# FIELD EXPERIMENT HISTORY

**Title:** **Crop Rotation Response to Nrate**
**Experiment:** 09ACOSW **Trial ID:** 6674 **Year:** 2022
**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:** Fayett
**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: | Rate lbs/A: | Date: |
|---|---|---|---|
| **Preplant :** | S,O,W :0-13.6-42.2 | 301 | 4 /20/22 |
| **Starter :** | C: 6-20-30 | 195 | 5 /9 /22 |
| **Post plant :** | C: 34-0-0 | See rates | 6/1/22 |
| | W: 34-0-0 | 30 | 4/19/22 |
| | A:0-8.2-38.3-2.75-0.4B | 460 | 6/03, 8/2/22 |
| **Manure:** | N/A | N/A | N/A |

**Herbicide** C: Resicore 1.25 qt/ac 5/17/22
Cornerstone 5 plus 28 oz/a 5/17/22
Halex GT 3.6 pt/a 6/13/22
A: Raptor 5 oz/a 6/10/22
S: Cornerstone 5 plus 32 oz/a 6/3/22
Warrant 48 oz/a 6/29/22
Flexstar GT 3 pt/a 6/29/22

**Hybrid:** C: Wyffles 4198 SSX
S: Syngenta NK 24-G7E3
W:Legacy LW 2023
A: Legacy 451SPH2+
O: Esker

**Planting Method:** White6100 No till planter

**Planting Date:** C: 5/9/22 W: 10/20/22
S: 5/27/22 A: 4/29/22
O: 4/29/22

**Planting Depth:** C:1.5"

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

**Target Plant Density:** 34000

**Harvest Date:** C:10/26/22 S:10/18/22
O: 7/26/22 W: 7/26/22
A: 6/1;6/29;7/29;8/29/22

**Row Width:** C:30" S:15"
O/A/W: 7.5"

**Fungicide:** N/A

**Notes:**

## Experimental Design

**Design:** RCB split-split-plot

**Replications:** 2

**Plot Size Seeded:** MP: 30' x 70'

**Harvest Plot Size:** 5' x 25'

**Experiment Size:** 2.7 A

**Factors/Treatments:**

**Rotation**

1) CC
2) CSCOA-2C
3) CSCOA- O
4) CSCOA- A
5) CSCOA-1C
6) CSCOA-1S
7) CCCAA-3C
8) CCCAA-1A
9) CCCAA-1C
10) CCCAA-2A
11) CCCAA-2C
12) CCOAA- O
13) CCOAA-1A
14) CCOAA-2A
15) CCOAA-1C
16) CCOAA-2C
17) CSW- S
18) CSW- C
19) CS- C
20) CSW- W
21) CS- S

**Corn N-rate (lbs/A)**

1) 0
2) 50
3) 100
4) 200

**Results: Table 2209-17 to 2209-21**

**Table:2209-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn Lancaster, WI - 2022.**

| Rotation | Nitrogen rate | Yield | Moisture | Test weight | AGI $6.09/bu |
|---|---|---|---|---|---|
| | N lb/A | bu/A | % | lbs/bu | $/A |
| CC-C | | 164 | 17.1 | 60.1 | 954 |
| CCCMM-C1 | | 237 | 17.1 | 61.0 | 1379 |
| CCCMM-C2 | | 199 | 16.9 | 60.7 | 1161 |
| CCCMM-C3 | | 195 | 17.0 | 60.4 | 1138 |
| CCOMM-C1 | | 243 | 17.1 | 60.7 | 1418 |
| CCOMM-C2 | | 218 | 16.9 | 60.6 | 1272 |
| CSb-C | | 182 | 18.0 | 60.2 | 1056 |
| CSbCOM-C1 | | 238 | 17.7 | 60.8 | 1385 |
| CSbCOM-C2 | | 211 | 17.7 | 60.7 | 1226 |
| CSbW-C | | 195 | 18.4 | 59.9 | 1131 |
| | 0 | 153 | 17.0 | 60.0 | 893 |
| | 50 | 206 | 17.3 | 60.3 | 1201 |
| | 100 | 236 | 17.7 | 60.8 | 1372 |
| | 200 | 238 | 17.7 | 60.8 | 1382 |
| CC-C | 0 | 79 | 16.0 | 59.4 | 461 |
| CC-C | 50 | 160 | 16.4 | 59.7 | 935 |
| CC-C | 100 | 201 | 17.7 | 60.3 | 1168 |
| CC-C | 200 | 216 | 18.2 | 60.9 | 1253 |
| CCCMM-C1 | 0 | 214 | 17.2 | 60.7 | 1248 |
| CCCMM-C1 | 50 | 242 | 17.1 | 61.2 | 1413 |
| CCCMM-C1 | 100 | 247 | 17.2 | 61.2 | 1438 |
| CCCMM-C1 | 200 | 243 | 16.9 | 60.8 | 1417 |
| CCCMM-C2 | 0 | 134 | 16.2 | 60.4 | 786 |
| CCCMM-C2 | 50 | 203 | 16.9 | 60.5 | 1186 |
| CCCMM-C2 | 100 | 239 | 17.5 | 61.3 | 1389 |
| CCCMM-C2 | 200 | 220 | 17.2 | 60.7 | 1282 |
| CCCMM-C3 | 0 | 129 | 16.9 | 60.3 | 750 |
| CCCMM-C3 | 50 | 191 | 17.0 | 59.9 | 1112 |
| CCCMM-C3 | 100 | 223 | 16.8 | 60.4 | 1298 |
| CCCMM-C3 | 200 | 239 | 17.4 | 61.1 | 1392 |
| CCOMM-C1 | 0 | 237 | 17.2 | 60.1 | 1380 |
| CCOMM-C1 | 50 | 237 | 17.6 | 60.9 | 1377 |
| CCOMM-C1 | 100 | 252 | 17.0 | 60.9 | 1470 |
| CCOMM-C1 | 200 | 248 | 16.9 | 61.1 | 1445 |

continue

**Table:2209-17. Corn, Soybean, Wheat, Oats and Alfalfa Rotation - Corn**
(continued) **Lancaster, WI - 2022**

| Rotation | Nitrogen rate | Yield | Moisture | Test weight | AGI $6.09/bu |
|---|---|---|---|---|---|
| | N lb/A | bu/A | % | lbs/bu | $/A |
| CCOMM-C2 | 0 | 147 | 16.4 | 60.1 | 861 |
| CCOMM-C2 | 50 | 233 | 16.6 | 60.4 | 1357 |
| CCOMM-C2 | 100 | 248 | 17.5 | 60.9 | 1442 |
| CCOMM-C2 | 200 | 245 | 17.0 | 61.0 | 1429 |
| CS-C | 0 | 119 | 17.2 | 59.8 | 695 |
| CS-C | 50 | 180 | 17.4 | 60.1 | 1046 |
| CS-C | 100 | 202 | 19.0 | 60.1 | 1168 |
| CS-C | 200 | 227 | 18.6 | 60.7 | 1314 |
| CSCOM-C1 | 0 | 210 | 17.6 | 60.5 | 1220 |
| CSCOM-C1 | 50 | 234 | 18.2 | 60.8 | 1359 |
| CSCOM-C1 | 100 | 262 | 17.8 | 61.2 | 1524 |
| CSCOM-C1 | 200 | 247 | 17.3 | 60.9 | 1439 |
| CSCOM-C2 | 0 | 157 | 17.9 | 60.0 | 913 |
| CSCOM-C2 | 50 | 205 | 17.3 | 60.4 | 1194 |
| CSCOM-C2 | 100 | 244 | 17.7 | 61.3 | 1416 |
| CSCOM-C2 | 200 | 238 | 18.1 | 61.1 | 1380 |
| CSW-C | 0 | 106 | 17.2 | 59.2 | 618 |
| CSW-C | 50 | 177 | 18.3 | 59.8 | 1027 |
| CSW-C | 100 | 243 | 18.6 | 60.3 | 1408 |
| CSW-C | 200 | 255 | 19.7 | 60.2 | 1471 |
| Mean | | 208 | 17.4 | 60.5 | 1212 |
| **Probability(%)** | | | | | |
| Rotation (R) | | 0.0 | 31.9 | 0.5 | 0.0 |
| Nitrogen (N) | | 0.0 | 0.0 | 0.0 | 0.0 |
| R x N | | 0.0 | 3.5 | 38.0 | 0.0 |
| **LSD (0.10)** | | | | | |
| Rotation (R) | | 17 | NS | 0.4 | 96 |
| Nitrogen (N) | | 6 | 0.3 | 0.2 | 33 |
| R x N | | 22 | 1.3 | NS | 125 |

*AGI: Adjusted Gross Income

**Table:2209-18. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Soybean Lancaster, WI - 2022.**

| Rotation | Nitrogen rate | Yield | Moisture | AGI $13.85/bu |
|---|---|---|---|---|
| | N lb/A | bu/A | % | $/A |
| CS-S | | 56 | 0.1 | 762 |
| CSCOM-S | | 64 | 0.1 | 873 |
| CSW-S | | 60 | 0.1 | 824 |
| | 0 | 61 | 0.1 | 829 |
| | 50 | 61 | 0.1 | 833 |
| | 100 | 59 | 0.1 | 800 |
| | 200 | 60 | 0.1 | 816 |
| CS-S | 0 | 58 | 0.1 | 783 |
| CS-S | 50 | 58 | 0.1 | 783 |
| CS-S | 100 | 53 | 0.1 | 723 |
| CS-S | 200 | 56 | 0.1 | 759 |
| CSCOM-S | 0 | 63 | 0.1 | 859 |
| CSCOM-S | 50 | 62 | 0.1 | 850 |
| CSCOM-S | 100 | 64 | 0.1 | 868 |
| CSCOM-S | 200 | 67 | 0.1 | 914 |
| CSW-S | 0 | 62 | 0.1 | 845 |
| CSW-S | 50 | 64 | 0.1 | 867 |
| CSW-S | 100 | 59 | 0.1 | 810 |
| CSW-S | 200 | 57 | 0.1 | 775 |
| Mean | | 60 | 0.1 | 820 |
| **Probability(%)** | | | | |
| Rotation (R) | | 11 | 5.4 | 11 |
| Nitrogen (N) | | 52 | 66.6 | 52 |
| R x N | | 27 | 27.3 | 27 |
| **LSD (0.10)** | | | | |
| Rotation (R) | | NS | NS | NS |
| Nitrogen (N) | | NS | NS | NS |
| R x N | | NS | NS | NS |

*AGI: Adjusted Gross Income

**Table:2209-19. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Wheat. Lancaster, WI - 2022.**

| Rotation | Nitrogen rate | Yield | Moisture | AGI $8.02/bu |
|---|---|---|---|---|
| | N lb/A | bu/A | % | |
| CSW-W | 0 | 57 | 13 | 443 |
| CSW-W | 50 | 61 | 13 | 473 |
| CSW-W | 100 | 57 | 13 | 443 |
| CSW-W | 200 | 62 | 13 | 487 |
| Mean | | 59 | 13 | 461 |
| **Probability(%)** | | | | |
| Nitrogen (N) | | 68.0 | - | 68.0 |
| **LSD (0.10)** | | | | |
| Nitrogen (N) | | NS | - | NS |

*AGI: Adjusted Gross Income

-- Average moisture for the trial: 13.0%

**Table:2209-20. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Oats. Lancaster, WI - 2022.**

| Rotation | Nitrogen rate | Yield | Moisture | AGI $2.00/bu |
|---|---|---|---|---|
| | N lb/A | bu/A | % | $/A |
| CCOAA-O | | 47 | 14.8 | 83 |
| CSCOA-O | | 44 | 14.8 | 78 |
| | 0 | 44 | 14.8 | 78 |
| | 50 | 42 | 14.8 | 74 |
| | 100 | 42 | 14.8 | 75 |
| | 200 | 53 | 14.8 | 94 |
| CCOAA-O | 0 | 46 | 14.8 | 81 |
| CCOAA-O | 50 | 49 | 14.8 | 86 |
| CCOAA-O | 100 | 41 | 14.8 | 73 |
| CCOAA-O | 200 | 52 | 14.8 | 91 |
| CSCOA-O | 0 | 43 | 14.8 | 76 |
| CSCOA-O | 50 | 35 | 14.8 | 62 |
| CSCOA-O | 100 | 43 | 14.8 | 76 |
| CSCOA-O | 200 | 54 | 14.8 | 96 |
| Mean | | 45 | 14.8 | 80 |
| **Probability(%)** | | | | |
| Rotation (R) | | 64 | - | 64 |
| Nitrogen (N) | | 21 | - | 21 |
| R x N | | 45 | - | 45 |
| **LSD (0.10)** | | | | |
| Rotation (R) | | NS | - | NS |
| Nitrogen (N) | | NS | - | NS |
| R x N | | NS | - | NS |

*AGI: Adjusted Gross Income

**Table:2209-21. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Alfalfa. Lancaster, WI - 2022.**

| | Nitrogen | Harvest Date | | | | |
|---|---|---|---|---|---|---|
| Rotation | rate | 1-Jun | 29-Jun | 29-Jul | 29-Aug | Total |
| | N lb/A | T dm/A | T dm/A | T dm/A | | T dm/A |
| CCCMM-M1 | | 1.2 | 1.6 | - | - | 2.8 |
| CCCMM-M2 | | 1.9 | 1.4 | 1.6 | 1.3 | 6.2 |
| CCOMM-M1 | | 1.8 | 1.2 | 1.8 | 1.3 | 6.1 |
| CCOMM-M2 | | 2.1 | 1.3 | 1.8 | 1.2 | 6.4 |
| CSCOM-M | | 1.7 | 1.1 | 1.6 | 1.3 | 5.8 |
| | 0 | 1.8 | 1.3 | 1.7 | 1.3 | 5.5 |
| | 50 | 1.8 | 1.3 | 1.7 | 1.3 | 5.5 |
| | 100 | 1.8 | 1.3 | 1.7 | 1.3 | 5.4 |
| | 200 | 1.6 | 1.3 | 1.7 | 1.3 | 5.4 |
| CCCMM-M1 | 0 | 1.4 | 1.5 | - | - | 2.9 |
| CCCMM-M1 | 50 | 1.1 | 1.7 | - | - | 2.8 |
| CCCMM-M1 | 100 | 1.2 | 1.5 | - | - | 2.7 |
| CCCMM-M1 | 200 | 1.3 | 1.6 | - | - | 2.8 |
| CCCMM-M2 | 0 | 1.8 | 1.5 | 1.7 | 1.3 | 6.3 |
| CCCMM-M2 | 50 | 1.8 | 1.3 | 1.6 | 1.3 | 6.1 |
| CCCMM-M2 | 100 | 1.9 | 1.5 | 1.6 | 1.3 | 6.2 |
| CCCMM-M2 | 200 | 1.9 | 1.3 | 1.6 | 1.3 | 6.1 |
| CCOMM-M1 | 0 | 2.0 | 1.2 | 1.8 | 1.4 | 6.4 |
| CCOMM-M1 | 50 | 1.9 | 1.1 | 1.8 | 1.3 | 6.0 |
| CCOMM-M1 | 100 | 1.9 | 1.1 | 1.8 | 1.3 | 6.1 |
| CCOMM-M1 | 200 | 1.6 | 1.2 | 1.8 | 1.4 | 6.1 |
| CCOMM-M2 | 0 | 2.0 | 1.3 | 1.8 | 1.2 | 6.2 |
| CCOMM-M2 | 50 | 2.1 | 1.4 | 1.8 | 1.4 | 6.7 |
| CCOMM-M2 | 100 | 2.1 | 1.4 | 1.7 | 1.1 | 6.3 |
| CCOMM-M2 | 200 | 2.0 | 1.2 | 1.8 | 1.2 | 6.2 |
| CSCOM-M | 0 | 1.9 | 1.2 | 1.6 | 1.3 | 5.9 |
| CSCOM-M | 50 | 1.9 | 1.2 | 1.7 | 1.3 | 6.0 |
| CSCOM-M | 100 | 1.7 | 1.2 | 1.6 | 1.4 | 5.9 |
| CSCOM-M | 200 | 1.4 | 1.0 | 1.7 | 1.3 | 5.5 |
| Mean | | 1.7 | 1.3 | 1.7 | 1.3 | 5.5 |
| **Probability(%)** | | | | | | |
| Rotation (R) | | 3.2 | 0.6 | 18.1 | 27.6 | 0.0 |
| Nitrogen (N) | | 5.9 | 58.5 | 40.4 | 45.3 | 10.6 |
| R x N | | 12.0 | 56.9 | 62.8 | 41.6 | 18.7 |
| **LSD (0.10)** | | | | | | |
| Rotation (R) | | 0.3 | 0.1 | NS | NS | 0.4 |
| Nitrogen (N) | | 0.1 | NS | NS | NS | NS |
| R x N | | NS | NS | NS | NS | NS |

- No harvest data