

Lincoln County

Cover Crop Comparison

Site C002

2016-2023 on-going



Imagery 7/11/2022

Ver. 060624

Cover Crop Management

Lincoln County

Site C002

					Termination Management			
Year	Planting Date	Method	Cover Crop Treatment 1	Seeding Rate (lbs/A)	Date	Method	Cover Crop Stage at Termination	Notes
2016	10/16/15	Drilled	Cereal Rye	60	3/28/16	Herbicide	8" vegetative	
	10/16/15	Drilled	Winter Wheat	60	3/28/16	Herbicide	8" vegetative	
2017	10/19/16	Drilled	Cereal Rye	60	4/12/17	Herbicide	8" vegetative	
	10/19/16	Drilled	Winter Wheat	60	4/12/17	Herbicide	8" vegetative	
2018	11/1/17	Drilled	Cereal Rye	60	4/11/18	Herbicide	3" vegetative	
	11/1/17	Drilled	Winter Wheat	60	4/11/18	Herbicide	3" vegetative	
2019	9/28/18	Broadcast	Cereal Rye		5/17/19	Herbicide		
	9/28/18	Broadcast	Winter Wheat		5/17/19	Herbicide		
2020	10/28/19	Broadcast	Cereal Rye		4/5/20	Herbicide	6" vegetative	
	10/28/19	Broadcast	Winter Wheat		4/5/20	Herbicide	6" vegetative	
2021	11/5/20?	Drilled	Cereal Rye		5/21/21	Herbicide	48" heading	Extensive vole damage.
	11/5/20?	Drilled	Winter Wheat		5/21/21	Herbicide	24" heading	Extensive vole damage.
2022			Cereal Rye		4/10/22	Herbicide		
			Winter Wheat		4/10/22	Herbicide		
2023			Cereal Rye		4/26/23	Herbicide		
			Winter wheat		4/26/23	Herbicide		

Grain Crop Management

Lincoln County

Site C002

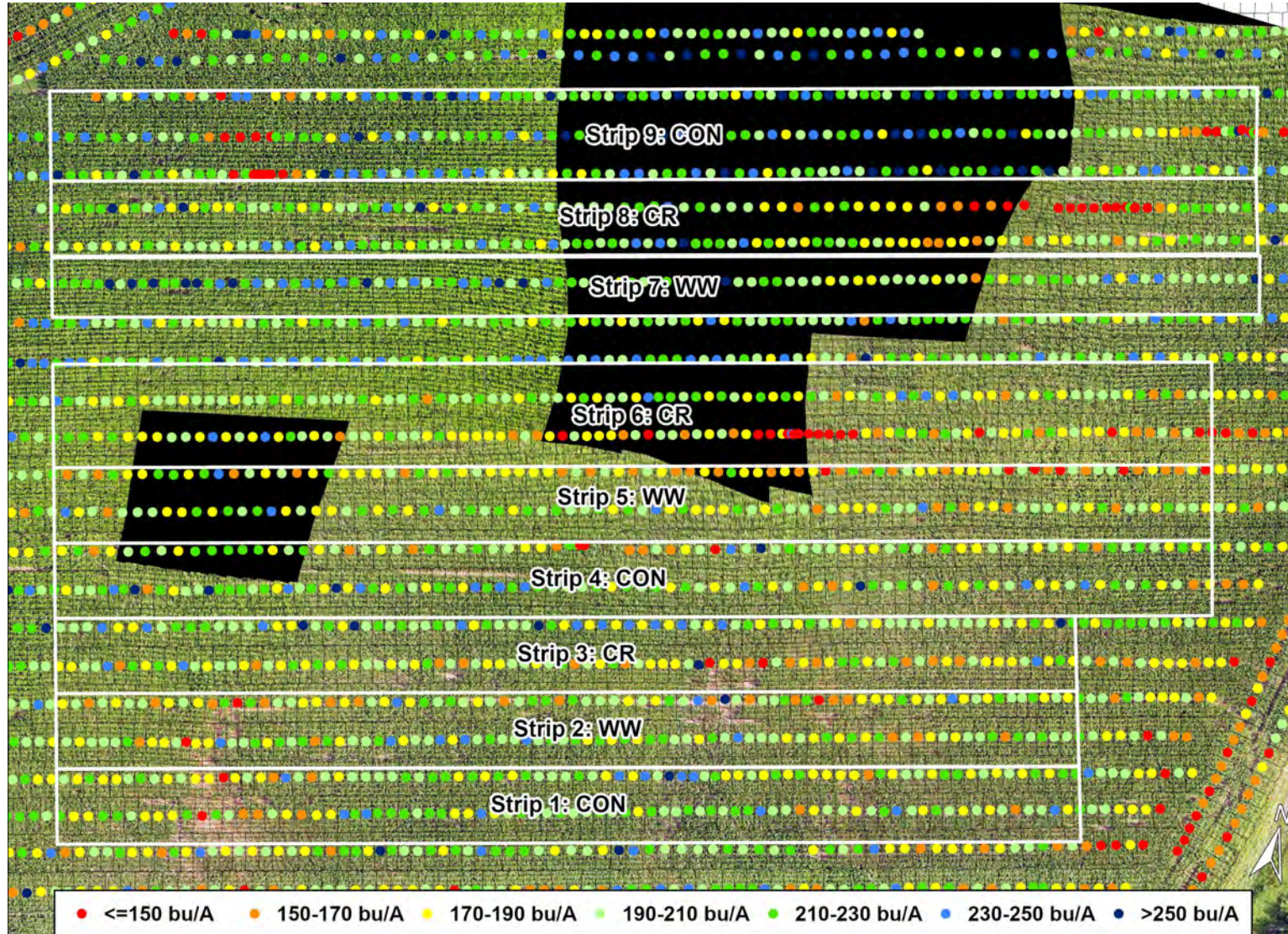
Year	Cover Crop Year	Grain Crop	Planting Date	Days after CC Termination	Variety	Seeding Rate (Seeds/A)	Harvest Date	Tillage	Notes
2016	1	Corn	4/17/16	20			9/19/16	NoTill	
2017	2	Soybean	5/15/17	33			10/1/17	NoTill	
2018	3	Corn	4/24/18	13	LG5650	34,000	9/22/18	NoTill	
2019	4	Soybean	5/17/19	0			10/18/19	NoTill	
2020	5	Corn	4/20/20	15	LG 5650 VT2RIB	34,000	10/31/20	NoTill	
2021	6	Soybean	5/14/21	-7			10/21/21	NoTill	
2022	7	Corn	5/12/22	32			10/21/22	NoTill	
2023	8	Soybean	4/26/23	0			10/18/23	NoTill	

Lincoln County

Cover Crop Comparison

Site 2

Year 1 (2016)
Corn Yield



Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	199 (11)	--
No Cover Control	205 (3)	--
Winter Wheat	206 (11)	1
Cereal Rye	187 (2)	-18

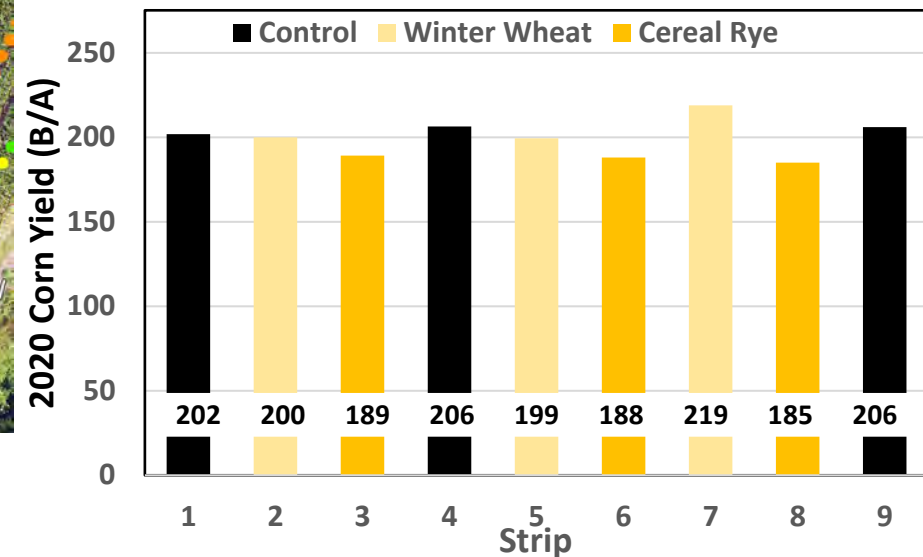


Figure 1. Yield for corn in 2016. Data from passes fully in treatment strips. Imagery from 100 meters on June 28, 2016.

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Cover Crop Comparison

Site 2

Year 2 (2017)
Beans Yield

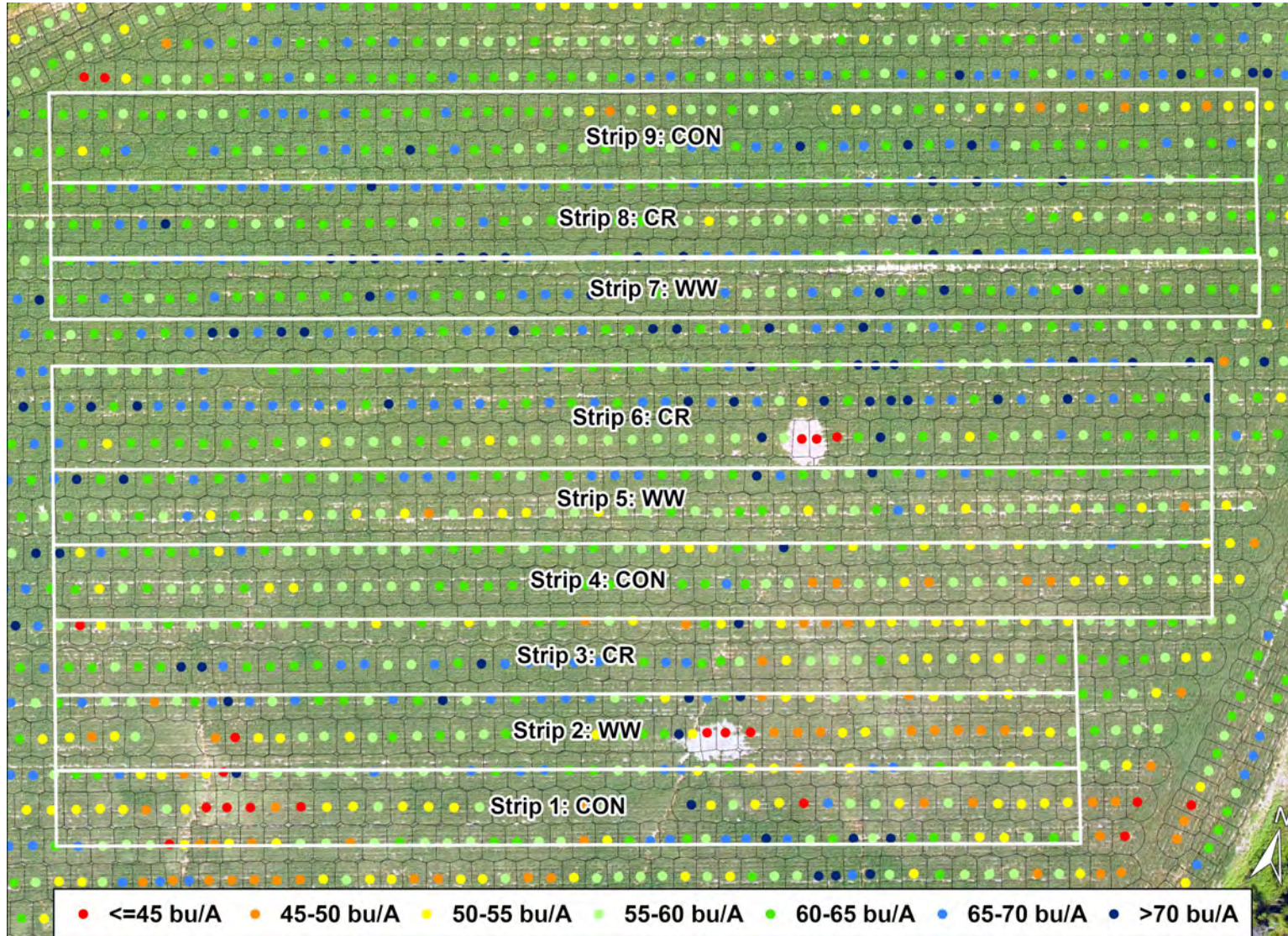
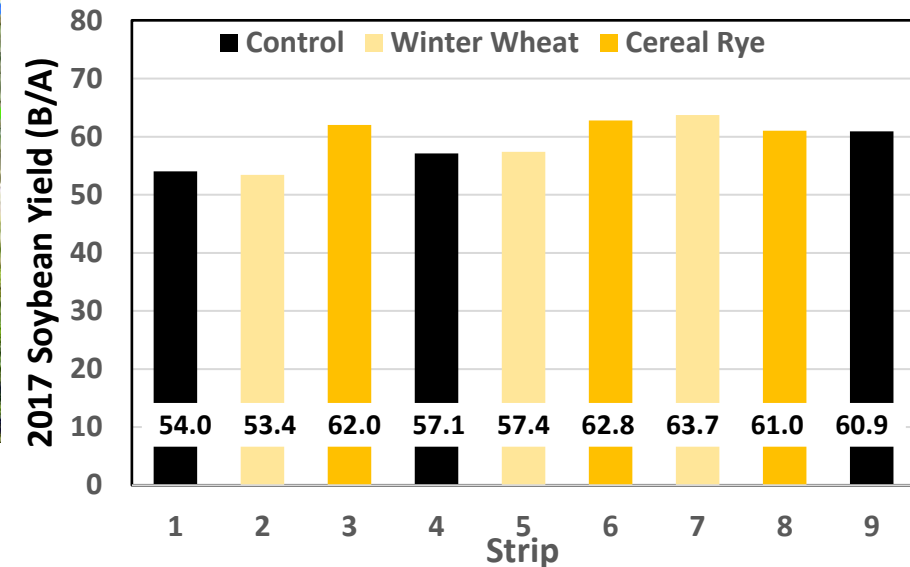


Figure 1. Yield for soybeans in 2017. Data from passes fully in treatment strips. Imagery from 100 meters on July 20, 2017.

Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	59.1 (4)	--
No Cover Control	57.3 (3)	--
Winter Wheat	58.1 (5)	1
Cereal Rye	61.9 (1)	5

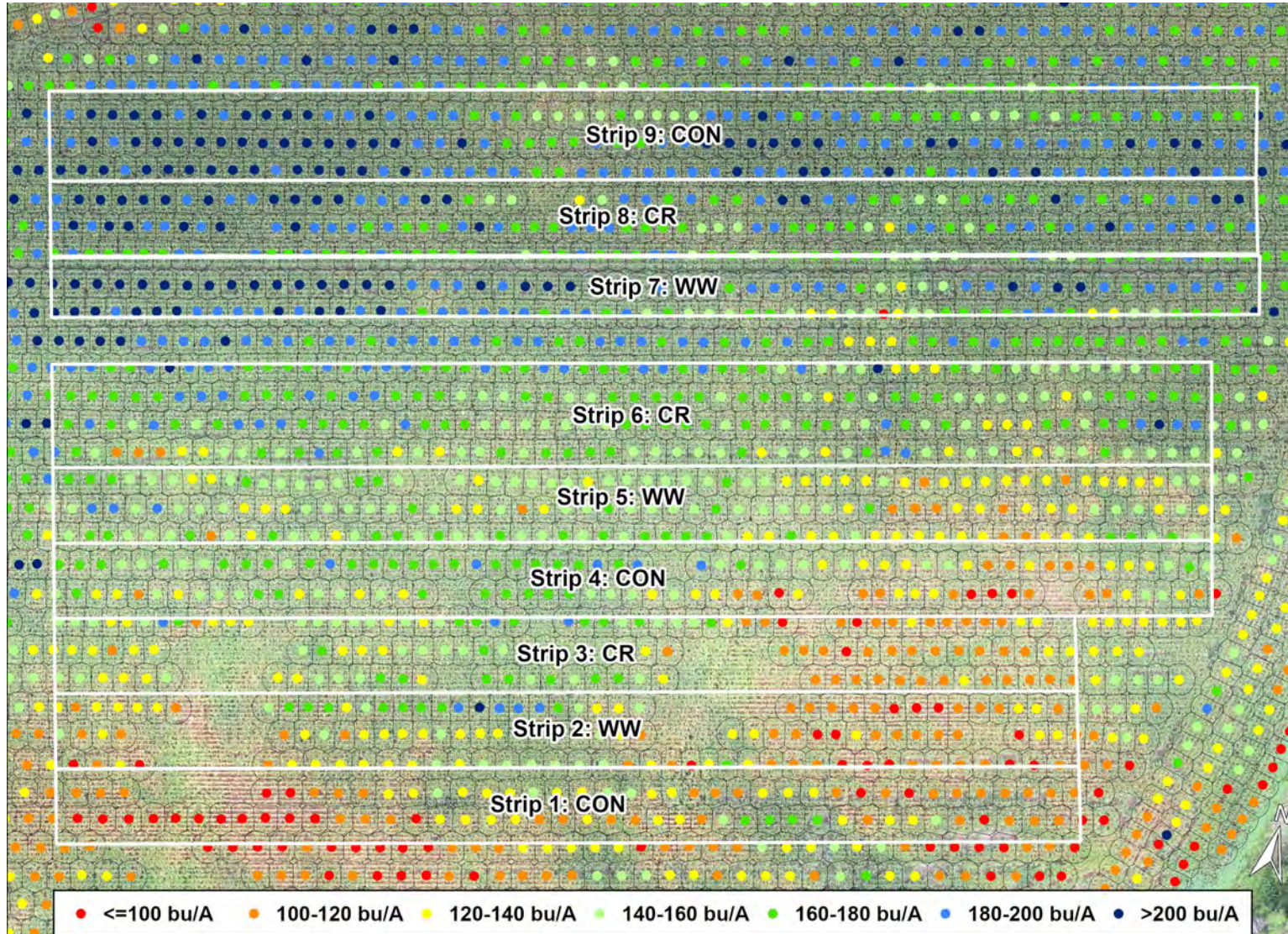


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Cover Crop Comparison

Site 2

Year 3 (2018)
Corn Yield



Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	156 (30)	--
No Cover Control	152 (40)	--
Winter Wheat	157 (34)	5
Cereal Rye	160 (26)	8

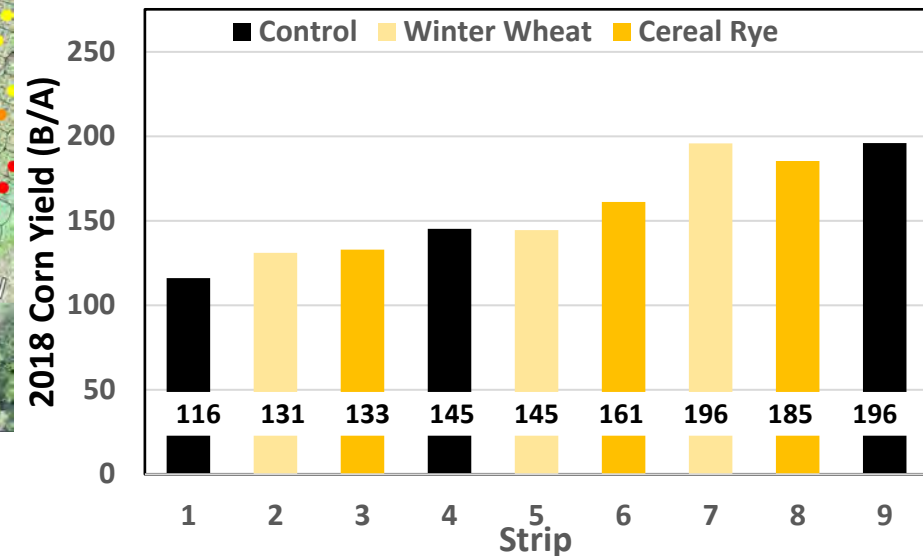


Figure 1. Yield for corn in 2018. Data from passes fully in treatment strips. Imagery from 100 meters on July 31, 2018.

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Cover Crop Comparison

Site 2

Year 4 (2019)
Beans Yield

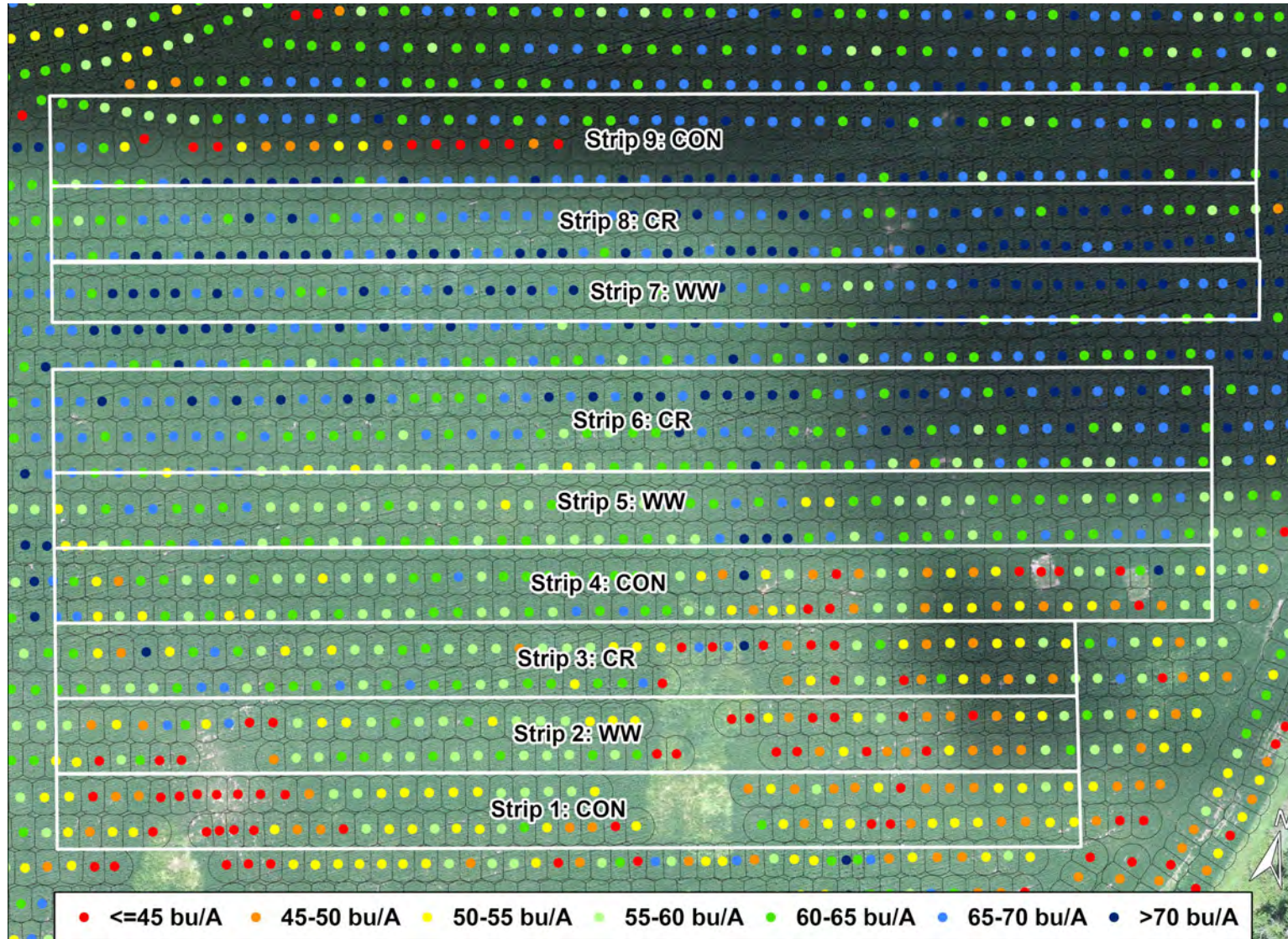
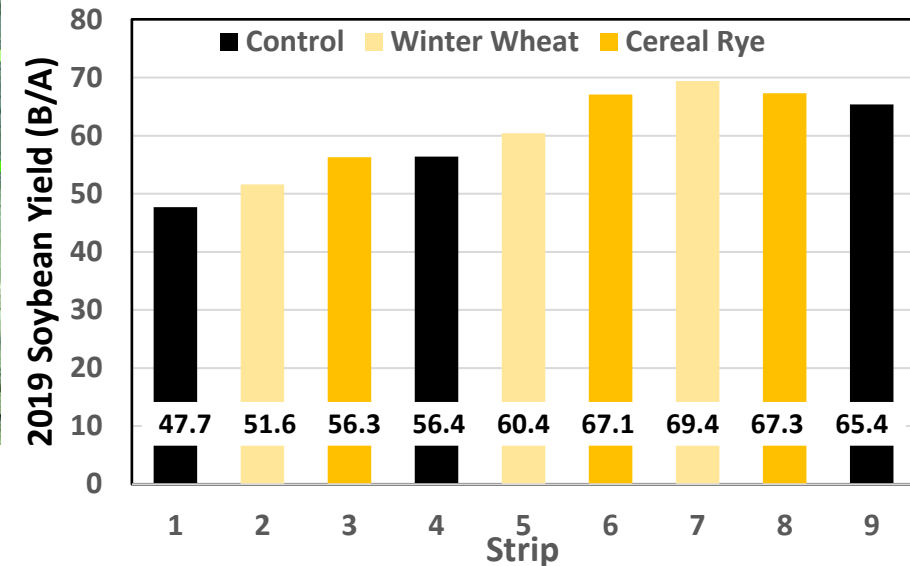


Figure 1. Yield for soybeans in 2019. Data from passes fully in treatment strips. Imagery from 100 meters on August 13, 2019.

Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	60.2 (8)	--
No Cover Control	56.5 (9)	--
Winter Wheat	60.5 (4)	3
Cereal Rye	63.6 (6)	7

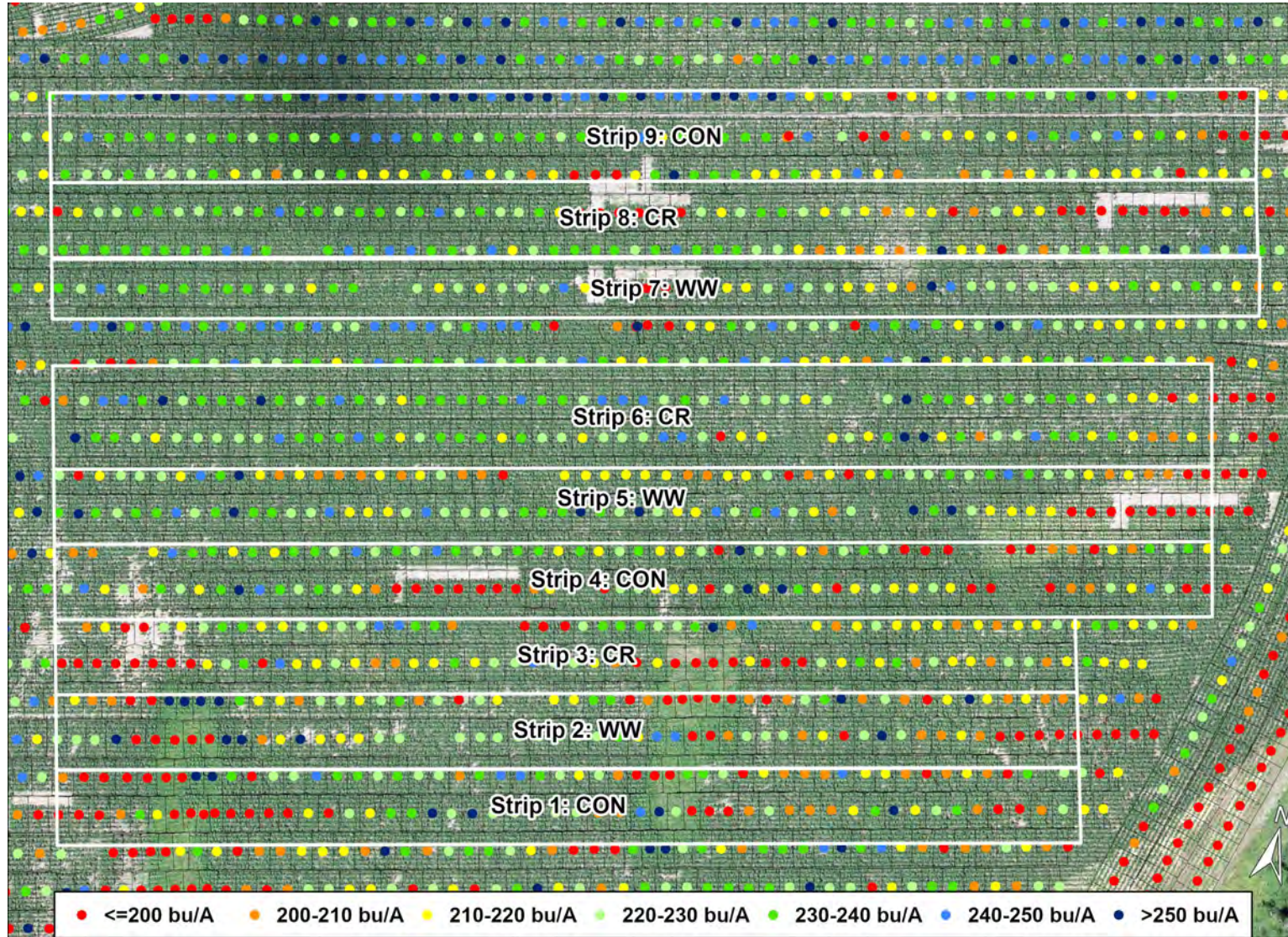


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Cover Crop Comparison

Site 2

Year 5 (2020)
Corn Yield



Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	217 (9)	-
No Cover Control	215 (13)	-
Winter Wheat	219 (4)	4
Cereal Rye	216 (12)	1

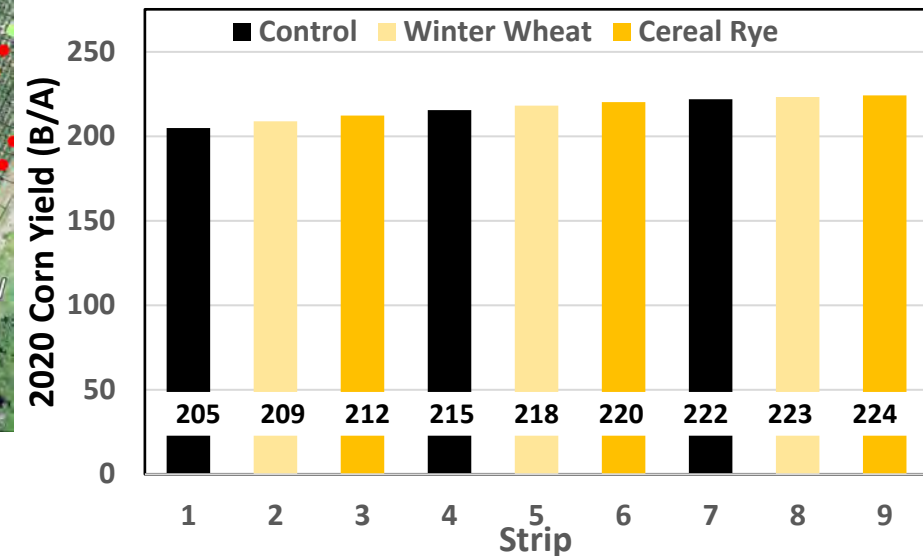


Figure 1. Yield for corn in 2020. Data from passes fully in treatment strips. Imagery from 100 meters on June 24, 2020.

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Cover Crop Comparison

Site 2

Year 6 (2021)
Soybeans Yield

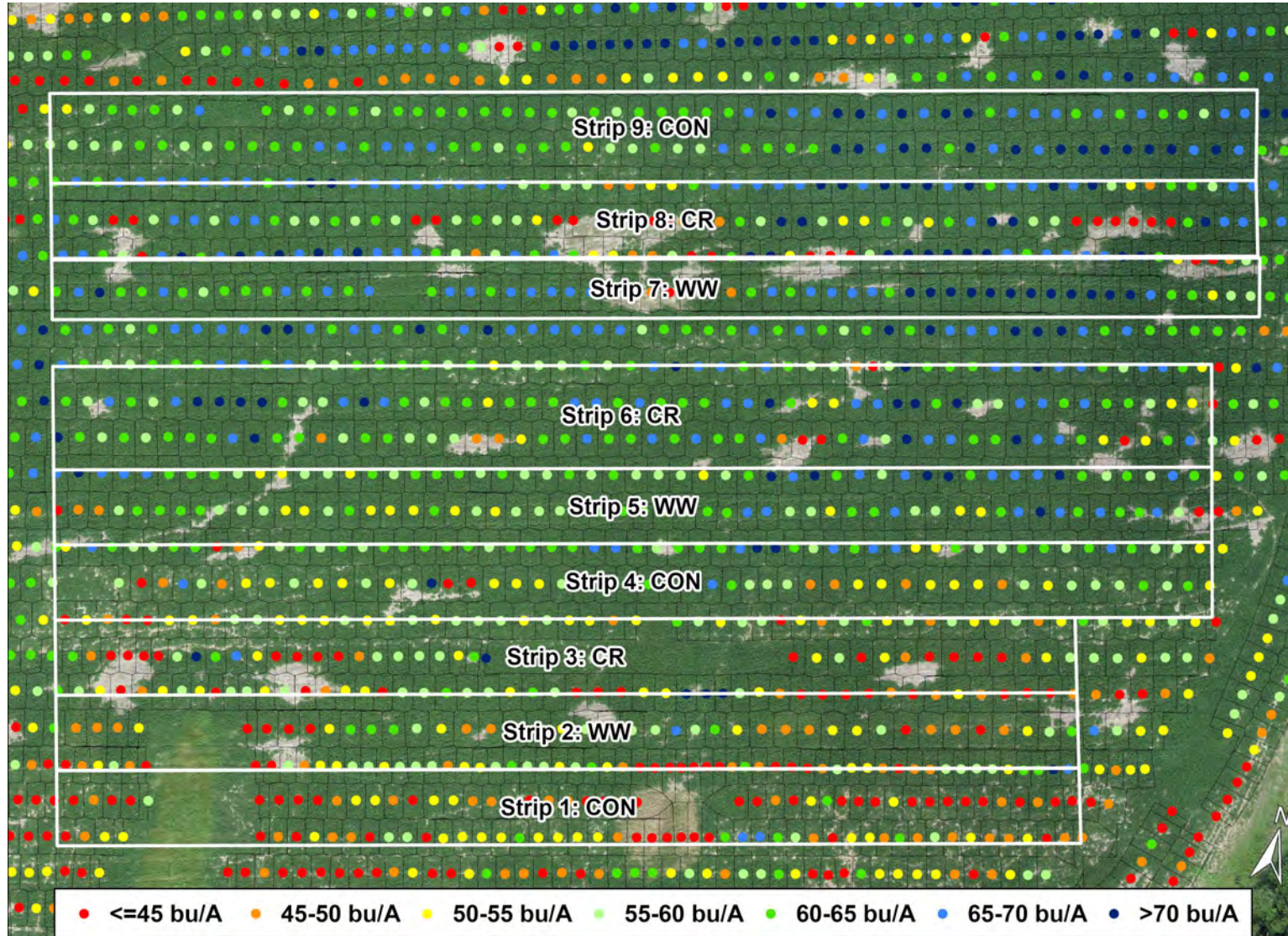
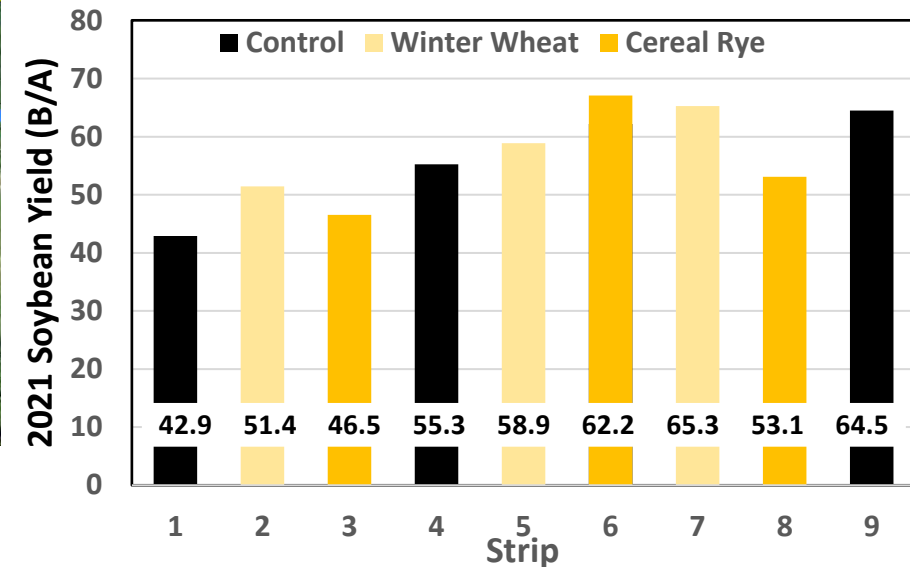


Figure 1. Yield for soybeans in 2021. Data from passes fully in treatment strips. Imagery from 100 meters on August 5, 2021.

Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	55.6 (8)	--
No Cover Control	54.2 (11)	--
Winter Wheat	58.5 (7)	5
Cereal Rye	53.9 (8)	0



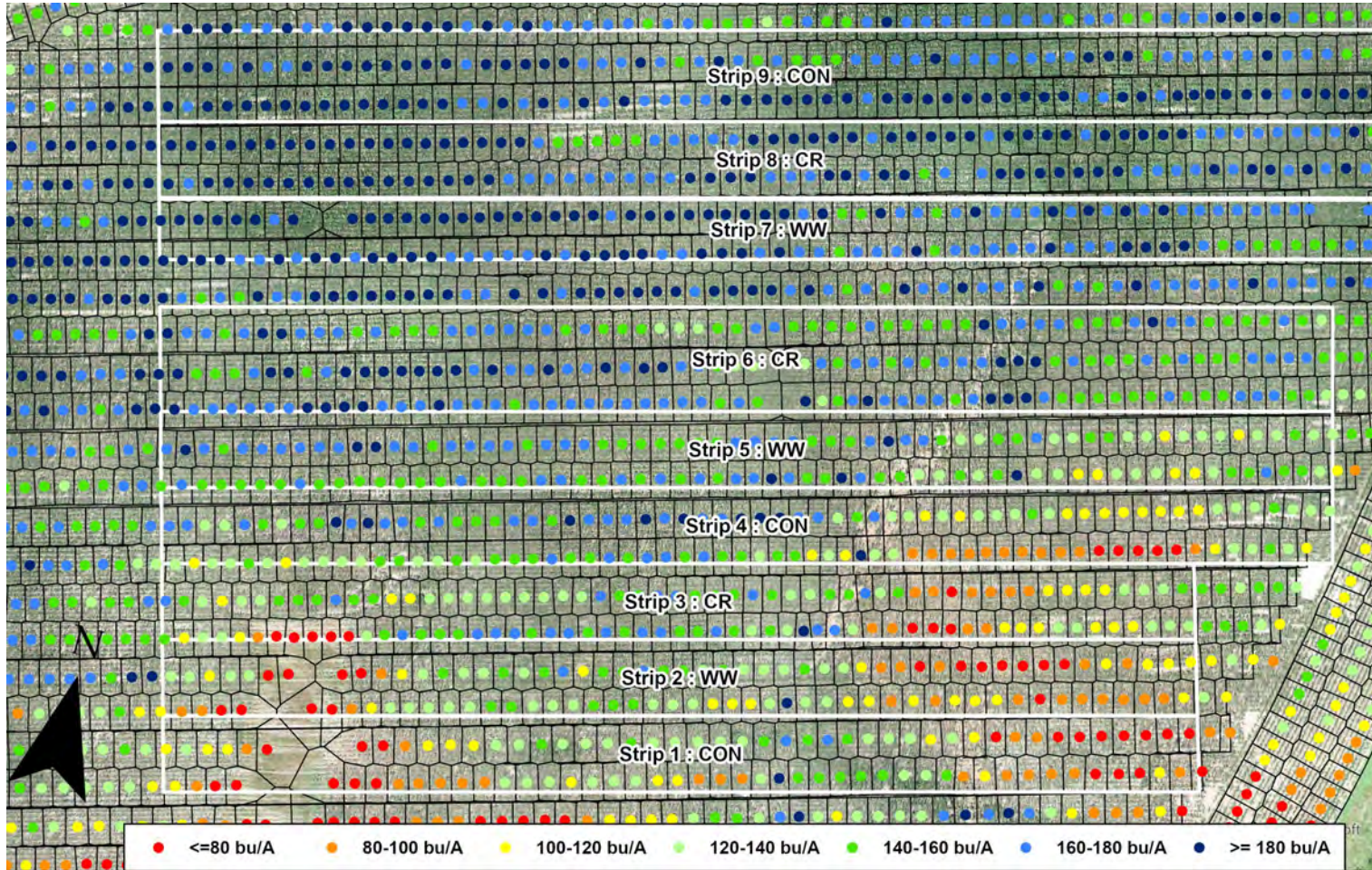
Lincoln County

Cover Crop Comparison

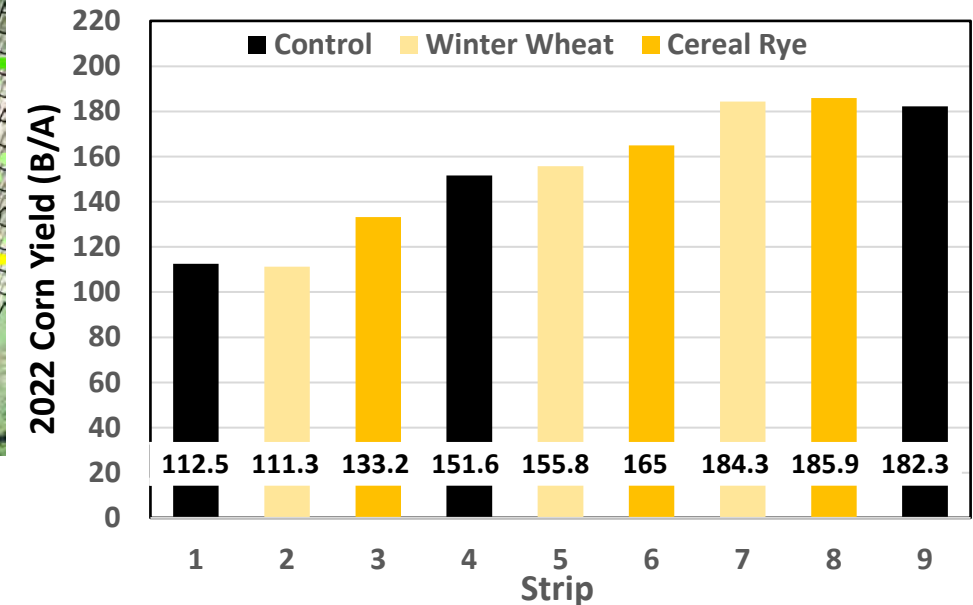
Site 2

Year 7 (2022)

Corn Yield



Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	154 (29)	--
No Cover Control	149 (35)	--
Winter Wheat	150 (37)	2
Cereal Rye	161 (27)	13



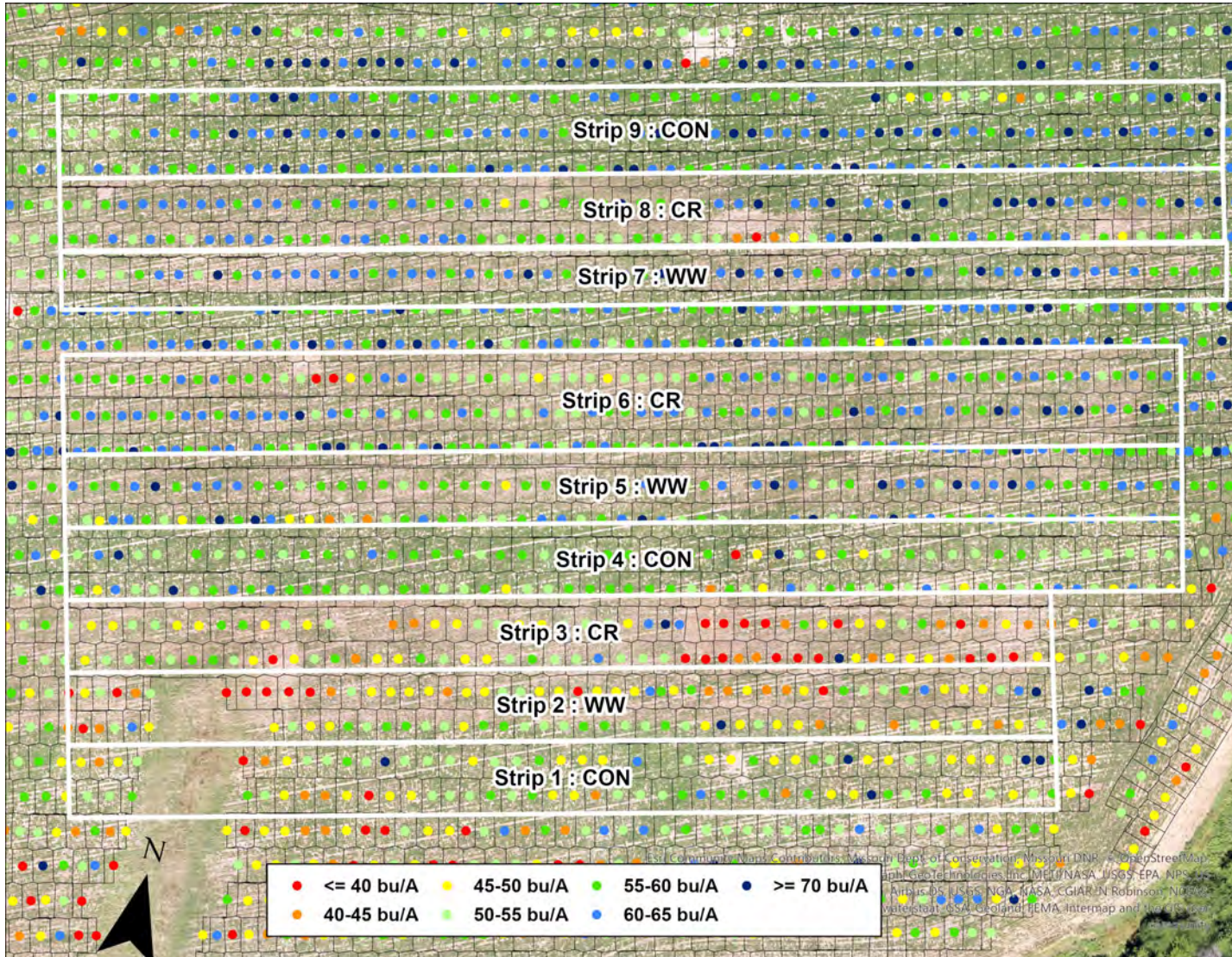
Yield for corn in 2022. Data from passes fully in treatment strips. Imagery from 100 meters on July 11, 2022.

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Cover Crop Comparison

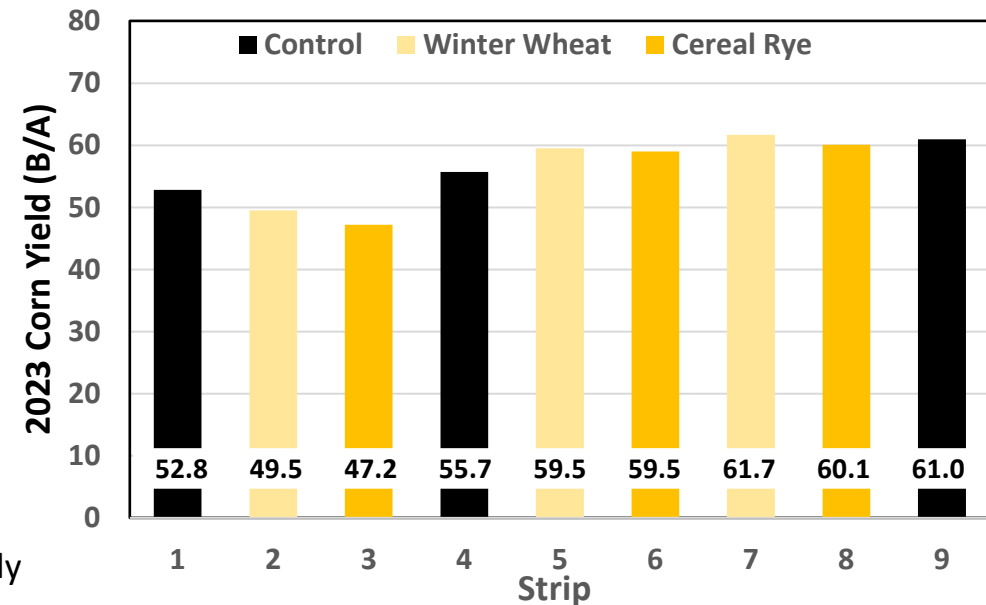
Site 2

Year 8 (2023)
Soybean Yield



Yield for corn in 2023. Data from passes fully in treatment strips. Imagery from 100 meters on July 17, 2023.

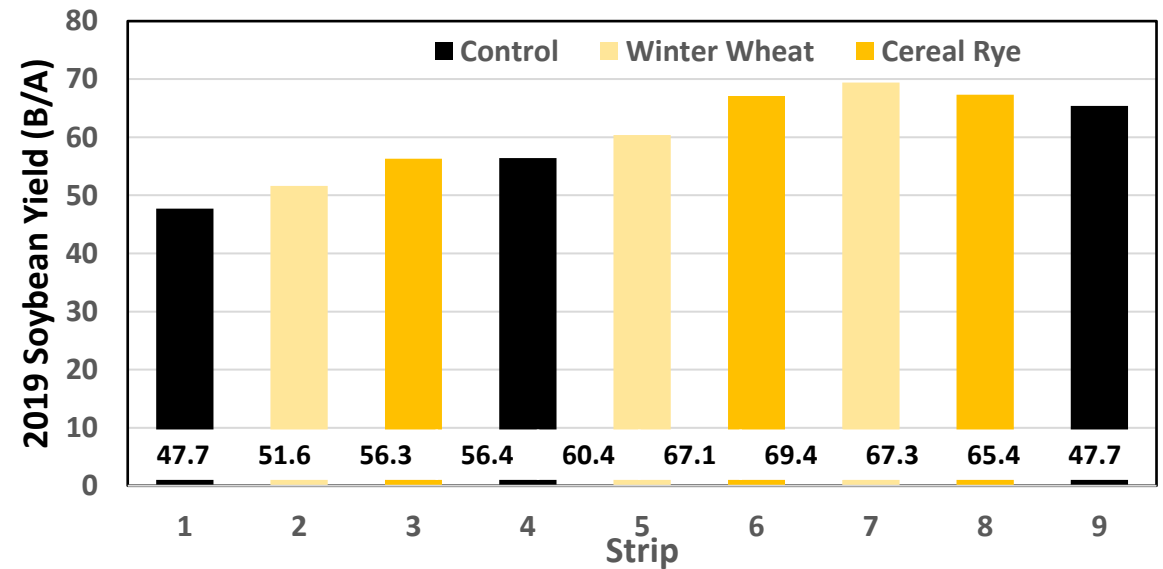
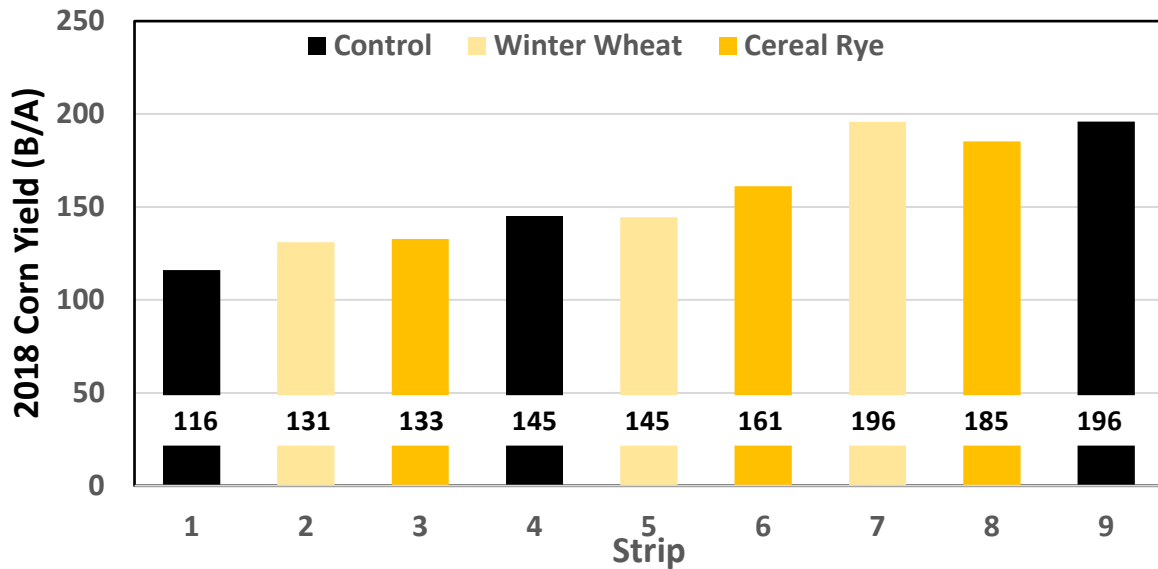
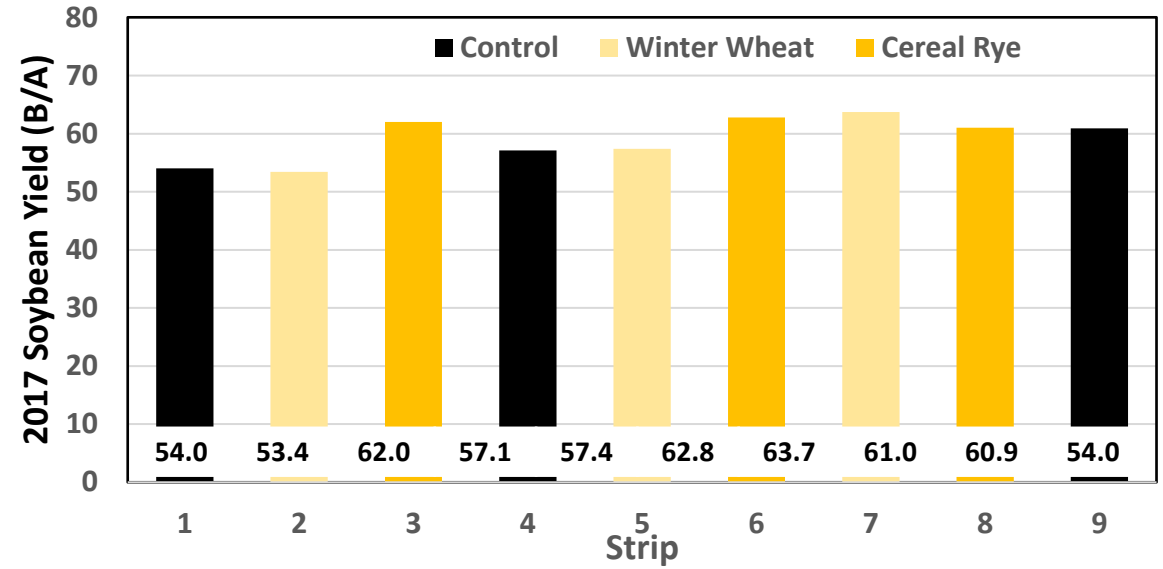
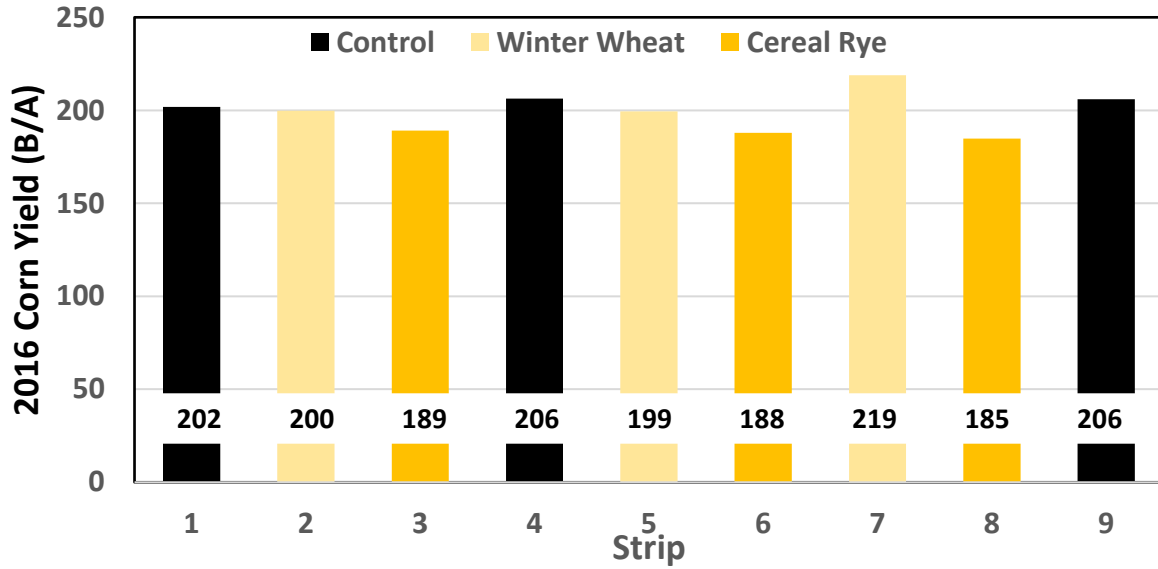
Crop	Site 2	
	Yield (SD)	Delta No Cover
	<i>bushels per acre</i>	
All strips	56.3 (5)	--
No Cover Control	56.5 (4)	--
Winter Wheat	56.9 (7)	0.4
Cereal Rye	55.4 (7)	-1.1

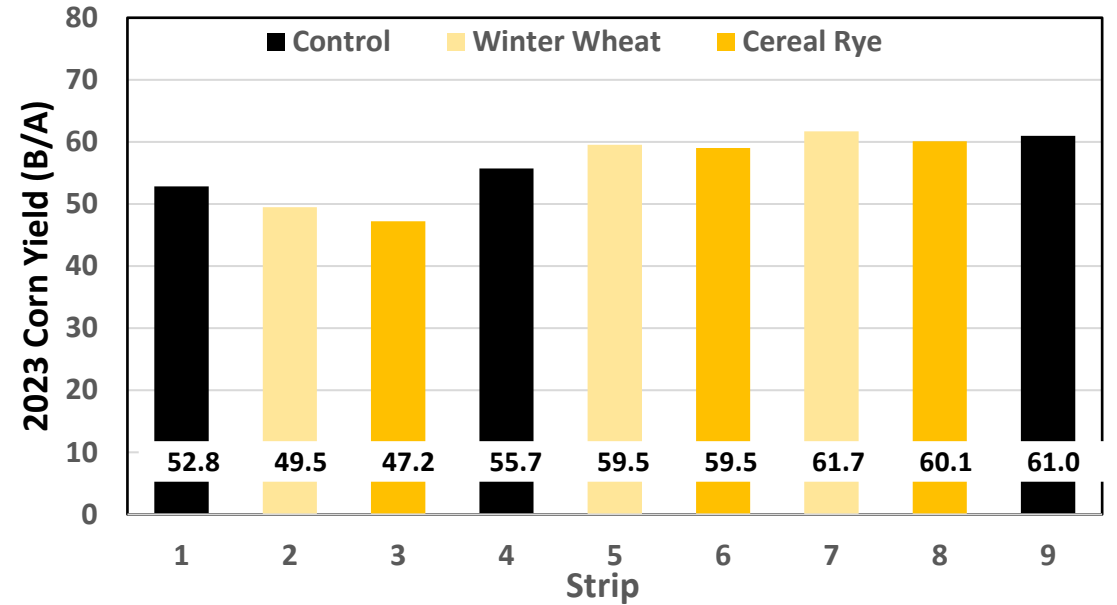
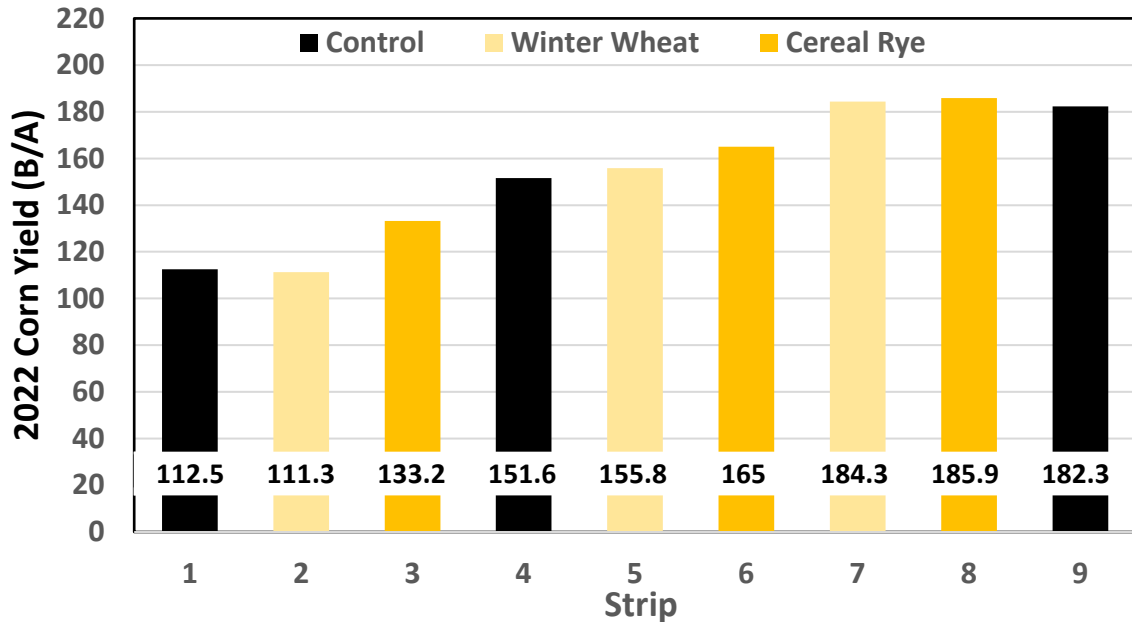
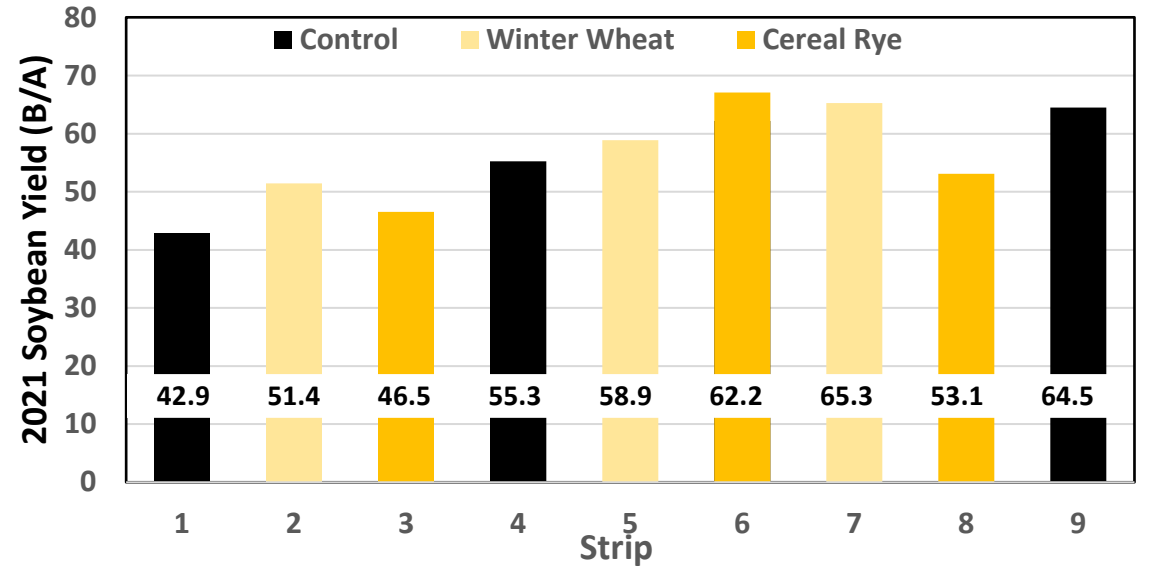
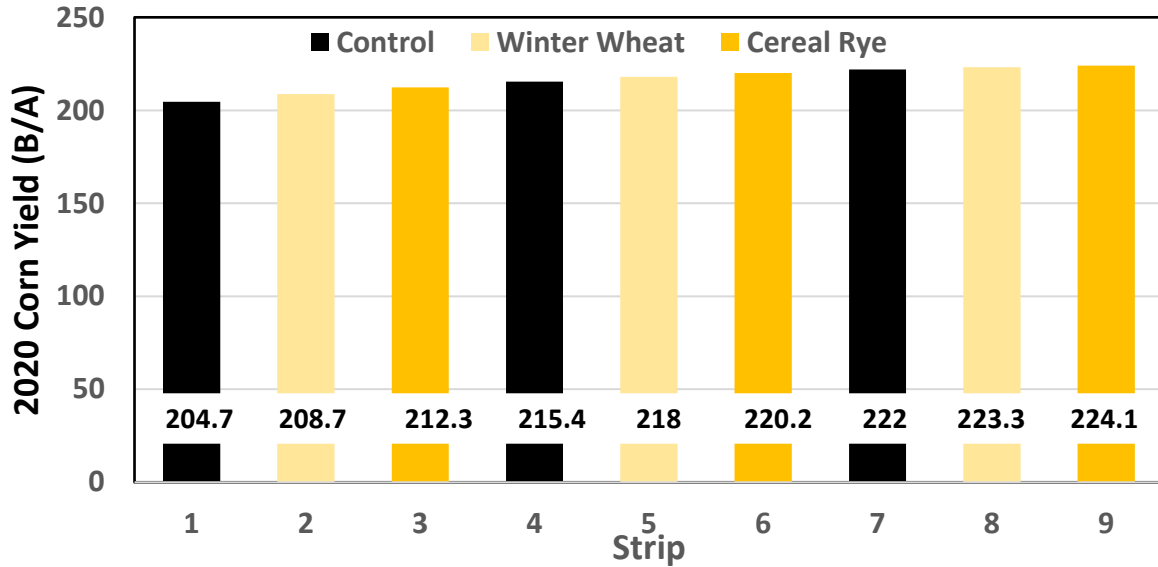


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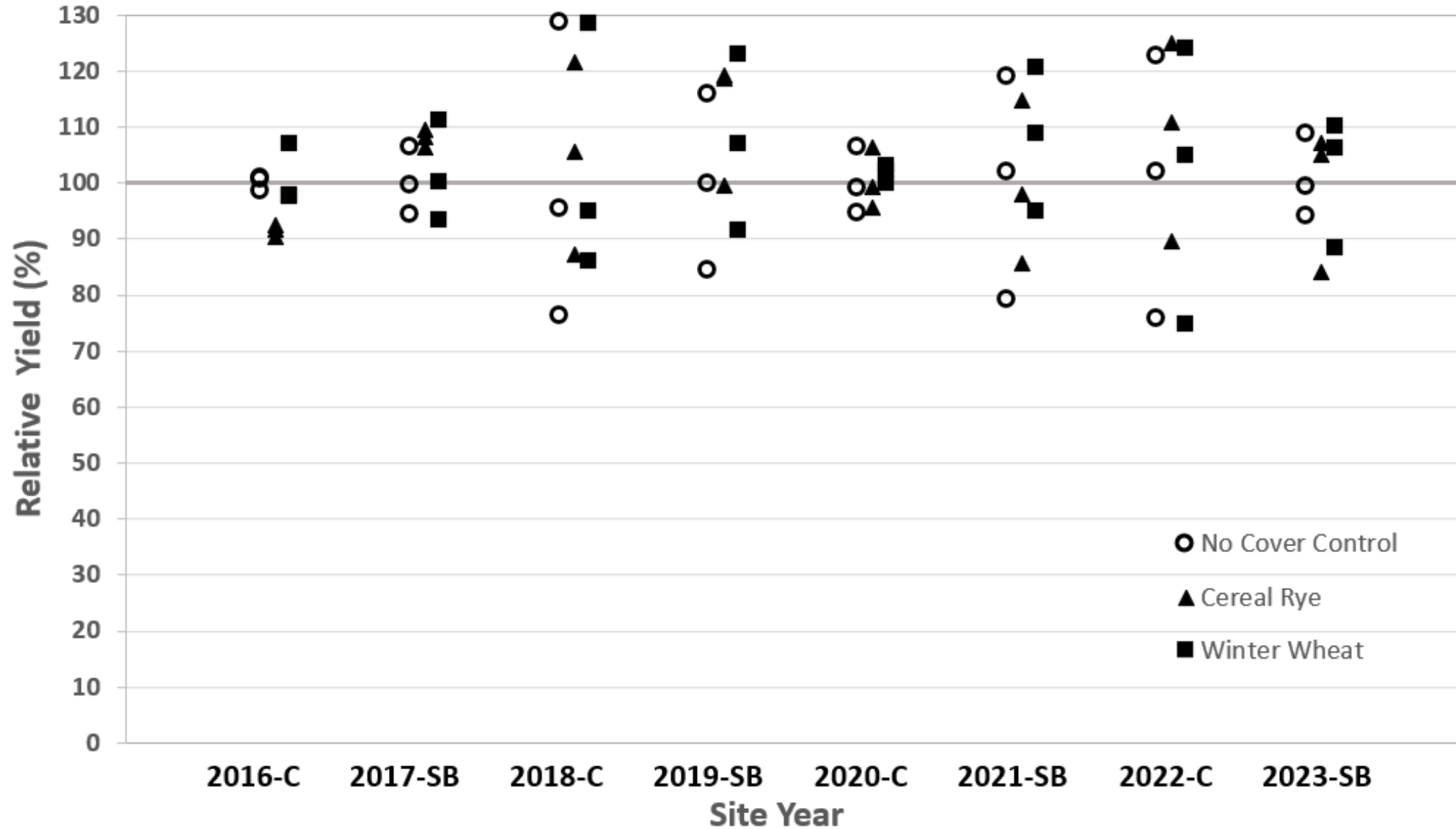
Cover Crop Comparison

Site 2





By-year effect of treatment on relative yield.



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

By Year Summary

		Cereal Rye	Winter Wheat
Crop	Year	Credible Interval	Credible Interval
		<i>bushels per acre</i>	<i>bushels per acre</i>
Corn	1	-15 (-20 to -10)	4 (-3 to 10)
Soybean	2	2 (-3 to 7)	-1 (-8 to 10)
Corn	3	-2 (-8 to 3)	6 (-1 to 12)
Soybean	4	2 (-3 to 7)	2 (-5 to 9)
Corn	5	-3 (-7 to 2)	2 (-5 to 9)
Soybean	6	-4 (-9 to 0.5)	2 (-5 to 4)
Corn	7	-2 (-7 to 3)	-3 (-10 to 5)
Soybean	8	-3 (-8 to 2)	0 (-7 to 8)

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	-5 (-7 to -2)	4	3 (0 to 6)
Soybean	4	-1 (-3 to 2)	4	1 (-2 to 4)
		% Effect on Yield		
Corn	4	-3 (-5 to 0)	4	1 (-1 to 4)
Soybean	4	-2 (-4 to 1)	4	1 (-1 to 4)
All crops	7	-2 (-4 to 0)		1.5 (1 to 4)

Conclusions:

- Results suggest cereal rye hurt corn yield and winter wheat improved corn yield at this site where strip yields were highly variable within each year.
- Cover crops had limited impact on soybean yield when assessed across all years.

CORN	2016		2018		2020		2022		Four-Year Total	
Treatments	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean	Delta Control
	<i>Corn Yield in bushels per acre</i>									
All strips	199 (11)	--	156 (30)	--	217 (9)	--	154 (29)	--	182	--
No Cover Control	205 (3)	--	152 (40)	--	215 (13)	--	149 (35)	--	180	--
Winter Wheat	206 (11)	1	157 (34)	5	219 (4)	4	150 (37)	1	183	3
Cereal Rye	187 (2)	-18	160 (26)	8	216 (12)	1	161 (27)	12	181	1

Soybean	2017		2019		2021		2023		Four-Year Total	
Treatments	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean (SD)	Delta Control	Mean	Delta Control
	<i>Soybean Yield in bushels per acre</i>									
All strips	59 (4)	--	60 (8)	--	56 (8)	--	56 (5)	-	57.8	--
No Cover Control	57 (3)	--	57 (9)	--	54 (11)	--	57 (4)	-	56.1	--
Winter Wheat	58 (5)	1	60 (4)	3	59 (7)	5	57 (7)	0	58.5	2.4
Cereal Rye	62 (1)	5	64 (6)	7	54 (8)	0	55 (4)	-1	58.7	2.6