

## FIELD EXPERIMENT HISTORY

**Title:** Corn - Soybean - Wheat Response to Rotation: Cover Crops  
**Experiment:** 09CSW **Trial ID:** 6525 **Year:** 2021  
**Personnel:** Joe Lauer, Thierno Diallo, Kent Kohn  
**Location:** Arlington, WI **County:** Columbia  
**Supported By:** HATCH

### Site Information

**Field:** 335 **Previous Crop:** See factors **Soil Type:** Plano Silt  
**Soil Test: Date:** 11/12/18 **pH** 7 **OM (%)** 2.9 **P (ppm)** 20 **K (ppm)** 134

### Plot Management

#### **Tillage Operations:**

<b>Fertilizer:</b>	<b>Preplant :</b>	<b>Analysis:</b>	<b>Rate lbs/A:</b>	<b>Date:</b>
		N/A	N/A	N/A
	<b>Starter :</b>	N/A	N/A	N/A
	<b>Post plant :</b>	C: 32-0-0 W: 46-0-0 N/A	C: 593 S: 0 lb/A W: 163 lb/A	6//14/21  4/05/20
	<b>Manure:</b>		N/A	N/A
<b>Herbicide:</b>	C,S: Durango DMA @ 32oz/a 4/22/21 2, 4-D LVA 4 @18 oz/a 4/22/21 Mocassin II Plus 24.0 oz/a 4/22/21 Durango DMA @ 36oz/a 6/9/21 w: Powerflex 2 oz/A 5/15/18 MPC Amine 8 oz/A 5/15/18		<b>Hybrid:</b> C: Dekalb DKC51-98RIB S: .NK S14-U9X W: Growmark FS 624	
<b>Planting Date:</b>	C: 5/14/21 S: 5/12/21 W: 09/25 & 10/10/20	<b>Planting Depth:</b> C: 1.5" S,W: 1"	<b>Planting Method:</b>	C,S: JD1700 with RTK W: JD750 No-Till Drill
<b>Target Plant Density:</b>	35000		<b>Harvest Method:</b>	C:MF 8XP combine
<b>Harvest Date:</b>	C: 10/16/21, CS: 9/20/21 S: 10/28/21, W: 7/21/21		<b>Row Width:</b> C,S: 30" W: 0.5"	CS: NH 707 S,W: Almaco Plot combine
			<b>Fungicide:</b>	N/A
<b>Notes:</b>	2020 Even out year, no cover crop or N treatment. Rotation and Density for corn.			

### Experimental Design

**Design:** RCB split-split-block **Replications:** 3  
**Plot Size Seeded:** MP: 60' x 60'; SP: 10' x 30'  
**Harvest Plot Size:** 5' x 26 **Experiment Size:** 3.47 A  
**Factors/Treatments:**

<b><u>Rotation:</u></b>	<b><u>Plant Density:</u></b>
1) CC	1) 25000 ppa
2) SS	2) 30000 ppa
3) WW	3) 35000 ppa
4) CS-C	4) 40000 ppa
5) CS-S	5) 45000 ppa
6) GS1: CSW-C	6) 50000 ppa
7) GS1: CSW-S(e)	
8) GS1: CSW-W	
9) GS2: CWS-C(e)	
10) GS2: CWS-W	
11) GS2: CWS-S	
12) Flex: CWS-C(s)	
13) Flex: CWS-W(s)	
14) Flex: CWS-S	

**Results: Tables 2109-09 to 2109-12**

**Table: 2109 - 09 . Corn, Soybean and Wheat Rotation - Corn  
Arlington, WI - 2021.**

Rotation	Density	Yield bu/A	Moisture %	Test weight lbs/bu	Lodged			Harvest plants plants/A	AGI \$5.22/bu \$/A
					Total %	Stalk %	Root %		
CC-C		202	27.6	52.1	0.9	0.6	0.3	33722	958
CSW-C		243	25.0	53.2	0.4	0.4	0.0	35194	1165
CWS-C(e)		216	23.0	53.9	1.6	1.6	0.0	35250	1043
SC-C		221	22.9	54.1	1.0	1.0	0.0	33861	1071
	25K	205	24.8	53.4	1.8	1.8	0.0	23875	987
	30K	215	25.3	53.3	0.8	0.5	0.3	28542	1029
	35K	218	24.6	52.9	0.2	0.2	0.0	32250	1050
	40K	233	23.9	53.6	1.2	1.2	0.0	36833	1121
	45K	224	24.6	53.1	1.1	1.1	0.0	41458	1079
	50K	227	24.5	53.6	0.9	0.8	0.1	44083	1090
CC-C	25K	192	28.5	51.7	0.8	0.8	0.0	22167	907
CC-C	30K	195	27.0	52.6	2.6	1.3	1.3	27833	927
CC-C	35K	205	28.5	51.3	0.0	0.0	0.0	32000	967
CC-C	40K	211	26.9	52.1	0.5	0.5	0.0	35167	1003
CC-C	45K	198	27.3	52.4	1.1	1.1	0.0	43000	942
CC-C	50K	211	27.4	52.4	0.4	0.0	0.4	42167	1004
CSW-C	25K	221	25.4	53.2	0.0	0.0	0.0	24500	1061
CSW-C	30K	236	25.5	53.3	0.0	0.0	0.0	30500	1129
CSW-C	35K	238	24.1	53.6	0.0	0.0	0.0	31833	1147
CSW-C	40K	256	24.6	52.7	0.5	0.5	0.0	38500	1232
CSW-C	45K	250	25.1	53.7	0.4	0.4	0.0	40833	1199
CSW-C	50K	255	25.0	52.7	1.8	1.8	0.0	45000	1223
CWS-C(e)	25K	204	22.5	54.2	5.9	5.9	0.0	25333	988
CWS-C(e)	30K	208	24.5	53.0	0.5	0.5	0.0	29667	1000
CWS-C(e)	35K	214	22.6	53.5	0.5	0.5	0.0	33167	1038
CWS-C(e)	40K	241	21.8	55.0	0.9	0.9	0.0	37500	1169
CWS-C(e)	45K	227	23.7	53.3	1.2	1.2	0.0	43000	1095
CWS-C(e)	50K	200	23.0	54.7	0.8	0.8	0.0	42833	967
SC-C	25K	204	22.6	54.6	0.6	0.6	0.0	23500	991
SC-C	30K	220	24.1	54.2	0.0	0.0	0.0	26167	1058
SC-C	35K	217	23.3	53.3	0.5	0.5	0.0	32000	1047
SC-C	40K	223	22.4	54.6	2.8	2.8	0.0	36167	1080
SC-C	45K	223	22.2	53.2	1.7	1.7	0.0	39000	1081
SC-C	50K	241	22.8	54.5	0.7	0.7	0.0	46333	1169

continue

**Table: 2109 - 09 : Corn, Soybean and Wheat Rotation - Corn****(continued) Arlington, WI - 2120.**

	Yield bu/A	Moisture %	Test weight lbs/bu	Lodged			Harvest plants plants/A	AGI \$5.22/bu \$/A
				Total %	Stalk %	Root %		
Mean	220	24.6	53.3	1.0	0.9	0.1	34507	1059
<b><u>Probability(%)</u></b>								
Rotation (R)	46.6	0.1	0.6	76.4	69.2	30.4	8.3	43.6
Density (D)	0.0	12.6	64.3	38.7	25.8	48.6	0.0	0.0
R x D	4.4	29.8	51.5	2.7	5.0	56.9	1.9	6.3
<b><u>LSD(0.10)</u></b>								
Rotation (R)	NS	1	1	NS	NS	NS	1193	NS
Density (D)	8	NS	NS	NS	NS	NS	1247	40
R x D	37	NS	NS	3	3	NS	2494	181

AGI\*: Adjusted Gross Income.

**Table: 2109-10. Corn, Soybean and Wheat Rotation - Corn Silage  
Arlington, WI 2021**

Density	Dry Matter		Kernel milk	Crude protein	Whole Plant					Milk per		Plant population plants/A
	Yield	Moisture			ADF	<i>In Vitro</i>		Starch	Ton	Acre		
	tons/A	%	%	%	%	%	%	%	%	lbs/T	lbs/T	
25K	9.2	49.1	8.7	6.6	16.3	32.7	86.5	58.85	37.8	3186	29205	24970
30K	10.4	45.3	5.0	6.6	16.2	32.9	86.8	60.1	37.0	3143	32578	29000
35K	9.4	47.1	5.0	6.4	16.8	33.7	86.3	59.2	36.7	3133	29559	36833
40K	10.3	45.6	4.2	6.5	16.3	32.8	86.6	59.6	38.2	3207	32955	35667
45K	11.0	44.9	3.3	6.7	15.3	31.6	87.5	60.3	38.7	3214	35406	42667
50K	10.3	44.6	5.0	6.4	16.4	33.5	86.4	59.6	37.3	3167	32824	40833
Mean	10.1	46.1	5.2	6.6	16.2	32.9	86.7	59.6	37.6	3175	32088	34995
<b>Probability(%)</b>												
Density(D)	1.2	9.8	66.7	58.8	95.5	92.7	95.1	93.1	96.9	96.9	4.3	0.0
<b>LSD(0.10)</b>												
Density(D)	0.8	2.7	NS	NS	NS	NS	NS	NS	NS	NS	3392.7	4305

**Table: 2109 - 11 . Corn, Soybean and Wheat Rotation - Soybean  
Arlington, WI - 2021.**

Rotation	Yield bu/A	Moisture %	AGI \$11.93/bu \$/A
CS-S	59.5	13.3	696
CSW-S(e)	54.4	13.6	636
CWS(L)-S	67.2	13.3	786
CWS-S	62.7	13.1	734
SS-S	53.9	13.4	629
Mean	59.5	13.3	696
<b><u>Probability(%)</u></b>			
Rotation (R)	0.2	11.4	0.2
<b><u>LSD(0.10)</u></b>			
Rotation (R)	4.5	NS	52

AGI\*: Adjusted Gross Income.

**Table: 2109 - 12 . Corn, Soybean and Wheat Rotation -Wheat.  
Arlington, WI - 2021.**

Rotation	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$7.06/bu \$/A
CSW-W	96	16.6	54.4	646
CWS(L)-W(s)	84	16.9	55.5	568
CWS-W	71	16.6	56.4	479
WW-W	--	--	--	--
Mean	83	16.7	55.4	565
<b><u>Probability(%)</u></b>				
Rotation (R)	7.0	7.1	2.4	7.0
<b><u>LSD(0.10)</u></b>				
Rotation (R)	16	0	1	107

AGI\*: Adjusted Gross Income.

-- No wheat to harvest from the continuous wheat plots.

## FIELD EXPERIMENT HISTORY

**Title:** Corn - Soybean - Wheat Response to Rotation  
**Experiment:** 09CSW **Trial ID:** 6524 **Year:** 2021  
**Personnel:** Joe Lauer, Thierno Diallo, Kent Kohn, Jason Cavadini  
**Location:** Marshfield, WI **County:** Marathon  
**Supported By:** HATCH

### Site Information

**Field:** 405 **Previous Crop:** See factors **Soil Type:** Withee Silt  
**Soil Test: Date:** 20/19/ **pH** 7.2 **OM (%)** 3.1 **P (ppm)** 54 **K (ppm)** 126

### Plot Management

#### **Tillage Operations:**

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
<b>Fertilizer:</b>			
<b>Preplant :</b>	C,S:9-23-30	170 lbs	5/13/21
<b>Starter :</b>		150 lbs	
<b>Post plant :</b>	C: 29-0-0	40 gal	6/16/21
	W: 0-0-60	150 lbs	5/13/21
	W: 46-0-0	300 lbs	4/26/21
<b>Manure:</b>	N/A	N/A	N/A
<b>Herbicide:</b>	C pre: Verdict 16 oz, C pre: Roundup Pmax 32 oz S post: Roundup Pmax 32 oz W: pre Roundup Pmax 32 oz	<b>Hybrid:</b> C: Legand LNG 9085 S: Stine 12EB32 W: (SRW) PIP 721	
<b>Planting Date:</b>	C: 5/13/21 S: 5/13/21 W: 10/8/20	<b>Planting Depth:</b> C: 1.5" S,W: 1"	<b>Planting Method:</b> C: JD 1750 planter S,W: Great Plains 1206 Nt drill
<b>Target Plant Density:</b>	35000	<b>Harvest Method:</b> CS: Hand Harvest	C,S,W: Almaco plot combine
<b>Harvest Date:</b>	C: 11/4/21, CS: 9/15/21 S: 10/20/21, W: 8/5/21	<b>Row Width:</b> C: 30" S: 15" W: 7.5"	<b>Fungicide:</b> N/A

#### **Notes:**

### Experimental Design

**Design:** RCB split-split-block **Replications:** 3  
**Plot Size Seeded:** 60' x 60'  
**Harvest Plot Size:** C: 60' x 5'; S,W: 60' x 5'; CS: 10' x 2.5' **Experiment Size:** 3.09 A  
**Factors/Treatments:**

#### Rotation: 2021 Treatments

- 1) CC
- 2) SS
- 3) WW
- 4) CS- C
- 5) SC- S
- 6) GS1: CSW- C
- 7) GS1: CSW- S (early)
- 8) GS1: CSW- W
- 9) GS2: CWS- C (early)
- 10) GS2: CWS- S
- 11) GS2: CWS- W
- 12) Flex: CWS- C (silage)
- 13) Flex: CWS- S
- 14) Flex: CWS- W (straw)

**Results: Tables 2109-13 to 2109-16**

**Table: 2109-13 Corn, Soybean, and Wheat Rotation- Corn  
Marshfield, WI - 2021.**

Rotation	Yield bu/A	Moisture %	Test Weight in.	Harvest Population ppa	Stalk Lodging %	AGI \$5.22/bu \$/A
Continuous	178	22.3	52.6	30,879	9.3	865
Alternating	197	24.2	52.9	33,138	8.9	951
Grain System I	167	22.7	52.7	28,975	6.8	809
Mean	181	23.1	52.8	30,998	8.4	875
<u>Probability (%)</u>						
Treatment	60.4	12.1	27.3	44.7	90.4	62.6
<u>LSD 10%</u>						
Treatment	NS	NS	NS	NS	NS	NS



**Table:2109 - 14. Corn, Soybean, and Wheat Rotation- Corn Silage  
Marshfield, WI - 2021.**

Rotation	Yield tn dm/A	Moisture %	Kernel milk %	Harvest Population ppa	CP %	ADF %	NDF %	NDFD %	TDN %	NFC %	Starch %	Milk per	
												Ton lb	Acre lb
Continuous	7.76	66.2	50	32,525	6.1	27.2	46.8	56.6	68.8	43.9	33.1	3,109	23,274
Alternating	8.01	68.4	50	33,493	6.1	26.8	46.3	56.0	69.1	44.5	32.4	3,119	23,984
Grain System I	7.12	66.4	50	31,750	5.3	26.5	51.4	58.9	69.3	45.1	35.7	3,219	22,938
Mean	7.6	67.0	50	32,589	5.8	26.9	48.2	57.2	69.0	44.5	33.7	3,149	23,399
<u>Probability (%)</u>													
Treatment	37.5	18.8	-	13.6	4.3	79.7	8.0	0.8	79.8	50.7	8.7	1.1	83.9
<u>LSD 10%</u>													
Treatment	NS	NS	-	NS	1	NS	4	1	NS	NS	3	59	NS

**Table: 2109 - 15 . Corn, Soybean and Wheat Rotation -Soybean  
Marshfield, WI - 2021.**

Rotation	Yield bu/A	Moisture %	Test Weight lb/bu	AGI \$11.93/bu \$/A
Continuous	40	11.9	57.6	464
Alternating	46	10.8	58.1	537
Grain System I	53	11.1	58.0	615
Mean	46	11.3	57.9	539
<u>Probability (%)</u>				
Treatment <u>LSD 10%</u>	23.3	1.6	35.1	23.3
Treatment	NS	0.5	NS	NS

AGI\*: Adjusted Gross Income.

**Table: 2109 - 16 . Corn, Soybean and Wheat Rotation -Wheat.  
Marshfield, WI - 2021.**

Rotation	Yield bu/A	Moisture %	Test Weight lb/bu	Height in.	Lodging 1 to 5	AGI \$7.06/bu \$/A
Continuous	36	13.0	55.3	31	1.0	249
Grain System I	50	12.7	54.6	30	1.0	342
Mean	43	12.8	55.0	30	1.0	296
<u>Probability (%)</u>						
Treatment	26.0	15.7	57.0	64.4	-	26.0
<u>LSD 10%</u>						
Treatment	NS	NS	NS	NS	-	NS

AGI\*: Adjusted Gross Income.