

FIELD EXPERIMENT HISTORY

Title: Corn - Soybean - Wheat - Alfalfa (Meadow) Response to Rotation
Experiment: 09ACOSW **Trial ID:** 3670 **Year:** 2013
Personnel: J. G. Lauer, T. M. Wood, T. H. Diallo, K. D. Kohn, M. K. Kazula
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:** 11/15/12 **pH:** 6.41 **OM (%)** 2.56 **P (ppm)** 18.7 **K (ppm)** 118

Plot Management

Tillage Operations: C: Chisel & No-till

Fertilizer:

| | <u>Analysis:</u> | <u>Rate lbs/A:</u> | <u>Date:</u> |
|---------------------|------------------|--------------------|--------------|
| Preplant : | A/O/S/W:0-50-123 | N/A | N/A |
| Starter : | C: 5-26-30 | C: 145 | N/A |
| Post plant : | 34-0-0 | see N rates | C:5/20/2014 |
| Manure: | N/A | N/A | N/A |

Herbicide: C:Dual 1.7pt-5/16/13, Callisto 5.3oz-5/16/13, PowerMax 28oz-5/16/13
Planting Depth: C: 1.5"
Hybrid: A: Croplan Alphatron RR
 C: Pio 832 AMX
 O: Esker
 S: NuTech G2-7250
 W: Pioneer 25R40

Planting Date: C:5/8/13
 S:5/16/13
 A/O:5/8/13
 W:10/2/12
Row Width: C:30" S:15"
 O/A/W:7.5"
Planting Method: White 6100 no-till corn planter

Target Plant Density: C:32000 **Harvest Method:** C:Massey 8XP

Harvest Date: C:12/5/13
 S:10/28/13
 O:8/7/13
 A:7/16/13&8/29/13
 W:7/24/13
Fungicide: N/A
Notes:

Experimental Design

Design: RCB split-plot **Replications:** 2
Plot Size Seeded: 20' x 50' **Experiment Size:** Total blocks/plots= 42/168
Harvest Plot Size: 5' x 50'

Factors/Treatments:

Rotation:

| | |
|---------------|---------------|
| 1) CC- 1C | 12) CCOMM- M1 |
| 2) CSCM- O | 13) CCOMM- M2 |
| 3) CSCM- M | 14) CCOMM- C1 |
| 4) CSCM- C1 | 15) CCOMM- C2 |
| 5) CSCM- S | 16) CCOMM- O |
| 6) CSCM- C2 | 17) CSW- S |
| 7) CCMM- M1 | 18) CSW- C |
| 8) CCMM- M2 | 19) CS- S |
| 9) CCMM- C2 | 20) CSW- W |
| 10) CCMM- C1 | 21) CS- C |
| 11) CCCMM- C3 | |

N rate for corn (lb/A):

1) 0
 2) 50 (1967 to 1976 = 75)
 3) 100 (1967 to 1976 = 150)
 4) 200 (1967 to 1976 = 300)

Tillage:

1) Conventional Tillage (Fall chisel, Spring disc and Cultimulching).
 2) No-Till

Results: Tables 1309-21 and 1309-22

Table: 1309-21. Corn, Soybean and Wheat Rotation at Lancaster - Greenhouse gases emission 2013.

| DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ | DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ |
|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 115 | | | 16.9 | 23.6 | -1.7 | 128 | CSWs | | 62.2 | 13.4 | 1.5 |
| 128 | | | 54.9 | 31.5 | 2.2 | 128 | CSWw | | 45.6 | 30.5 | 3.6 |
| 142 | | | 66.0 | 42.0 | -3.7 | | | | | | |
| 155 | | | 57.8 | 70.5 | -1.3 | 142 | CC | | 77.7 | 96.4 | -5.1 |
| 169 | | | 56.7 | 36.1 | -2.4 | 142 | CSc | | 45.6 | 32.4 | -3.6 |
| 182 | | | 101.5 | 90.0 | -1.7 | 142 | CSs | | 87.6 | 50.7 | 2.7 |
| 192 | | | 159.6 | 26.2 | -2.0 | 142 | CSWc | | 55.9 | 31.8 | -10.1 |
| 204 | | | 89.6 | 266.0 | -4.0 | 142 | CSWs | | 49.1 | 13.5 | -5.5 |
| 218 | | | 158.8 | 13.0 | -6.2 | 142 | CSWw | | 80.0 | 27.1 | -0.6 |
| 232 | | | 97.9 | 78.5 | -6.4 | | | | | | |
| 249 | | | 62.4 | 16.9 | -8.0 | 155 | CC | | 65.6 | 226.4 | 1.0 |
| 259 | | | 58.1 | 44.6 | -5.0 | 155 | CSc | | 45.4 | 98.3 | -7.2 |
| 291 | | | 19.6 | 2.6 | 0.0 | 155 | CSs | | 68.3 | 26.3 | 0.4 |
| | | | | | | 155 | CSWc | | 40.4 | 58.8 | 1.2 |
| | CC | | 101.7 | 112.3 | -2.5 | 155 | CSWs | | 52.9 | 5.5 | -4.6 |
| | CSc | | 83.5 | 37.4 | -3.8 | 155 | CSWw | | 74.2 | 7.6 | 1.5 |
| | CSs | | 76.7 | 56.0 | -1.3 | | | | | | |
| | CSWc | | 75.5 | 55.6 | -4.4 | 169 | CC | | 97.7 | 131.9 | -4.1 |
| | CSWs | | 66.8 | 37.3 | -4.3 | 169 | CSc | | 67.6 | 24.5 | -5.1 |
| | CSWw | | 57.3 | 43.6 | -2.2 | 169 | CSs | | 20.4 | 10.7 | -0.2 |
| | | BR | 74.5 | 76.8 | -2.9 | 169 | CSWc | | 55.8 | 28.3 | 0.0 |
| | | IR | 79.3 | 37.2 | -3.3 | 169 | CSWs | | 43.6 | 9.7 | -1.2 |
| | | | | | | 169 | CSWw | | 55.3 | 11.2 | -3.9 |
| 115 | CC | | 17.4 | 27.4 | -0.4 | 182 | CC | | 174.5 | 350.9 | -1.3 |
| 115 | CSc | | 13.9 | 17.6 | -4.0 | 182 | CSc | | 140.6 | 79.9 | -4.0 |
| 115 | CSs | | 20.9 | 28.2 | 1.4 | 182 | CSs | | 30.3 | 16.6 | -0.1 |
| 115 | CSWc | | 19.5 | 19.1 | -4.8 | 182 | CSWc | | 148.5 | 66.7 | -2.5 |
| 115 | CSWs | | 23.6 | 22.6 | 1.4 | 182 | CSWs | | 34.6 | 6.5 | -3.4 |
| 115 | CSWw | | 5.9 | 26.6 | -3.7 | 182 | CSWw | | 80.3 | 19.2 | 0.9 |
| 128 | CC | | 74.2 | 47.0 | 0.5 | 192 | CC | | 221.9 | 85.6 | -4.6 |
| 128 | CSc | | 40.4 | 23.4 | 2.0 | 192 | CSc | | 181.3 | 23.6 | -5.2 |
| 128 | CSs | | 52.1 | 44.8 | 4.1 | 192 | CSs | | 183.4 | 12.4 | 1.1 |
| 128 | CSWc | | 54.7 | 29.8 | 1.2 | 192 | CSWc | | 146.0 | 18.0 | -1.2 |

continued

Table: 1309-21. Corn, Soybean and Wheat Rotation at Lancaster - Greenhouse gases emission 2013.

| DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ | DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ |
|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 192 | CSWs | | 134.0 | 8.2 | -0.7 | 259 | CSWc | | 63.3 | 47.3 | -7.3 |
| 192 | CSWw | | 91.1 | 9.4 | -1.5 | 259 | CSWs | | 60.4 | 70.6 | -6.5 |
| | | | | | | 259 | CSWw | | 41.1 | 51.1 | -2.9 |
| 204 | CC | | 111.9 | 357.5 | 0.3 | 291 | CC | | 28.6 | 4.2 | -3.2 |
| 204 | CSc | | 101.0 | 143.4 | -5.1 | 291 | CSc | | 9.1 | 3.1 | -2.9 |
| 204 | CSs | | 93.6 | 416.8 | -6.8 | 291 | CSs | | 23.8 | 4.6 | -1.2 |
| 204 | CSWc | | 91.2 | 346.0 | -2.9 | 291 | CSWc | | 23.6 | 3.5 | 1.3 |
| 204 | CSWs | | 89.5 | 267.1 | -2.5 | 291 | CSWs | | 25.0 | -0.4 | 2.9 |
| 204 | CSWw | | 50.5 | 65.4 | -6.9 | 291 | CSWw | | 7.7 | 0.6 | 2.9 |
| 218 | CC | | 201.7 | 24.1 | 3.3 | | | | | | |
| 218 | CSc | | 209.8 | 18.0 | 0.4 | 115 | | BR | 16.1 | 21.1 | -2.1 |
| 218 | CSs | | 196.2 | 10.5 | -1.8 | 115 | | IR | 17.6 | 26.0 | -1.3 |
| 218 | CSWc | | 147.5 | 16.7 | -18.1 | 128 | | BR | 50.0 | 28.7 | 2.1 |
| 218 | CSWs | | 145.6 | 7.8 | -15.5 | 128 | | IR | 59.7 | 34.3 | 2.2 |
| 218 | CSWw | | 51.7 | 0.7 | -5.6 | | | | | | |
| 232 | CC | | 114.9 | 48.6 | -6.1 | 142 | | BR | 65.2 | 54.2 | -3.2 |
| 232 | CSc | | 98.8 | 12.4 | -3.8 | 142 | | IR | 66.7 | 29.8 | -4.2 |
| 232 | CSs | | 91.6 | 34.8 | -8.3 | 155 | | BR | 60.4 | 69.3 | -1.6 |
| 232 | CSWc | | 75.8 | 38.3 | -7.7 | 155 | | IR | 55.2 | 71.6 | -0.9 |
| 232 | CSWs | | 90.0 | 30.1 | -9.8 | 169 | | BR | 51.7 | 35.0 | -3.9 |
| 232 | CSWw | | 116.1 | 307.1 | -2.9 | 169 | | IR | 61.7 | 37.1 | -1.0 |
| 249 | CC | | 82.3 | 18.6 | -7.8 | 182 | | BR | 83.2 | 94.6 | -0.7 |
| 249 | CSc | | 64.5 | 6.5 | -7.2 | 182 | | IR | 119.8 | 85.3 | -2.8 |
| 249 | CSs | | 65.7 | 17.6 | -4.4 | 192 | | BR | 167.5 | 30.4 | -4.7 |
| 249 | CSWc | | 59.3 | 18.8 | -6.6 | 192 | | IR | 151.8 | 22.0 | 0.6 |
| 249 | CSWs | | 57.6 | 29.7 | -12.3 | 204 | | BR | 93.9 | 498.1 | -3.6 |
| 249 | CSWw | | 44.9 | 10.3 | -9.6 | 204 | | IR | 85.3 | 34.0 | -4.3 |
| 259 | CC | | 53.4 | 41.7 | -5.3 | 218 | | BR | 159.6 | 12.2 | -7.0 |
| 259 | CSc | | 67.2 | 3.4 | -4.0 | 218 | | IR | 158.0 | 13.8 | -5.4 |
| 259 | CSs | | 63.4 | 53.8 | -3.8 | | | | | | |

continued

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| DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ | DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ |
|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 232 | | BR | 80.8 | 46.6 | -4.6 | 128 | CC | BR | 50.3 | 47.2 | -3.4 |
| 232 | | IR | 115.0 | 110.5 | -8.3 | 128 | CC | IR | 98.0 | 46.8 | 4.4 |
| 249 | | BR | 59.0 | 27.6 | -4.5 | 128 | CSc | BR | 32.4 | 15.9 | 0.0 |
| 249 | | IR | 65.8 | 6.3 | -11.5 | 128 | CSc | IR | 48.3 | 30.9 | 3.9 |
| | | | | | | 128 | CSs | BR | 51.9 | 32.8 | 4.8 |
| 259 | | BR | 60.7 | 79.0 | -2.5 | 128 | CSs | IR | 52.3 | 56.9 | 3.4 |
| 259 | | IR | 55.5 | 10.2 | -7.4 | 128 | CSWc | BR | 45.8 | 19.3 | 4.3 |
| 291 | | BR | 20.3 | 2.2 | -1.2 | 128 | CSWc | IR | 63.6 | 40.3 | -1.8 |
| 291 | | IR | 19.0 | 3.0 | 1.1 | 128 | CSWs | BR | 54.7 | 14.5 | 2.2 |
| | CC | BR | 99.6 | 145.3 | -3.1 | 128 | CSWs | IR | 69.8 | 12.4 | 0.8 |
| | CC | IR | 103.8 | 79.4 | -2.0 | 128 | CSWw | BR | 64.8 | 42.7 | 4.9 |
| | CSc | BR | 82.0 | 46.2 | -5.5 | 128 | CSWw | IR | 26.4 | 18.3 | 2.4 |
| | CSc | IR | 85.0 | 28.6 | -2.2 | 142 | CC | BR | 77.5 | 130.0 | -7.4 |
| | CSs | BR | 79.0 | 93.2 | 0.4 | 142 | CC | IR | 77.8 | 62.8 | -2.8 |
| | CSs | IR | 74.5 | 18.8 | -2.9 | 142 | CSc | BR | 45.9 | 41.3 | -8.9 |
| | CSWc | BR | 75.8 | 84.9 | -4.4 | 142 | CSc | IR | 45.2 | 23.5 | 1.8 |
| | CSWc | IR | 75.2 | 26.4 | -4.5 | 142 | CSs | BR | 79.4 | 67.5 | 6.5 |
| | CSWs | BR | 62.9 | 63.1 | -2.6 | 142 | CSs | IR | 95.7 | 33.9 | -1.0 |
| | CSWs | IR | 70.7 | 11.4 | -6.0 | 142 | CSWc | BR | 65.7 | 36.4 | -8.0 |
| | CSWw | BR | 47.7 | 28.4 | -2.1 | 142 | CSWc | IR | 46.0 | 27.3 | -12.2 |
| | CSWw | IR | 66.8 | 58.8 | -2.3 | 142 | CSWs | BR | 50.3 | 21.0 | -9.7 |
| 115 | CC | BR | 13.6 | 26.9 | -3.1 | 142 | CSWs | IR | 47.9 | 6.0 | -1.4 |
| 115 | CC | IR | 21.1 | 27.9 | 2.3 | 142 | CSWw | BR | 72.6 | 28.9 | 8.3 |
| 115 | CSc | BR | 11.2 | 11.3 | -3.0 | 142 | CSWw | IR | 87.4 | 25.4 | -9.4 |
| 115 | CSc | IR | 16.6 | 23.9 | -5.0 | 155 | CC | BR | 67.6 | 188.9 | 0.6 |
| 115 | CSs | BR | 19.8 | 21.2 | -1.2 | 155 | CC | IR | 63.7 | 263.8 | 1.5 |
| 115 | CSs | IR | 22.0 | 35.3 | 4.0 | 155 | CSc | BR | 47.6 | 110.2 | -10.5 |
| 115 | CSWc | BR | 20.9 | 26.0 | -1.2 | 155 | CSc | IR | 43.2 | 86.4 | -3.9 |
| 115 | CSWc | IR | 18.1 | 12.3 | -8.5 | 155 | CSs | BR | 69.1 | 32.6 | 2.5 |
| 115 | CSWs | BR | 20.3 | 21.7 | -2.4 | 155 | CSs | IR | 67.5 | 19.9 | -1.7 |
| 115 | CSWs | IR | 26.9 | 23.6 | 5.2 | 155 | CSWc | BR | 49.3 | 71.0 | -0.2 |
| 115 | CSWw | BR | 10.6 | 19.9 | -1.6 | 155 | CSWc | IR | 31.4 | 46.7 | 2.7 |
| 115 | CSWw | IR | 1.1 | 33.2 | -5.8 | 155 | CSWs | BR | 61.7 | 7.3 | -1.2 |
| | | | | | | 155 | CSWs | IR | 44.1 | 3.7 | -7.9 |

continued

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| DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ | DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ |
|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 155 | CSWw | BR | 67.0 | 5.8 | -0.9 | 192 | CSWc | BR | 133.8 | 19.5 | -4.6 |
| 155 | CSWw | IR | 81.3 | 9.3 | 4.0 | 192 | CSWc | IR | 158.1 | 16.4 | 2.2 |
| 169 | CC | BR | 79.8 | 117.0 | -2.2 | 192 | CSWs | BR | 115.0 | 9.7 | -3.2 |
| 169 | CC | IR | 115.6 | 146.8 | -6.0 | 192 | CSWs | IR | 153.0 | 6.7 | 1.8 |
| 169 | CSc | BR | 75.5 | 24.9 | -10.0 | 192 | CSWw | BR | 74.7 | 9.1 | -4.7 |
| 169 | CSc | IR | 59.7 | 24.1 | -0.1 | 192 | CSWw | IR | 107.4 | 9.8 | 1.8 |
| 169 | CSs | BR | 28.6 | 11.6 | 1.7 | 204 | CC | BR | 113.7 | 683.4 | -3.3 |
| 169 | CSs | IR | 12.1 | 9.8 | -2.0 | 204 | CC | IR | 110.2 | 31.7 | 4.0 |
| 169 | CSWc | BR | 59.9 | 33.4 | -2.7 | 204 | CSc | BR | 115.8 | 257.2 | -9.0 |
| 169 | CSWc | IR | 51.8 | 23.1 | 2.6 | 204 | CSc | IR | 86.1 | 29.5 | -1.2 |
| 169 | CSWs | BR | 34.0 | 13.2 | -6.2 | 204 | CSs | BR | 89.3 | 801.7 | -2.5 |
| 169 | CSWs | IR | 53.3 | 6.2 | 3.9 | 204 | CSs | IR | 98.0 | 31.9 | -11.1 |
| 169 | CSWw | BR | 32.6 | 10.1 | -3.6 | 204 | CSWc | BR | 107.1 | 630.5 | -0.2 |
| 169 | CSWw | IR | 77.9 | 12.2 | -4.2 | 204 | CSWc | IR | 75.2 | 61.5 | -5.5 |
| 182 | CC | BR | 145.6 | 379.5 | 3.1 | 204 | CSWs | BR | 87.8 | 495.4 | 0.8 |
| 182 | CC | IR | 203.5 | 322.3 | -5.6 | 204 | CSWs | IR | 91.2 | 38.9 | -5.8 |
| 182 | CSc | BR | 102.0 | 78.4 | -6.1 | 204 | CSWw | BR | 49.9 | 120.4 | -7.7 |
| 182 | CSc | IR | 179.2 | 81.5 | -2.0 | 204 | CSWw | IR | 51.1 | 10.4 | -6.1 |
| 182 | CSs | BR | 19.6 | 19.9 | 2.2 | 218 | CC | BR | 213.9 | 23.9 | -1.4 |
| 182 | CSs | IR | 41.0 | 13.3 | -2.5 | 218 | CC | IR | 189.5 | 24.3 | 8.0 |
| 182 | CSWc | BR | 137.2 | 63.2 | -2.7 | 218 | CSc | BR | 208.4 | 17.5 | -5.2 |
| 182 | CSWc | IR | 159.9 | 70.3 | -2.3 | 218 | CSc | IR | 211.3 | 18.6 | 6.1 |
| 182 | CSWs | BR | 31.8 | 6.3 | -4.8 | 218 | CSs | BR | 187.1 | 9.2 | 7.8 |
| 182 | CSWs | IR | 37.3 | 6.7 | -2.0 | 218 | CSs | IR | 205.4 | 11.8 | -11.3 |
| 182 | CSWw | BR | 63.0 | 20.5 | 4.0 | 218 | CSWc | BR | 152.8 | 15.3 | -22.1 |
| 182 | CSWw | IR | 97.7 | 17.8 | -2.2 | 218 | CSWc | IR | 142.2 | 18.2 | -14.1 |
| 192 | CC | BR | 265.6 | 107.2 | -7.8 | 218 | CSWs | BR | 141.0 | 6.4 | -10.1 |
| 192 | CC | IR | 178.1 | 64.0 | -1.4 | 218 | CSWs | IR | 150.3 | 9.1 | -20.9 |
| 192 | CSc | BR | 206.3 | 25.1 | -8.2 | 218 | CSWw | BR | 54.3 | 0.9 | -11.2 |
| 192 | CSc | IR | 156.4 | 22.1 | -2.1 | 218 | CSWw | IR | 49.2 | 0.5 | 0.0 |
| 192 | CSs | BR | 209.3 | 11.8 | 0.6 | 232 | CC | BR | 117.1 | 79.7 | -6.1 |
| 192 | CSs | IR | 157.5 | 13.1 | 1.7 | 232 | CC | IR | 112.6 | 17.4 | -6.1 |
| | | | | | | 232 | CSc | BR | 93.7 | 15.7 | -3.0 |

continued

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| DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ | DOY | Rotation | Place | CO ₂ flux mg C m ⁻² h ⁻¹ | N ₂ O flux µg N m ⁻² h ⁻¹ | CH ₄ flux µg C m ⁻² h ⁻¹ |
|-----|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------------|----------|-------|--------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 232 | CSc | IR | 103.9 | 9.0 | -4.6 | 291 | CSc | BR | 10.2 | 4.0 | -4.7 |
| 232 | CSs | BR | 89.4 | 63.3 | -16.1 | 291 | CSc | IR | 7.9 | 2.2 | -1.1 |
| 232 | CSs | IR | 93.7 | 6.4 | -0.6 | 291 | CSs | BR | 23.0 | 3.2 | -0.3 |
| 232 | CSWc | BR | 70.1 | 69.2 | -5.5 | 291 | CSs | IR | 24.7 | 5.9 | -2.1 |
| 232 | CSWc | IR | 81.5 | 7.3 | -9.9 | 291 | CSWc | BR | 21.1 | 4.1 | -5.4 |
| 232 | CSWs | BR | 72.0 | 51.9 | 2.7 | 291 | CSWc | IR | 26.1 | 2.8 | 8.1 |
| 232 | CSWs | IR | 108.1 | 8.3 | -22.4 | 291 | CSWs | BR | 31.2 | -2.3 | 11.1 |
| 232 | CSWw | BR | 42.4 | -0.4 | 0.6 | 291 | CSWs | IR | 18.8 | 1.4 | -5.4 |
| 232 | CSWw | IR | 189.8 | 614.6 | -6.4 | 291 | CSWw | BR | 8.9 | 1.3 | -9.1 |
| 249 | CC | BR | 83.5 | 26.0 | -7.6 | 291 | CSWw | IR | 6.4 | -0.1 | 14.9 |
| 249 | CC | IR | 81.2 | 11.2 | -8.0 | Mean | | | 76.9 | 57.0 | -3.1 |
| 249 | CSc | BR | 62.1 | 7.4 | -0.8 | Probability(%) | | | | | |
| 249 | CSc | IR | 67.0 | 5.5 | -13.6 | Date(D) | | | 0.0 | 0.0 | 1.0 |
| 249 | CSs | BR | 68.1 | 33.1 | -0.1 | Treatment(T) | | | 0.0 | 0.1 | 11.5 |
| 249 | CSs | IR | 63.4 | 2.0 | -8.6 | Place(P) | | | 2.8 | 0.0 | 57.0 |
| 249 | CSWc | BR | 54.4 | 33.0 | -0.9 | D x T | | | 0.0 | 1.7 | 39.8 |
| 249 | CSWc | IR | 64.2 | 4.6 | -12.2 | D x P | | | 0.0 | 0.0 | 15.1 |
| 249 | CSWs | BR | 53.7 | 53.7 | -8.0 | T x D | | | 5.1 | 0.7 | 10.4 |
| 249 | CSWs | IR | 61.4 | 5.8 | -16.5 | D x T x P | | | 0.3 | 6.2 | 3.1 |
| 249 | CSWw | BR | 32.4 | 12.1 | -9.4 | LSD(0.10) | | | | | |
| 249 | CSWw | IR | 57.5 | 8.5 | -9.9 | Date(D) | | | 21.8 | 47.5 | 3.5 |
| 259 | CC | BR | 39.3 | 75.7 | -2.5 | Treatment(T) | | | 7.4 | 30.2 | NS |
| 259 | CC | IR | 67.6 | 7.6 | -8.1 | Place(P) | | | 3.6 | 14.2 | NS |
| 259 | CSc | BR | 54.8 | -7.7 | -1.7 | D x T | | | 31.3 | 108.9 | NS |
| 259 | CSc | IR | 79.5 | 14.6 | -6.3 | D x P | | | 21.9 | 57.0 | NS |
| 259 | CSs | BR | 91.8 | 103.7 | -1.3 | T x D | | | 9.5 | 38.5 | 3.1 |
| 259 | CSs | IR | 34.9 | 3.8 | -6.4 | D x T x P | | | 38.4 | 140.1 | 11.3 |
| 259 | CSWc | BR | 67.2 | 82.7 | -7.5 | | | | | | |
| 259 | CSWc | IR | 59.4 | 11.9 | -7.2 | | | | | | |
| 259 | CSWs | BR | 63.9 | 121.4 | -5.5 | | | | | | |
| 259 | CSWs | IR | 56.8 | 19.8 | -7.6 | | | | | | |
| 259 | CSWw | BR | 47.2 | 98.4 | 3.2 | | | | | | |
| 259 | CSWw | IR | 35.0 | 3.8 | -9.1 | | | | | | |
| 291 | CC | BR | 27.4 | 2.9 | 1.4 | | | | | | |
| 291 | CC | IR | 29.8 | 5.6 | -7.9 | | | | | | |

**Table:1309-22. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Corn
Lancaster, WI - 2013.**

| Rotation | N Rate lb/A | Tillage | Yield bu/A | Moisture % | Test weight lbs/bu | Return \$4.04/bu \$/A |
|----------|----------------|---------|---------------|---------------|--------------------------|-----------------------------|
| CC | | | 139 | 17.1 | 55.8 | 525 |
| CCCMM-C1 | | | 215 | 17.4 | 57.1 | 811 |
| CCCMM-C2 | | | 188 | 17.7 | 56.7 | 710 |
| CCCMM-C3 | | | 170 | 17.9 | 56.0 | 638 |
| CCOMM-C1 | | | 231 | 17.8 | 57.3 | 869 |
| CCOMM-C2 | | | 188 | 18.0 | 56.3 | 709 |
| CS-C | | | 172 | 17.6 | 55.9 | 648 |
| CSCOM-C1 | | | 217 | 18.3 | 57.2 | 813 |
| CSCOM-C2 | | | 199 | 17.9 | 57.3 | 747 |
| CSW-C | | | 201 | 17.8 | 56.9 | 757 |
| | 0 | | 140 | 17.7 | 55.7 | 526 |
| | 50 | | 182 | 17.7 | 56.7 | 684 |
| | 100 | | 209 | 17.8 | 57.1 | 788 |
| | 200 | | 237 | 17.8 | 57.1 | 892 |
| | | CT | 193 | 17.8 | 56.7 | 727 |
| | | NT | 191 | 17.7 | 56.6 | 718 |
| CC | 0 | | 61 | 16.0 | 53.9 | 232 |
| CC | 50 | | 123 | 17.2 | 54.9 | 463 |
| CC | 100 | | 149 | 17.2 | 57.3 | 562 |
| CC | 200 | | 224 | 17.9 | 57.2 | 842 |
| CCCMM-C1 | 0 | | 180 | 17.3 | 57.2 | 678 |
| CCCMM-C1 | 50 | | 212 | 17.2 | 57.3 | 802 |
| CCCMM-C1 | 100 | | 233 | 17.6 | 57.2 | 876 |
| CCCMM-C1 | 200 | | 235 | 17.3 | 56.9 | 886 |
| CCCMM-C2 | 0 | | 117 | 18.0 | 56.0 | 440 |
| CCCMM-C2 | 50 | | 180 | 17.7 | 56.6 | 678 |
| CCCMM-C2 | 100 | | 210 | 17.6 | 56.9 | 792 |
| CCCMM-C2 | 200 | | 247 | 17.6 | 57.3 | 929 |
| CCCMM-C3 | 0 | | 87 | 17.9 | 54.1 | 327 |
| CCCMM-C3 | 50 | | 153 | 17.9 | 56.0 | 575 |
| CCCMM-C3 | 100 | | 193 | 17.9 | 56.9 | 727 |
| CCCMM-C3 | 200 | | 246 | 18.0 | 57.2 | 925 |
| CCOMM-C1 | 0 | | 205 | 17.9 | 57.3 | 771 |
| CCOMM-C1 | 50 | | 231 | 17.7 | 57.3 | 870 |
| CCOMM-C1 | 100 | | 255 | 17.7 | 57.4 | 960 |
| CCOMM-C1 | 200 | | 232 | 17.7 | 57.2 | 873 |

continued

Table:1309-22. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Corn
 (continue) **Lancaster, WI - 2013.**

| Rotation | N Rate lb/A | Tillage | Yield bu/A | Moisture % | Test weight lbs/bu | Return \$4.04/bu \$/A |
|----------|----------------|---------|---------------|---------------|--------------------------|-----------------------------|
| CCOMM-C2 | 0 | | 124 | 18.2 | 55.4 | 466 |
| CCOMM-C2 | 50 | | 183 | 17.8 | 56.0 | 688 |
| CCOMM-C2 | 100 | | 213 | 17.9 | 56.9 | 801 |
| CCOMM-C2 | 200 | | 234 | 18.2 | 56.7 | 879 |
| CS-C | 0 | | 103 | 18.0 | 54.4 | 386 |
| CS-C | 50 | | 143 | 17.3 | 55.6 | 541 |
| CS-C | 100 | | 213 | 17.7 | 57.1 | 801 |
| CS-C | 200 | | 229 | 17.4 | 56.6 | 864 |
| CSCOM-C1 | 0 | | 207 | 18.0 | 56.9 | 776 |
| CSCOM-C1 | 50 | | 205 | 18.6 | 57.2 | 770 |
| CSCOM-C1 | 100 | | 215 | 18.4 | 57.3 | 809 |
| CSCOM-C1 | 200 | | 239 | 18.2 | 57.3 | 898 |
| CSCOM-C2 | 0 | | 142 | 17.7 | 56.1 | 535 |
| CSCOM-C2 | 50 | | 185 | 17.8 | 57.7 | 695 |
| CSCOM-C2 | 100 | | 225 | 18.0 | 57.5 | 847 |
| CSCOM-C2 | 200 | | 243 | 18.2 | 57.7 | 912 |
| CSW-C | 0 | | 173 | 17.7 | 56.1 | 651 |
| CSW-C | 50 | | 202 | 17.6 | 57.9 | 761 |
| CSW-C | 100 | | 187 | 18.0 | 56.2 | 704 |
| CSW-C | 200 | | 242 | 17.7 | 57.4 | 911 |
| CC | | CT | 148 | 17.3 | 56.0 | 560 |
| CC | | NT | 130 | 16.8 | 55.6 | 490 |
| CCCMM-C1 | | CT | 216 | 17.8 | 57.1 | 814 |
| CCCMM-C1 | | NT | 214 | 17.0 | 57.2 | 807 |
| CCCMM-C2 | | CT | 189 | 17.7 | 56.8 | 712 |
| CCCMM-C2 | | NT | 188 | 17.7 | 56.6 | 707 |
| CCCMM-C3 | | CT | 170 | 18.3 | 55.9 | 640 |
| CCCMM-C3 | | NT | 169 | 17.5 | 56.1 | 637 |
| CCOMM-C1 | | CT | 228 | 17.7 | 57.0 | 857 |
| CCOMM-C1 | | NT | 234 | 17.8 | 57.6 | 880 |
| CCOMM-C2 | | CT | 175 | 17.8 | 56.4 | 660 |
| CCOMM-C2 | | NT | 202 | 18.2 | 56.1 | 757 |
| CS-C | | CT | 178 | 17.2 | 56.2 | 671 |
| CS-C | | NT | 166 | 18.1 | 55.7 | 624 |
| CSCOM-C1 | | CT | 215 | 18.4 | 57.1 | 807 |
| CSCOM-C1 | | NT | 218 | 18.2 | 57.2 | 820 |
| CSCOM-C2 | | CT | 205 | 18.2 | 57.4 | 769 |
| CSCOM-C2 | | NT | 193 | 17.7 | 57.1 | 726 |

continued

Table:1309-22. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Corn
 (continue) **Lancaster, WI - 2013.**

| Rotation | N Rate lb/A | Tillage | Yield bu/A | Moisture % | Test weight lbs/bu | Return \$4.04/bu \$/A |
|----------|----------------|---------|---------------|---------------|--------------------------|-----------------------------|
| CSW-C | | CT | 207 | 17.8 | 57.4 | 780 |
| CSW-C | | NT | 195 | 17.7 | 56.4 | 733 |
| | 0 | CT | 139 | 17.9 | 55.9 | 524 |
| | 0 | NT | 140 | 17.4 | 55.6 | 528 |
| | 50 | CT | 181 | 17.8 | 56.9 | 682 |
| | 50 | NT | 182 | 17.6 | 56.4 | 687 |
| | 100 | CT | 214 | 17.9 | 57.1 | 803 |
| | 100 | NT | 205 | 17.7 | 57.0 | 772 |
| | 200 | CT | 239 | 17.7 | 57.0 | 899 |
| | 200 | NT | 235 | 17.9 | 57.3 | 885 |
| CC | 0 | CT | 63 | 17.6 | 54.0 | 238 |
| CC | 0 | NT | 59 | 14.3 | 53.9 | 225 |
| CC | 50 | CT | 131 | 16.8 | 55.0 | 495 |
| CC | 50 | NT | 115 | 17.6 | 54.9 | 431 |
| CC | 100 | CT | 183 | 17.1 | 58.1 | 691 |
| CC | 100 | NT | 114 | 17.2 | 56.6 | 434 |
| CC | 200 | CT | 217 | 17.9 | 57.1 | 814 |
| CC | 200 | NT | 231 | 17.9 | 57.2 | 869 |
| CCCMM-C1 | 0 | CT | 176 | 17.9 | 57.2 | 664 |
| CCCMM-C1 | 0 | NT | 183 | 16.8 | 57.2 | 693 |
| CCCMM-C1 | 50 | CT | 215 | 17.8 | 57.6 | 811 |
| CCCMM-C1 | 50 | NT | 209 | 16.6 | 56.9 | 792 |
| CCCMM-C1 | 100 | CT | 237 | 17.8 | 56.9 | 893 |
| CCCMM-C1 | 100 | NT | 228 | 17.4 | 57.6 | 859 |
| CCCMM-C1 | 200 | CT | 235 | 17.6 | 56.7 | 887 |
| CCCMM-C1 | 200 | NT | 234 | 17.1 | 57.1 | 885 |
| CCCMM-C2 | 0 | CT | 119 | 17.9 | 56.4 | 449 |
| CCCMM-C2 | 0 | NT | 115 | 18.2 | 55.6 | 430 |
| CCCMM-C2 | 50 | CT | 178 | 17.9 | 56.6 | 669 |
| CCCMM-C2 | 50 | NT | 182 | 17.6 | 56.6 | 686 |
| CCCMM-C2 | 100 | CT | 214 | 17.6 | 56.9 | 805 |
| CCCMM-C2 | 100 | NT | 207 | 17.6 | 56.9 | 779 |
| CCCMM-C2 | 200 | CT | 246 | 17.6 | 57.4 | 927 |
| CCCMM-C2 | 200 | NT | 247 | 17.5 | 57.2 | 932 |
| CCCMM-C3 | 0 | CT | 86 | 18.5 | 54.0 | 322 |
| CCCMM-C3 | 0 | NT | 88 | 17.2 | 54.1 | 331 |
| CCCMM-C3 | 50 | CT | 152 | 18.4 | 56.0 | 570 |
| CCCMM-C3 | 50 | NT | 154 | 17.5 | 56.1 | 579 |

continued

Table:1309-22. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Corn
 (continue) **Lancaster, WI - 2013.**

| Rotation | N Rate lb/A | Tillage | Yield bu/A | Moisture % | Test weight lbs/bu | Return \$4.04/bu \$/A |
|----------|----------------|---------|---------------|---------------|--------------------------|-----------------------------|
| CCCMM-C3 | 100 | CT | 195 | 18.2 | 56.8 | 732 |
| CCCMM-C3 | 100 | NT | 192 | 17.5 | 57.0 | 722 |
| CCCMM-C3 | 200 | CT | 249 | 18.0 | 57.0 | 934 |
| CCCMM-C3 | 200 | NT | 243 | 17.9 | 57.3 | 916 |
| CCOMM-C1 | 0 | CT | 196 | 17.7 | 57.4 | 737 |
| CCOMM-C1 | 0 | NT | 215 | 18.2 | 57.3 | 805 |
| CCOMM-C1 | 50 | CT | 227 | 17.8 | 56.8 | 855 |
| CCOMM-C1 | 50 | NT | 235 | 17.6 | 57.7 | 885 |
| CCOMM-C1 | 100 | CT | 253 | 17.7 | 57.2 | 952 |
| CCOMM-C1 | 100 | NT | 257 | 17.7 | 57.6 | 967 |
| CCOMM-C1 | 200 | CT | 235 | 17.7 | 56.6 | 884 |
| CCOMM-C1 | 200 | NT | 229 | 17.7 | 57.8 | 863 |
| CCOMM-C2 | 0 | CT | 109 | 18.1 | 55.9 | 409 |
| CCOMM-C2 | 0 | NT | 139 | 18.3 | 54.9 | 523 |
| CCOMM-C2 | 50 | CT | 169 | 17.3 | 56.3 | 637 |
| CCOMM-C2 | 50 | NT | 197 | 18.3 | 55.8 | 739 |
| CCOMM-C2 | 100 | CT | 199 | 17.9 | 56.8 | 749 |
| CCOMM-C2 | 100 | NT | 227 | 17.9 | 57.1 | 853 |
| CCOMM-C2 | 200 | CT | 225 | 17.9 | 56.8 | 845 |
| CCOMM-C2 | 200 | NT | 243 | 18.5 | 56.6 | 913 |
| CS-C | 0 | CT | 112 | 17.7 | 54.6 | 423 |
| CS-C | 0 | NT | 93 | 18.4 | 54.1 | 350 |
| CS-C | 50 | CT | 145 | 17.2 | 56.0 | 548 |
| CS-C | 50 | NT | 142 | 17.5 | 55.2 | 534 |
| CS-C | 100 | CT | 214 | 17.5 | 57.8 | 808 |
| CS-C | 100 | NT | 211 | 17.9 | 56.4 | 794 |
| CS-C | 200 | CT | 239 | 16.3 | 56.3 | 908 |
| CS-C | 200 | NT | 219 | 18.6 | 56.9 | 819 |
| CSCOM-C1 | 0 | CT | 201 | 18.0 | 56.8 | 756 |
| CSCOM-C1 | 0 | NT | 212 | 18.1 | 57.0 | 796 |
| CSCOM-C1 | 50 | CT | 206 | 18.7 | 57.3 | 773 |
| CSCOM-C1 | 50 | NT | 204 | 18.4 | 57.1 | 767 |
| CSCOM-C1 | 100 | CT | 210 | 18.6 | 57.3 | 788 |
| CSCOM-C1 | 100 | NT | 221 | 18.1 | 57.4 | 829 |
| CSCOM-C1 | 200 | CT | 243 | 18.3 | 57.1 | 911 |
| CSCOM-C1 | 200 | NT | 236 | 18.1 | 57.5 | 886 |
| CSCOM-C2 | 0 | CT | 143 | 18.0 | 55.9 | 539 |
| CSCOM-C2 | 0 | NT | 141 | 17.4 | 56.2 | 531 |

continued

Table:1309-22. Corn, Soybean, Wheat, Oats and Alfalfa (Meadow) Rotation - Corn
 (continue) **Lancaster, WI - 2013.**

| Rotation | N Rate lb/A | Tillage | Yield bu/A | Moisture % | Test weight lbs/bu | Return \$4.04/bu \$/A |
|-----------------------|----------------|---------|---------------|---------------|--------------------------|-----------------------------|
| CSCOM-C2 | 50 | CT | 194 | 18.2 | 58.7 | 727 |
| CSCOM-C2 | 50 | NT | 176 | 17.5 | 56.8 | 662 |
| CSCOM-C2 | 100 | CT | 232 | 18.2 | 57.4 | 870 |
| CSCOM-C2 | 100 | NT | 219 | 17.8 | 57.7 | 825 |
| CSCOM-C2 | 200 | CT | 250 | 18.3 | 57.5 | 940 |
| CSCOM-C2 | 200 | NT | 235 | 18.0 | 57.9 | 884 |
| CSW-C | 0 | CT | 188 | 17.9 | 56.7 | 706 |
| CSW-C | 0 | NT | 158 | 17.5 | 55.5 | 596 |
| CSW-C | 50 | CT | 195 | 17.8 | 59.0 | 732 |
| CSW-C | 50 | NT | 209 | 17.4 | 56.8 | 789 |
| CSW-C | 100 | CT | 198 | 18.0 | 56.2 | 746 |
| CSW-C | 100 | NT | 176 | 18.1 | 56.2 | 662 |
| CSW-C | 200 | CT | 249 | 17.6 | 57.7 | 937 |
| CSW-C | 200 | NT | 235 | 17.9 | 57.0 | 885 |
| Mean | | | 192 | 17.7 | 56.7 | 723 |
| Probability(%) | | | | | | |
| Rotation (R) | | | 0.1 | 28.0 | 3.3 | 0.1 |
| Fertilizer (F) | | | 0.0 | 53.3 | 0.0 | 0.0 |
| R x F | | | 4.0 | 11.4 | 12.9 | 4.1 |
| Tillage(T) | | | 35.0 | 6.7 | 23.0 | 36.6 |
| T x R | | | 3.7 | 0.1 | 50.2 | 3.8 |
| T x F | | | 54.1 | 3.7 | 31.1 | 53.0 |
| R x F x T | | | 85.9 | 4.2 | 97.6 | 84.2 |
| LSD(0.10) | | | | | | |
| Rotation (R) | | | 22 | NS | 0.8 | 82 |
| Fertilizer (F) | | | 13 | NS | 0.4 | 48 |
| R x F | | | 40 | NS | NS | 151 |
| Tillage(T) | | | NS | 0.1 | NS | NS |
| T x R | | | 22 | 0.7 | NS | 82 |
| T x F | | | NS | 0.3 | NS | NS |
| R x F x T | | | NS | 1.0 | NS | NS |