

## FIELD EXPERIMENT HISTORY

**Title:** Corn and Soybean Rotation Study  
**Experiment:** 09CS **Trial ID** 3288 **Year:** 2009  
**Personnel:** J. G. Lauer, J.M. Gaska, K. D. Kohn, T. H. Diallo  
**Location:** Arlington **County:** Columbia  
**Supported By:** HATCH

### Site Information

**Field:** 334W **Previous Crop:** Corn/Soybean **Soil Type:** Plano Silt Loam  
**Soil Test:** **Date:** 10/26/09 **pH** 6.3 **OM (%)** 3.7 **P (ppm)** 18 **K (ppm)** 137

### Plot Management

**Tillage Operations:** See Factors

<b>Fertilizer:</b>	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
<b>Preplant :</b>	NH4NO3	190	5/7/09
	ESN	190	5/7/09
	SUPER U	190	5/7/09
<b>Starter :</b>	N/A	N/A	N/A
<b>Post plant :</b>	32-0-0	200	6 /10/09
<b>Manure:</b>	N/A	N/A	N/A
<b>Herbicide:</b>	Dual II 24 oz/A 5/4/2009	<b>Insecticide:</b>	Force 3G 4.4 lbs/A 5/6/07
	Honcho plus 32 oz/A 5/4/2009		
<b>Irrigation:</b>	None	<b>Hybrid:</b>	C: Pioneer 35F44 S: Pioneer 92Y20
<b>Planting Date:</b>	Corn: 5/6/09 <b>Planting Depth:</b>	C: 1.5"	<b>Row Width:</b> 30"
	Soybean: 5/18/09	S: 1"	
<b>Target Plant Density:</b>	Corn: 32500	<b>Planting Method:</b>	Kinze 2000 Interplant planter
	Soybean: 150000		
<b>Harvest Date:</b>	Corn: 11/3/09	<b>Harvest Method:</b>	C: Kincaid plot combine S: Almaco plot combine #2
	Soybean: 10/12/09		
<b>Notes:</b>			

### Experimental Design

**Design:** RCB split-split plot **Replications:** 4  
**Plot Size Seeded:** 10' x35' **Experiment Size:** 2.7 acres  
**Harvest Plot Size:** Corn: 5' x 31'

#### **Factors/Treatments:**

<u>Tillage:</u>	<u>Rotation</u>	<u>Surface Applied Fertilizer/ Rhizobium</u>
No-Till	Continuous Corn or Soybean	C: 1-NH4NO3
Conventional	Alternating Corn - Soybean	2-ESN
	Corn 5yrs. / Soybean 5 yrs.	3-SUPER U
		S: 1-UTC
		2-Excalibur
		3-Optimize

**Results: Tables C-38, C-39**

**Table C-38. Corn/Soybean Rotation and Tillage Study - Corn.  
Arlington, WI - 2009.**

Tillage	Rotation	Fertilizer	Yield bu/A	Moisture %	Test weight lbs/bu	Grower return \$/A	Lodged			Harvest plants plants/A
							Total %	Stalk %	Root %	
		ESN	226	32.0	53.5	748	1.3	0.6	0.7	29125
		SuperU	226	32.4	53.5	745	1.1	0.9	0.2	30071
		AN	228	32.5	53.8	751	1.5	0.5	1.0	30696
	1C		235	28.5	54.8	794	1.5	1.5	0.0	31542
	1CC		212	32.3	52.2	700	1.1	0.9	0.2	29458
	1CS		244	30.8	54.1	813	0.4	0.3	0.1	30125
	2C		228	33.3	53.6	750	0.9	0.5	0.4	28375
	3C		225	34.1	53.9	735	1.6	0.1	1.5	30125
	4C		223	32.8	53.5	734	3.3	1.0	2.3	30208
	5C		218	34.4	53.0	712	0.1	0.1	0.0	29917
	1C	ESN	238	28.3	55.3	803	1.9	1.9	0.0	31000
	1C	SuperU	238	28.0	54.7	806	2.0	2.0	0.0	31375
	1C	AN	229	29.2	54.5	772	0.8	0.8	0.0	32250
	1CC	ESN	209	31.9	51.7	694	0.0	0.0	0.0	28750
	1CC	SuperU	210	31.9	52.0	696	1.6	1.6	0.0	29375
	1CC	AN	216	33.0	53.0	709	1.7	0.9	0.7	30250
	1CS	ESN	240	30.6	53.6	802	0.9	0.4	0.4	30500
	1CS	SuperU	244	31.0	54.6	814	0.4	0.4	0.0	30750
	1CS	AN	247	30.9	54.0	823	0.0	0.0	0.0	29125
	2C	ESN	222	32.6	53.5	732	0.8	0.8	0.0	25250
	2C	SuperU	233	33.9	53.3	763	0.0	0.0	0.0	28500
	2C	AN	230	33.6	54.1	754	1.8	0.7	1.1	31375
	3C	ESN	226	33.7	54.0	741	3.5	0.4	3.0	28875
	3C	SuperU	215	34.5	53.5	702	0.4	0.0	0.4	30125
	3C	AN	233	34.0	54.2	761	1.1	0.0	1.1	31375
	4C	ESN	226	32.4	53.6	748	2.1	0.4	1.7	30500
	4C	SuperU	222	33.3	53.3	730	3.0	1.8	1.3	29500
	4C	AN	220	32.8	53.7	724	4.8	0.8	4.0	30625
	5C	ESN	219	34.5	53.1	715	0.0	0.0	0.0	29000
	5C	SuperU	216	34.5	53.0	703	0.4	0.4	0.0	30875
	5C	AN	219	34.2	52.9	717	0.0	0.0	0.0	29875

continued

**Table C-38 . Corn/Soybean Rotation and Tillage Study - Corn.**  
(continued) **Arlington, WI - 2009.**

Tillage	Rotation	Fertilizer	Yield	Moisture	Test	Grower	Lodged			Harvest
					weight	return	Total	Stalk	Root	plants
			bu/A	%	lbs/bu	\$/A	%	%	%	plants/A
Conv			233	30.2	54.3	778	0.8	0.5	0.3	29095
NoTill			220	34.5	52.9	718	1.8	0.8	1.0	30833
Conv		ESN	230	30.1	54.3	771	1.0	0.5	0.5	28643
Conv		SuperU	233	30.2	54.2	779	0.5	0.5	0.0	28750
Conv		AN	235	30.3	54.5	784	0.9	0.5	0.4	29893
NoTill		ESN	221	33.9	52.8	724	1.6	0.7	1.0	29607
NoTill		SuperU	218	34.7	52.8	711	1.7	1.3	0.5	31393
NoTill		AN	221	34.7	53.1	719	2.0	0.4	1.6	31500
Conv	1C		239	29.4	54.8	804	0.0	0.0	0.0	29917
Conv	1CC		216	29.4	53.4	727	1.2	1.2	0.0	28500
Conv	1CS		245	29.5	55.1	823	0.6	0.3	0.3	29333
Conv	2C		232	31.1	53.9	770	1.5	0.8	0.7	27833
Conv	3C		232	31.2	54.8	773	0.9	0.0	0.9	29667
Conv	4C		236	29.9	54.5	791	1.4	1.2	0.3	29417
Conv	5C		229	30.8	53.7	761	0.0	0.0	0.0	29000
NoTill	1C		231	27.6	54.9	784	3.1	3.1	0.0	33167
NoTill	1CC		207	35.1	51.1	673	1.0	0.5	0.5	30417
NoTill	1CS		243	32.2	53.1	802	0.3	0.3	0.0	30917
NoTill	2C		225	35.6	53.3	729	0.2	0.2	0.0	28917
NoTill	3C		217	37.0	53.0	696	2.4	0.3	2.2	30583
NoTill	4C		210	35.8	52.5	678	5.2	0.8	4.4	31000
NoTill	5C		208	37.9	52.3	662	0.3	0.3	0.0	30833
Conv	1C	ESN	236	29.2	55.1	796	0.0	0.0	0.0	29500
Conv	1C	SuperU	243	29.0	54.6	818	0.0	0.0	0.0	29250
Conv	1C	AN	238	29.9	54.6	797	0.0	0.0	0.0	31000
Conv	1CC	ESN	212	29.2	53.0	714	0.0	0.0	0.0	28500
Conv	1CC	SuperU	213	28.9	53.0	719	1.7	1.7	0.0	28250
Conv	1CC	AN	224	30.2	54.2	749	1.9	1.9	0.0	28750
Conv	1CS	ESN	240	29.5	54.3	805	1.7	0.9	0.9	29500
Conv	1CS	SuperU	249	29.7	55.9	837	0.0	0.0	0.0	29000
Conv	1CS	AN	246	29.3	55.0	828	0.0	0.0	0.0	29500

continued

**Table C-38 Corn/Soybean Rotation and Tillage Study - Corn.**  
(continued) **Arlington, WI - 2009.**

Tillage	Rotation	Fertilizer	Yield bu/A	Moisture %	Test weight lbs/bu	Grower return \$/A	Lodged			Harvest
							Total %	Stalk %	Root %	plants plants/A
Conv	2C	ESN	226	30.8	54.2	754	1.6	1.6	0.0	24250
Conv	2C	SuperU	235	31.4	53.3	781	0.0	0.0	0.0	27500
Conv	2C	AN	233	31.0	54.3	776	2.9	0.7	2.2	31750
Conv	3C	ESN	235	31.3	55.2	781	1.9	0.0	1.9	28250
Conv	3C	SuperU	222	31.2	54.1	738	0.0	0.0	0.0	29750
Conv	3C	AN	241	31.0	55.1	801	0.7	0.0	0.7	31000
Conv	4C	ESN	237	29.6	54.7	797	1.6	0.8	0.8	31500
Conv	4C	SuperU	240	30.2	54.4	802	1.9	1.9	0.0	28250
Conv	4C	AN	231	30.0	54.5	772	0.9	0.9	0.0	28500
Conv	5C	ESN	226	31.0	53.6	753	0.0	0.0	0.0	29000
Conv	5C	SuperU	229	30.7	53.9	762	0.0	0.0	0.0	29250
Conv	5C	AN	231	30.8	53.7	768	0.0	0.0	0.0	28750
NoTill	1C	ESN	239	27.5	55.5	811	3.8	3.8	0.0	32500
NoTill	1C	SuperU	233	27.1	54.9	794	3.9	3.9	0.0	33500
NoTill	1C	AN	221	28.4	54.3	747	1.6	1.6	0.0	33500
NoTill	1CC	ESN	207	34.7	50.4	674	0.0	0.0	0.0	29000
NoTill	1CC	SuperU	207	34.8	51.0	674	1.6	1.6	0.0	30500
NoTill	1CC	AN	207	35.8	51.8	669	1.5	0.0	1.5	31750
NoTill	1CS	ESN	241	31.7	53.0	798	0.0	0.0	0.0	31500
NoTill	1CS	SuperU	239	32.4	53.4	790	0.8	0.8	0.0	32500
NoTill	1CS	AN	248	32.6	53.1	817	0.0	0.0	0.0	28750
NoTill	2C	ESN	218	34.4	52.8	710	0.0	0.0	0.0	26250
NoTill	2C	SuperU	231	36.3	53.3	746	0.0	0.0	0.0	29500
NoTill	2C	AN	227	36.2	53.8	731	0.7	0.7	0.0	31000
NoTill	3C	ESN	217	36.1	52.7	700	5.1	0.8	4.2	29500
NoTill	3C	SuperU	209	37.9	52.9	667	0.8	0.0	0.8	30500
NoTill	3C	AN	225	36.9	53.4	721	1.5	0.0	1.5	31750

continued



**Table C-39. Corn/Soybean Rotation Study - Soybean  
Expt. 2990 Arlington, WI**

Tillage	Rotation		Inoculant		Grain		BSR Incidence	Seed Composition	
	Name	#	Brand	Product	Yield bu/a	Lodg. 1-5	4-Sep %	Protein ---- % ----	Oil
				UTC	48.5	1.0	19.5	34.1	19.0
			ABM	Excalibre	48.5	1.0	19.4	34.2	19.0
			EMD	Optimize	49.2	1.0	20.3	34.0	19.0
	5th year SB	8			46.6	1.0	26.0	34.0	19.1
	4th year SB	9			45.2	1.0	28.8	34.3	19.0
	3rd year SB	10			49.7	1.0	22.7	33.8	18.9
	2nd year SB	1			49.8	1.0	23.3	34.1	19.0
	1st year SB	2			52.9	1.0	4.6	34.3	19.0
	S/C rotation	13			50.9	1.0	13.8	33.8	19.1
	Continuous SB	14			46.2	1.0	18.8	34.3	18.9
	5th year SB	8		UTC	45.0	1.0	28.8	33.8	19.2
	5th year SB	8	ABM	Excalibre	46.2	1.0	24.4	34.3	18.9
	5th year SB	8	EMD	Optimize	48.5	1.0	25.0	34.0	19.1
	4th year SB	9		UTC	45.6	1.0	30.6	34.5	18.9
	4th year SB	9	ABM	Excalibre	45.1	1.0	27.5	34.3	19.1
	4th year SB	9	EMD	Optimize	44.7	1.0	28.1	34.2	18.9
	3rd year SB	10		UTC	47.5	1.0	17.5	33.7	19.0
	3rd year SB	10	ABM	Excalibre	50.2	1.0	25.6	33.8	18.8
	3rd year SB	10	EMD	Optimize	51.4	1.0	25.0	33.8	19.0
	2nd year SB	1		UTC	51.2	1.0	21.3	34.3	19.0
	2nd year SB	1	ABM	Excalibre	48.4	1.0	23.8	34.3	19.0
	2nd year SB	1	EMD	Optimize	49.7	1.0	25.0	33.9	19.0
	1st year SB	2		UTC	54.0	1.0	3.8	34.2	19.1
	1st year SB	2	ABM	Excalibre	52.2	1.0	3.8	34.6	19.1
	1st year SB	2	EMD	Optimize	52.6	1.0	6.3	34.3	18.9
	S/C rotation	13		UTC	50.9	1.0	14.4	33.9	19.0
	S/C rotation	13	ABM	Excalibre	51.4	1.0	12.5	34.0	19.1
	S/C rotation	13	EMD	Optimize	50.3	1.0	14.4	33.6	19.1
	Continuous SB	14		UTC	45.1	1.0	20.0	34.2	19.0
	Continuous SB	14	ABM	Excalibre	46.2	1.0	18.1	34.5	18.9
	Continuous SB	14	EMD	Optimize	47.3	1.0	18.1	34.2	18.9
Notill					48.1	1.0	25.1	34.1	19.0
Conventional					49.4	1.0	14.3	34.1	19.0
Notill				UTC	47.6	1.0	24.6	34.0	19.0
Notill			ABM	Excalibre	48.1	1.0	24.1	34.2	19.0
Notill			EMD	Optimize	48.5	1.0	26.4	34.0	19.0
Conventional				UTC	49.4	1.0	14.3	34.1	19.0
Conventional			ABM	Excalibre	49.0	1.0	14.6	34.3	19.0
Conventional			EMD	Optimize	49.9	1.0	14.1	34.0	19.0

continued

**Table C-39. Corn/Soybean Rotation Study - Soybean**  
 (continued) **Expt. 2990 Arlington, WI**

Tillage	Rotation		Inoculant		Grain		BSR Incidence	Seed Composition	
	Name	#	Brand	Product	Yield bu/a	Lodg. 1-5	4-Sep %	Protein ---- % ----	Oil
Notill	5th year SB	8			46.5	1.0	34.6	33.9	19.0
Notill	4th year SB	9			45.5	1.0	35.8	34.1	19.0
Notill	3rd year SB	10			48.6	1.0	30.4	33.9	18.8
Notill	2nd year SB	1			49.1	1.0	30.8	34.1	19.0
Notill	1st year SB	2			51.1	1.0	4.6	34.5	19.0
Notill	S/C rotation	13			51.1	1.0	17.9	33.9	19.1
Notill	Continuous SB	14			44.3	1.0	21.3	34.1	18.9
Conventional	5th year SB	8			46.6	1.0	17.5	34.2	19.1
Conventional	4th year SB	9			44.8	1.0	21.7	34.6	18.9
Conventional	3rd year SB	10			50.8	1.0	15.0	33.7	19.0
Conventional	2nd year SB	1			50.4	1.0	15.8	34.2	19.0
Conventional	1st year SB	2			54.8	1.0	4.6	34.2	19.1
Conventional	S/C rotation	13			50.6	1.0	9.6	33.8	19.1
Conventional	Continuous SB	14			48.1	1.0	16.3	34.5	18.9
Notill	5th year SB	8		UTC	45.8	1.0	37.5	33.8	19.0
Notill	5th year SB	8	ABM	Excalibre	44.9	1.0	32.5	34.1	18.9
Notill	5th year SB	8	EMD	Optimize	48.8	1.0	33.8	33.9	19.1
Notill	4th year SB	9		UTC	45.3	1.0	38.8	34.2	18.9
Notill	4th year SB	9	ABM	Excalibre	45.6	1.0	32.5	34.0	19.3
Notill	4th year SB	9	EMD	Optimize	45.7	1.0	36.3	34.0	18.9
Notill	3rd year SB	10		UTC	46.8	1.0	22.5	33.9	18.9
Notill	3rd year SB	10	ABM	Excalibre	49.7	1.0	35.0	33.9	18.7
Notill	3rd year SB	10	EMD	Optimize	49.4	1.0	33.8	33.9	19.0
Notill	2nd year SB	1		UTC	50.4	1.0	31.3	34.0	19.1
Notill	2nd year SB	1	ABM	Excalibre	48.6	1.0	28.8	34.3	18.9
Notill	2nd year SB	1	EMD	Optimize	48.4	1.0	32.5	33.9	18.9
Notill	1st year SB	2		UTC	51.7	1.0	3.8	34.4	19.1
Notill	1st year SB	2	ABM	Excalibre	50.8	1.0	3.8	34.8	19.0
Notill	1st year SB	2	EMD	Optimize	50.8	1.0	6.3	34.5	18.9
Notill	S/C rotation	13		UTC	50.7	1.0	15.0	34.0	19.0
Notill	S/C rotation	13	ABM	Excalibre	52.4	1.0	17.5	33.9	19.2
Notill	S/C rotation	13	EMD	Optimize	50.3	1.0	21.3	33.7	19.1
Notill	Continuous SB	14		UTC	42.2	1.0	23.8	34.0	19.0
Notill	Continuous SB	14	ABM	Excalibre	44.4	1.0	18.8	34.5	18.9
Notill	Continuous SB	14	EMD	Optimize	46.4	1.0	21.3	33.9	18.9
Conventional	5th year SB	8		UTC	44.1	1.0	20.0	33.9	19.3
Conventional	5th year SB	8	ABM	Excalibre	47.5	1.0	16.3	34.5	19.0
Conventional	5th year SB	8	EMD	Optimize	48.1	1.0	16.3	34.2	19.1
Conventional	4th year SB	9		UTC	46.0	1.0	22.5	34.8	18.8
Conventional	4th year SB	9	ABM	Excalibre	44.5	1.0	22.5	34.6	19.0
Conventional	4th year SB	9	EMD	Optimize	43.8	1.0	20.0	34.4	19.0

continued

**Table C-39. Corn/Soybean Rotation Study - Soybean**(continued) **Expt. 2990 Arlington, WI**

Tillage	Rotation		Inoculant		Grain Yield bu/a	Lodg. 1-5	BSR Incidence 4-Sep %	Seed Composition	
	Name	#	Brand	Product				Protein ---- % ----	Oil
Conventional	3rd year SB	10		UTC	48.1	1.0	12.5	33.6	19.2
Conventional	3rd year SB	10	ABM	Excalibre	50.8	1.0	16.3	33.8	18.9
Conventional	3rd year SB	10	EMD	Optimize	53.5	1.0	16.3	33.7	19.0
Conventional	2nd year SB	1		UTC	52.1	1.0	11.3	34.5	19.0
Conventional	2nd year SB	1	ABM	Excalibre	48.1	1.0	18.8	34.3	19.1
Conventional	2nd year SB	1	EMD	Optimize	50.9	1.0	17.5	33.9	19.1
Conventional	1st year SB	2		UTC	56.3	1.0	3.8	34.0	19.1
Conventional	1st year SB	2	ABM	Excalibre	53.7	1.0	3.8	34.4	19.3
Conventional	1st year SB	2	EMD	Optimize	54.4	1.0	6.3	34.1	18.9
Conventional	S/C rotation	13		UTC	51.1	1.0	13.8	33.8	19.1
Conventional	S/C rotation	13	ABM	Excalibre	50.4	1.0	7.5	34.0	19.0
Conventional	S/C rotation	13	EMD	Optimize	50.4	1.0	7.5	33.5	19.2
Conventional	Continuous SB	14		UTC	48.0	1.0	16.3	34.4	18.9
Conventional	Continuous SB	14	ABM	Excalibre	48.0	1.0	17.5	34.5	18.8
Conventional	Continuous SB	14	EMD	Optimize	48.2	1.0	15.0	34.4	18.9
Means					48.7	1.0	950.9	34.1	19.0
<b>Probability %</b>									
Tillage (T)					34.9	>50	<0.1	>50	>50
Rotation (R)					<0.1	>50	<0.1	12.5	>50
T x R					44.7	>50	9.9	>50	>50
Inoculant (I)					33.5	>50	>50	<0.1	>50
T x I					>50	>50	>50	>50	>50
R x I					9.1	>50	>50	20.3	9.9
T x R x I					>50	>50	>50	>50	>50
<b>LSD 10%</b>									
Tillage (T)					NS	NS	1.1	NS	NS
Rotation (R)					2.3	NS	5.5	NS	NS
T x R					NS	NS	7.3	NS	NS
Inoculant (I)					NS	NS	NS	0.2	NS
T x I					NS	NS	NS	NS	NS
R x I					3.0	NS	NS	NS	NS
<b>CV %</b>					6	0	37	1	1