

## FIELD EXPERIMENT HISTORY

**Title:** Corn - Soybean - Wheat Response to Rotation.

**Experiment:** 09CSW

**Trial ID:** 6167

**Year:** 2017

**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:** 11/1 /16      **pH** 5.7      **OM (%)** 3.1      **P (ppm)** 24      **K (ppm)** 92

### Plot Management

#### Tillage Operations:

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
<b>Fertilizer:</b>			
<b>Preplant :</b>	N/A	N/A	N/A
<b>Starter :</b>	N/A	N/A	N/A
<b>Post plant :</b>	28-0-0	C: 714 S: 0 lb/A W: 80 lb/A	6 /09/17
<b>Manure:</b>	N/A	N/A	N/A

<b>Herbicide:</b>	C,S:Medal II 24 fl oz/a 4/24/17, Durango DMA 22 oz/a 4/24/17 2,4-D low vol 4. 16.0 oz/a 4/24/17 Durango DMA 28 oz/a 6/17/17 Roundup Wmax 32.0 oz/a 6/27/17	<b>Hybrid:</b>	C: DKC54-38RIB S: NK S15-P1 Brand W: Pioneer 25R40
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<b>Planting Date:</b>	C: 5/8/17 S: 5/8/17 W:10/4/16	<b>Planting Depth:</b>	C: 1.5" S,W: 1"	<b>Planting Method:</b>	C,S: JD1700 with RTK W: JD750 No-Till Drill
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**Target Plant Density:** 35000

<b>Harvest Method:</b>	C:MF 8XP combine
<b>Row Width:</b>	C,S: 30" CS: NH 707 W: 0.5" S,W: Almaco Plot combine

**Harvest Date:** C: 10/5/17, CS: 9/25/17  
S: 9/25/17, W: 7/24/17

**Fungicide:** N/A

**Notes:** Even up year, no Split Treatments.

### Experimental Design

**Design:** RCB split-split-block

**Replications:** 3

**Plot Size Seeded:** MP: 60' x 60'; SP: 10' x 30'

**Experiment Size:** 3.47 A

**Harvest Plot Size:** 5' x 26'

#### Factors/Treatments:

<u>Rotation:</u>	<u>Cover Crop</u>	<u>Nitrogen Rate lb/A</u>
1) CC	In Corn and Soybean plots	1) 0
2) SS	use:	2) 30
3) WW	1) UTC	
4) CS-S	2) Oat pre-harvest	
5) CS-C	3) Oat post-harvest	
6) GS1: CSW-C	4) Rye pre-harvest	
7) GS1: CSW-S	5) Rye post-harvest	
8) GS1: CSW-W	6) Oat/Rye in Strip/Wheel	
9) GS2: CWS-W	track post-harvest	
10) GS2: CWS-S		
11) GS2: CWS-W	In wheat plots use Berseem	
12) Flex: CWS-C	and Red Clover for Trtmts.	
13) Flex: CWS-W	2-5, and for Trtmt. 6 use	
14) Flex: CWS-S	radish.	

**Results: Tables 1709-09 to 1709-12**

**Table: 1709 - 09 . Corn, Soybean and Wheat Rotation - Corn  
Arlington, WI - 2017.**

Rotation	Yield bu/A	Moisture %	Test weight lbs/bu	Lodged			Harvest plants plants/A	AGI \$3.44/bu \$/A
				Total %	Stalk %	Root %		
CC-C	192	36.6	53.2	0.0	0.0	0.0	24278	541
CSW-C	227	32.0	53.6	0.4	0.3	0.1	28806	657
CWS-C(e)	238	32.6	53.7	0.4	0.3	0.2	29873	684
SC-C	238	30.5	53.0	0.1	0.1	0.0	33083	692
Mean	224	32.9	53.4	0.2	0.2	0.1	29010	644
<b><u>Probability(%)</u></b>								
Rotation	58.9	45.7	63.0	45.3	60.3	36.0	45.4	53.9
<b><u>LSD(0.10)</u></b>								
Rotation	NS	NS	NS	NS	NS	NS	NS	NS

AGI\*: Adjusted Gross Income.

**Table: 1709-10. Corn, Soybean and Wheat Rotation - Corn Silage  
Arlington, WI - 2017.**

*Treatment	Whole Plant											
	Dry Matter	Kernel		Crude	<i>In Vitro</i>				Milk per		Plant	
	Yield	Moisture	milk	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre	population
	tons/A	%	%	%	%	%	%	%	%	lbs/T	lbs/T	plants/A
*Mean	9.5	53.7	25.3	6.2	15.5	31.8	87.1	59.5	37.7	3160	29957	30694
<b><u>Probability(%)</u></b>												
Nitrogen (N)	--	--	--	--	--	--	--	--	--	--	--	--
<b><u>LSD(0.10)</u></b>												
Nitrogen (N)	--	--	--	--	--	--	--	--	--	--	--	--

\* Establishment year, no treatment to analyze.

**Table: 1709 - 11 . Corn, Soybean and Wheat Rotation -Soybean  
Arlington, WI - 2017.**

Rotation	Yield bu/A	Moisture %	AGI \$8.48/bu \$/A
CS-S	64	11.9	527
CSW-S(e)	73	12.5	604
CWS-S	66	12.0	548
CWSL-S	73	12.3	598
SS-S	53	11.3	435
Mean	66	12.0	542
<b><u>Probability(%)</u></b>			
Rotation (R)	0.6	18.2	0.6
<b><u>LSD(0.10)</u></b>			
Rotation (R)	8	NS	62

AGI\*: Adjusted Gross Income.

**Table: 1709 - 12 . Corn, Soybean and Wheat Rotation -Wheat.  
Arlington, WI - 2017.**

Rotation	Yield bu/A	Moisture %	Test weight lbs/bu	AGI \$3.44/bu \$/A
CSW-W	99	14.3	54.3	348
CWS-W	84	14.1	52.8	298
CWSL-W(s)	85	14.3	53.8	300
WW-W	41	12.7	49.2	145
Mean	77	13.9	52.5	273
<b><u>Probability(%)</u></b>				
Rotation (R)	0.1	7.4	0.5	0.1
<b><u>LSD(0.10)</u></b>				
Rotation (R)	10	1.0	1.4	35

## FIELD EXPERIMENT HISTORY

**Title:** Corn - Soybean - Wheat Response to Rotation.

**Experiment:** 09CSW

**Trial ID:** 6253

**Year:** 2017

**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:** 4 /24/15      **pH** 7.4      **OM (%)** 3.1      **P (ppm)** 41      **K (ppm)** 124

### Plot Management

#### **Tillage Operations:**

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
<b>Fertilizer:</b>			
<b>Preplant :</b>	N/A	N/A	N/A
<b>Starter :</b>	C: 20-10-20-4S	200 lbs	6/1/17
	C: 7-9-13-2S	5 gal/A	6/1/17
<b>Post plant :</b>	S: 20-10-20-4S	150 lb/A	6/16/17
	WW: 46-0-0	50 lb/A	5/10/17
	C: 46-0-0	200 lb/A	7/11/17
<b>Manure:</b>	N/A	N/A	N/A

**Herbicide:** C pre: Verdict 16 oz,  
C pre: Roundup Pmax 32 oz  
S post: Roundup Pmax 32 oz  
W: Affinity broadspec 0.5 oz  
2,4-D 4lb Amine 0.5 oz

**Hybrid:** C: Masters Choice 4210  
S: Renk RS 145NR2  
W: Pioneer 25R34

**Planting Date:** C: 6/1/17      **Planting Depth:** C: 1.5"  
S: 5/15/17      S,W: 1"  
W: 10/15/16

**Planting Method:** C: JD 1750 planter  
S,W: Great Plains 1206 Ntdrill

**Harvest Method:** CS: Hand Harvest

**Target Plant Density:** 35000

**Row Width:** C: 30"  
S: 15"  
W: 7.5"

**Harvest Date:** C: 11/30/17, CS: 10/10/17  
S: 10/20/16, W: 8/26/17

**Fungicide:** 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: 2017 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 1709-13 to 1709-16**

**Table: 1709 - 13 . Corn, Soybean and Wheat Rotation - Corn  
Marshfield, WI - 2017.**

Rotation	Yield bu/A	Moisture %	Test weight lbs/bu	Lodged	Harvest plants/A	AGI
				Stalk %		\$3.44/bu \$/A
Continuous	84	--	--	18.6	33880	268
Alternating	125	--	--	3.5	34364	400
Grain System	105	--	--	7.8	33880	338
Mean	105	--	--	10.0	34041	335
<b><u>Probability(%)</u></b>						
Rotation (R)	39.8	--	--	10.9	93.4	39.8
<b><u>LSD(0.10)</u></b>						
Rotation (R)	NS	--	--	NS	NS	NS

AGI\*: Adjusted Gross Income.

-- Combine malfunction in collecting moisture and test weight

**Table:1709 - 14. Corn, Soybean, and Wheat Rotation- Corn Silage  
Marshfield, WI - 2017.**

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	5.19	60.6	50	33,686	4.8	21.9	36.9	58.9	66.6	53.7	37.8	3,204	16,736
Alternating	6.83	56.6	50	33,106	5.7	25.3	43.2	57.3	64.3	46.2	31.3	3,024	22,776
Grain System I	6.50	64.1	50	33,106	5.1	22.9	37.5	59.1	66.4	52.2	36.5	3,186	16,396
Mean	6.2	60.4	50.0	33,299	5.2	23.4	39.2	58.4	65.8	50.7	35.2	3,138	18,636
<u>Probability (%)</u>													
Treatment	10.6	3.7	--	91.7	3.0	33.6	20.7	23.2	15.9	16.5	20.0	13.1	5.9
<u>LSD 10%</u>													
Treatment	1.3	3.9	--	3403	0.5	4.4	6.8	2.0	2.2	7.0	6.6	159	4335



**Table: 1709 - 15 . Corn, Soybean and Wheat Rotation -Soybean  
Marshfield, WI - 2017.**

Rotation	Yield bu/A	Moisture %	Test			AGI
			Weight lb/bu	Height in.	Lodging 1 to 5	\$8.48/bu \$/A
Continuous	38	12.8	54.3	26	1.0	314
Alternating	54	13.8	54.8	30	1.0	447
Grain System I	47	13.8	54.6	61	1.0	390
Mean	47	13.5	54.6	39	1.0	384
<u>Probability (%)</u>						
Treatment	2	24.8	56.9	46	--	2
<u>LSD 10%</u>						
Treatment	7.1	NS	NS	NS	--	58.4

AGI\*: Adjusted Gross Income.

**Table: 1709 - 16 . Corn, Soybean and Wheat Rotation -Wheat.  
Marshfield, WI - 2017.**

Rotation	Yield bu/A	Moisture %	Test Weight lb/bu	Height in.	Lodging 1 to 5	AGI \$3.78/bu \$/A
Continuous	31	11.7	55.7	24	0.0	109
Grain System I	30	12.5	55.5	25	0.3	106
Mean	30	12.1	55.6	25	0.2	107
<u>Probability (%)</u>						
Treatment	26.8	31.0	31.6	56.2	42.3	27.0
<u>LSD 10%</u>						
Treatment	NS	NS	NS	NS	NS	NS

AGI\*: Adjusted Gross Income.