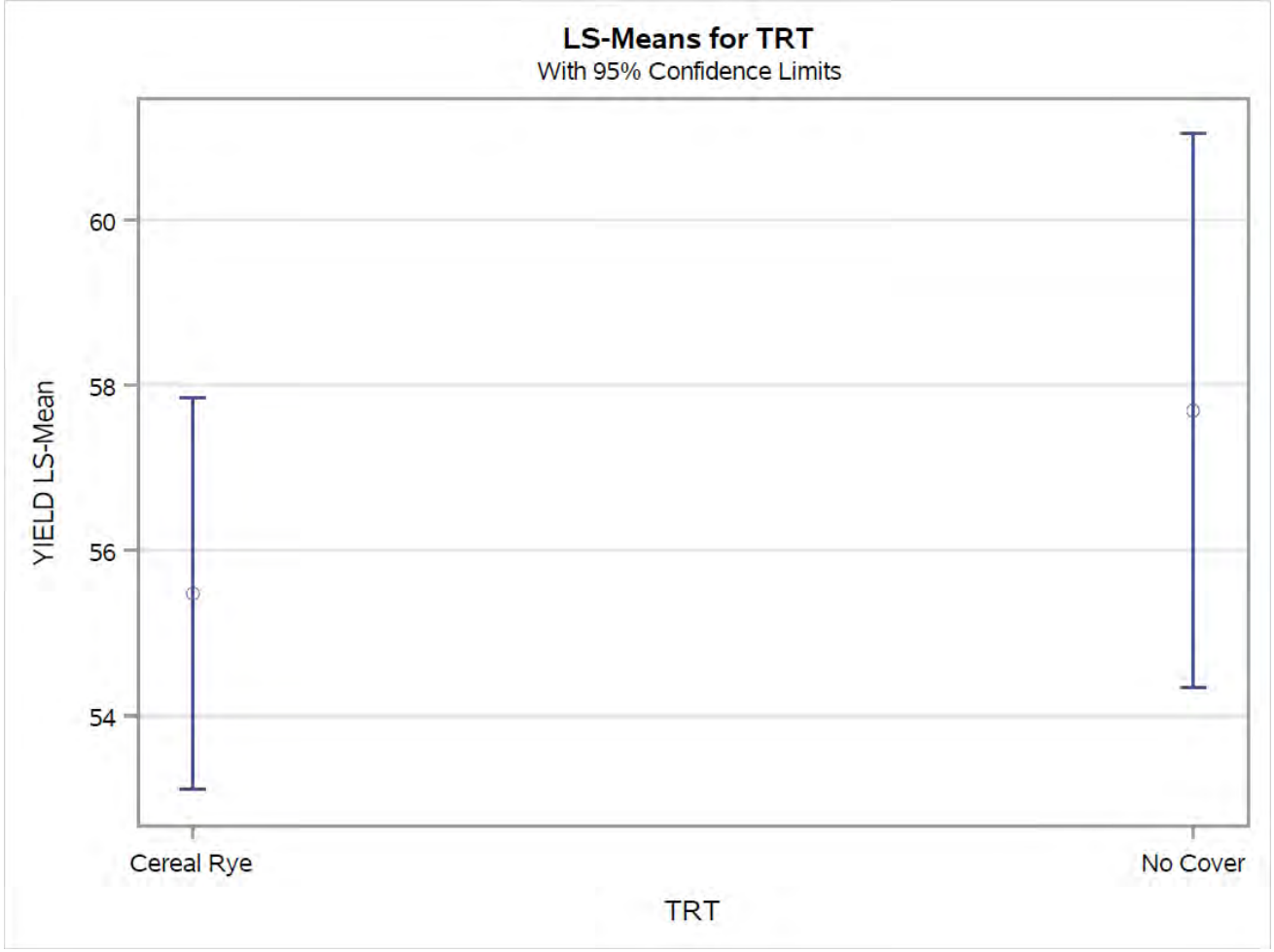
Analysis of Variance (ANOVA)

Source	DF	Type III SS	Mean Square	F Value	Pr > F
BLOCK	3	34.00724902	11.33574967	1.41	0.3175
TRT	1	13.02322049	13.02322049	1.62	0.2436

The analysis of variance results show no significant (α=0.1) effect on variation in yield attributed to the cover crop treatment or block.

TRT	YIELD LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
Cereal Rye	55.4808180	0.2436
No Cover	57.6907292	

A t-test confirms that the cereal rye cover crop treatment did not have a significant (α=0.1) effect on soybean yield in this trial.



Spring Oat Forage Trial - 2018

Location: EDC 500
Investigators: Talon Becker, Nathan Johanning, & Marc Lamczyk
Plot Size: 10ft x 180ft
Reps: 3

Crop Information

Cover Crop: None (Purple Deadnettle & wild barley)
Crop: Oats & Oat/Forage Mix
Variety/Hybrid: Multiple
Planting Date: 4/17/2018
Planting Method: No-till Drill (100 setting) - 8" rows / 3/4" depth
Seeding Rate: 3 bu.(96lbs)/A solo | 1.5 bu/A mix
Soil Conditions (planting): Good
Previous Crop: Corn
Harvest Date: 6/14/2018

Comments:
Mix w/ peas in approx. 3:1 ratio oat:peas by seed number - attempting 4 pea plants for 15-20 oat plants

Mix w/ alfalfa was approx. 2:1 ratio oat:alfalfa by weight

Harvest area = 38.5"x18.5" = 712.25"^{2} = 4.946ft^2 = 0.000135 A

Treatment #	Treatment	Plot Numbers		
1	Forage Plus Oats	101	201	301
2	Jerry Oats	102	202	302
3	FP Oats & Field Peas	401	501	601
4	Jerry Oats & Field Peas	402	502	602
5	FP Oats & Alfalfa	701	801	901
6	Jerry Oats & Alfalfa	702	802	902

Pest Management

Date	Application Timing	Product(s)	Rate
4/17/18	Pre-plant	Roundup WeatherMax	1 qt/A
4/17/18	Pre-plant	2,4-D	1 pt/A
4/17/18	Pre-plant	C.O.C	0.25% v/v
4/17/18	Pre-plant	AMS	17 lbs/ 100 gal

Soil Fertility

Date	Application Timing	Product(s)	Rate
5/15/18	F2-3	Urea	60 lb N/A

Summary

Analysis of the data from this trial showed little significant (α=0.1) difference between spring-planted forage treatments in yield as well as nutritional components tested. The one exception to this is in nitrate content. While all spring-planted forage treatments (oats, oats mixed w/ peas, oats mixed w/ alfalfa) showed nitrate levels which indicate this forage should not be grazed or fed as a pure ration, the nitrate levels of oats w/ alfalfa were significantly lower than oats w/ peas or oats alone, according to mean separation with Waller groupings (α=0.1).

It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of this product in this geography. Further data would be needed to draw any reliable conclusions about the effectiveness of this product.

10 ft

	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
101	Forage Plus oats
102	Jerry oats
201	Forage Plus oats
202	Jerry oats
301	Forage Plus oats
302	Jerry oats
	BORDER
401	Forage Plus oats w/ pea
402	Jerry oats w/ pea
501	Forage Plus oats w/ pea
502	Jerry oats w/ pea
601	Forage Plus oats w/ pea
602	Jerry oats w/ pea
	BORDER
701	Forage Plus oats w/ alfalfa
702	Jerry oats w/ alfalfa
801	Forage Plus oats w/ alfalfa
802	Jerry oats w/ alfalfa
901	Forage Plus oats w/ alfalfa
902	Jerry oats w/ alfalfa
	BORDER
101	Robust
102	Saber
103	Excel
104	Reins
201	Saber
202	Reins
203	Robust
204	Excel
301	Excel
302	Reins
303	Robust
304	Saber
401	Excel
402	Robust
403	Reins
404	Saber
	BORDER

90 ft

NOT HARVESTED DUE TO GRASS WEED CONTROL ISSUES

Summer Annual Forage Trial - 2018

Location: EDC 500
Investigators: Talon Becker, Nathan Johanning, & Marc Lamczyk
Plot Size: 10ft x 180ft
Reps: 3

Treatment #	Treatment	Plot Numbers
1	GW-400 BMR SxS after oats	101 201 301
2	Tifleaf III Pearl Millet after oats	102 202 302
3	PM after oats & peas	401 501 601
4	SxS after oats & peas	402 502 602
5	SxS w/ alfalfa	701 801 901
6	PM w/ alfalfa	702 802 902

Crop Information

Cover Crop: Following spring forages
Crop: Pearl Millet and Forage Sorghum
Variety/Hybrid: Multiple
Planting Date: 7/11/2018
Planting Method: No-till Drill (100 setting) - 8" rows / 1/2" depth
Seeding Rate: 15 lbs/A
Soil Conditions (planting): Good
Previous Crop: Oats & Oat/Forage Mix
Harvest Date: 9/13/2018

Pest Management

Date	Application Timing	Product(s)	Rate
7/11/2018	Pre-emergence	SelectMax	14 oz/A
7/11/2018	Pre-emergence	NIS	0.25% v/v

Soil Fertility

Date	Application Timing	Product(s)	Rate

No additional fertility applied

Comments:

Harvest area = 38.5"x18.5" = 712.25"^{2} = 4.946ft^2 = 0.000135 A

Summary

There were far more significant (α=0.1) differences between summer annual forage treatments than was seen for spring forages, according to mean separation with Waller groupings. Notably, DM yield of the forage sorghum alone, following a grass/legume mix, or planted into alfalfa was significantly higher than all treatments containing pearl millet. Additionally, several nutrients showed significant (α=0.1) variation between species groups (treatments containing pearl millet versus those containing forage sorghum), including phosphorus, sulfur, and manganese. Another interesting result of the data analysis is the apparent "legume effect" that causes certain nutrients or nutritional components to be affected by the growth of a legume in the mix, or in some cases, the presence of the legume in the previous crop. For example, forage analysis results show soluble protein (SP) to be significantly lower in both pearl millet and forage sorghum planted either after a grass legume mix or into standing alfalfa compared to stands planted after oats alone. Similarly, total sugar content of forage sorghum planted after or with a legume was significantly higher than forage sorghum planted after oats.

It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of this product in this geography. Further data would be needed to draw any reliable conclusions.

10 ft

	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
	BORDER
101	GW-400 BMR SxS after oats
102	Tifleaf III Pearl Millet after oats
201	GW-400 BMR SxS after oats
202	Tifleaf III Pearl Millet after oats
301	GW-400 BMR SxS after oats
302	Tifleaf III Pearl Millet after oats
	BORDER
401	PM after oats & peas
402	SxS after oats & peas
501	PM after oats & peas
502	SxS after oats & peas
601	PM after oats & peas
602	SxS after oats & peas
701	PM w/ alfalfa
702	Jerry oats w/ alfalfa
801	PM w/ alfalfa
802	Jerry oats w/ alfalfa
901	PM w/ alfalfa
902	Jerry oats w/ alfalfa
	BORDER
	BORDER
	BORDER
	Fallow

90 ft

VARIABLE	UNIT	DEFINITION
ADF	**% DM**	Acid-Detergent Fiber
ADIP (HD)	**% DM**	Acid-Detergent Insoluble Protein
ASH	**% DM**	Total crude mineral
CA	**% DM**	Calcium
CAL	**Kcal/lb**	Calories/Energy
CL	**% DM**	Chlorine
CP	**% DM**	Crude Protein
CU	**PPM**	Copper
FE	**PPM**	Iron
IVDMD	**% DM**	In-Vitro Dry Matter Digestibility
K	**% DM**	Potassium
LIG	**% DM**	Total lignin
MG	**% DM**	Magnesium
MN	**PPM**	Manganese
NA	**% DM**	Sodium
NDF	**% DM**	Neutral-Detergent Fiber
NDIP	**% DM**	Neutral-Detergent Insoluble Protein
NEG	**MCAL/LB**	Net Energy of Gain
NEL	**MCAL/LB**	Net Energy of Lactation
NEM	**MCAL/LB**	Net Energy of Maintenance
NFC	**% DM**	Non-Fiber Carbohydrate
NIT	**PPM**	Nitrate-N
OIL	**% DM**	Total fat/oil
PHOS	**% DM**	Phosphorus
RFQ		Relative Feed Quality
RFV		Relative Feed Value
S	**% DM**	Sulfur
SP	**% DM**	Soluble Protein
STARCH	**% DM**	Total starch
TDN	**% DM**	Total Digestible Nutrients
TL-SUGAR	**% DM**	Total Free Sugars
ZN	**PPM**	Zinc

ANOVA By Trt	CP	ADF	NDF	ADIP (HD)	IVDMD	TDN	RFV	RFQ	NIT
Rep	0.6563	0.4255	0.3869	0.1006	0.1889	0.4575	0.3488	0.5006	0.2817
Trt	***<0.0001***	***<0.0001***	***<0.0001***	***0.0011***	***<0.0001***	***0.0004***	***<0.0001***	***0.0117***	***<0.0001***
ANOVA By Group									
Rep	0.7050	0.3807	0.3452	0.1593	0.1661	0.4201	0.3053	0.4562	0.4655
Group	***<0.0001***	***<0.0001***	***<0.0001***	***0.0038***	***<0.0001***	***<0.0001***	***<0.0001***	***0.0011***	***<0.0001***

Group	YIELD (lb DM/A)		CP (%DM)		SP (%DM)		ADF (%DM)		NDF (%DM)		ADIP/HD (%DM)		NDIP (%DM)		IVDMD (%DM)		TDN (%DM)	
O	1625.46	C	16.85	A	33.58	A	35.17	DE	56.23	C	0.72	BCD	5.06	AB	64.37	AB	61.67	A
O+A	1432.97	C	16.88	A	30.85	AB	33.81	E	54.17	C	0.69	CD	5.16	AB	67.29	A	62.83	A
O+P	1789.43	C	18.49	A	32.24	AB	35.54	DE	54.22	C	0.96	ABC	5.95	A	65.67	A	60.17	A
PM	5787.29	B	8.98	B	27.19	BC	46.27	A	72.44	A	1.19	A	4.30	BC	50.33	D	50.33	D
PM after O+P	5634.49	B	8.11	B	20.65	D	41.79	BC	70.95	A	0.99	AB	4.30	BC	54.15	CD	55.33	BC
PM+A	4899.14	B	8.18	B	23.04	CD	43.76	AB	69.97	A	0.86	BCD	4.29	BC	55.53	C	53.00	CD
SS	9349.43	A	7.89	B	30.19	AB	44.95	AB	70.06	A	0.99	AB	3.48	C	53.52	CD	51.67	CD
SS after O+P	9502.23	A	7.19	B	13.74	E	38.88	CD	62.68	B	0.68	CD	4.25	BC	60.40	B	58.33	AB
SS+A	9015.18	A	7.42	B	14.03	E	37.52	DE	63.95	B	0.62	D	4.97	AB	60.66	B	60.33	A

Group	RFV		RFQ		CAL (Kcal/lb DM)		NE_L (Mcal/lb DM)		NE_M (Mcal/lb DM)		NE_G (Mcal/lb DM)		NIT (PPM)	
O	101.50	A	105.83	AB	435.17	AB	0.63	A	0.56	A	0.30	A	4746.17	A
O+A	107.17	A	119.32	A	466.83	A	0.65	A	0.57	A	0.32	A	2628.00	B
O+P	104.83	A	101.58	ABC	437.33	AB	0.62	A	0.53	AB	0.28	AB	4124.17	A
PM	67.67	C	72.23	BCD	341.67	E	0.51	D	0.35	E	0.11	E	14.67	C
PM after O+P	73.67	C	53.17	DE	375.00	DE	0.56	BC	0.43	CD	0.18	CD	19.67	C
PM+A	72.33	C	58.43	CDE	391.33	CD	0.54	CD	0.39	DE	0.15	DE	11.67	C
SS	71.00	C	79.23	ABCD	360.33	DE	0.52	CD	0.37	DE	0.13	DE	7.67	C
SS after O+P	88.33	B	25.30	E	418.33	BC	0.60	AB	0.48	BC	0.23	BC	4.67	C
SS+A	86.67	B	38.97	DE	437.33	AB	0.61	AB	0.51	AB	0.25	AB	4.33	C

Group	STARCH (%DM)		OIL (%DM)		TL-SUGAR (%DM)		LIG (%DM)		NFC (%DM)		ASH (%DM)	
O	9.32	A	2.34	A	4.75	CD	3.98	D	19.21	BCDE	10.43	A
O+A	9.30	A	2.23	A	5.74	BC	4.24	CD	22.21	ABC	9.66	AB
O+P	9.32	A	2.13	A	3.88	CD	5.24	BC	20.77	ABCD	10.33	A
PM	9.23	B	1.27	CD	2.50	D	6.47	A	13.32	E	8.28	C
PM after O+P	9.17	D	1.15	D	4.41	CD	6.16	AB	17.27	CDE	6.82	D
PM+A	9.16	D	1.33	CD	4.03	CD	5.50	AB	17.90	CDE	6.91	D
SS	9.21	BC	1.47	C	5.33	CD	5.51	AB	15.26	DE	8.79	BC
SS after O+P	9.18	CD	1.35	CD	10.65	A	4.27	CD	26.11	A	6.90	D
SS+A	9.19	CD	1.71	B	8.63	AB	4.10	D	25.52	AB	6.37	D

Group	NA (%DM)		MG (%DM)		PHOS (%DM)		S (%DM)		K (%DM)		CA (%DM)		CL (%DM)		MN (PPM)		FE (PPM)		CU (PPM)		ZN (PPM)	
O	0.32	A	0.20	ABC	0.32	DE	0.15	A	3.04	A	0.59	BC	1.69	A	133.33	A	190.17	AB	8.50	AB	41.50	AB
O+A	0.36	A	0.18	BC	0.35	CD	0.13	A	2.89	AB	0.75	B	1.65	A	99.50	B	138.00	AB	8.33	AB	40.00	AB
O+P	0.28	A	0.21	AB	0.36	BC	0.14	A	2.89	AB	1.04	A	1.43	A	98.33	B	249.00	A	7.50	AB	43.33	AB
PM	0.01	B	0.24	A	0.37	ABC	0.13	A	2.50	BC	0.47	CD	0.91	B	140.67	A	99.67	AB	8.67	A	53.67	A
PM after O+P	0.01	B	0.19	ABC	0.39	AB	0.11	B	2.26	C	0.41	D	0.79	BC	120.00	AB	75.33	B	7.00	BC	38.33	AB
PM+A	0.01	B	0.15	C	0.41	A	0.10	B	2.19	CD	0.38	D	0.66	BC	118.33	AB	78.00	B	5.67	CD	53.00	A
SS	0.01	B	0.18	BC	0.24	G	0.05	C	2.10	CD	0.38	D	0.82	BC	66.33	C	246.00	A	5.00	D	35.00	B
SS after O+P	0.01	B	0.17	BC	0.26	FG	0.04	C	1.80	D	0.39	D	0.70	BC	59.00	C	121.00	AB	5.00	D	42.33	AB
SS+A	0.01	B	0.15	C	0.29	EF	0.04	C	1.84	D	0.39	D	0.56	C	63.00	C	127.67	AB	5.33	D	40.33	AB

Species treatments significantly affected yield as well as a number of nutritional components, according to means separation with Waller groupings (α=0.1). Although this analysis is preliminary, obvious and expected conclusions are the differences in DM yield between species groupings (pure or mixed stands containing oats, pearl millet, or forage sorghum). Also, not surprisingly, the presence of a legume in the growing mixture appears to affect several nutritional components. What is perhaps more surprising is that many of the significant (α=0.1) differences apparently attributable to the presence of a legume are also seen in the summer annual forages grown after a legume was present in the previous crop, but not actively growing in the stand. This can be seen in nutritional components such as soluble protein for both pearl millet and forage sorghum, starch content for pearl millet, and total sugars for forage sorghum. While this is an interesting result, the differences between treatments are highly complex and subject to change with the inclusion of more site-years of data. Replication of this trial next year will improve confidence of analysis results.

Late Planted Corn vs. Sorghum

Location:	EDC 500
Investigators:	Talon Becker, Nathan Johanning, & Marc Lamczyk
Plot Size:	10ft x 180ft
Reps:	3

Crop Information

Cover Crop:	None (Purple Deadnettle & wild barley?)
Crop:	Corn/Sorghum
Variety/Hybrid:	Corn - DKC 62-53 RIB | Sorghum - DKS 38-16
Seed Treatment:	Corn - FALH1B | Sorghum - Concep Poncho
Planting Date:	6/11/2018
Planting Method:	No-till Planter 30" rows 1" deep
Seeding Rate:	Corn - approx. 30,000 s/A | Sorghum - approx. 80,000 s/A
Soil Conditions @ planting:	Good
Previous Crop:	Corn
Harvest Date:	Corn - 10/25/18 | Sorghum - 11/9/18

Comments:

Harvest area = 870 sq. ft.

Pest Management

Date	Application Timing	Product(s)	Rate
6/11/18	Pre-plant	RoundUp Powermax	32 oz/A
6/11/18	Pre-plant	Aatrex	64 oz/A
6/11/18	Pre-plant	Dual II Magnum	24 oz/A

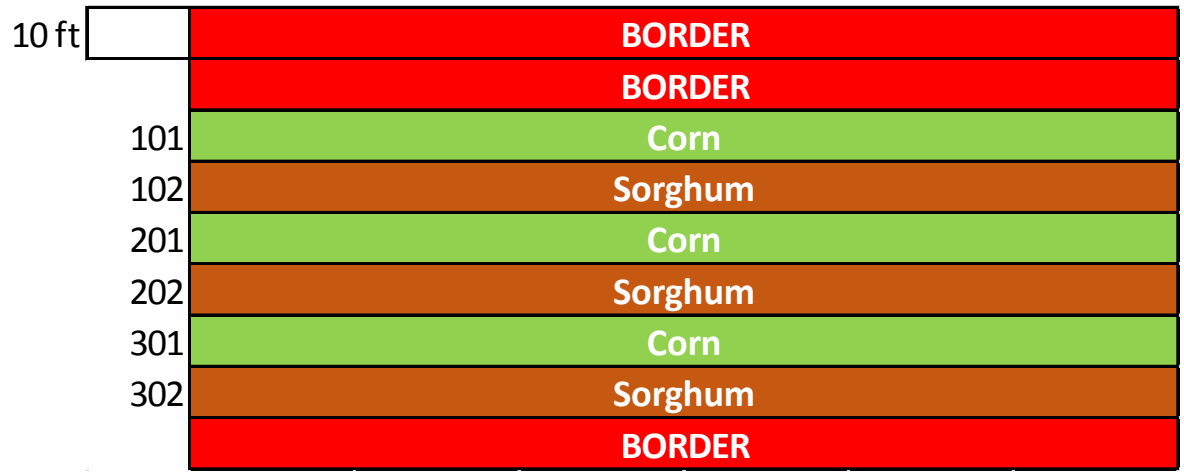
Soil Fertility

Date	Application Timing	Product(s)	Rate
6/29/18	V3-4	UAN 32%	120 lbs N/A

Summary:

Preliminary analysis of the data from this trial indicate a significant (α=0.1) difference in yield between late-planted corn and sorghum. This trial was also planted in an area of EDC 500 which is generally dryer, with plants exhibiting signs of drought stress earlier and more persistently than the rest of the plot area. This was done in an effort to simulate a drought-stressed environment. Applied N was also limited to 120 lbs N/A. Under these conditions, sorghum out-yielded corn by a factor of 4:1. With similar cash prices reported at local elevators for corn and sorghum (link) and presumably lower seed cost (link) for sorghum compared to corn, sorghum was shown to be the more productive as well as profitable crop in this scenario.

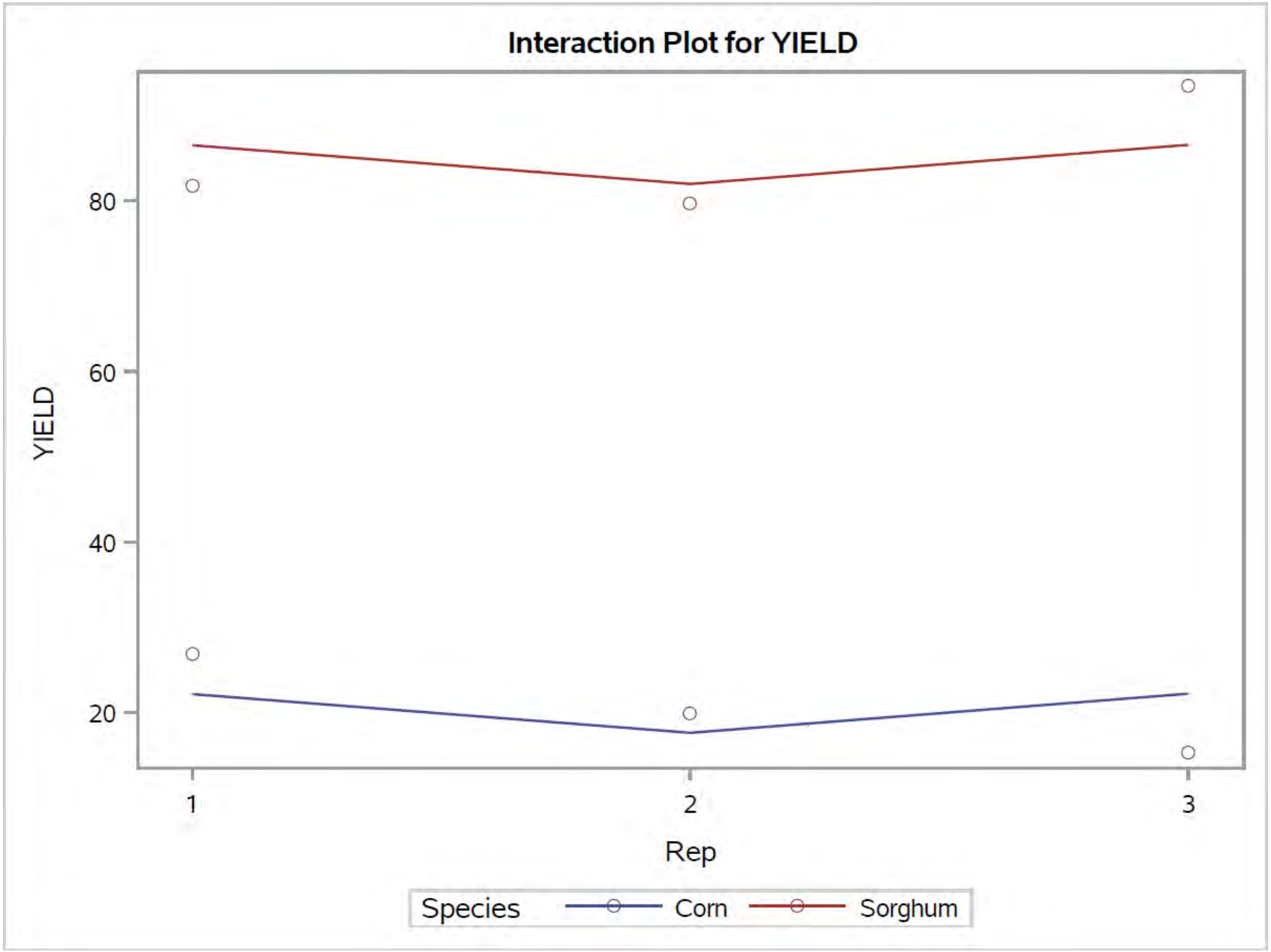
It should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of this product in this geography. Further data would be needed to draw any reliable conclusions about the effectiveness of this product.



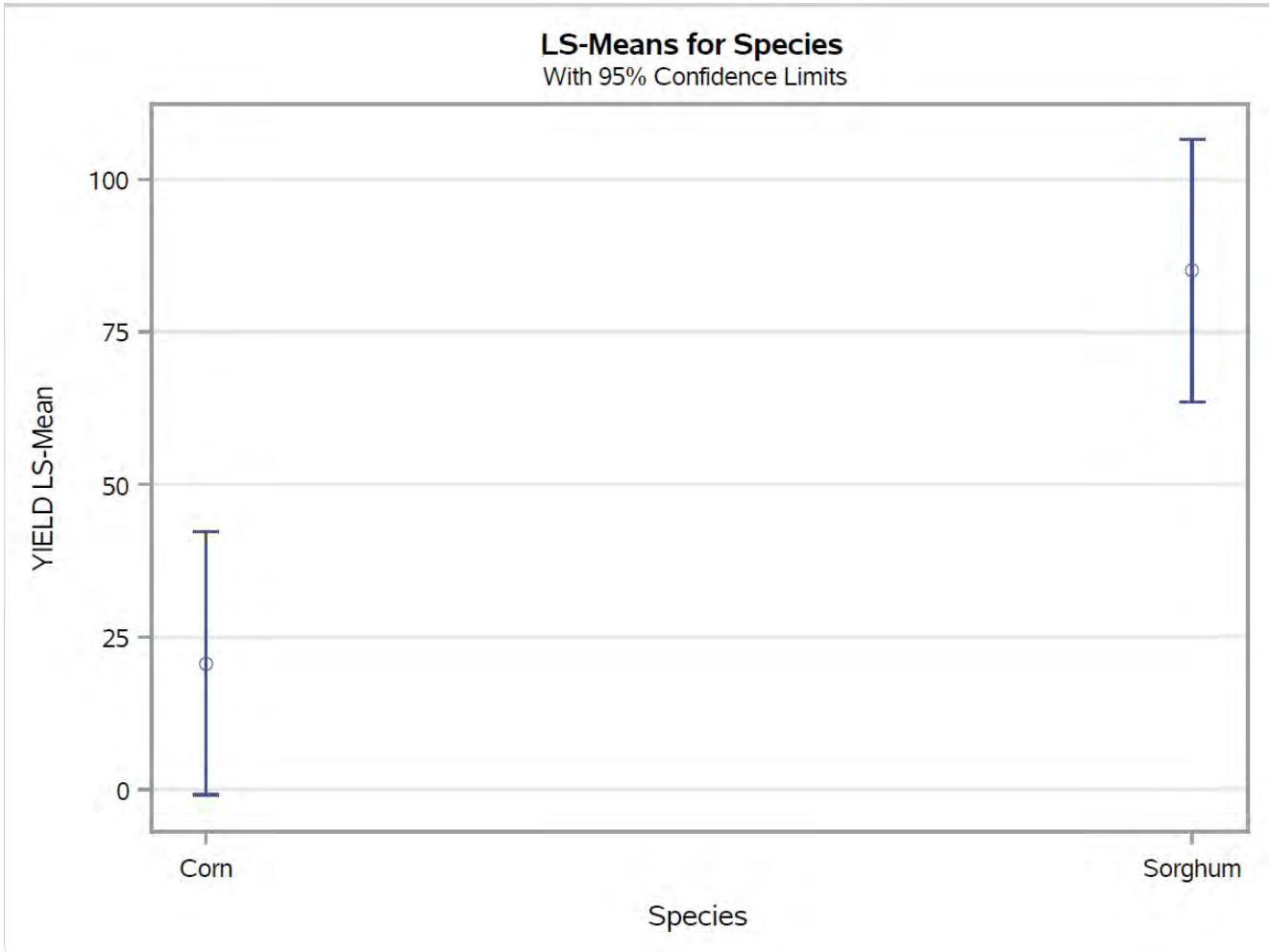
Analysis of Variance (ANOVA)

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Rep	2	27.712655	13.856327	0.18	0.8443
Species	1	6204.480897	6204.480897	82.58	0.0119

The analysis of variance shows highly significant (α=0.1) variation in yield attributable to species (corn vs. sorghum) with no significant variation attributable to replicates of a given species treatment.


Interaction Plot for YIELD
YIELD
80
60
40
20
1
2
3
Rep
Species
Corn
Sorghum

Species	YIELD LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
Corn	20.6844151	0.0119
Sorghum	84.9986484	



The significant variation in species treatment seen in the ANOVA is confirmed by a significant (α=0.1) t-test result.

Evaluation of Commence Seed Treatment for Corn

Investigators: Talon Becker, Nathan Johanning, Marc Lamczyk
Location: 18-EDC-700N
Plot Size: 10' x 150'
Replications: 6

Cover Crop Information: CR between 302&401; 601&602 : ARG between 301&302; 402&501 (Variable covers because research was planned/coordinated with Agnition after late cover crop trial had been planted. Tried to minimize CC effect through randomization and by offsetting plots by 5' so that a given cover plot was straddling the corn plots)

Crop Information:

Crop: Corn
Variety/Hybrid: Pfister 2874PCR
Seed Treatment Cruiser Maxx CB500 (+ Commence on treatment plots)
Relative Maturity 112
Planting Date: 5/10/2018
Planting Method: No-till planter 30" rows 1.5" deep
Seeding Rate: 29,900 seeds/A
Soil Conditions @ Planting: Slightly wet but not muddy
Previous Crop: Soybean
Harvest Date: 10/24/2018

Notes:

Harvested area = 720 ft.^{2}

Pest Management

Date	Application Timing	Product	Rate
4/30/2018	Pre-plant Burndown	Roundup WeatherMax	32 oz/A
4/30/2018	Pre-plant Burndown	2,4-D	16 oz/A
4/30/2018	Pre-plant Burndown	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	Acuron	80 oz/A
5/30/2018	Post-emergence	Aatrex	32 oz/A
5/30/2018	Post-emergence	Roundup PowerMax	32 oz/A
5/30/2018	Post-emergence	Ammonium Sulfate	17 lbs/100 gal
5/30/2018	Post-emergence	COC	0.25% v/v

Soil Fertility

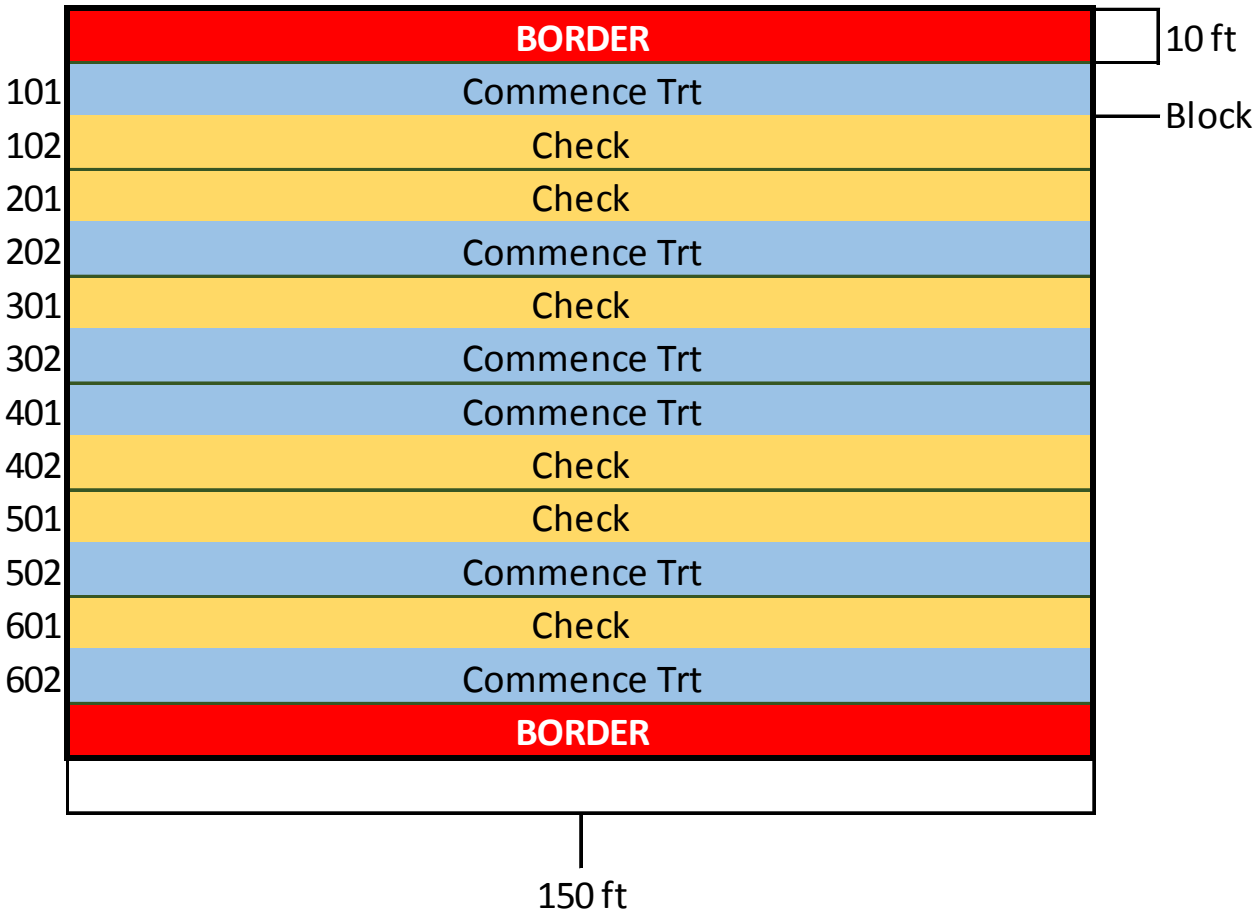
Date	Application Timing	Product	Rate
5/30/2018	V4	UAN 32%	180 lb N/A

Summary

Results of the preliminary analysis of the data from this trial show no treatment effect from the Commence seed treatment. Preliminary analysis included all replicates, however, the sixth replicate appears to be somewhat of an outlier compared to replicates 1-5. For this reason, the analysis of variance was conducted again using data from the first five replicates. This did not change the result, and the seed treatment was still found to have no statistically significant (α=0.1) effect on corn yield.

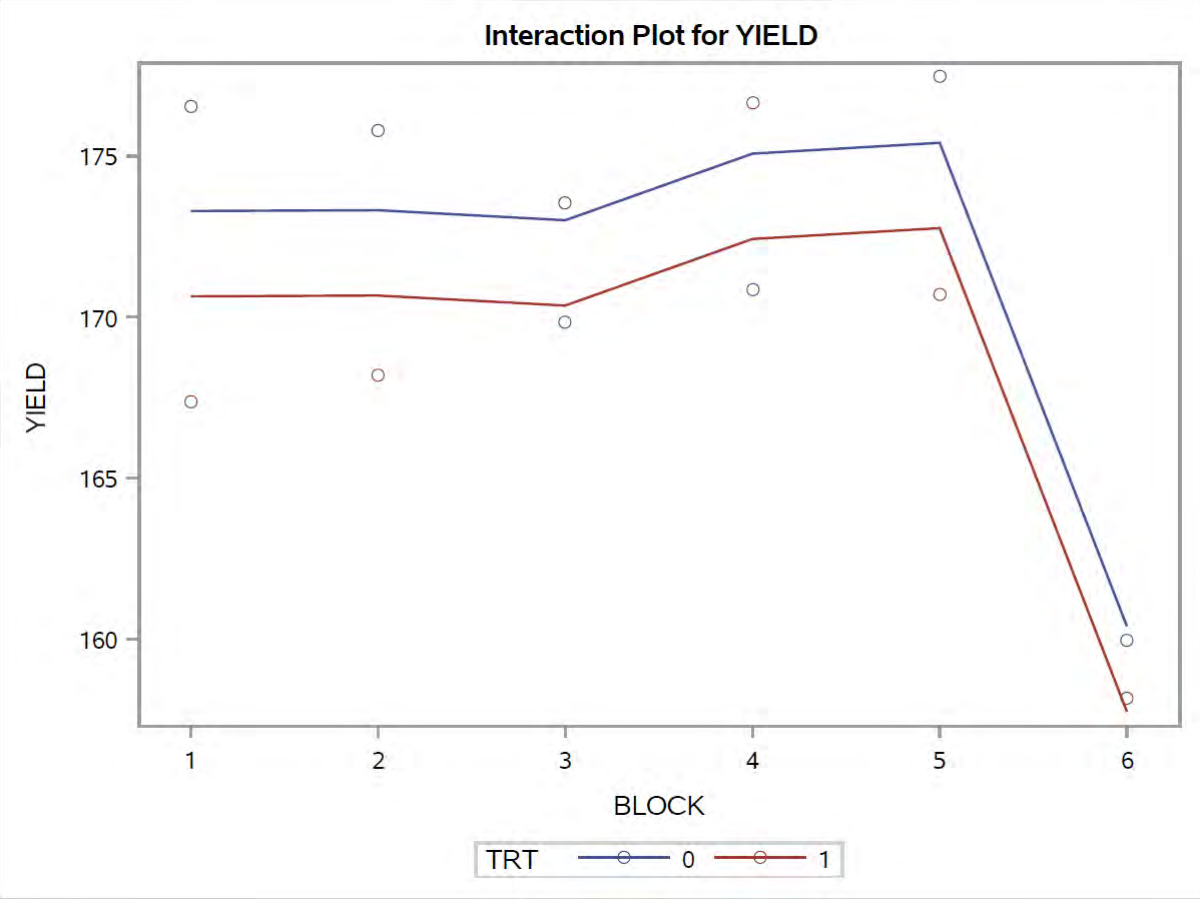
While this trial concluded in a null result, it should be emphasized that these data represent only a single site-year of a relatively small strip plot study. Results from this single year trial may not be indicative of the overall effect of this product in this geography. Further data would be needed to draw any reliable conclusions about the effectiveness of this product.


N
30
60
E
120
150
S
210
240
W
300
330

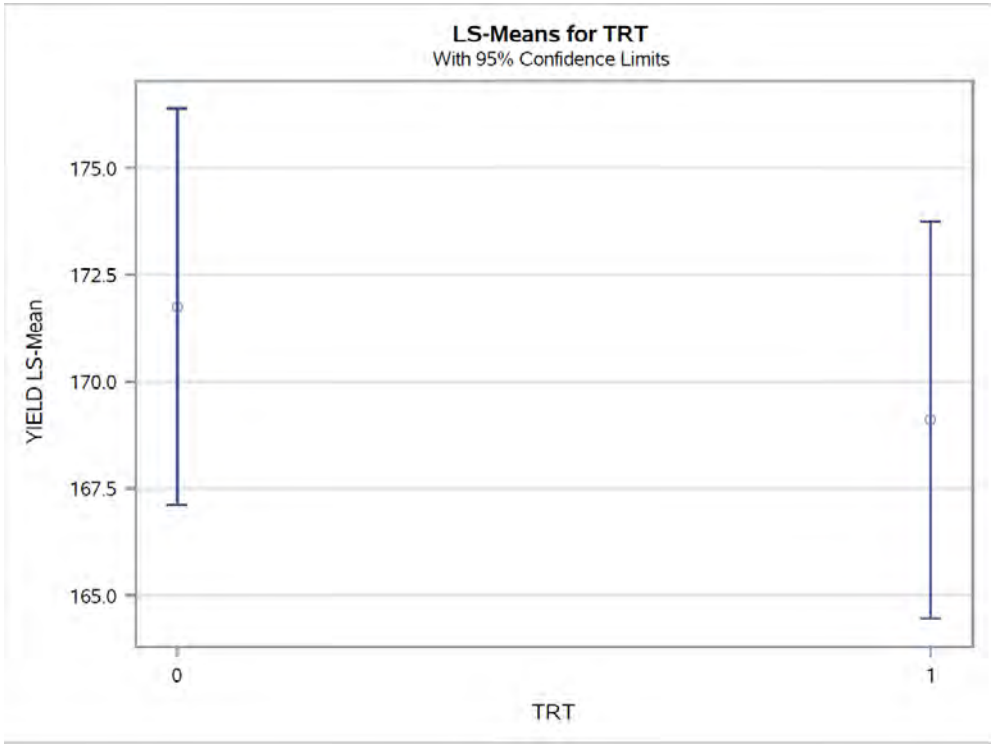

BORDER
101 Commence Trt
102 Check
201 Check
202 Commence Trt
301 Check
302 Commence Trt
401 Commence Trt
402 Check
501 Check
502 Commence Trt
601 Check
602 Commence Trt
BORDER
10 ft
Block
150 ft

Analysis of Variance (ANOVA)

Source	DF	Type I SS	Mean Square	F Value	Pr > F
BLOCK	5	319.8005583	63.9601117	3.26	0.1103
TRT	1	21.0696505	21.0696505	1.07	0.3476



The analysis of variance results show no significant (α=0.1) effect on variation in yield from block (which is synonymous with replicate in this trial) or the Commence seed treatment. Examination of the interaction plot for yield shows values for both treatment and control groups in block 6 below the trend of the other five blocks.



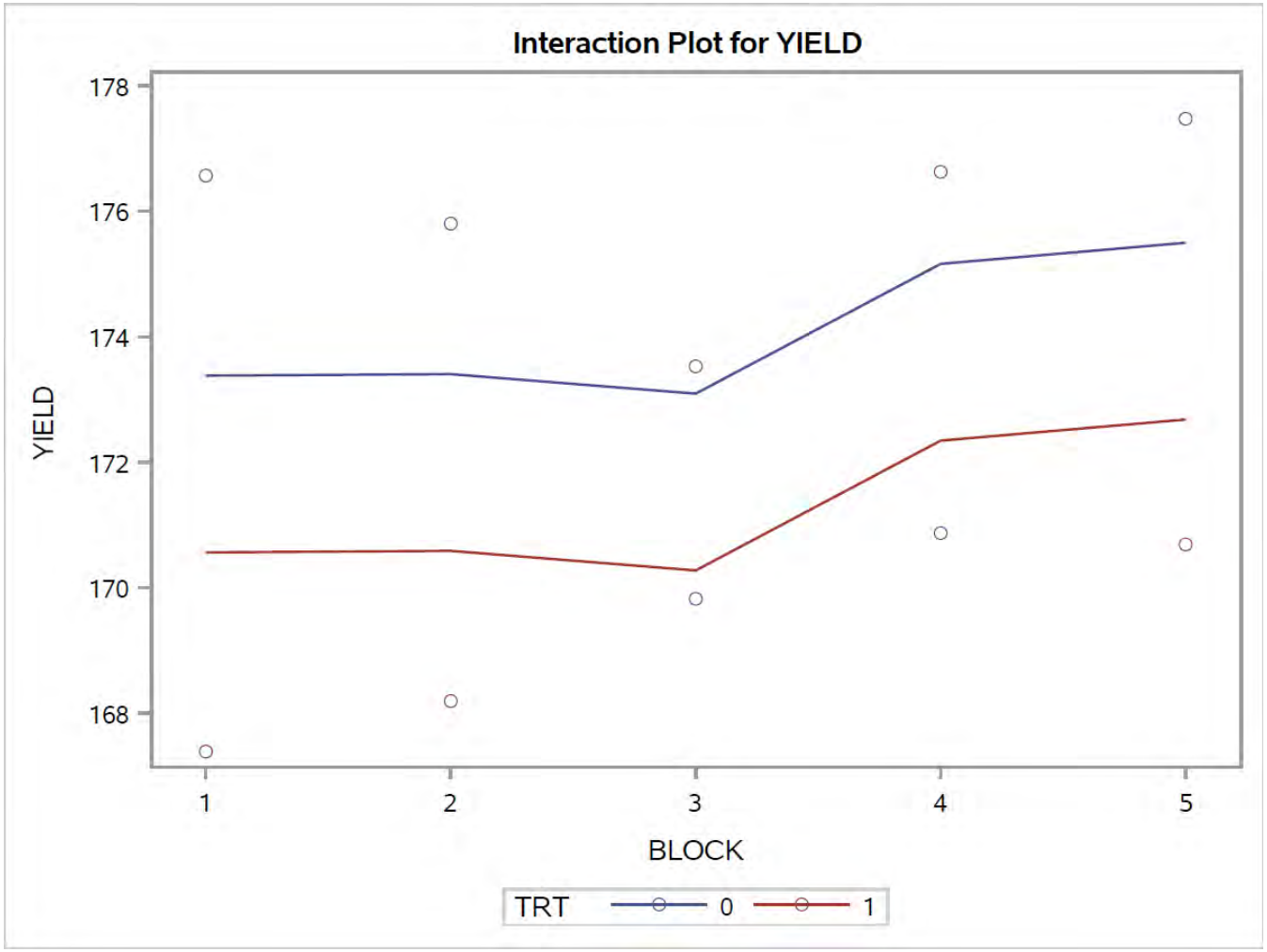
TRT	Method	N	Mean	Std Dev	Std Err	Minimum	Maximum
0		6	171.8	6.5650	2.6802	160.0	177.5
1		6	169.1	6.3625	2.5975	158.2	176.6
Diff (1-2)	Pooled		2.6501	6.4646	3.7323		
Diff (1-2)	Satterthwaite		2.6501		3.7323		

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
171.8	164.9	178.6	6.5650	4.0979	16.1014
169.1	162.4	175.8	6.3625	3.9715	15.6048
2.6501	-5.6660	10.9662	6.4646	4.5169	11.3449
2.6501	-5.6671	10.9673			

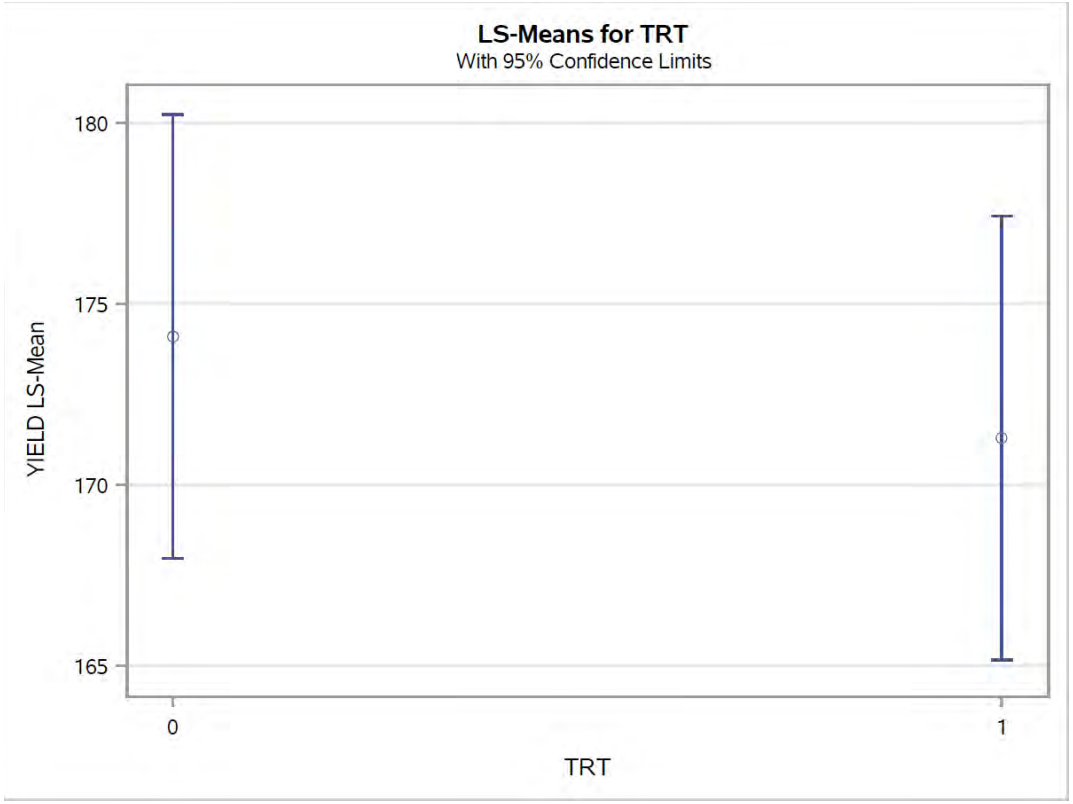
Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	10	0.71	0.4939
Satterthwaite	Unequal	9.9902	0.71	0.4939

The LS means plot of treated and control groups reflect the lack of a significant result from ANOVA, with largely overlapping 95% confidence limits of the yield estimates. This is confirmed by the t-test comparing means from Commence treated and control groups, which showed no significant difference at α=0.1.

Source	DF	Type I SS	Mean Square	F Value	Pr > F
BLOCK	4	10.20071483	2.55017871	0.10	0.9749
TRT	1	19.85613910	19.85613910	0.81	0.4182



A reanalysis of the data set without the sixth block did not change the ANOVA result for the seed treatment. The difference observed was still considered insignificant at α=0.1.



TRT	Method	N	Mean	Std Dev	Std Err	Minimum	Maximum	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		5	174.1	3.5010	1.5657	169.8	177.5	174.1	169.8	178.5	3.5010	2.0976	10.0604
1		5	171.3	3.8357	1.7154	167.4	176.6	171.3	166.5	176.1	3.8357	2.2981	11.0222
Diff (1-2)	Pooled		2.8182	3.6722	2.3225			2.8182	-2.5375	8.1739	3.6722	2.4804	7.0351
Diff (1-2)	Satterthwaite		2.8182		2.3225			2.8182	-2.5452	8.1817			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	8	1.21	0.2596
Satterthwaite	Unequal	7.9342	1.21	0.2598

Removal of the sixth block also did not change results from the t-test comparing yields of corn that received the Commence seed treatment to that which did not. They were not significantly different at α=0.1.