

Boone County

Cover Crop Comparison

Site C008

2016-2023 ongoing



At the Missouri Soybean Association Bay Farm Research Facility

Field overview  
July 27<sup>th</sup>, 2022.



CC008  
Boone  
County

Field overview  
June 23<sup>rd</sup>, 2022.

# Cover Crop Management

# Boone County

# Site C008

						Termination Management		
Year	Years in Cover Crop	Planting Date	Method	Cover Crop Treatment 1	Seeding Rate (lbs/A)	Date	Method	Cover Crop Stage at Termination
2016	0	11/4/15	Drilled	Cereal Rye		4/5/16	Herbicide	8" vegetative
	0	11/4/15	Drilled	Winter Wheat		4/5/16	Herbicide	8" vegetative
2017	1	10/25/16	Drilled	Cereal Rye	50	4/14/17	Herbicide	8" vegetative
	1	10/25/16	Drilled	Winter Wheat	50	4/14/17	Herbicide	8" vegetative
2018	2	10/27/17	Drilled	Cereal Rye	50	4/19/18	Herbicide	4" vegetative
	2	10/27/17	Drilled	Winter Wheat	50	4/19/18	Herbicide	4" vegetative
2019	3	10/22/18	Drilled	Cereal Rye	65	5/10/19	Herbicide	
	3	10/22/18	Drilled	Winter Wheat	65	5/10/19	Herbicide	
2020	4	11/6/19	Drilled	Cereal Rye		4/8/20	Herbicide	8" vegetative
	4	11/6/19	Drilled	Winter Wheat		4/8/20	Herbicide	5" vegetative
2021	5	10/16/20	Drilled	Cereal Rye	50	5/7/21	Herbicide	24"
	5	10/16/20	Drilled	Winter Wheat	50	5/7/21	Herbicide	24"
2022	6	-	Drilled	Cereal Rye	-	5/1/22	Herbicide	-
	6	-	Drilled	Winter Wheat	-	5/1/22	Herbicide	-
2023	7	-	Drilled	Cereal Rye	-	4/26/23	Herbicide	-
	7	-	Drilled	Winter Wheat	-	4/26/23	Herbicide	-

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Year	Crop	Planting Date	Days after CC Termination	Variety	Seeding Rate (Seeds/A)	Harvest Date	Tillage	Notes
2016	Corn	4/18/16	13			10/3/16	No Till	
2017	Soybean	5/31/17	48	Pioneer P94Y23		10/25/17	No Till	
2018	Corn	5/1/18	12	Pioneer 1151	33,000	9/20/18	No Till	
2019	Soybean	6/4/19	25	P37T09L	140,000		No Till	
2020	Corn	4/21/20	13	Pioneer P1244AM	33,000	10/14/20	No Till	
2021	Soybean	6/11/21	35	-	-	-	No Till	
2022	Corn	6/6/22	36	-	-	-	No Till	
2023	Soybean	~4/26/24	0	-	-	10/25/23	No Till	Weigh wagon only.

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Year 1 (2016)  
Corn



Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	195 (14)	-
No Cover Crop	199 (6)	-
Cereal Rye	198 (6)	-1
Winter Wheat	189 (24)	-10

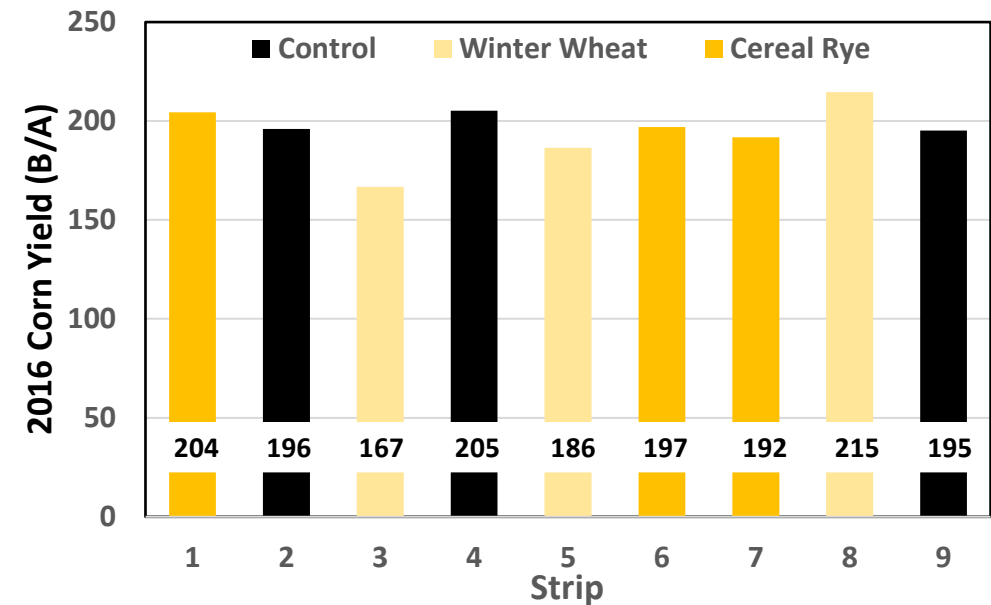
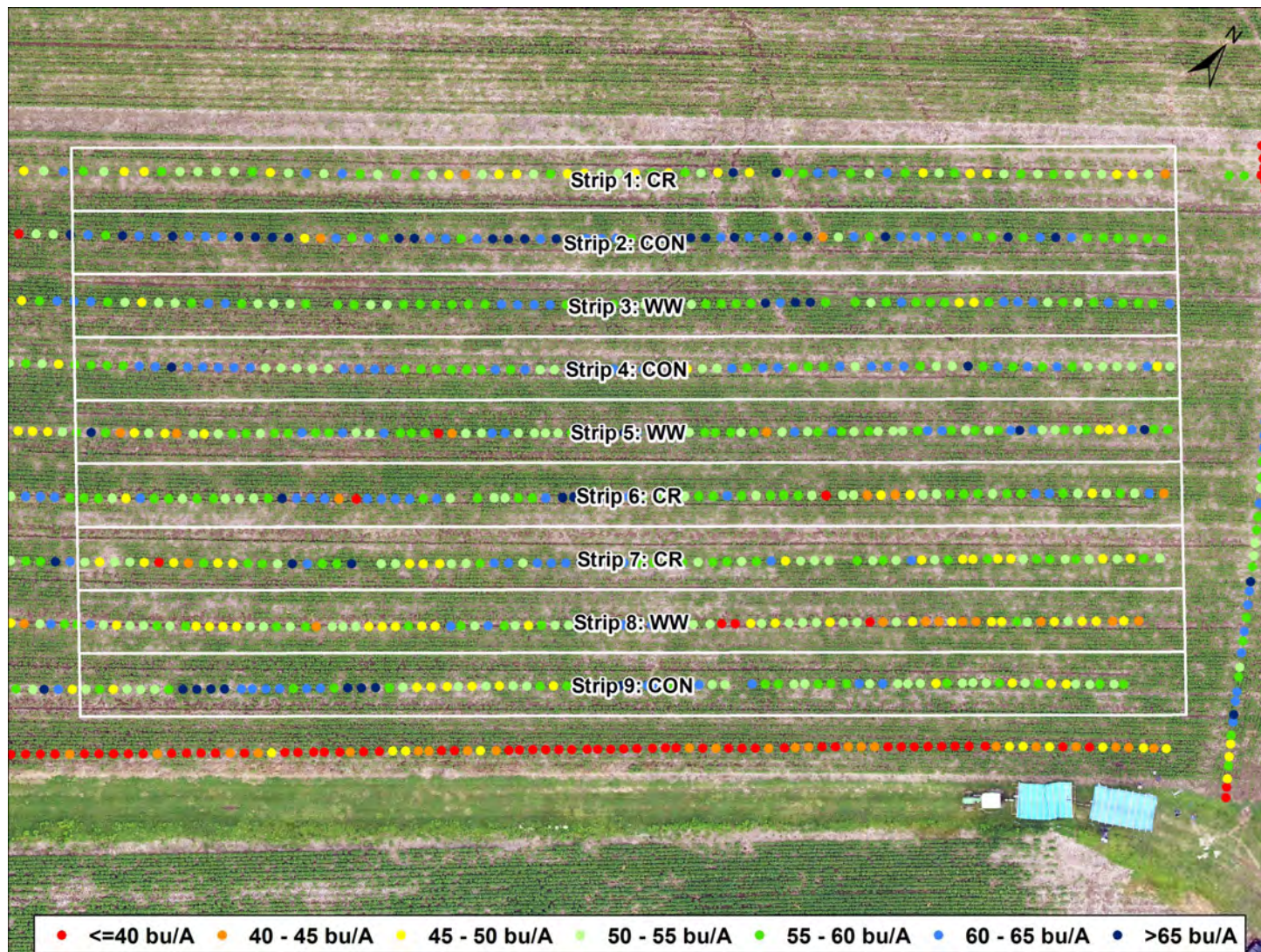


Figure 1. Yield for corn in 2016. Imagery from 30 meters on May 31st, 2016.



Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	56.2 (3.1)	-
No Cover Crop	58.9 (2.6)	-
Cereal Rye	54.8 (1.4)	-4.2
Winter Wheat	54.8 (3.6)	-4.1

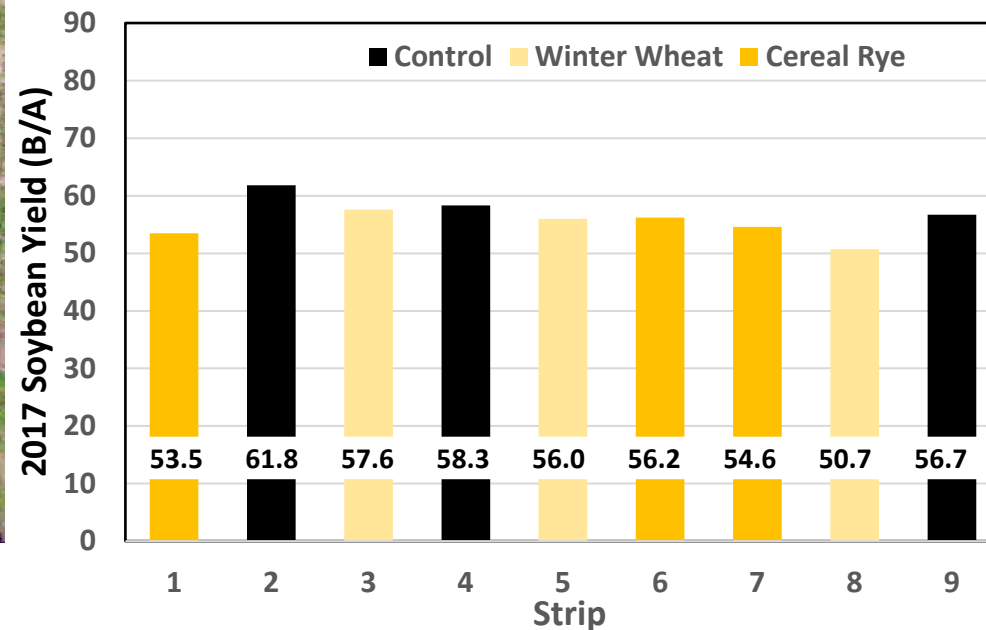
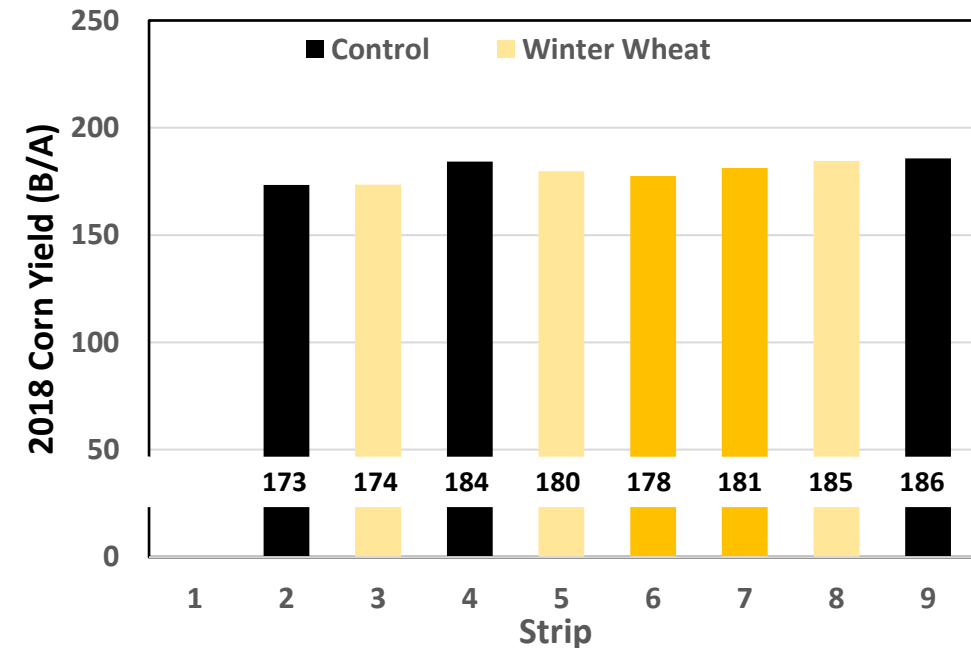


Figure 1. Yield for soybean in 2017. Imagery from 117 meters on July 5th, 2017.



Figure 1. Yield for corn in 2018. Imagery from 100 meters on June 19th, 2018.

Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	180 (5)	-
No Cover Crop	181 (7)	-
Cereal Rye	179 (3)	-2
Winter Wheat	179 (6)	-2





Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	74.9 (2.4)	-
No Cover Crop	73.9 (2.8)	-
Cereal Rye	74.7 (1.8)	0.8
Winter Wheat	76.1 (2.8)	2.2

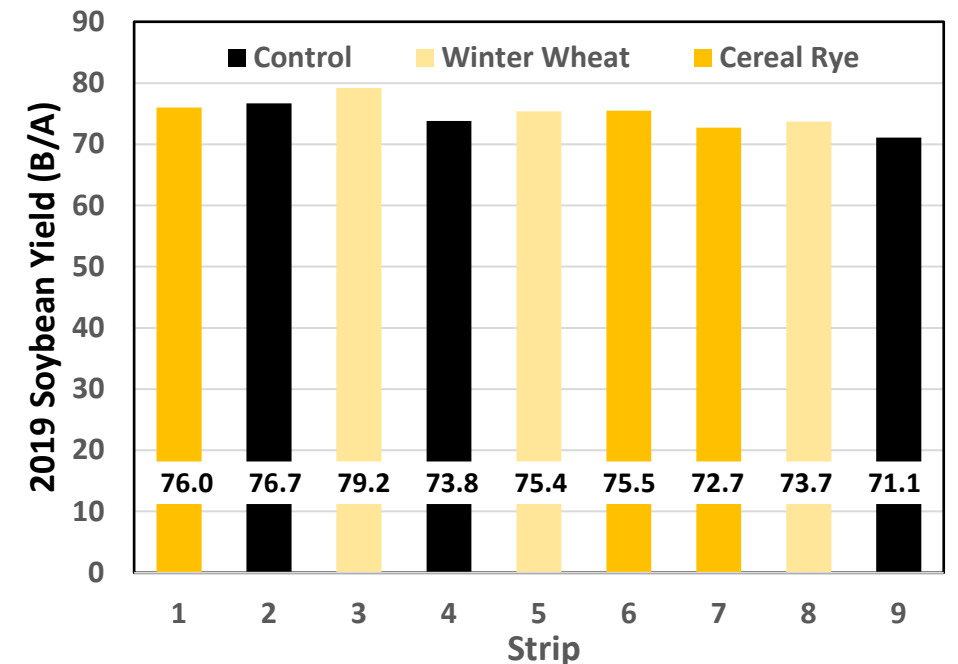


Figure 1. Yield for soybean in 2019. Imagery from 75 meters on August 20th, 2019.



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# Cover Crop Comparison

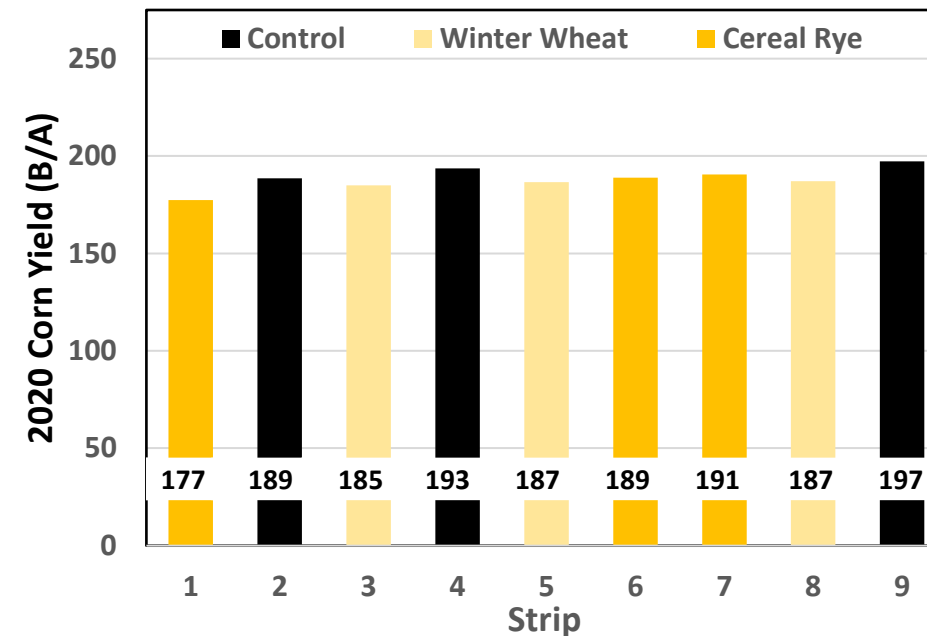
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Year 5 (2020)  
Corn



Yield for corn in 2020. Imagery from 75 meters on June 26th, 2020.

Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	188 (5)	-
No Cover Crop	193 (4)	-
Cereal Rye	186 (7)	-8
Winter Wheat	186 (1)	-8

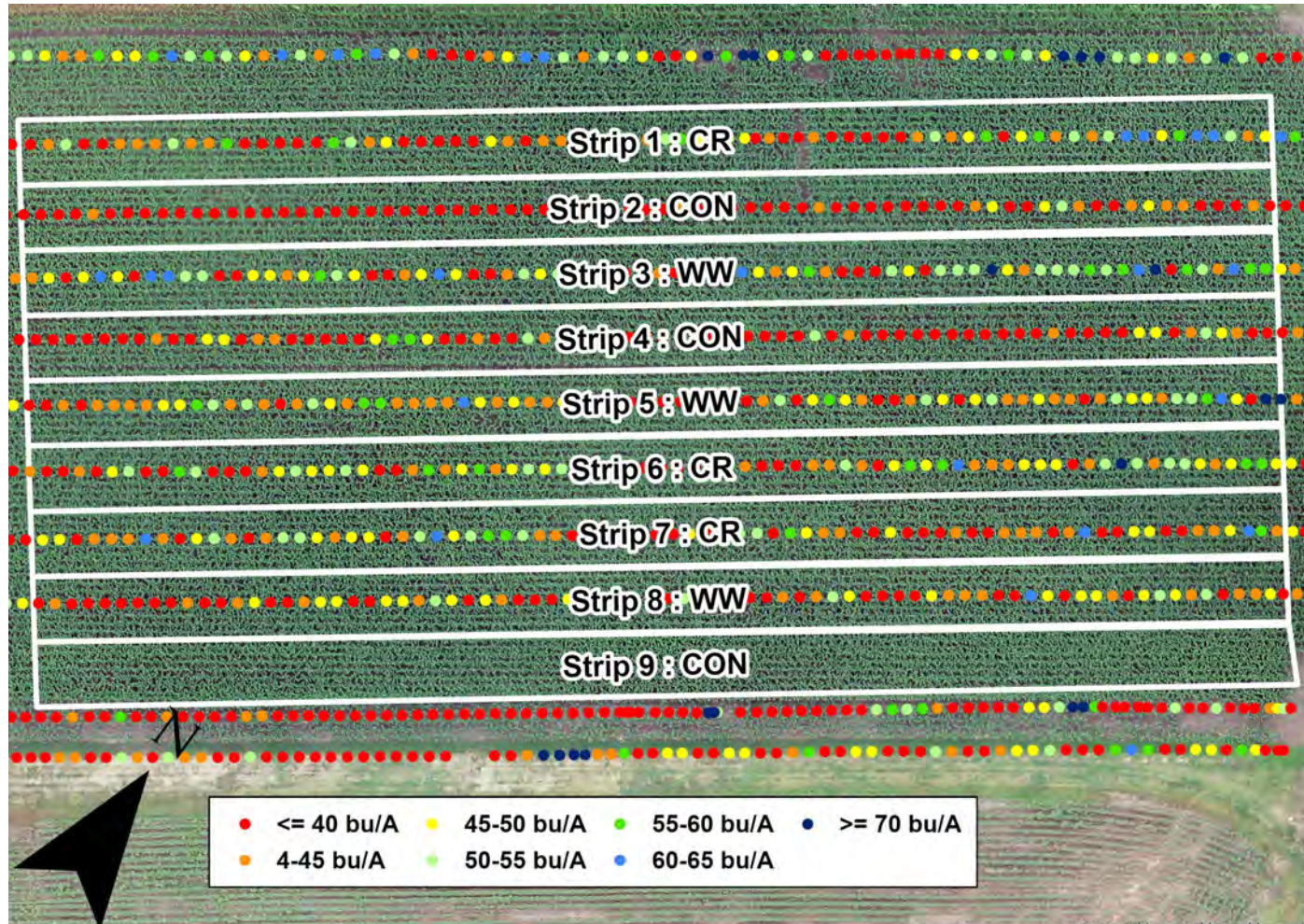


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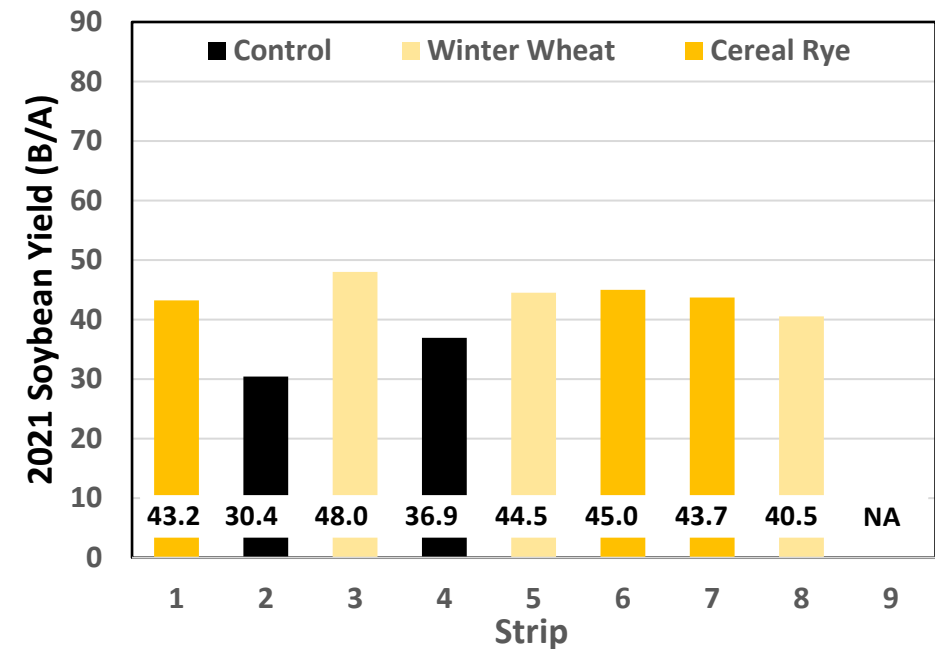
# Cover Crop Comparison

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Year 6 (2021)  
Soybean



	Yield (STD)	Delta No Cover
Treatments	<i>bushels per acre</i>	
Site mean	41.5 (5.6)	-
No Cover Crop	33.7 (4.6)	-
Cereal Rye	44.0 (0.9)	10.3
Winter Wheat	44.3 (3.8)	10.6



Yield for soybean in 2021. Imagery from 100 meters on July 27th, 2021.  
Note: no yield data was collected for Strip 9 in 2021.

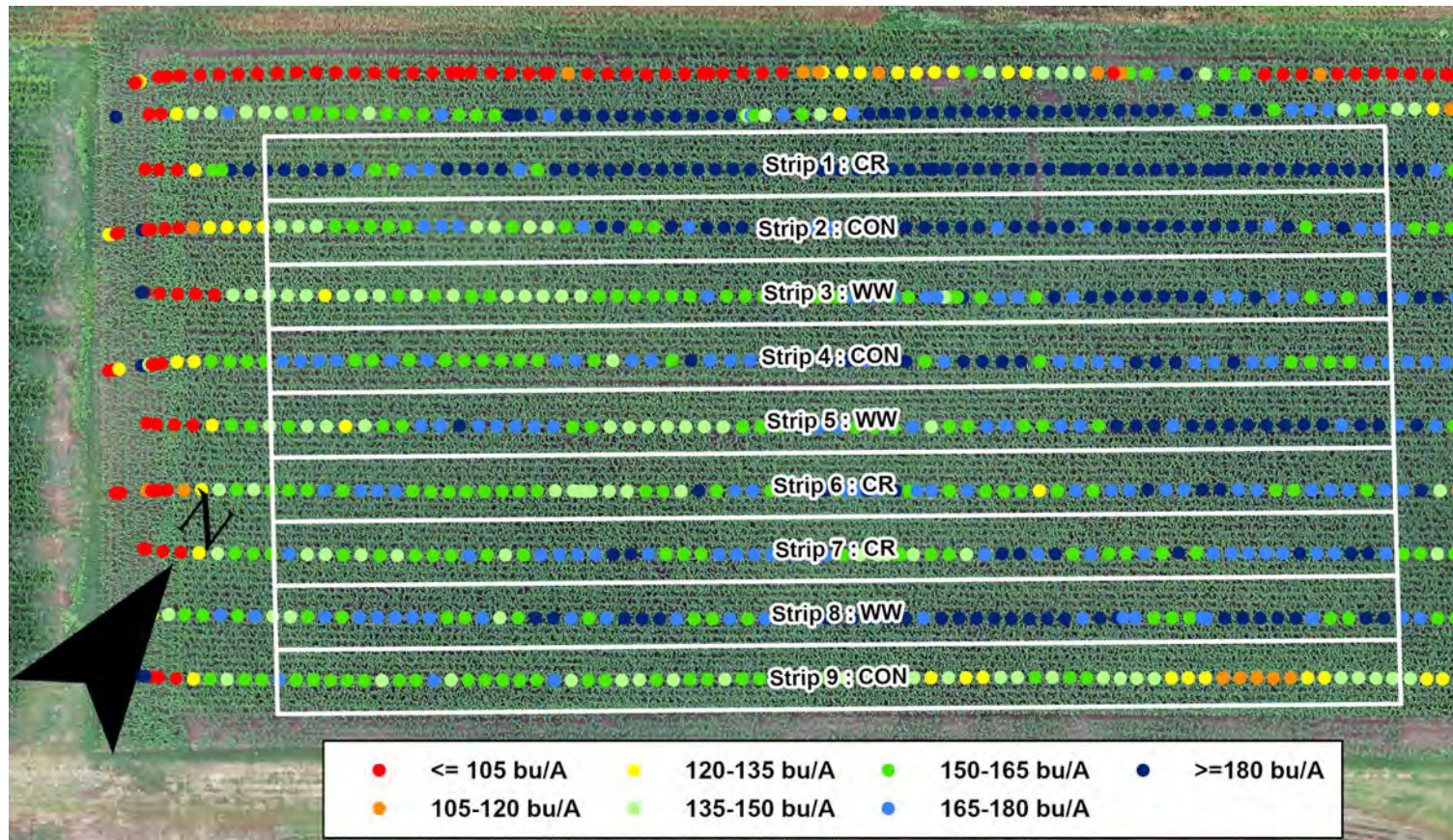
# Boone County

# Cover Crop Comparison

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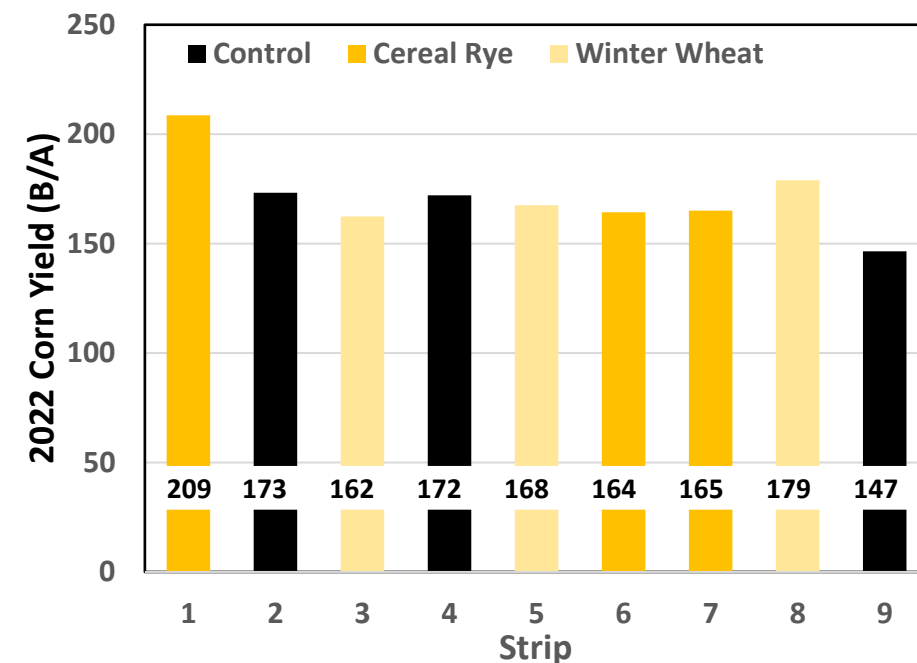
Year 7 (2022)

Corn



Yield for corn in 2022. Data from passes fully in treatment strips. Imagery from 100 meters on July 27, 2022.

Treatments	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	171 (17)	-
No Cover Crop	164 (15)	-
Cereal Rye	179 (25)	15
Winter Wheat	170 (8)	6



# Boone County

# Cover Crop Comparison

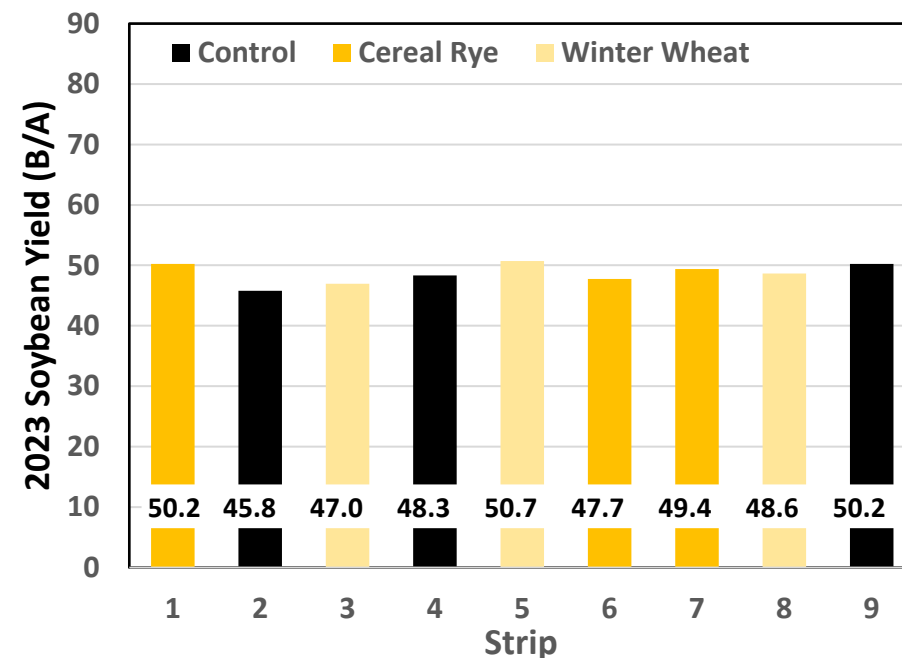
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Year 8 (2023)

Soybean



	Yield (STD)	Delta No Cover
	<i>bushels per acre</i>	
Site mean	48.7 (1.6)	-
No Cover Crop	48.1 (2.2)	-
Cereal Rye	49.1 (1.3)	1.0
Winter Wheat	48.7 (1.9)	0.6

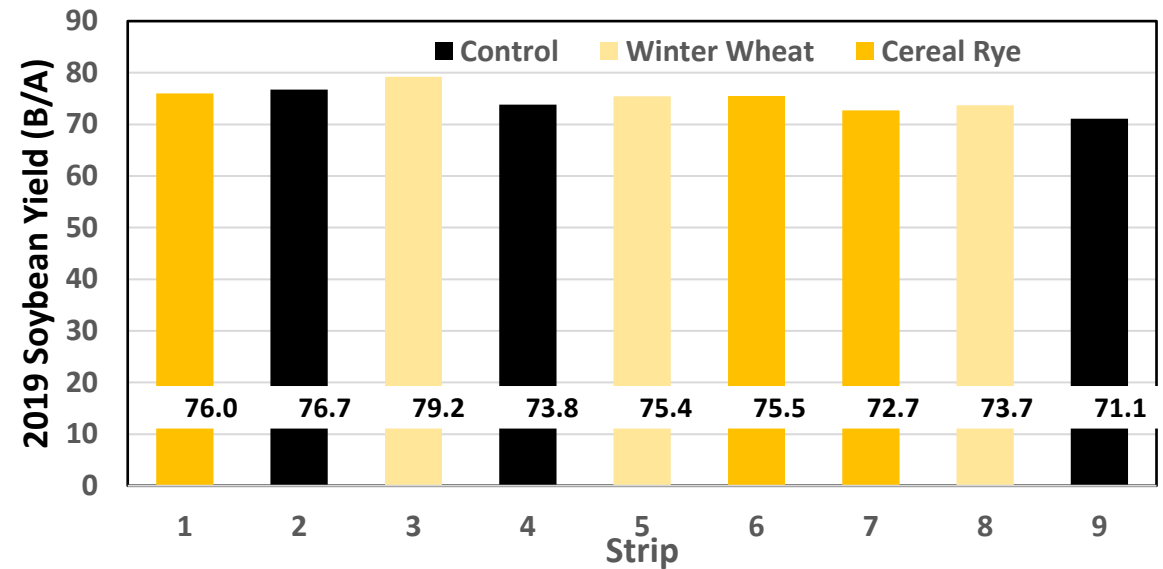
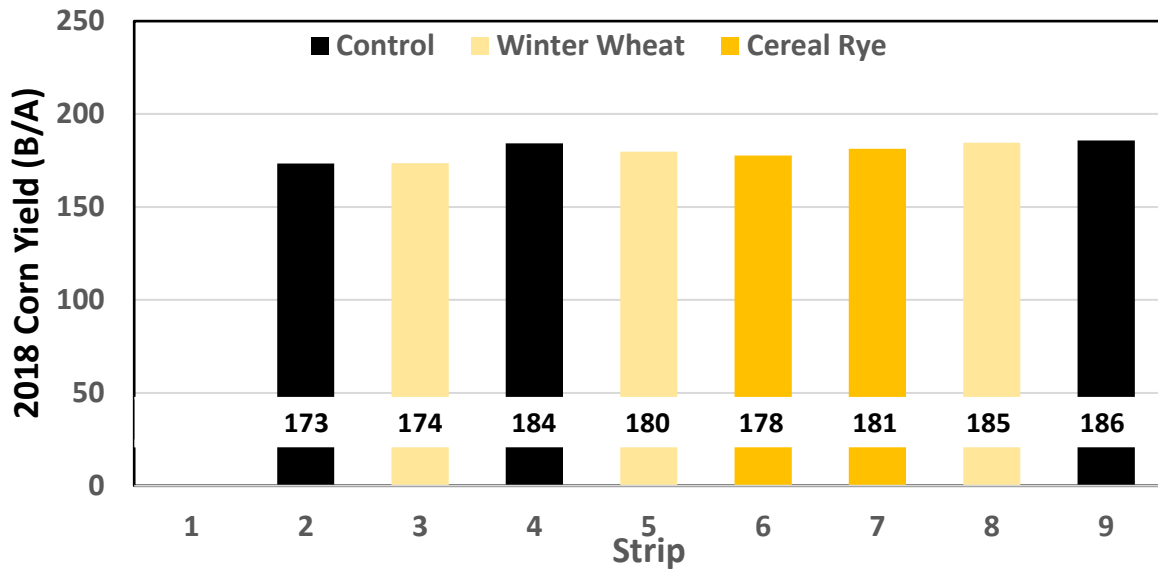
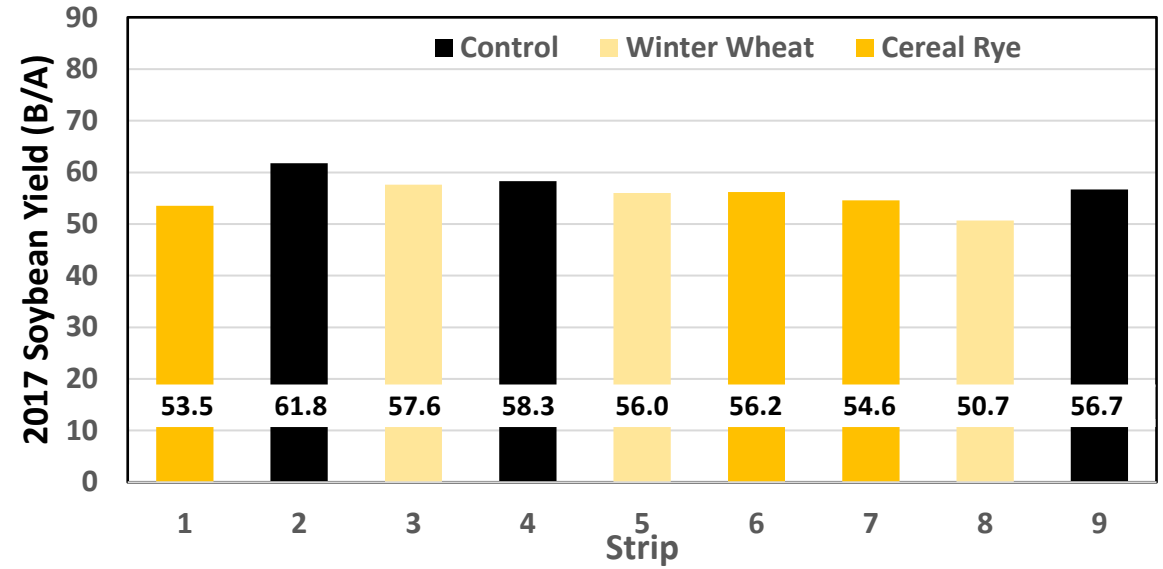
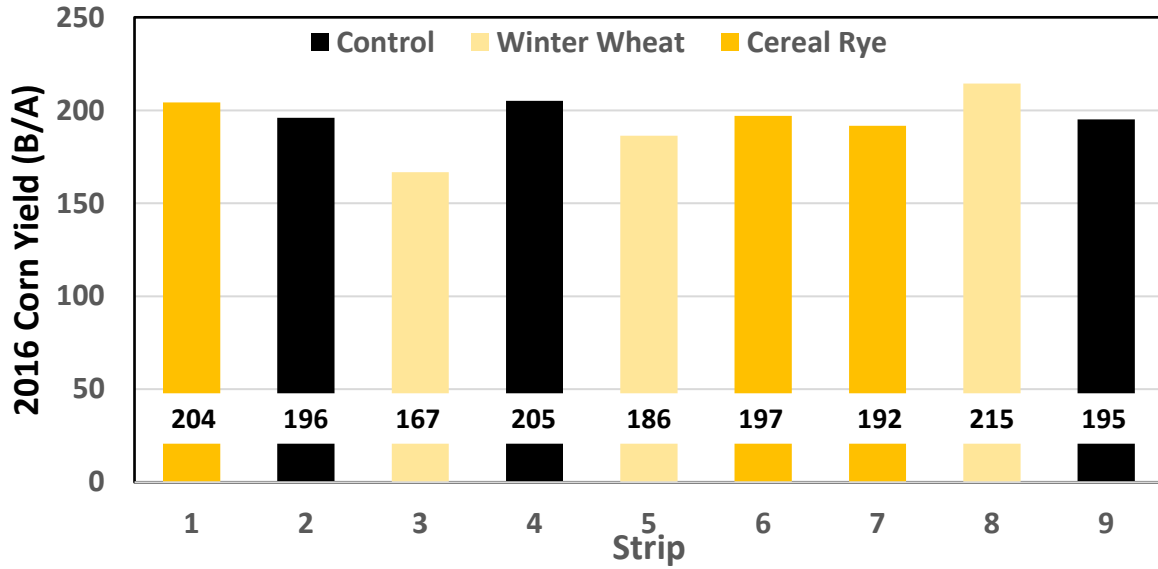


Yield for corn from weigh wagon in 2023. Data from passes fully in treatment strips. Imagery from 100 meters on July 25<sup>th</sup>, 2023 .

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# Cover Crop Comparison

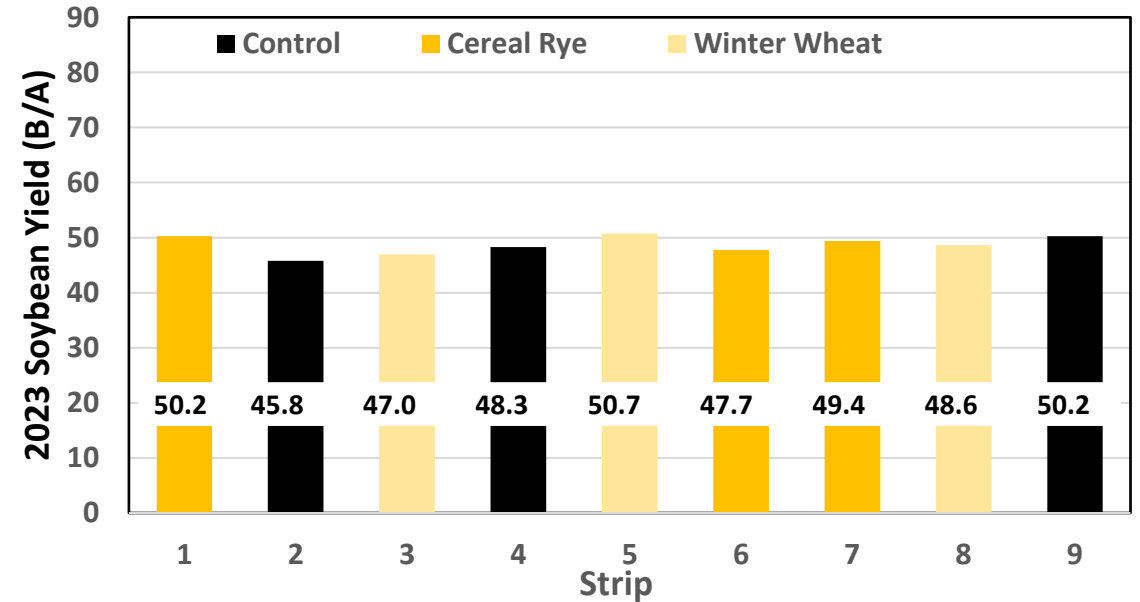
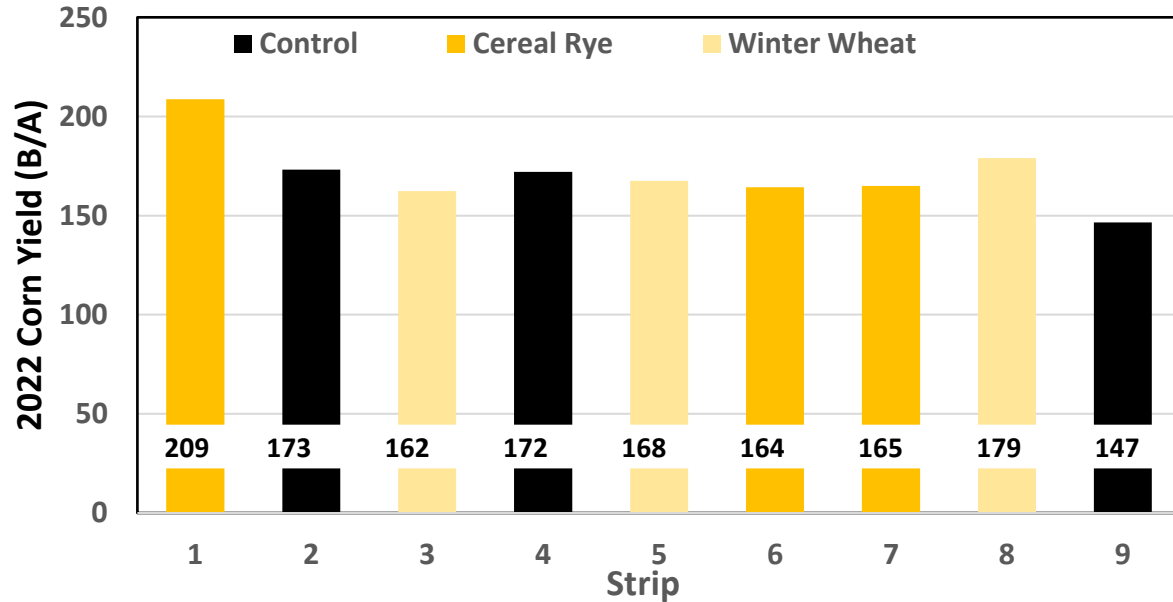
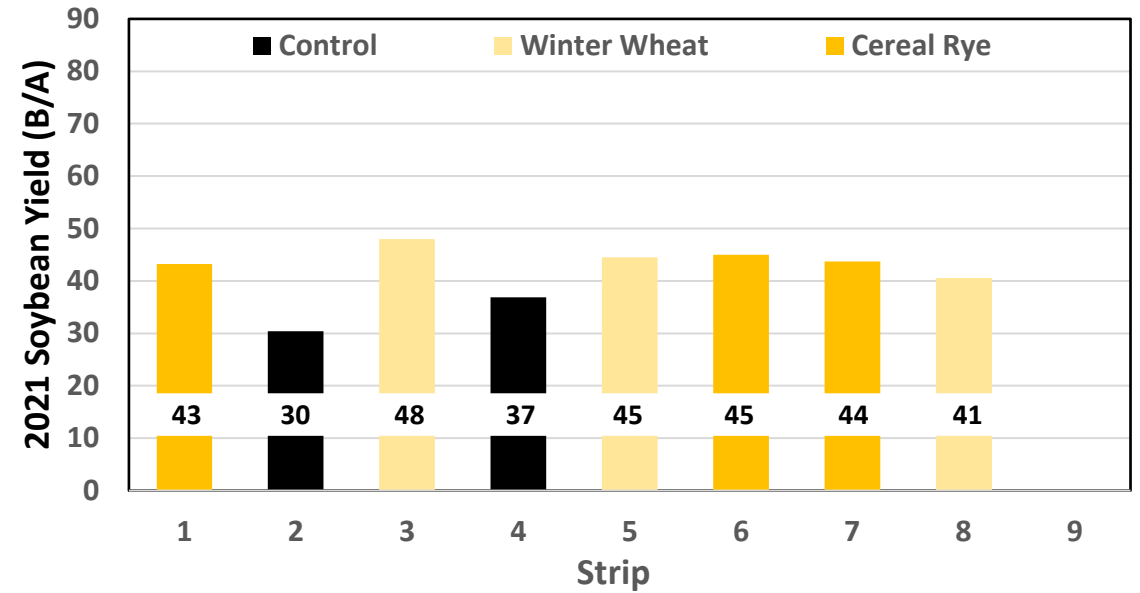
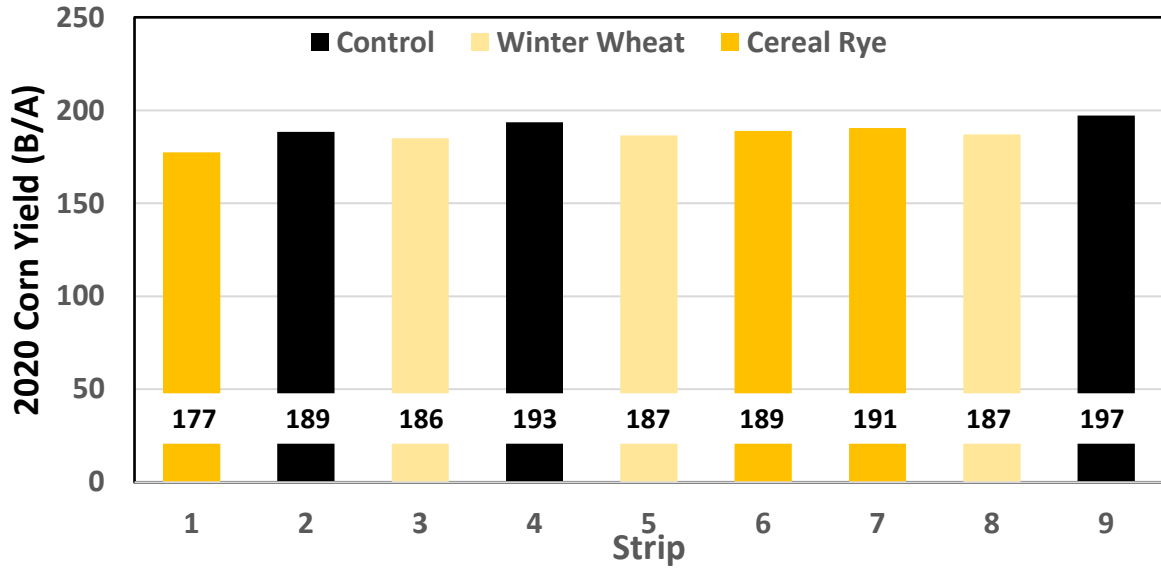
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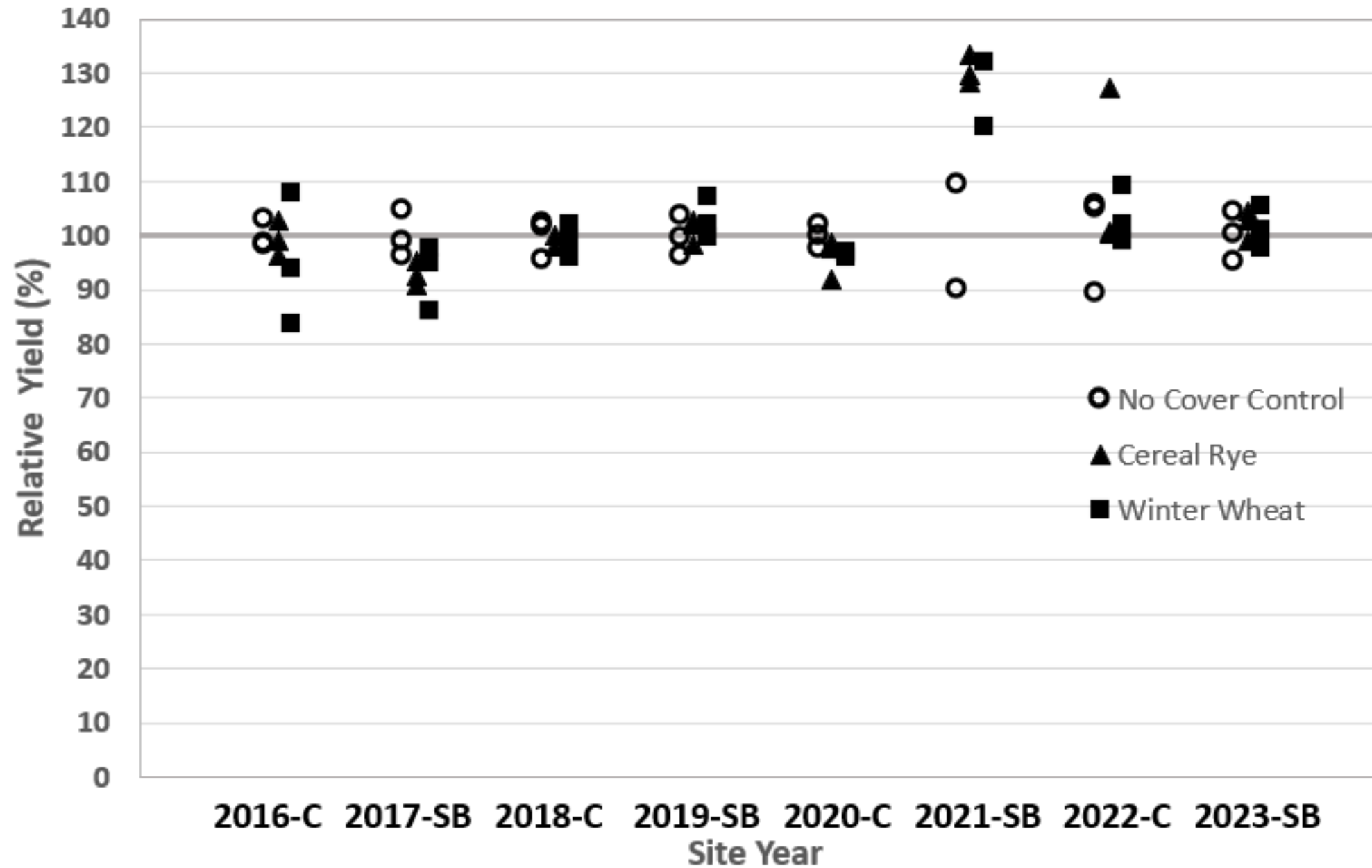


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# Cover Crop Comparison

# Site 3





Question: How does cover crop affect corn and soybean yield?

### Multi-Year Summary

Crop	Cereal Rye		Winter Wheat	
	Site-years	Credible Interval	Site-years	Credible Interval
		<i>bushels per acre</i>		<i>bushels per acre</i>
Corn	4	1.5 (-2 to 5)	4	-1.5 (-5 to 2)
Soybean	4	0.4 (-3 to 3)	4	0.6 (-3 to 5)
		% Effect on Yield		
Corn	4	0.9 (-3 to 5)	4	-0.8 (-5 to 3)
Soybean	4	1.9 (-2 to 5)	4	2.0 (-2 to 6)
All crops	7	1.5 (-1 to 4)		-0.7 (-5 to 3)

### Conclusions:

- Results suggest a trend to better yields with cover crops over time. In some years cover crops had a large impact, both positive and negative.
- Differences between cereal rye and winter wheat were relatively small and favored cereal rye.