FIELD EXPERIMENT HISTORY

Title: **Alfalfa - Corn Response to Rotation**

Experiment: 09Rotation **Trial ID:** 5750 **Year:** 2013

Personnel: J.G. Lauer, D. Undersander,T.H. Diallo, K. D. Kohn, K. Silvera

Location: Arlington, WI **County:** Columbia

Supported By: HATCH

Site Information

Field: ARS333 **Previous Crop:** See Factors **Soil Type:** Plano silt loam

Soil Test Date: 11/4/2013 **pH:** 6.1 **OM (%)** 3.4 **P (ppm)** 18 **K (ppm)** 110

Plot Management

Tillage Operations: No-Till

Fertilizer:	**Analysis:**	**Rate lbs/A:**	**Date:**
Preplant :	N/A	N/A	N/A
Starter :	N/A	N/A	N/A
Post plant :	28-0-0	190	6 /18/13
Manure:	N/A	N/A	N/A

Herbicide: Roundup 28 oz/A 5/14/13
Weedone LV4 16 oz/A 5/14/13
Hornet 4 oz/A 6/8/13
Rifle 12 oz/A 6/8/13
Dual 28 oz/A 6/8/13
Warrior/Zeon 2 oz/A 7/31/1

Insecticide: None

Irrigation: None

Hybrid: C: Pioneer 0705 AM1
A: Pioneer 54R01

Planting Date: C: 6/03/13
A: 6/07/13

Planting Depth: C: 1.5"
A: 0.5"

Row Width: C: 30"
A: 6"

Target Plant Density: C:32000

Planting Method: C:JD1700
A:JD750 No-Till drill

Harvest Date: G: 11/4/13
S: 9/27/13
A: 5/24; 7/15; 8/28/13

Harvest Method: G: Massey 8XP
S: NH 707
A: Almaco Harvester

Notes:

Experimental Design

Design: RCB split-split-block **Replications:** 3

Plot Size Seeded: MP: 60' x 75' SP: 10’ x 34. **Experiment Size:** 3.47 A

Harvest Plot Size: G: 5' x 34.5'

Factors/Treatments:

Rotation:

1) AAACC- 1A
2) AAACC- 2A
3) AAACC- 3A
4) AAACC- 1C
5) AAACC- 2C
6) AACC- 1A
7) AACC- 2A
8) AACC- 1C (Ruark)
9) AACC- 2C
10) AACC- 1A
11) AACC- 2A
12) AACC- 1C (Silage)(Ruark)
13) AACC- 2C (Silage)
14) CC- Grain & Silae (S/S, S/G, G/S, G/G) (Ruark)

N Fertilizer

1) 0
2) Recommended AN
3) Recommended ESN
4) Recommended ESN- 20%
5) Recommended Super U
6) Recommended Super U - 20%
7) Recommended Agrotain
8) Recommended Urea

Results: Tables 1309-01,1309-02,1309-03,1309-04,1309-05 & 1309-06

Table:1309-01. Alfalfa-Corn Rotation Study - Corn.
Arlington, WI - 2013.

Rotation	Yield	Moisture	Test weight	Lodged			Harvest density	Return $4.04/bu
				Total	Stalk	Root		
	bu/A	%	lbs/bu	%	%	%	plants/A	$/A
AAACC-1C	174	26.5	47.6	0.0	0.0	0.0	32000	625
AAACC-2C	185	27.8	47.4	0.0	0.0	0.0	29000	659
AACC-1C	178	28.7	47.4	1.1	0.0	1.1	34333	632
AACC-2C	188	28.1	47.6	0.3	0.1	0.1	30500	668
CC-1C	158	32.7	47.0	0.6	0.3	0.3	27875	549
Mean	176	28.8	47.4	0.4	0.1	0.3	30742	626
Probability(%)								
Rotation (R)	4.2	0.0	26.0	62.2	90.2	39.5	0.4	1.5
LSD(0.10)								
Rotation (R)	34	3.9	NS	NS	NS	NS	3644	122

Table:1309-02. Alfalfa-Corn Rotation Study - Corn in CC-1C Rotation. Arlington, WI - 2013.

N-Fertilizer	Yield	Moisture	Test weight	Lodged			Harvest density	Return $4.04/bu
				Total	Stalk	Root		
lb-N-/A	bu/A	%	lbs/bu	%	%	%	plants/A	$/A
UTC	155	34.0	46.9	1.2	1.2	0.0	25333	538
AN/130	135	33.3	47.0	0.0	0.0	0.0	29667	466
AN/165	131	35.2	46.8	0.0	0.0	0.0	25333	447
ESN/130	163	32.3	46.8	1.1	0.0	1.1	30667	568
ESN/165	154	32.3	46.7	1.0	0.0	1.0	30000	535
SU/165	184	31.5	47.4	1.4	1.4	0.0	28000	641
AGROTAIN/165	185	30.5	47.4	0.0	0.0	0.0	27667	647
UREA/165	158	32.7	46.9	0.0	0.0	0.0	26333	549
Mean	158	32.7	47.0	0.6	0.3	0.3	27875	549
Probability(%)								
N-Fertilizer(F)	69.7	50.1	63.2	76.0	55.9	56.1	52.4	65.2
LSD(0.10)								
N-Fertilizer(F)	NS	NS	NS	NS	NS	NS	NS	NS

Table:1309-03. Alfalfa-Corn Rotation Study - Corn in AACC-2C Rotation. Arlington, WI - 2013.

N-Fertilizer	Yield	Moisture	Test weight	Lodged			Harvest density	Return $4.04/bu
				Total	Stalk	Root		
lb-N-/A	bu/A	%	lbs/bu	%	%	%	plants/A	$/A
UTC	182	29.0	48.0	0.0	0.0	0.0	31333	645
AN/100	183	23.6	48.2	0.0	0.0	0.0	28667	669
AN/125	192	29.0	46.9	1.2	1.2	0.0	30667	678
ESN/100	193	25.9	47.9	0.0	0.0	0.0	32333	695
ESN/125	200	31.1	47.3	0.0	0.0	0.0	30000	701
SU/125	178	29.5	47.1	0.0	0.0	0.0	32000	628
AGRO/125	196	27.5	47.8	1.0	0.0	1.0	30000	697
UREA/125	178	29.3	47.5	0.0	0.0	0.0	29000	628
Mean	188	28.1	47.6	0.3	0.1	0.1	30500	668
Probability(%)								
N-Fertilizer(F)	86.6	38.7	73.6	56.0	47.1	47.1	75.4	89.8
LSD(0.10)								
N-Fertilizer(F)	NS	NS	NS	NS	NS	NS	NS	NS

Table:1309-04. Alfalfa-Corn Rotation Study -Alfalfa. Arlington, WI - 2013.

Rotation	Harvest Date 24-May	15-Jul	28-Aug	Total
	T dm/A	T dm/A	T dm/A	T dm/A
AAACC-1A	-	-	1.1	1.1
AAACC-2A	1.5	1.4	1.2	4.1
AAACC-3A	1.7	1.4	1.1	4.2
AACC(s)-1A	-	-	1.1	1.1
AACC(s)-2A	1.1	1.2	0.9	3.2
AACC-1A	-	-	1.1	1.1
AACC-2A	1.2	1.2	0.8	3.2
Mean	1.4	1.3	1.0	3.7
Probability (%)				
Rotation (R)	40.6	21.8	9.9	0.0
LSD 10%				
Rotation (R)	NS	NS	0.2	1.1

-Establishment year: First cutting was August 28

Table:1309-05. Alfalfa-Corn Rotation Study - Silage.

	Whole Plant												
	Dry Matter		Kernel	Crude			*In Vitro*			Milk per		Harvest	
Rotation	Yield	Moisture	milk	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre	density	Total N
	T/A	%	%	%	%	%	%	%	%	lb	lb	plants/A	%
AACC(s)-1C	7.5	69.9	50.0	7.0	27.2	47.2	83.1	64.1	32.3	3405	25670	31649	1.0
AACC(s)-2C	7.4	65.5	52.9	6.9	26.7	46.9	83.3	64.5	32.5	3422	25163	30239	1.0
Mean	7.5	67.7	51.5	7.0	26.9	47.0	83.2	64.3	32.4	3414	25417	30944	1.0
Probability(%)													
Rotation (R)	84.6	5.0	66.5	50.3	61.3	85.9	78.0	68.5	92.7	78.7	82.9	8.6	62.8
LSD(0.10)													
Rotation (R)	NS	3.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	1348	NS

Table:1309-06. Alfalfa-Corn Rotation Study - Silage in AACC(s)-2C Rotation

	Whole Plant												
	Dry Matter		Kernel	Crude			*In Vitro*			Milk per		Harvest	
N-Fertilizer	Yield	Moisture	milk	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre	density	Total N
lb-N-/A	T/A	%	%	%	%	%	%	%	%	lb	lb	plants/A	%
UTC	6.9	66.6	45.0	6.8	26.0	45.5	84.1	65.3	33.8	3475	23708	30976	0.9
AN/100	7.7	62.5	45.0	6.8	27.6	47.5	82.6	63.4	32.1	3378	25859	29798	1.0
AN/125	7.3	67.3	58.3	6.9	26.4	46.2	83.3	63.9	33.4	3426	24950	30808	1.0
ESN/100	8.1	64.2	58.3	6.8	26.9	47.6	83.5	65.3	31.8	3425	27744	30808	1.0
ESN/125	7.9	64.2	53.3	7.0	27.6	48.6	82.3	63.6	30.3	3352	26520	30471	0.9
SU/125	6.8	68.2	56.7	7.2	25.6	46.2	84.1	65.7	32.9	3469	23730	30303	1.0
AGROTAIN/125	8.1	64.3	56.7	6.9	26.8	46.9	83.0	63.8	32.6	3406	27595	29798	1.0
UREA/125	6.2	66.9	50.0	6.9	26.3	46.4	83.7	64.9	33.2	3446	21202	28956	1.0
Mean	7.4	65.5	52.9	6.9	26.7	46.9	83.3	64.5	32.5	3422	25163	30239	1.0
Probability(%)													
N-Fertilizer(N)	48.6	55.3	67.9	63.2	88.7	95.2	84.4	33.0	95.1	88.4	41.1	38.5	62.8
LSD(0.10)													
N-Fertilizer(N)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

FIELD EXPERIMENT HISTORY

Title: **Alfalfa/Corn Rotation Study**
Experiment: 09Rotation **Trial ID:** 13V91 **Year:** 2013

Personnel: J. Cavadini, M. Bertram, M. Ruark, J. Lauer, D. Undersander
Location: Stratford, WI **County:** Marathon

Supported by: Marshfield Ag. Research Station

Site Information

Field: 402 **Previous Crop:** Alfalfa/Corn **Soil Type:** Withee silt loam

Soil Test : **Date:** 11/7/11 **pH** 7.1 **SOM (%)** 3.2 **P (ppm)** 22 **K (ppm)** 49

Plot Management

Tillage Operations: C,A: Spring chisel plow, Field cultivator; No Corn Cultivation
A: Spring pulvimulcher

Fertilizer:

	Analysis	Rate	Date	Crop
Starter	None			
Preplant	0-0-60	300 lb/A	5/8/2013	Entire study
	Gypsum	100 lb/A	5/8/2013	Entire study
Post plant	See factors	See factors	7/15/2013	Corn N Rate Study
	28-0-0	40 gal/A	7/18/2013	Corn- 2nd yr
	28-0-0	13 gal/A	7/18/2013	Corn- 1st yr
Manure	None			

Herbicide: C: Brawl II 1.67 pt/A; Hornet WDG 3 oz/A
C,A: Roundup WeatherMax 32 oz/A

Insecticide: A: Baythroid XL 1.6 oz/A

Irrigation: None

Hybrid: Corn: Pioneer 39D95 (79 RM, RR)
Alfalfa: Pioneer 54QR04 (RR)

Planting Date: C,A: 7/5/2013

Planting Depth: C: 1.5"; A: 0.25"

Row Width: C: 30"; A: 7.5"

Target Plant Density: C: 35,000; A: 20 lb

Planting Method: C: John Deere 1750 planter; A: IH 5300 Drill

Harvest Date: C: None; CS: 11/7/13; A: 9/9/2013

Harvest Method: CS: hand harvested; A: MARS forage plot harvester

Notes: Fourth year of establishing Rotation Study. All alfalfa plots winter-killed. Plots in final year were seeded to red clover cover crop to keep a legume in the rotation. No data were collected. Alfalfa year 2 of 3 was reseeded to alfalfa and data pooled with new seeding plots. Due to the late planting date, corn grain did not reach maturity and no data was collected.

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 60' x 60' **Experiment Size:** 5.40 A
Harvest Plot size: C: 60' x 5'; CS: 10' x 2.5'; A: 60' x 3.5'

Factors/Treatments:	N Source	Rate (lb N/A) AACC,AACsCs	Rate (lb N/A) CC
Rotation	None	0	0
3 year Alfalfa, 2 year Corn	Agrotain	85	125
2 year Alfalfa, 2 year Corn	AN	60	100
2 year Alfalfa, 2 year Corn Silage	AN	85	125
Continuous Corn	ESN	60	100
	ESN	85	125
	SU	85	125
	Urea	85	125

Results: Tables 1309-07 & 1309-08

Table:1309-07. Alfalfa and Corn Rotation- Alfalfa* Marshfield, WI - 2013.

Rotation	Yield 9-Sep tn dm/A	Yield Season tn dm/A
AAACC	0.72	0.72
AAACC	0.42	0.42
AACC	0.63	0.63
AACsCs	0.44	0.44
Mean	0.55	0.55
Probability (%)		
Treatment	0.8	0.8
LSD 10%		
Treatment	0.12	0.1
CV (%)	14	14

* New Seeding Alfalfa

Table:1309-08. Alfalfa and Corn Rotation- Corn Silage
Marshfield, WI - 2013.

Rotation	Yield	Moisture	Kernel milk	Harvest Population	CP	ADF	NDF	NDFD	NFC	Starch	TDN	Milk per Ton	Milk per Acre
	tn dm/A	%	%	ppa	%	%	%	%	%	%	%	lb	lb
AACsCs	4.4	68.2	90	32,138	8.0	24.9	46.7	57.9	41.2	23.5	66.2	2,902	12,755
AACsCs	4.4	65.0	90	30,976	8.2	26.5	49.3	58.1	38.7	20.5	64.1	2,732	12,115
Mean	4.4	66.6	90	31,557	8.1	25.7	48.0	58.0	40.0	22.0	65.2	2,817	12,435
Probability (%)													
Treatment	>50	2.8	>50	>50	38.7	>50	>50	>50	>50	>50	48.6	47.5	>50
LSD 10%													
Treatment	NS	2.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV (%)	15	4	0	11	2	13	11	1	12	24	5	9	21