

FIELD EXPERIMENT HISTORY

Year: 2003

Title: Ten year Corn/Soybean/Wheat Rotation Study
Experiment: 09 Ten year Corn/Soybean/Wheat Rotation
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Organization: UW Madsion, Dept. of Agronomy
Location: Arlington Agricultural Research Station, Arlington, WI

FIELD INFORMATION

Field: ARS 335
 Soil Type: Plano Silt Loam
 Soil Test Results: Date:10/99 pH: 6.5 O.M.(%): 3.2 P(ppm): 35 K(ppm): 203
 Fertilizer Applied: Soybean: None
 Wheat: None
 Corn: 210 lb/a nitrogen preemerge
 Tillage Operations: No-till
 Previous Crop: Corn/Soybean/Wheat
 Previous Herbicide: Roundup
 Irrigation: None

EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split plot

Replicates: 3

Variables:

Factors/Treatments:SystemRotation

Continuous	Corn, Soybean or Winter Wheat
Alternating	Corn/Soybean
Grain system I	Corn/Soybean(early)/Winter Wheat(red clover)
Grain system II	Corn(early)/Winter Wheat(red clover)/Soybean
Livestock system	Corn(silage)/Winter Wheat(straw removed)/Soybean

CornSoybeanWheat

Area Planted:	60' x 60'	60' x 60'	60' x 60'
Area Harvested:	5' x 56'	5' x 56'	5' x 56'
Row Spacing:	30"	30"	7.5"
Seeding Rate (spa):	32,500 seeds/acre	130,000 seeds/acre	100 lb/acre
Hybrid/Variety:	Dekalb DKC39-47(e) Kaltenberg (MBS1236 X LH295)	Kaltenberg KB121(e) Kaltenberg KB230	Hopewell
Planting Date:	21-May-03	17-May-03	27-Sep-02
Planting Equip:	Kinze 2000 Interplant planter	Kinze 2000 Interplant planter	JD 750 No-Till Drill
Harvesting Date:	26-Sept and 17-Oct	27-Sept and 7-Oct	31-Jul
Harvesting Equip:	Kincaid plot combine	Almaco plot combine	Almaco plot combine
Seed Treatments:	Maxim XL Captan 400 + Allegiance Maxim XL + Apron XL Maxim XL + Azoxystrobin	SoyGard Rival/Alleg ApronMaxx	None

MaterialCropRateTiming

Herbicides:	2, 4-D	Corn/Soybean	1.0 pt/A	preplant
	Gramoxone	Corn/Soybean	2.0 pt/A	preplant
	Dual	Corn	2.0 pt/A	preemerge
	Hornet	Corn	3.0 oz/A	preemerge
	Harness	Corn	2.5 pt/A	preemerge
	Callisto	Corn	3.0 oz/A	preemerge
	Roundup	Soybean	1.0 qt/A	postemerge
	Roundup	Soybean	21 oz/A	postemerge
Insecticides:	Force 3G	Corn	4.4 lbs/A	at planting

Results: Tables C-72, C-73, C-74, C-75, and C-76.

**Table C-72. Corn, Soybean, and Wheat Rotation.
Arlington, WI - 2003.**

Crop	Rotation	Treatment	Yield	Moisture	Test Wt	Grower Return	Lodged			Ears Dropped	Harvest	
							Total	Stalk	Root		plants/A	ears/A
			bu/A	%	lbs/bu	\$/A	%	%	%	%	plants/A	ears/A
Corn		Maxim XL	133	17.9	58	259	1	1	0	0	30091	29538
Corn		Captan 400 + Allegiance	124	18.9	58	240	0	0	0	0	23896	24006
Corn		Maxim XL + Apron XL	138	18.0	58	270	1	1	0	0	29206	28763
Corn		Maxim XL + Azoxystrobin	143	18.0	58	279	1	1	0	0	30533	29980
Corn	Continuous		111	18.3	59	216	0	0	0	0	28376	27712
Corn	Alternating		133	16.6	58	264	1	1	0	0	29621	29455
Corn	Grain system I		159	19.8	58	306	1	1	0	0	27298	27049
Corn	Continuous	Maxim XL	105	17.8	59	207	0	0	0	0	29870	29206
Corn	Continuous	Captan 400 + Allegiance	103	19.1	59	199	0	0	0	0	25555	25223
Corn	Continuous	Maxim XL + Apron XL	115	17.9	59	226	1	1	0	0	26219	25223
Corn	Continuous	Maxim XL + Azoxystrobin	120	18.3	59	234	0	0	0	0	31861	31197
Corn	Alternating	Maxim XL	134	16.7	57	265	1	1	0	0	30202	30202
Corn	Alternating	Captan 400 + Allegiance	123	16.7	58	244	1	0	1	0	26219	26551
Corn	Alternating	Maxim XL + Apron XL	135	16.6	57	267	2	2	0	0	31861	31529
Corn	Alternating	Maxim XL + Azoxystrobin	141	16.3	58	279	1	1	0	0	30202	29538
Corn	Grain system I	Maxim XL	159	19.3	58	306	1	1	0	0	30202	29206
Corn	Grain system I	Captan 400 + Allegiance	146	21.0	57	278	0	0	0	0	19913	20245
Corn	Grain system I	Maxim XL + Apron XL	163	19.4	58	315	1	1	0	0	29538	29538
Corn	Grain system I	Maxim XL + Azoxystrobin	168	19.4	58	324	1	1	0	0	29538	29206
Mean			134	18.2	58	262	1	1	0	0	28432	28072
Probability(%)												
	Rotation (R)		5.7	1.6	34.7	6.2	31.1	13.5	44.2	44.4	48.0	52.6
	Treatment (T)		0.0	0.0	20.6	0.0	1.0	0.6	84.5	41.6	0.0	0.1
	R x T		88.6	5.1	68.5	86.9	53.5	55.8	67.1	45.5	8.6	7.0
LSD (0.10)												
	Rotation (R)		29	1.3	NS	55	NS	NS	NS	NS	NS	NS
	Treatment (T)		6	0.4	NS	11	0	0	NS	NS	2189	2158
	R x T		NS	0.6	NS	NS	NS	NS	NS	NS	3791	3737
Contrasts-T (%)												
	Maxim XL		41.4	3.2	61.8	50.2	24.7	40.7	54.3	10.0	4.6	7.0
	Captan 400 + Allegiance		0.0	0.0	40.9	0.0	2.6	0.8	42.1	57.1	0.0	0.0
	Maxim XL + Apron XL		10.3	8.6	14.6	8.0	0.2	0.2	94.8	57.1	33.0	37.6
	Maxim XL + Azoxystrobin		0.1	15.6	7.9	0.0	97.0	90.4	89.2	57.1	1.4	2.2
CV(%)												
			5	2	1	5	70	82	258	600	9	9

**Table C-73. Corn, Soybean, and Wheat Rotation.
Arlington, WI - 2003.**

Crop	Rotation	Yield	Moisture	Test Wt	Grower Return	Lodged			Ears Dropped	Harvest	
						Total	Stalk	Root		plants/A	ears/A
		bu/A	%	lbs/bu	\$/A	%	%	%	%	plants/A	ears/A
Corn	Continuous	111	16.4	59	216	0	0	0	0	28376	27712
Corn	Alternating	133	15.9	58	264	1	1	0	0	29621	29455
Corn	Grain system I	159	16.9	58	306	1	1	0	0	27298	27049
Corn	Grain system II	137	19.0	53	245	1	1	0	0	30948	29953
Mean		135	17.0	57	258	1	1	0	0	29061	28542
Probability(%)											
Rotation (R)		0.0	0.0	0.0	0.0	6.6	15.5	6.2	58.4	10.6	20.7
LSD (0.10)											
Rotation (R)		9	0.6	0	17	0	NS	0	NS	NS	NS
Contrasts-R (%)											
Continuous		0.0	0.0	0.0	0.0	4.9	3.7	94.9	35.7	46.4	38.8
Alternating		76.2	0.0	0.1	56.4	2.3	20.2	1.1	42.6	54.9	34.3
Grain system I		0.0	32.7	0.0	0.0	70.7	31.7	19.9	42.6	6.4	12.4
Grain system II		74.3	0.0	0.0	22.2	48.1	87.5	19.9	50.2	4.8	14.6
CV(%)											
		17	7.6	2	16	90	96	306	497	13	13

**Table C-74. Corn, Soybean, and Wheat Rotation.
Arlington, WI - 2003.**

Crop	Treatment	Dry Matter		Kernel Milk	Crude Protein	ADF	NDF	<i>In Vitro</i>			Milk per		Harvest plants/A
		Yield tons/A	Moisture %					Digest %	NDFD %	Starch %	Ton lbs/T	Acre lbs/T	
Corn Silage	Maxim XL	7.1	57.5	63.3	7.1	29.6	57.9	78.1	62.2	26.6	3171	22626	29538
Corn Silage	Captan 400 + Allegiance	6.8	61.5	75.0	7.3	28.8	56.0	79.2	62.8	25.9	3314	22600	24891
Corn Silage	Maxim XL + Apron XL	6.5	60.1	61.7	7.5	29.0	56.8	79.2	63.3	26.2	3305	21494	27547
Corn Silage	Maxim XL + Azoxystrobin	8.0	59.3	75.0	7.0	28.0	54.7	79.9	63.3	28.8	3324	26568	31529
Mean		7.1	59.6	68.8	7.2	28.8	56.3	79.1	62.9	26.9	3278	23322	28376
<u>Probability(%)</u>													
Treatment (T)		31.3	47.0	40.2	21.1	86.6	71.2	75.4	82.6	70.4	45.3	46.7	9.1
<u>LSD (0.10)</u>													
Treatment (T)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4179
<u>Contrasts-T (%)</u>													
Maxim XL		96.0	20.1	39.0	27.0	53.5	39.8	36.4	44.1	89.5	13.5	73.5	41.2
Captan 400 + Allegiance		55.2	24.8	32.6	56.7	95.5	83.0	94.1	87.7	55.8	59.4	72.5	3.8
Maxim XL + Apron XL		22.7	75.0	27.1	8.6	91.3	78.8	92.1	64.4	69.3	68.5	38.7	55.2
Maxim XL + Azoxystrobin		10.3	86.3	32.6	20.0	50.3	37.0	45.3	63.4	28.6	48.9	14.9	5.4
<u>CV(%)</u>													
		13	5	17	4	8	6	3	3	12	4	17	9

**Table C-75. Corn, Soybean, and Wheat Rotation.
Arlington, WI - 2003.**

Crop	Rotation	Treatment	Yield	Moisture	Grower return	NIR			
						Moisture	Protein	Oil	Fiber
			bu/A	%	\$/A	%	%	%	%
Soybean		Untreated	29	10.8	200	9.7	38.1	19.3	4.8
Soybean		SoyGard	28	11.0	189	9.7	38.1	19.2	4.8
Soybean		Rival/Alleg	29	10.7	196	9.7	38.1	19.3	4.8
Soybean		ApronMaxx	30	10.7	207	9.7	38.0	19.3	4.8
Soybean	Continuous		30	10.0	202	9.7	38.1	19.5	4.8
Soybean	Alternating		34	10.1	233	9.9	38.0	19.5	4.8
Soybean	Grain system I		28	13.0	190	9.0	38.7	18.7	4.9
Soybean	Grain system II		23	10.8	160	10.2	37.7	19.3	4.8
Soybean	Livestock system		31	10.2	209	9.8	38.0	19.4	4.8
Soybean	Continuous	Untreated	31	9.9	213	9.8	38.0	19.6	4.8
Soybean	Continuous	SoyGard	29	9.9	195	9.7	38.0	19.5	4.8
Soybean	Continuous	Rival/Alleg	30	10.0	204	9.7	38.1	19.6	4.8
Soybean	Continuous	ApronMaxx	29	10.0	198	9.8	38.2	19.3	4.8
Soybean	Alternating	Untreated	35	10.1	236	9.9	38.0	19.4	4.8
Soybean	Alternating	SoyGard	33	10.4	224	9.9	38.0	19.4	4.9
Soybean	Alternating	Rival/Alleg	34	9.9	231	9.9	38.0	19.6	4.8
Soybean	Alternating	ApronMaxx	35	10.1	237	9.8	37.9	19.5	4.8
Soybean	Grain system I	Untreated	31	12.9	210	8.9	38.8	18.8	4.9
Soybean	Grain system I	SoyGard	27	12.9	184	9.0	38.9	18.6	4.9
Soybean	Grain system I	Rival/Alleg	25	13.0	173	9.0	38.9	18.6	4.9
Soybean	Grain system I	ApronMaxx	28	13.0	194	9.1	38.4	18.9	4.9
Soybean	Grain system II	Untreated	21	10.8	142	10.3	37.7	19.2	4.8
Soybean	Grain system II	SoyGard	22	11.1	154	10.3	37.8	19.3	4.8
Soybean	Grain system II	Rival/Alleg	23	10.5	158	10.3	37.6	19.4	4.8
Soybean	Grain system II	ApronMaxx	27	10.7	187	10.0	37.7	19.4	4.8
Soybean	Livestock system	Untreated	29	10.2	200	9.7	38.2	19.2	4.8
Soybean	Livestock system	SoyGard	29	10.3	201	9.9	37.8	19.5	4.8
Soybean	Livestock system	Rival/Alleg	32	10.3	216	9.8	38.1	19.3	4.8
Soybean	Livestock system	ApronMaxx	32	10.0	221	9.8	37.8	19.6	4.8
Mean			29	10.8	198	9.7	38.1	19.3	4.8
Probability(%)									
	Rotation (R)		2.0	0.0	2.0	0.0	23.6	21.5	0.7
	Treatment (T)		50.0	49.1	50.0	86.9	78.7	88.6	47.7
	R x T		59.1	93.5	59.1	51.0	93.8	81.9	25.6
LSD (0.10)									
	Rotation (R)		4.4	0.2	30	0.1	NS	NS	0.0
	Treatment (T)		NS	NS	NS	NS	NS	NS	NS
	R x T		NS	NS	NS	NS	NS	NS	NS
Contrasts-R (%)									
	Continuous		66.8	0.0	66.8	69.0	99.8	2.9	13.3
	Alternating		0.0	0.0	0.0	0.1	18.7	6.0	1.1
	Grain system I		13.4	0.0	13.4	0.0	0.0	0.0	0.0
	Grain system II		0.0	99.8	0.0	0.0	0.1	81.1	13.3
	Livestock system		12.3	0.0	12.3	3.9	27.0	17.1	0.1
CV(%)									
			12	3	12	2	1	2	1

**Table C-76. Corn, Soybean, and Wheat Rotation.
Arlington, WI - 2003.**

Crop	Rotation	Yield	Moisture	Grower return
		bu/A	%	\$/A
Wheat	Continuous	56	12.8	184
Wheat	Grain system I	66	13.0	216
Wheat	Grain system II	56	12.8	182
Wheat	Livestock system	58	12.4	188
Mean		59	12.7	192
<u>Probability(%)</u>				
	Rotation (R)	7.2	84.4	7.2
<u>LSD (0.10)</u>				
	Rotation (R)	3	NS	9
<u>Contrasts-R (%)</u>				
	Continuous	25.8	89.7	25.8
	Grain system I	1.5	62.1	1.5
	Grain system II	17.5	83.9	17.5
	Livestock system	56.7	41.9	56.7
<u>CV(%)</u>				
		7	7	7