

FIELD EXPERIMENT HISTORY

Title: Crop Rotation Response to Nrate
Experiment: 09ACOSW **Trial ID:** 6493 **Year:** 2020
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

Fertilizer:	Analysis:	Product Rate lbs/A:	Date:
Preplant :	S,O,W 0-19.5-35	273	4 /21/20
Starter :	C: 9-23-30	195	5 /1 /20
Post plant :	C: 34-0-0	See rates	5/22/2020
	W: 34-0-0	30	4/10/2020
	W,O: 34-0-0	315	5/22/2020
	A:0-8.4-37.5-2.9s-0.34B	400	6/9/, 8/10/20
Manure:	N/A	N/A	N/A

Herbicide: C: Powermax 21 oz/a 5/12/20
 Resicore 1.25 qt/ac 5/12/20
 A: Raptor 5 oz/a 6/4/20
 O: butyrac 3 qt/a 6/2/20
 S: Warrant Ult 48 oz/a 5/21/20
 powermax 28 oz/a 5/21/20

Planting Depth: C:1.5" **Hybrid:** C:Dekalb 54-64
Row Width: C:30" S:15"
 O/A/W: 7.5" S: Cornelius CB24x64
 W:Limagrain 11719 (bagged as L420)
 A: Croplan Rebound 6.0
 O: Ogle

Planting Date: C: 5/1/20 W: 10/28/19
 S: 5/12/20 A: 4/22/20
 O: 4/22/20

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:10/29/20 S: 10/8/20
 O: 7/27/20 W: 7/27/20
 A: 6/4; 7/2. 8/4 9/14

Fungicide: N/A

Notes: ** application error: Corn "N" rates were applied to alfalfa, oats, and soybeans in addition to corn.**

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:

Rotation	Corn N-rate (lbs/A)
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-10	
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 2009-17 to 2009-21

**Table:2009-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn
Lancaster, WI - 2020.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$3.58/bu \$/A
CC-C		151	16.0	55.9	502
CCCMM-C1		245	16.7	56.9	814
CCCMM-C2		174	16.0	53.9	580
CCCMM-C3		161	15.9	56.5	536
CCOMM-C1		252	16.6	57.0	837
CCOMM-C2		180	16.3	56.8	600
CSb-C		194	16.0	57.5	645
CSbCOM-C1		239	16.1	56.0	798
CSbCOM-C2		199	16.8	56.0	660
CSbW-C		175	15.5	55.9	583
	0	134	15.3	56.3	450
	50	183	15.4	56.4	610
	100	224	16.4	56.4	744
	200	247	17.6	55.9	818
CC-C	0	67	14.9	56.0	225
CC-C	50	128	14.4	56.3	430
CC-C	100	179	16.6	56.2	595
CC-C	200	229	18.1	55.2	756
CCCMM-C1	0	194	15.9	56.5	649
CCCMM-C1	50	228	16.2	56.9	762
CCCMM-C1	100	285	17.1	57.2	945
CCCMM-C1	200	272	17.9	57.0	899
CCCMM-C2	0	121	15.4	49.9	404
CCCMM-C2	50	145	15.3	55.1	484
CCCMM-C2	100	187	15.7	56.1	625
CCCMM-C2	200	244	17.6	54.5	808
CCCMM-C3	0	97	15.2	57.4	323
CCCMM-C3	50	138	15.8	56.6	462
CCCMM-C3	100	191	15.8	57.2	638
CCCMM-C3	200	218	16.9	55.0	723
CCOMM-C1	0	213	15.0	56.8	714
CCOMM-C1	50	243	15.5	57.2	811
CCOMM-C1	100	282	17.5	57.4	935
CCOMM-C1	200	270	18.5	56.4	887

continue

Table:2009-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn
 (continued) **Lancaster, WI - 2020**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$3.58/bu \$/A
CCOMM-C2	0	118	15.5	56.3	394
CCOMM-C2	50	162	15.7	56.3	543
CCOMM-C2	100	217	16.6	56.9	721
CCOMM-C2	200	224	17.5	58.0	743
CS-C	0	109	14.5	61.4	364
CS-C	50	194	15.3	56.4	650
CS-C	100	220	16.4	56.1	731
CS-C	200	253	18.1	56.3	836
CSCOM-C1	0	204	15.3	56.0	682
CSCOM-C1	50	235	16.0	57.6	785
CSCOM-C1	100	250	16.9	54.3	832
CSCOM-C1	200	268	16.4	56.1	893
CSCOM-C2	0	127	15.8	56.5	423
CSCOM-C2	50	197	15.9	56.6	658
CSCOM-C2	100	226	17.0	56.6	751
CSCOM-C2	200	246	18.4	54.6	809
CSW-C	0	96	15.3	56.3	319
CSW-C	50	155	14.6	55.7	517
CSW-C	100	200	15.1	55.9	671
CSW-C	200	248	17.3	55.6	824
Mean		197	16.2	56.2	656
Probability(%)					
Rotation (R)		0.0	79.9	26.8	0.0
Nitrogen (N)		0.0	0.0	85.0	0.0
R x N		0.3	81.1	72.9	0.3
LSD (0.10)					
Rotation (R)		19	NS	NS	63
Nitrogen (N)		8	0.5	NS	27
R x N		28	NS	NS	93

*AGI: Adjusted Gross Income

**Table:2009-18. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Soybean
Lancaster, WI - 2020.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$8.48/bu \$/A
CS-S		53	9.9	525
CSCOM-S		57	9.8	565
CSW-S		57	9.6	573
	0	55	9.9	554
	50	55	9.8	548
	100	56	9.8	559
	200	56	9.6	558
			0.0	
CS-S	0	51	10.2	506
CS-S	50	50	10.0	500
CS-S	100	55	9.8	553
CS-S	200	54	9.7	542
CSCOM-S	0	57	9.8	571
CSCOM-S	50	56	9.8	560
CSCOM-S	100	57	10.0	573
CSCOM-S	200	56	9.6	558
CSW-S	0	58	9.8	584
CSW-S	50	59	9.6	584
CSW-S	100	55	9.7	550
CSW-S	200	57	9.4	573
			0.0	
Mean		56	9.8	554
<u>Probability(%)</u>				
Rotation (R)		56	35.5	56
Nitrogen (N)		96	28.4	96
R x N		69	90.5	69
<u>LSD (0.10)</u>				
Rotation (R)		NS	NS	NS
Nitrogen (N)		NS	NS	NS
R x N		NS	NS	NS

*AGI: Adjusted Gross Income

**Table:2009-19. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Wheat.
Lancaster, WI - 2020.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$5.22/bu \$/A
CSW-W	0	24	14.3	120
CSW-W	50	51	14.3	257
CSW-W	100	51	13	252
CSW-W	200	54	14.2	270
Mean		45	13.95	225
<u>Probability(%)</u>				
Nitrogen (N)		4.9	0.1	4.9
<u>LSD (0.10)</u>				
Nitrogen (N)		15	0.0	76

*AGI: Adjusted Gross Income

-- Average moisture for the trial: 15 %

**Table:2009-20. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow)
Rotation - Oats. Lancaster, WI - 2020.**

Rotation	Nitrogen rate N lb/A	Yield bu/A	Moisture %	AGI \$2.00/bu \$/A
CCOAA-O		64	12.3	112
CSCOA-O		70	12.4	124
	0	32	13.1	56
	50	75	12.1	133
	100	79	12.0	140
	200	82	12.3	144
			0.0	
CCOAA-O	0	34	13.2	61
CCOAA-O	50	76	12.0	135
CCOAA-O	100	73	11.8	129
CCOAA-O	200	70	12.2	125
CSCOA-O	0	29	13.0	52
CSCOA-O	50	74	12.2	131
CSCOA-O	100	85	12.2	151
CSCOA-O	200	93	12.3	164
Mean		67	12.4	118
<u>Probability(%)</u>				
Rotation (R)		65	69.8	65
Nitrogen (N)		0	9.7	0
R x N		19	90.5	19
<u>LSD (0.10)</u>				
Rotation (R)		NS	NS	NS
Nitrogen (N)		12	0	21
R x N		NS	NS	NS

*AGI: Adjusted Gross Income

**Table:2009-21. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Alfalfa.
Lancaster, WI - 2020.**

Rotation	Nitrogen	Harvest Date				Total
	rate N lb/A	4-Jun T dm/A	2-Jul T dm/A	4-Aug T dm/A	4-Sep T dm/A	
CCCMM-M1		0.8	1.2	-	-	2.0
CCCMM-M2		1.9	1.0	1.3	1.1	5.4
CCOMM-M1		1.6	1.0	1.2	1.0	4.8
CCOMM-M2		2.0	1.0	1.1	1.1	5.2
CSCOM-M		1.8	1.0	1.1	0.9	4.7
	0	1.6	0.9	1.0	0.9	4.1
	50	1.7	1.0	1.0	0.9	4.2
	100	1.7	1.1	1.1	1.0	4.5
	200	1.5	1.1	1.6	1.3	4.9
CCCMM-M1	0	0.8	1.0	-	-	1.8
CCCMM-M1	50	0.9	1.1	-	-	2.0
CCCMM-M1	100	0.7	1.5	-	-	2.3
CCCMM-M1	200	0.8	1.1	-	-	1.9
CCCMM-M2	0	1.9	0.9	1.0	0.9	4.7
CCCMM-M2	50	2.0	0.9	1.1	0.8	4.9
CCCMM-M2	100	2.0	1.0	1.2	1.2	5.3
CCCMM-M2	200	1.8	1.0	2.1	1.7	6.5
CCOMM-M1	0	1.8	0.8	1.0	1.0	4.6
CCOMM-M1	50	1.7	0.9	1.0	0.9	4.6
CCOMM-M1	100	1.7	1.1	1.2	0.9	4.8
CCOMM-M1	200	1.4	1.1	1.5	1.1	5.1
CCOMM-M2	0	1.9	0.9	1.0	0.9	4.7
CCOMM-M2	50	2.0	1.1	0.9	1.0	5.0
CCOMM-M2	100	2.1	1.0	1.1	1.1	5.2
CCOMM-M2	200	1.7	1.0	1.6	1.4	5.7
CSCOM-M	0	1.7	0.9	1.0	0.8	4.5
CSCOM-M	50	1.8	1.0	0.9	0.8	4.5
CSCOM-M	100	1.8	1.1	1.0	0.9	4.8
CSCOM-M	200	1.7	1.1	1.3	1.0	5.2
Mean		1.6	1.0	1.2	1.0	4.4
Probability(%)						
Rotation (R)		6.9	49.8	58.4	19.8	0.6
Nitrogen (N)		10.7	0.3	0.1	0.0	0.0
R x N		89.2	13.1	66.4	2.0	1.5
LSD (0.10)						
Rotation (R)		0.6	NS	NS	NS	0.9
Nitrogen (N)		NS	0.1	0.2	0.1	0.2
R x N		NS	NS	NS	0.2	0.8

- No harvest data