

**FIELD EXPERIMENT HISTORY**

**Title:** Crop Rotation Response to Nrate  
**Experiment:** 09ACOSW **Trial ID:** 6527 **Year:** 2021  
**Personnel:** Carrie Laboski, Joe Lauer, Thierno Diallo  
**Location:** Lancaster, WI **County:** Grant  
**Supported By:** HATCH

**Site Information**

**Field:** 300 B **Previous Crop:** See factors **Soil Type:** Fayette silt loam  
**Soil Test: Date:** N/A **pH:** 6.8 **OM (%)** 2.3 **P (ppm)** 18 **K (ppm)** 124

**Plot Management**

**Tillage Operations:** C: Fall chisel

<b>Fertilizer:</b>	<b>Analysis:</b>	<b>Product Rate lbs/A:</b>	<b>Date:</b>
<b>Preplant :</b>	S,O,W :0-17.7-37	354	4 /2 /21
<b>Starter :</b>	C: 9-23-30	195	4/27/21
<b>Post plant :</b>	C: 34-0-0	See rates	5/25/21
	W: 34-0-0	30	4/2/2021
	A:0-6.8-39.1-2.9S-0.4B	400	6/10, 8/9/21
<b>Manure:</b>	N/A	N/A	N/A

**Herbicide:** C: Powermax 21 oz/a 5/13/21  
 Resicore 1.25 qt/ac 5/13/21  
 Halex GT 3.6 pt/a 6/11/21  
 A: Raptor 5 oz/a 6/10/21  
 S: Warrant Ult 55 oz/a 6/3/21  
 powermax 32 oz/a 6/3/21  
 Select Max 9 oz/a 7/2/21  
 Sequence 3 pt/a 7/2/21

**Planting Depth:** C:1.5" **Hybrid:** C:LC5319SSX  
**Row Width:** C:30" S:15" S: P24A80X  
 O/A/W: 7.5" W:Pioneer 25r74  
 A: Croplan Rebound 6.0  
 O: Antigo

**Planting Date:** C: 4/27/21 W: 10/14/20  
 S: 5/14/21 A: 4/6/21  
 O: 4/6/21

**Planting Method:** White6100 No till planter

**Target Plant Density:** Corn: 32500 Plants/A  
 Soybean: 150000 Plants/A

**Harvest Method:** C: MF 8XP Combine.

**Harvest Date:** C:11/1/21 S: 10/19/21  
 O: 7/27/21 W: 7/27/21  
 A: 6/1; 7/2. 8/3; 9/2/21

**Fungicide:** N/A

**Notes:** Lime (50-59) @ 2.4T/A on 4/21/17

**Experimental Design**

**Design:** RCB split-split-plot **Replications:** 2  
**Plot Size Seeded:** MP: 30' x 70' **Experiment Size:** 2.7 A  
**Harvest Plot Size:** 5' x 25'

**Factors/Treatments:**

<b>Rotation</b>	<b>Corn N-rate (lbs/A)</b>
1) CC	1) 0
2) CSCOA-2C	2) 50
3) CSCOA-10	3) 100
4) CSCOA-1A	4) 200
5) CSCOA-1C	
6) CSCOA-1S	
7) CCCAA-3C	
8) CCCAA-1A	
9) CCCAA-1C	
10) CCCAA-2A	
11) CCCAA-2C	
12) CCOAA-1O	
13) CCOAA-1A	
14) CCOAA-2A	
15) CCOAA-1C	
16) CCOAA-2C	
17) CSW-1W	
18) CSW-1S	
19) CS-1S	
20) CSW-1C	
21) CS-1C	

**Results: Tables 2109-17 to 2109-21**

**Table:2109-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn  
Lancaster, WI - 2021.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$5.22/bu \$/A
CC-C		146	17.6	58.8	720
CCCMM-C1		239	17.6	60.0	1182
CCCMM-C2		181	17.5	58.6	896
CCCMM-C3		172	17.9	59.1	850
CCOMM-C1		237	17.6	59.7	1175
CCOMM-C2		190	18.1	58.9	939
CSb-C		206	17.8	59.2	1017
CSbCOM-C1		237	17.8	59.8	1172
CSbCOM-C2		219	17.7	59.5	1083
CSbW-C		186	17.2	58.5	919
	0	152	16.9	58.1	753
	50	198	17.5	59.3	979
	100	219	17.9	59.6	1082
	200	237	18.4	59.8	1168
CC-C	0	82	16.9	58.3	409
CC-C	50	129	17.7	58.7	638
CC-C	100	159	18.1	59.6	786
CC-C	200	211	17.9	58.7	1045
CCCMM-C1	0	213	17.3	59.6	1053
CCCMM-C1	50	238	17.5	60.1	1179
CCCMM-C1	100	254	17.7	60.1	1256
CCCMM-C1	200	251	18.1	60.1	1239
CCCMM-C2	0	128	15.5	55.6	636
CCCMM-C2	50	155	17.7	59.2	765
CCCMM-C2	100	214	18.3	59.6	1055
CCCMM-C2	200	229	18.7	59.8	1128
CCCMM-C3	0	108	17.6	58.6	537
CCCMM-C3	50	190	18.0	59.3	937
CCCMM-C3	100	182	17.7	58.9	899
CCCMM-C3	200	208	18.5	59.7	1026
CCOMM-C1	0	209	17.0	59.1	1037
CCOMM-C1	50	241	17.8	59.8	1194
CCOMM-C1	100	251	17.6	60.0	1245
CCOMM-C1	200	248	18.3	59.9	1224

continue

**Table:2109-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn**

(continued)

**Lancaster, WI - 2021**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$5.22/bu \$/A
CCOMM-C2	0	132	17.2	57.1	656
CCOMM-C2	50	189	17.7	59.3	936
CCOMM-C2	100	209	18.2	59.2	1034
CCOMM-C2	200	230	19.4	60.2	1130
CS-C	0	158	17.0	58.1	781
CS-C	50	201	17.4	58.9	995
CS-C	100	232	18.3	59.9	1143
CS-C	200	233	18.6	59.9	1149
CSCOM-C1	0	211	17.1	59.3	1045
CSCOM-C1	50	241	17.7	60.0	1191
CSCOM-C1	100	250	18.1	60.0	1234
CSCOM-C1	200	247	18.3	59.9	1218
CSCOM-C2	0	165	16.9	58.3	821
CSCOM-C2	50	216	17.5	59.6	1072
CSCOM-C2	100	241	17.7	60.0	1190
CSCOM-C2	200	253	18.5	60.1	1247
CSW-C	0	111	16.7	57.3	549
CSW-C	50	178	16.4	57.9	883
CSW-C	100	197	17.8	59.2	974
CSW-C	200	257	18.1	59.4	1270
Mean		201	17.7	59.2	995
<b>Probability(%)</b>					
Rotation (R)		0.0	90.7	2.7	0.0
Nitrogen (N)		0.0	0.0	0.0	0.0
R x N		2.1	74.6	18.4	1.8
<b>LSD (0.10)</b>					
Rotation (R)		19	NS	0.7	97
Nitrogen (N)		9	0.4	0.4	45
R x N		31	NS	NS	153

\*AGI: Adjusted Gross Income

**Table:2109-18. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Soybean  
Lancaster, WI - 2021.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$11.93/bu \$/A
CS-S		53	9.9	785
CSCOM-S		57	9.8	792
CSW-S		57	9.6	805
	0	55	9.9	820
	50	55	9.8	814
	100	56	9.8	807
	200	56	9.6	736
			0.0	
CS-S	0	51	10.2	824
CS-S	50	50	10.0	812
CS-S	100	55	9.8	794
CS-S	200	54	9.7	712
CSCOM-S	0	57	9.8	789
CSCOM-S	50	56	9.8	779
CSCOM-S	100	57	10.0	816
CSCOM-S	200	56	9.6	783
CSW-S	0	58	9.8	846
CSW-S	50	59	9.6	852
CSW-S	100	55	9.7	810
CSW-S	200	57	9.4	713
			0.0	
Mean		56	9.8	794
<b><u>Probability(%)</u></b>				
Rotation (R)		81	28.5	81
Nitrogen (N)		11	51.1	11
R x N		67	74.5	67
<b><u>LSD (0.10)</u></b>				
Rotation (R)		NS	NS	NS
Nitrogen (N)		NS	NS	NS
R x N		NS	NS	NS

\*AGI: Adjusted Gross Income

**Table:2109-19. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Wheat.  
Lancaster, WI - 2021.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$7.06/bu \$/A
CSW-W	0	28	13.9	193
CSW-W	50	51	13.9	346
CSW-W	100	42	13.9	288
CSW-W	200	49	13.9	338
Mean		43	13.9	291
<b><u>Probability(%)</u></b>				
Nitrogen (N)		21.6	-	21.6
<b><u>LSD (0.10)</u></b>				
Nitrogen (N)		NS	-	NS

\*AGI: Adjusted Gross Income

-- Average moisture for the trial: 13.9 %

**Table:2109-20. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow)  
Rotation - Oats. Lancaster, WI - 2021.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$2.00/bu \$/A
CCOAA-O		54	14.4	95
CSCOA-O		30	14.4	54
	0	30	14.4	54
	50	44	14.4	78
	100	41	14.4	72
	200	54	14.4	95
			0.0	
CCOAA-O	0	35	14.4	63
CCOAA-O	50	54	14.4	95
CCOAA-O	100	55	14.4	97
CCOAA-O	200	72	14.4	127
CSCOA-O	0	25	14.4	45
CSCOA-O	50	34	14.4	60
CSCOA-O	100	26	14.4	47
CSCOA-O	200	35	14.4	63
Mean		42	14.4	75
<b><u>Probability(%)</u></b>				
Rotation (R)		16	-	16
Nitrogen (N)		4	-	4
R x N		22	-	22
<b><u>LSD (0.10)</u></b>				
Rotation (R)		NS	-	NS
Nitrogen (N)		12	-	21
R x N		NS	-	NS

\*AGI: Adjusted Gross Income

**Table:2109-21. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Alfalfa.  
Lancaster, WI - 2021.**

Rotation	Nitrogen rate N lb/A	Harvest Date				Total T dm/A
		1-Jun T dm/A	2-Jul T dm/A	3-Aug T dm/A	2-Sep	
CCCMM-M1		1.1	1.6	-	-	2.6
CCCMM-M2		2.6	1.6	1.3	1.0	6.4
CCOMM-M1		2.0	1.5	1.2	1.0	5.8
CCOMM-M2		2.1	1.4	1.3	0.9	5.7
CSCOM-M		2.2	1.6	1.3	1.1	6.1
	0	2.0	1.6	1.3	1.0	5.5
	50	2.0	1.5	1.3	1.0	5.3
	100	2.0	1.5	1.3	1.0	5.3
	200	2.0	1.4	1.2	1.0	5.2
CCCMM-M1	0	1.1	1.6	-	-	2.7
CCCMM-M1	50	0.9	1.6	-	-	2.5
CCCMM-M1	100	1.2	1.6	-	-	2.8
CCCMM-M1	200	1.0	1.5	-	-	2.6
CCCMM-M2	0	2.6	1.7	1.3	1.0	6.6
CCCMM-M2	50	2.6	1.6	1.2	1.0	6.4
CCCMM-M2	100	2.5	1.5	1.3	1.0	6.4
CCCMM-M2	200	2.6	1.6	1.2	1.0	6.4
CCOMM-M1	0	2.1	1.5	1.2	1.1	5.9
CCOMM-M1	50	2.2	1.6	1.4	1.0	6.1
CCOMM-M1	100	1.9	1.4	1.2	1.1	5.6
CCOMM-M1	200	2.0	1.3	1.2	1.0	5.5
CCOMM-M2	0	2.2	1.5	1.3	0.9	5.9
CCOMM-M2	50	2.0	1.3	1.3	1.0	5.6
CCOMM-M2	100	2.1	1.5	1.3	1.0	5.8
CCOMM-M2	200	2.2	1.2	1.3	1.0	5.7
CSCOM-M	0	2.2	1.7	1.3	1.1	6.3
CSCOM-M	50	2.1	1.6	1.4	1.0	6.1
CSCOM-M	100	2.2	1.6	1.3	1.1	6.1
CSCOM-M	200	2.2	1.5	1.3	1.1	6.1
Mean		2.0	1.5	1.3	1.0	5.3
<b><u>Probability(%)</u></b>						
Rotation (R)		0.6	44.2	83.9	24.3	0.1
Nitrogen (N)		69.1	13.1	12.6	92.8	35.3
R x N		83.1	56.6	17.8	90.6	60.2
<b><u>LSD (0.10)</u></b>						
Rotation (R)		0.4	NS	NS	NS	0.7
Nitrogen (N)		NS	NS	NS	NS	NS
R x N		NS	NS	NS	NS	NS

- No harvest data