

## FIELD EXPERIMENT HISTORY

**Year:** 2001  
**Expt. Number:** 2190  
**Title:** Twenty Year Corn/Soybean Rotation Study  
**Personnel:** P. Pedersen, J.G. Lauer, C. R. Grau, J.M. Gaska, and K.D. Kohn  
**Organization:** University of Wisconsin, Dept. of Agronomy and Plant Pathology  
**Location:** Arlington Research Station, Arlington, WI  
**Supported by:** HATCH Project 142-E018

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### FIELD INFORMATION

**Field:** 334W  
**Soil Type:** Plano Silt Loam  
**Soil Test Results:** Date:10/99 pH: 6.5 P: 35 ppm K: 203 ppm O.M.: 3.2%  
**Fertilizer Applied:** Soybean : None  
Corn: 210 lb/a nitrogen preemerge  
**Tillage Operations:** No-till and fall chisel plowed  
Spring field cultivated and cultmulched  
**Previous Crop:** Corn and soybean  
**Previous Herbicide:** Roundup  
**Irrigation:** None

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### EXPERIMENTAL PROCEDURE

**Exp. Design:** RCB Split-Split Plot  
**Replicates:** 4  
**Variables:** A: Tillage, B: Rotation Sequence, C: Row Spacing

	<u>Corn</u>	<u>Soybean</u>
<b>Area Planted:</b>	10' x 35'	10' x 35'
<b>Area Harvested:</b>	5' x 31'	5' x 31' for 15" and 30" rows, 4.375' x 31' for 7.5" rows
<b>Row Spacing:</b>	7.5, 15, and 30"	7.5, 15, and 30"
<b>Seeding Rate (spa)</b>	40K, 35K, and 30K	225K, 175K, and 125K
<b>Hybrid/Variety:</b>	DeKalb DK493RR Roundup Ready	Asgrow AG2301 Roundup Ready
<b>Planting Date:</b>	2-May-00	
<b>Planting Equip:</b>	Kinze 2000 Interplant planter (15" and 30") and John Deere 750 No-till Drill (7.5")	
<b>Harvesting Date:</b>	Oct. 8	Oct. 8
<b>Harvesting Equip:</b>	Kincaid plot combine	Almaco plot combine #1

	<u>Date</u>	<u>Material</u>	<u>Crop</u>	<u>Rate</u>
<b>Herbicides:</b>	27-Apr	Touchdown	No-till only	1 qt/a
	1-May	Dual	Both	2 pt/a
	30-May	Round-Up	Both	1 qt/a
	3-Jul	Warrior	SB only	0.02 lb ai/a
	17-Jul	Warrior	SB only	0.02 lb ai/a
<b>Insecticides:</b>	2-May	Force 3G	Corn only	4 oz/1000' row

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**Results:** Table C39-C45.

**Table C-40. 20 Year Corn/Soybean Rotation Study - Soybean  
Arlington, WI Expt. 2190**

Tillage	Rotation	Row Spacing	Yield bu/a	Moist. %	Plant density x 1000	Plant density x 1000	Plant height in	Lodge score 1-5	-----Brown stem rot incidence-----						Seed wt g/100 seeds
									-----Foliar-----					Stem 25-Sep 1-11	
									17-Aug	24-Aug	29-Aug	6-Sep	12-Sep		
Notill			59.1	11.8	132.4	128.8	39.9	1.7	0.0	0.1	0.1	0.5	1.1	0.8	13.88
Conv			53.7	11.9	135.3	135.6	38.4	1.6	0.0	0.0	0.2	0.3	0.3	0.6	13.41
	1st year soybean		61.0	12.2	125.9	126.0	39.8	2.0	0.0	0.0	0.2	0.3	0.5	0.3	14.25
	2nd year soybean		59.1	11.8	129.3	131.8	40.9	1.9	0.0	0.2	0.1	0.4	0.8	0.6	13.70
	3rd year soybean		54.9	11.9	136.7	131.8	39.0	1.5	0.0	0.0	0.1	0.3	1.0	0.6	13.65
	4th year soybean		54.4	11.8	138.7	138.3	38.0	1.4	0.0	0.0	0.2	0.5	1.0	0.8	13.10
	5th year soybean		53.8	11.8	135.9	135.6	38.3	1.3	0.0	0.0	0.0	0.2	1.0	1.1	13.44
	Continuous soybean		53.1	11.7	137.3	133.7	38.9	1.1	0.0	0.0	0.0	0.4	0.4	0.9	13.56
	S/C rotation		58.7	12.0	133.1	124.0	39.2	2.1	0.0	0.2	0.6	0.5	0.0	0.7	13.85
Notill	1st year soybean		61.3	12.3	116.7	117.7	39.8	1.9	0.0	0.0	0.2	0.3	0.3	0.3	14.46
Notill	2nd year soybean		60.4	11.8	127.5	129.6	41.3	2.0	0.0	0.3	0.1	0.3	1.5	1.0	13.72
Notill	3rd year soybean		56.8	11.9	139.7	129.8	40.0	1.6	0.0	0.0	0.1	0.6	1.6	0.8	13.97
Notill	4th year soybean		60.1	11.7	143.6	135.3	40.2	1.6	0.0	0.1	0.2	1.0	1.5	0.9	13.64
Notill	5th year soybean		57.5	11.6	135.6	137.2	40.1	1.4	0.0	0.0	0.1	0.4	1.6	1.3	13.82
Notill	Continuous soybean		55.1	11.6	140.0	132.7	39.2	1.1	0.0	0.0	0.1	0.8	0.6	0.9	13.83
Notill	S/C rotation		62.7	12.1	123.9	112.0	38.8	2.0	0.0	0.1	0.0	0.5	0.7	0.7	13.75
Conv	1st year soybean		60.7	12.2	135.0	134.2	39.7	2.2	0.0	0.1	0.3	0.3	0.6	0.4	14.04
Conv	2nd year soybean		57.8	11.8	131.1	134.6	40.5	1.8	0.0	0.1	0.1	0.6	0.1	0.2	13.67
Conv	3rd year soybean		52.9	11.9	133.7	133.7	38.1	1.3	0.0	0.0	0.2	0.1	0.3	0.5	13.33
Conv	4th year soybean		48.6	11.9	133.7	141.6	35.8	1.2	0.0	0.0	0.2	0.0	0.4	0.7	12.56
Conv	5th year soybean		50.2	11.9	136.2	134.0	36.6	1.2	0.0	0.1	0.0	0.0	0.4	0.9	13.06
Conv	Continuous soybean		51.1	11.8	134.6	134.6	38.7	1.1	0.0	0.0	0.0	0.0	0.3	0.8	13.29
Conv	S/C rotation		54.8	12.0	142.4	135.9	39.6	2.2	0.0	0.0	0.4	0.8	0.3	0.6	13.94
		7.5"	53.7	12.0	118.5	124.5	39.3	2.1	0.0	0.0	0.1	0.5	0.9	0.7	13.69
		15"	58.0	11.9	153.0	151.2	39.5	1.5	0.0	0.1	0.1	0.3	0.6	0.8	13.78
		30"	57.5	11.7	130.0	118.9	38.7	1.3	0.0	0.0	0.1	0.4	0.7	0.6	13.48
Notill		7.5"	56.0	12.0	114.9	123.2	39.8	2.1	0.0	0.1	0.2	0.6	1.4	0.7	13.94
Notill		15"	61.0	11.9	152.8	147.3	40.3	1.5	0.0	0.1	0.0	0.4	0.9	1.0	13.93
Notill		30"	60.3	11.7	129.6	114.7	39.5	1.3	0.0	0.0	0.0	0.6	1.0	0.7	13.78
Conv		7.5"	51.4	12.0	122.2	125.8	38.7	2.0	0.0	0.0	0.1	0.3	0.4	0.7	13.44
Conv		15"	55.1	12.0	153.2	155.3	38.6	1.5	0.0	0.1	0.2	0.3	0.3	0.5	13.63
Conv		30"	54.7	11.8	130.4	123.3	37.9	1.2	0.0	0.0	0.2	0.2	0.4	0.5	13.17

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**Table C-40. 20 Year Corn/Soybean Rotation Study - Soybean  
Arlington, WI Expt. 2190**

Tillage	Rotation	Row Spacing	Yield bu/a	Moist. %	Plant density x 1000	Plant density x 1000	Plant height in	Lodge score 1-5	-----Brown stem rot incidence-----					Seed wt g/100 seeds	
									-----Foliar-----			Stem			
									17-Aug	24-Aug	29-Aug	6-Sep	12-Sep	25-Sep	
									-----1-11-----					1-11	
<b>Probability</b>															
Tillage (T)			1.2	7.2	8.5	19.9	3.5	26.7	>50	49.5	>50	1.1	8.7	18.5	1.4
Rotation (R)			0.3	0.8	11.2	9.0	16.7	<0.1	>50	>50	48.8	>50	15.8	5.6	<0.1
T x R			22.8	>50	2.3	22.0	17.7	53.4	>50	>50	27.8	5.7	4.8	48.1	1.6
Row Spacing (S)			<0.1	<0.1	<0.1	<0.1	14.6	<0.1	>50	45.3	>50	44.6	2.5	>50	0.6
T x S			>50	21.8	41.7	>50	>50	>50	>50	45.3	3.9	39.8	31.4	23.0	24.2
R x S			0.4	>50	>50	>50	6.8	9.6	>50	42.7	>50	24.4	2.8	42.4	2.9
T x R x S			>50	>50	>50	>50	0.9	>50	>50	42.7	>50	20.6	8.0	10.8	72.0
<b>LSD 10%</b>															
Tillage (T)			2.3	0.1	2.6	NS	1.0	NS	NS	NS	NS	0.1	0.7	NS	0.21
Rotation (R)			3.7	0.2	NS	9.6	NS	0.3	NS	NS	NS	NS	NS	0.4	0.29
T x R			NS	NS	11.0	NS	NS	NS	NS	NS	NS	0.5	0.9	NS	0.44
Row Spacing (S)			1.7	0.1	4.9	6.0	NS	0.2	NS	NS	NS	NS	0.2	NS	0.16
T x S			NS	NS	NS	NS	NS	NS	NS	NS	0.2	NS	NS	NS	NS
R x S			5.2	NS	NS	NS	2.3	0.5	NS	NS	NS	NS	0.7	NS	0.45
<b>CV %</b>			10	2	12	15	5	31	0	362	287	140	99	102	4

**Table C-41. 20 Year Corn/Soybean Rotation Study - Soybean  
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Tillage	Rotation	<i>Diaporthe-Phomopsis</i> Complex				<i>Fusarium oxysporum</i>				<i>Rhizoctonia solani</i>				<i>Trichoderma</i> ssp.			
		Percent incidence				Percent incidence				Percent incidence				Percent incidence			
		V1 %	R1 %	R2 %	R8 %	V1 %	R1 %	R2 %	R8 %	V1 %	R1 %	R2 %	R8 %	V1 %	R1 %	R2 %	R8 %
Notill		43.6	52.9	56.5	64.8	19.3	15.4	13.5	7.8	3.6	0.4	2.2	0.0	3.2	4.6	2.2	2.6
Conv		47.9	43.6	53.8	53.1	23.6	17.9	12.5	10.4	3.6	2.5	2.9	1.2	1.4	2.9	2.1	2.3
	1st year soybean	50.0	36.3	55.0	51.4	8.8	12.5	5.0	17.1	1.3	2.5	1.3	0.0	1.3	2.5	1.3	7.1
	2nd year soybean	40.0	42.5	50.0	56.3	27.5	13.8	18.3	2.5	2.5	0.0	1.7	1.3	0.0	5.0	0.0	1.3
	3rd year soybean	35.0	50.0	55.7	61.3	22.5	12.5	18.6	11.3	7.5	1.3	1.4	1.3	1.3	7.5	1.4	0.0
	4th year soybean	43.8	52.5	55.0	67.5	35.0	18.8	13.8	2.5	0.0	3.8	1.3	0.0	0.0	2.5	7.5	2.5
	5th year soybean	57.5	60.0	48.8	61.4	11.3	16.3	13.8	10.0	5.0	2.5	2.5	0.0	6.3	0.0	0.0	0.0
	Continuous soybean	60.0	58.8	61.7	67.5	11.3	18.8	16.7	11.3	3.8	0.0	8.3	1.3	3.8	3.8	0.0	5.0
	S/C rotation	33.8	37.5	65.0	45.7	33.8	23.8	2.5	10.0	5.0	0.0	2.5	0.0	3.8	5.0	5.0	1.4
Notill	1st year soybean	52.5	40.0	60.0	56.7	12.5	15.0	10.0	13.3	0.0	2.5	2.5	0.0	0.0	0.0	2.5	16.7
Notill	2nd year soybean	40.0	37.5	56.7	72.5	27.5	22.5	13.3	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Notill	3rd year soybean	32.5	60.0	62.5	60.0	15.0	7.5	12.5	12.5	5.0	0.0	0.0	0.0	2.5	12.5	2.5	0.0
Notill	4th year soybean	45.0	62.5	52.5	67.5	27.5	12.5	15.0	5.0	0.0	0.0	0.0	0.0	0.0	5.0	2.5	0.0
Notill	5th year soybean	55.0	67.5	47.5	67.5	10.0	12.5	12.5	2.5	5.0	0.0	5.0	0.0	10.0	0.0	0.0	0.0
Notill	Continuous soybean	57.5	55.0	55.0	75.0	12.5	15.0	30.0	12.5	5.0	0.0	10.0	0.0	5.0	7.5	0.0	5.0
Notill	S/C rotation	22.5	47.5	65.0	52.5	30.0	22.5	5.0	7.5	10.0	0.0	0.0	0.0	5.0	7.5	10.0	0.0
Conv	1st year soybean	47.5	32.5	50.0	47.5	5.0	10.0	0.0	20.0	2.5	2.5	0.0	0.0	2.5	5.0	0.0	0.0
Conv	2nd year soybean	40.0	47.5	43.3	40.0	27.5	5.0	23.3	2.5	5.0	0.0	3.3	2.5	0.0	10.0	0.0	2.5
Conv	3rd year soybean	37.5	40.0	46.7	62.5	30.0	17.5	26.7	10.0	10.0	2.5	3.3	2.5	0.0	2.5	0.0	0.0
Conv	4th year soybean	42.5	42.5	57.5	67.5	42.5	25.0	12.5	0.0	0.0	7.5	2.5	0.0	0.0	0.0	12.5	5.0
Conv	5th year soybean	60.0	52.5	50.0	53.3	12.5	20.0	15.0	20.0	5.0	5.0	0.0	0.0	2.5	0.0	0.0	0.0
Conv	Continuous soybean	62.5	62.5	65.0	60.0	10.0	22.5	10.0	10.0	2.5	0.0	7.5	2.5	2.5	0.0	0.0	5.0
Conv	S/C rotation	45.0	27.5	65.0	36.7	37.5	25.0	0.0	13.3	0.0	0.0	5.0	0.0	2.5	2.5	0.0	3.3
<b>Means</b>		45.7	48.2	55.1	59.1	21.4	16.6	13.0	9.1	3.6	1.4	2.6	0.6	2.3	3.8	2.1	2.5
<b>Probability</b>																	
Tillage (T)		>50	4.4	40.1	2.4	>50	>50	>50	24.4	>50	18.2	>50	9.1	23.9	31.2	>50	>50
Rotation (R)		2.5	3.7	>50	15.2	<0.1	>50	18.7	9.1	>50	29.4	40.8	>50	13.1	>50	3.8	35.2
T x R		>50	34.4	>50	>50	>50	34.4	25.5	39.7	>50	29.4	>50	>50	>50	12	8.5	16
<b>LSD 10%</b>																	
Tillage (T)		NS	6.5	NS	6.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Rotation (R)		10.0	14.5	NS	NS	6.6	NS	NS	8.7	NS	NS	NS	NS	NS	NS	4.5	NS
T x R		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6.1	NS
<b>CV %</b>		39	36	33	30	69	83	97	111	258	266	256	448	213	200	223	297

**Table C-42. 20 Year Corn/Soybean Rotation Study - Soybean  
Arlington, WI Expt. 2190  
Leaf Area Index for 15" row spacing**

Tillage	Rotation	Leaf Area Index				
		25-Aug	5-Sep	12-Sep	18-Sep	24-Sep
		-----M <sup>2</sup> /M <sup>2</sup> -----				
Notill		6.11	5.57	4.56	4.25	3.13
Conv		6.19	5.68	4.93	4.17	3.18
	1st year soybean	5.96	5.44	4.48	4.24	2.99
	2nd year soybean	6.17	5.71	4.58	4.51	3.15
	3rd year soybean	6.09	5.59	4.75	4.09	3.11
	4th year soybean	5.94	5.60	4.92	3.68	2.85
	5th year soybean	6.25	5.65	4.39	4.25	3.18
	Continuous soybean	6.22	5.74	5.05	4.32	3.63
	S/C rotation	6.43	5.68	5.06	4.39	3.15
Notill	1st year soybean	5.89	5.41	4.59	4.33	3.10
Notill	2nd year soybean	6.26	5.69	4.52	4.42	3.25
Notill	3rd year soybean	6.02	5.61	4.65	4.44	3.27
Notill	4th year soybean	5.66	5.46	4.39	3.49	2.76
Notill	5th year soybean	6.07	5.51	4.24	3.90	2.69
Notill	Continuous soybean	6.18	5.55	4.67	4.74	3.54
Notill	S/C rotation	6.69	5.79	4.88	4.46	3.30
Conv	1st year soybean	6.02	5.46	4.37	4.16	2.89
Conv	2nd year soybean	6.09	5.72	4.64	4.60	3.06
Conv	3rd year soybean	6.17	5.56	4.85	3.73	2.94
Conv	4th year soybean	6.22	5.74	5.44	3.88	2.95
Conv	5th year soybean	6.42	5.78	4.54	4.61	3.68
Conv	Continuous soybean	6.27	5.94	5.44	3.89	3.73
Conv	S/C rotation	6.18	5.56	5.24	4.33	3.00
<b>Means</b>		6.15	5.63	4.75	4.21	3.15
<b><u>Probability</u></b>						
Tillage (T)		40.4	2.7	6.7	39.5	>50
Rotation (R)		25.1	>50	7.8	33.9	>50
T x R		25.1	>50	31.5	27.5	>50
<b><u>LSD 10%</u></b>						
Tillage (T)		NS	0.06	0.31	NS	NS
Rotation (R)		NS	NS	0.45	NS	NS
T x R		NS	NS	NS	NS	NS
<b>CV %</b>		7	7	11	17	26

**Table C-43. 20 Year Corn/Soybean Rotation Study - Soybean  
Arlington, WI Expt. 2190  
Multispectral Radiometer Readings for 15" row spacing**

Tillage	Rotation	Wavelength (10 <sup>3</sup> m)				Wavelength (10 <sup>3</sup> m)				Wavelength (10 <sup>3</sup> m)				Wavelength (10 <sup>3</sup> m)							
		660	710	760	810	660	710	760	810	660	710	760	810	660	710	760	810	660	710	760	810
		% reflectance - 17 Aug, 2001				% reflectance - 24 Aug, 2001				% reflectance - 29 Aug, 2001				% reflectance - 6 Sep, 2001				% reflectance - 12 Sep, 2001			
Notill		2.35	3.75	43.99	56.69	3.11	4.59	49.42	61.51	2.80	4.39	46.79	59.26	3.61	6.32	42.36	52.01	6.07	10.18	34.51	43.01
Conv		2.38	3.78	43.63	55.99	3.17	4.67	49.37	61.29	2.75	4.32	45.50	57.63	3.67	6.40	41.01	50.34	6.44	10.60	32.98	41.23
	1st year soybean	2.38	3.82	44.69	57.43	3.13	4.65	49.74	61.89	2.75	4.31	45.55	57.44	3.53	6.08	42.53	52.18	5.93	9.99	36.28	45.22
	2nd year soybean	2.34	3.70	42.81	55.06	3.15	4.66	48.28	59.78	2.82	4.47	45.60	57.93	3.71	6.52	41.75	51.26	6.71	10.93	34.20	42.84
	3rd year soybean	2.52	3.97	45.18	57.86	3.11	4.58	49.80	61.91	2.69	4.21	46.77	59.33	3.63	6.33	40.93	50.38	5.69	9.56	34.44	42.66
	4th year soybean	2.28	3.67	42.99	55.33	3.12	4.59	49.41	61.37	2.76	4.33	45.72	57.93	3.63	6.35	42.14	51.59	6.10	9.99	31.94	39.62
	5th year soybean	2.32	3.68	43.65	56.13	3.16	4.67	50.07	62.33	2.75	4.32	46.09	58.30	3.82	6.60	41.13	50.56	7.24	11.89	34.00	42.47
	Continuous soybean	2.35	3.71	43.40	56.07	3.14	4.62	48.78	60.71	2.94	4.61	47.98	60.70	3.53	6.22	41.95	51.52	5.74	9.74	32.07	40.28
	S/C rotation	2.39	3.80	43.98	56.50	3.17	4.66	49.70	61.79	2.74	4.25	45.32	57.47	3.65	6.44	41.36	50.73	6.39	10.62	33.32	41.78
Notill	1st year soybean	2.48	3.93	46.90	60.34	3.07	4.54	50.10	62.34	2.68	4.14	47.28	59.78	3.12	5.35	45.00	55.31	5.10	8.88	39.32	48.57
Notill	2nd year soybean	2.28	3.66	42.04	54.26	3.13	4.60	47.83	59.22	2.86	4.49	45.55	57.72	3.58	6.21	41.30	50.74	6.52	10.51	33.70	41.86
Notill	3rd year soybean	2.49	3.97	44.91	57.53	3.07	4.55	49.92	62.19	2.61	4.11	45.82	58.13	3.69	6.43	41.15	50.49	5.63	9.53	35.65	44.58
Notill	4th year soybean	2.41	3.85	44.54	57.23	3.07	4.52	48.96	60.94	2.94	4.69	48.29	61.36	3.60	6.45	43.65	53.52	5.28	8.73	30.05	37.15
Notill	5th year soybean	2.21	3.54	43.38	56.19	3.19	4.70	51.52	64.05	2.78	4.39	47.08	59.41	3.95	6.79	40.77	50.20	7.47	12.27	34.24	42.55
Notill	Continuous soybean	2.23	3.55	41.94	54.45	3.09	4.57	48.35	60.31	2.91	4.55	47.09	59.58	3.68	6.45	42.73	52.34	5.98	10.40	35.15	44.19
Notill	S/C rotation	2.38	3.74	44.26	56.85	3.15	4.67	49.27	61.49	2.81	4.36	46.45	58.82	3.69	6.56	41.91	51.48	6.49	10.93	33.49	42.20
Conv	1st year soybean	2.29	3.72	42.48	54.53	3.20	4.76	49.37	61.43	2.82	4.47	43.82	55.09	3.94	6.80	40.07	49.06	6.77	11.09	33.24	41.86
Conv	2nd year soybean	2.40	3.74	43.59	55.87	3.18	4.73	48.74	60.34	2.78	4.45	45.65	58.14	3.84	6.84	42.20	51.78	6.90	11.35	34.70	43.83
Conv	3rd year soybean	2.55	3.98	45.46	58.18	3.15	4.61	49.67	61.62	2.76	4.30	47.72	60.53	3.58	6.23	40.70	50.27	5.74	9.59	33.22	40.74
Conv	4th year soybean	2.15	3.48	41.44	53.43	3.18	4.66	49.86	61.79	2.58	3.97	43.14	54.50	3.67	6.25	40.62	49.67	6.92	11.25	33.83	42.09
Conv	5th year soybean	2.43	3.82	43.92	56.07	3.13	4.64	48.61	60.62	2.71	4.26	45.10	57.19	3.69	6.41	41.50	50.92	7.01	11.52	33.76	42.39
Conv	Continuous soybean	2.48	3.88	44.85	57.70	3.19	4.66	49.21	61.12	2.97	4.67	48.88	61.83	3.38	5.98	41.17	50.71	5.49	9.08	29.00	36.37
Conv	S/C rotation	2.41	3.85	43.69	56.16	3.18	4.66	50.13	62.10	2.66	4.15	44.20	56.12	3.62	6.31	40.80	49.98	6.29	10.31	33.14	41.36
Means		2.37	3.76	43.81	56.34	3.14	4.63	49.40	61.40	2.78	4.36	46.15	58.44	3.64	6.36	41.68	51.17	6.26	10.39	33.75	42.12
<b>Probability</b>																					
Tillage (T)		17.2	19.3	>50	>50	21.9	14.7	>50	>50	25.7	46.1	32.1	32.1	>50	>50	13.6	13.2	15.7	24.6	24.7	25.7
Rotation (R)		38.9	23.7	28.0	35.1	>50	>50	40.2	28.0	46.6	48.5	>50	>50	>50	>50	>50	>50	4.3	10.8	34.4	30.3
T x R		14.7	10.4	2.2	2.9	>50	>50	27.1	37.8	35	21.9	13	11.2	35.2	26.7	40.5	34.1	16.6	18.4	13.8	9.5
<b>LSD 10%</b>																					
Tillage (T)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.99	NS	NS	NS	NS	NS
Rotation (R)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.86	NS	NS	NS
T x R		NS	NS	3.14	3.60	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5.9
CV %		9	7	5	5	4	4	4	4	9	9	6	6	14	14	7	7	16	16	12	16



**Table C-44. 20 Year Corn/Soybean Rotation Study - Soybean**  
**Arlington, WI Expt. 2190**  
**Biomass, height, and growth stages**

Tillage	Rotation	26 June, 2001				18 July, 2001				3 Aug, 2001				26 Sep, 2001			
		Biomass DM g/pla.	V-stage	R-stage	Height cm	Biomass DM g/pla.	V-stage	R-stage	Height cm	Biomass DM g/pla.	V-stage	R-stage	Height cm	Biomass DM g/pla.	V-stage	R-stage	Height cm
Notill		1.87	4.73	0.18	14.00	13.55	10.35	1.95	36.76	19.96	15.71	3.39	77.05	36.32	19.61	7.81	101.24
Conv		1.58	4.62	0.15	13.32	12.51	10.12	1.95	33.81	18.83	15.90	3.29	70.95	33.29	19.88	7.68	95.07
	1st year soybean	1.89	4.67	0.21	14.08	13.60	10.67	2.00	37.75	19.32	15.54	3.42	77.67	41.44	19.96	7.58	103.42
	2nd year soybean	2.12	5.04	0.29	14.67	13.89	10.71	1.83	39.71	18.98	15.96	3.42	78.71	36.12	19.75	7.96	105.04
	3rd year soybean	1.66	4.46	0.08	14.21	12.82	9.88	1.92	35.50	20.59	16.17	3.42	75.50	37.75	20.08	7.79	99.29
	4th year soybean	1.54	4.71	0.17	13.21	12.45	9.67	2.00	31.46	18.12	15.79	3.21	69.83	28.38	19.54	7.67	96.04
	5th year soybean	1.80	4.83	0.21	14.00	12.91	10.29	1.92	34.25	17.38	15.46	3.50	74.38	36.43	20.00	7.63	87.75
	Continuous soybean	1.51	4.42	0.17	12.88	13.36	10.17	2.00	32.38	20.38	16.33	3.29	67.42	29.76	19.33	7.88	93.38
	S/C rotation	1.54	4.58	0.04	12.58	12.16	10.25	2.00	35.96	21.02	15.42	3.13	74.50	33.78	19.54	7.71	102.17
Notill	1st year soybean	1.61	4.25	0.08	13.33	11.80	10.33	2.00	35.83	20.31	14.92	3.42	72.25	42.60	19.33	7.33	102.42
Notill	2nd year soybean	2.27	5.17	0.17	15.33	13.83	10.58	2.00	39.92	18.10	15.92	3.17	77.83	38.92	19.83	8.00	109.50
Notill	3rd year soybean	1.92	4.50	0.00	14.92	13.86	9.83	1.83	38.58	21.31	16.67	3.75	82.58	40.16	19.58	8.00	102.92
Notill	4th year soybean	1.88	5.08	0.33	13.83	14.04	10.33	2.00	37.00	19.89	16.17	3.58	85.75	33.19	19.83	7.75	107.17
Notill	5th year soybean	2.22	5.25	0.42	15.50	14.88	10.58	1.83	37.58	19.48	15.42	3.58	79.00	36.53	19.33	7.75	86.58
Notill	Continuous soybean	1.73	4.50	0.17	13.17	14.16	10.42	2.00	33.75	21.73	15.83	3.25	69.83	28.81	19.67	8.00	96.50
Notill	S/C rotation	1.44	4.33	0.08	11.92	12.25	10.33	2.00	34.67	18.92	15.08	3.00	72.08	34.05	19.67	7.83	103.58
Conv	1st year soybean	2.17	5.08	0.33	14.83	15.40	11.00	2.00	39.67	18.33	16.17	3.42	83.08	40.29	20.58	7.83	104.42
Conv	2nd year soybean	1.97	4.92	0.42	14.00	13.96	10.83	1.67	39.50	19.85	16.00	3.67	79.58	33.31	19.67	7.92	100.58
Conv	3rd year soybean	1.40	4.42	0.17	13.50	11.79	9.92	2.00	32.42	19.88	15.67	3.08	68.42	35.34	20.58	7.58	95.67
Conv	4th year soybean	1.21	4.33	0.00	12.58	10.85	9.00	2.00	25.92	16.35	15.42	2.83	53.92	23.58	19.25	7.58	84.92
Conv	5th year soybean	1.38	4.42	0.00	12.50	10.94	10.00	2.00	30.92	15.29	15.50	3.42	69.75	36.33	20.67	7.50	88.92
Conv	Continuous soybean	1.30	4.33	0.17	12.58	12.55	9.92	2.00	31.00	19.02	16.83	3.33	65.00	30.71	19.00	7.75	90.25
Conv	S/C rotation	1.64	4.83	0.00	13.25	12.06	10.17	2.00	37.25	23.12	15.75	3.25	76.92	33.52	19.42	7.58	100.75
Means		1.72	4.67	0.17	13.66	13.03	10.23	1.95	35.29	19.40	15.81	3.34	74.00	34.81	19.74	7.74	98.16
<b>Probability</b>																	
Tillage (T)		0.2	48.6	>50	11.9	14.0	>50	>50	11.6	21.2	>50	17.0	0.5	9.2	30.2	24.2	0.7
Rotation (R)		0.3	19.4	27.4	1.1	>50	6.7	18.7	<0.1	>50	>50	>50	6.7	20.0	>50	7.2	0.3
T x R		<0.1	1.7		0.7	2.20	17.5	3.9	<0.1	>50	43.3	15.4	<0.1	>50	>50	4.0	10.8
<b>LSD 10%</b>																	
Tillage (T)		0.07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.89	NS	NS	NS	2.2
Rotation (R)		0.27	NS	NS	0.27	NS	0.61	NS	2.87	NS	NS	NS	6.56	NS	NS	0.22	7.22
T x R		0.33	NS	0.23	1.18	2.70	NS	0.16	5.79	NS	NS	NS	8.07	NS	NS	0.40	NS
<b>CV %</b>		18	11	123	9	16	7	8	10	28	8	15	10	30	8	3	9

**Table C-45. 20 Year Corn/Soybean Rotation Study - Soybean**  
**Arlington, WI Expt. 2190**  
**Gravimetric soil moisture**

Tillage	Rotation	2-May		25-May		13-Jun		29-Jun		11-Jul		27-Jul		10-Aug		24-Aug		5-Sep	
		0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm	0-15 cm	15-30 cm
Notill		15.86	18.54	20.85	22.16	21.35	21.98	15.96	19.81	12.81	14.39	17.47	16.23	18.68	20.08	17.72	16.18	18.52	19.35
Conv		16.57	17.64	20.98	22.23	21.75	21.60	16.20	18.99	12.77	14.84	18.30	16.52	19.69	21.72	19.84	17.90	18.29	19.83
	1st year soybean	-	-	21.92	24.55	22.20	22.01	17.05	19.38	12.18	14.43	18.50	17.24	19.31	20.93	18.51	16.59	19.06	19.48
	2nd year soybean	-	-	20.58	23.14	22.03	22.25	16.28	20.25	13.06	15.11	18.94	17.22	20.93	22.36	19.84	18.60	19.11	20.09
	3rd year soybean	-	-	20.83	21.70	21.34	21.20	16.04	18.66	12.59	14.68	17.83	16.51	18.46	19.96	18.89	17.13	18.29	19.01
	4th year soybean	-	-	20.83	21.32	21.29	21.01	15.54	18.40	12.75	14.30	17.69	15.26	19.35	21.13	18.79	17.20	18.75	20.74
	5th year soybean	-	-	21.07	21.81	21.63	21.29	15.47	18.50	13.29	14.66	17.48	15.49	18.31	21.06	18.48	16.94	18.13	19.26
	Continuous soybean	-	-	20.70	21.09	20.97	20.86	15.52	18.48	12.47	14.03	16.79	15.55	17.43	19.01	17.47	15.69	18.01	18.44
	S/C rotation	-	-	20.47	21.76	21.39	23.93	16.69	22.11	13.21	15.09	17.97	17.34	20.49	21.84	19.48	17.15	17.49	20.11
Notill	1st year soybean	-	-	22.19	22.53	21.78	21.58	17.19	20.22	13.72	15.08	18.77	17.48	18.56	20.27	18.53	16.39	19.55	19.52
Notill	2nd year soybean	-	-	19.56	23.27	22.02	22.03	16.82	19.94	12.95	14.89	18.78	17.67	20.80	22.23	18.77	18.24	19.34	20.06
Notill	3rd year soybean	-	-	21.08	22.17	21.15	21.21	15.10	18.67	12.59	14.83	17.15	16.17	18.03	19.41	16.55	15.45	18.35	19.08
Notill	4th year soybean	-	-	21.14	21.50	21.27	21.03	15.48	18.22	12.25	13.19	16.97	14.80	18.45	20.05	18.44	16.67	19.24	22.05
Notill	5th year soybean	-	-	20.89	21.70	21.34	21.13	14.97	17.82	12.65	13.62	16.14	14.73	18.56	19.78	17.15	15.66	17.09	17.91
Notill	Continuous soybean	-	-	20.93	21.14	20.49	20.90	15.30	18.35	12.33	13.68	16.39	14.53	15.97	17.28	16.09	14.24	17.73	17.92
Notill	S/C rotation	-	-	20.17	22.80	21.40	25.97	16.89	25.44	13.17	15.47	18.09	18.22	20.38	21.54	18.50	16.62	18.37	18.90
Conv	1st year soybean	-	-	21.66	26.57	22.63	22.44	16.91	18.54	10.63	13.78	18.23	16.99	20.05	21.60	18.49	16.79	18.57	19.45
Conv	2nd year soybean	-	-	21.61	23.00	22.04	22.46	15.74	20.57	13.16	15.34	19.10	16.78	21.06	22.48	20.91	18.96	18.87	20.12
Conv	3rd year soybean	-	-	20.58	21.24	21.54	21.19	16.98	18.65	12.59	14.54	18.51	16.86	18.90	20.52	21.24	18.80	18.22	18.95
Conv	4th year soybean	-	-	20.52	21.15	21.31	20.99	15.61	18.57	13.24	15.42	18.41	15.71	20.24	22.21	19.14	17.73	18.26	19.43
Conv	5th year soybean	-	-	21.25	21.91	21.93	21.45	15.97	19.19	13.93	15.71	18.81	16.26	18.07	22.35	19.80	18.22	19.16	20.61
Conv	Continuous soybean	-	-	20.47	21.03	21.46	20.82	15.73	18.61	12.61	14.38	17.19	16.57	18.90	20.74	18.85	17.13	18.29	18.96
Conv	S/C rotation	-	-	20.76	20.72	21.37	21.88	16.49	18.78	13.26	14.71	17.85	16.45	20.61	22.14	20.45	17.68	16.62	21.32
Means				20.91	22.20	21.55	21.79	16.08	19.40	12.79	14.62	17.88	16.37	19.18	20.90	18.78	17.04	18.40	19.59
<b>Probability</b>																			
Tillage (T)		-	-	>50	>50	3.7	>50	27.4	46.4	>50	12.7	6.4	>50	4.5	1.5	0.2	1.1	15.5	>50
Rotation (R)		-	-	>50	2.7	29.6	28.8	30.0	28.1	>50	39.8	25.2	4.7	3.0	4.0	13.4	18.2	>50	>50
T x R		-	-	>50	16.2	>50	>50	>50	28.2	12.2	1.5	>50	26.6	>50	>50	13.4	>50	>50	>50
<b>LSD 10%</b>																			
Tillage (T)		-	-	NS	NS	0.27	NS	NS	NS	NS	NS	0.68	NS	0.72	0.76	0.47	0.7	NS	NS
Rotation (R)		-	-	NS	1.77	NS	NS	NS	NS	NS	NS	NS	1.42	1.8	1.69	NS	NS	NS	NS
T x R		-	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV %		-	-	9	9	5	12	10	17	12	7	9	10	11	7	9	11	11	18