

FIELD EXPERIMENT HISTORY

Title: 17 Tillage in Corn and Soybean Production Systems
Experiment: 17 Tillage **Trial ID:** 2920 **Year:** 2006
Personnel: J. G. Lauer, J.M. Gaska, K. D. Kohn, J.H. Hopf
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: ARS396 **Previous Crop:** Corn / Soybean **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 5 /6 /04 **pH** 6.8 **OM (%)** 3.0 **P (ppm)** 22 **K (ppm)** 139

Plot Management

Tillage Operations: See Factors

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer:			
Preplant :	N/A	N/A	N/A
Starter :	N/A	N/A	N/A
Post plant :	28-0-0	70 gpa	5/5/06
	34-0-0	150 lb/a	6/23/06
Manure:	N/A	N/A	N/A
Herbicide:	2,4-D Ester 12 oz/a 4/26/06	Insecticide: Force 3G 4.4 lbs/A 4/28/06	
	Dual II Mag 24 oz/a 4/26/06		
	Mirage Plus 32 oz/a 6/14/06		
Irrigation: None		Hybrid/Variety: C: Dekalb DKC5020 S: Asgrow AG2203	
Planting Date: Corn: 4/28/06 Soybean: 5/6/06		Row Width: 30"	
Planting Method: Kinze 2000 Interplant planter		Planting Depth: Corn: 1.5"	
Harvest Date: Corn: 10/24/06 Soybean: 10/9/06		Harvest Method: C: Kincaid plot combine S: Almaco plot combine	

Experimental Design

Design: RCB split plot **Replications:** 4
Plot Size Seeded: 20' x 100' **Experiment Size:** 4.5 Acres
Harvest Plot Size: 5' x 96'
Factors/Treatments:

Rotation:

Continuous Corn
 Corn / Soybean
 Soybean / Corn

Tillage For All Rotation:

CP: Fall chisel plow +2 spring field cultivator. Spring 1-13 wave coulter with trash whippers
 T1: Spring Strip-Till 4-inch berm - Spring 1-13 wave coulter
 T2: Spring Strip-Till 2-inch berm - Spring 1-13 wave coulter
 T3: Spring Strip-Till 0-inch berm - Spring 1-13 wave coulter
 T4: Spring chisel plow +2 spring field cultivator. Spring 1-13 wave coulter with trash whippers
 NT: Spring 1-13 wave coulter

Results: Tables C-67 and C-68.

**Table C-67. Tillage in Corn and Soybean Production Systems - Corn.
Arlington, WI - 2006.**

Rotation	Tillage treatment	Yield bu/A	Moisture %	Test Weight lbs/bu	Grower return \$/A	Lodged			Harvest plants/A	Grain Composition			Ethanol	
						Total %	Stalk %	Root %		Oil %	Starch %	Protein %	per bu gallons	per A gallons
	CP	220	18.6	56.2	682	0.4	0.4	0.0	29000	3.5	60.8	7.2	2.92	642
	NT	208	20.4	54.5	637	3.5	0.0	3.5	32250	3.4	60.7	7.2	2.91	607
	T1	214	20.0	55.1	657	26.1	0.0	26.1	31000	3.4	60.8	7.2	2.91	624
	T2	217	20.2	54.8	666	11.4	0.4	11.0	30125	3.4	60.8	7.1	2.92	633
	T3	232	17.9	56.9	721	1.1	0.0	1.1	32500	3.5	60.7	7.3	2.91	675
	T4	210	19.2	55.6	647	0.8	0.0	0.8	31125	3.4	61.0	7.1	2.93	613
CC		210	20.3	54.8	644	7.7	0.3	7.4	30708	3.4	60.7	7.2	2.91	612
SC		223	18.5	56.2	693	6.7	0.0	6.7	31292	3.5	60.8	7.2	2.92	652
CC	CP	218	18.9	56.2	673	0.8	0.8	0.0	27750	3.5	60.8	7.1	2.92	635
CC	NT	204	22.0	53.3	618	6.2	0.0	6.2	32000	3.4	60.4	7.3	2.91	593
CC	T1	207	21.1	53.9	632	18.6	0.0	18.6	30750	3.4	60.7	7.3	2.90	602
CC	T2	211	21.3	54.0	642	16.9	0.8	16.1	29500	3.4	60.7	7.1	2.91	614
CC	T3	226	18.3	56.5	702	2.2	0.0	2.2	33000	3.4	60.8	7.3	2.91	659
CC	T4	195	20.0	54.8	600	1.6	0.0	1.6	31250	3.4	61.0	7.1	2.93	571
SC	CP	223	18.3	56.3	692	0.0	0.0	0.0	30250	3.4	60.8	7.4	2.91	649
SC	NT	212	18.9	55.6	656	0.8	0.0	0.8	32500	3.5	60.9	7.2	2.92	621
SC	T1	221	19.0	56.2	682	33.5	0.0	33.5	31250	3.5	60.8	7.1	2.92	646
SC	T2	223	19.0	55.6	690	5.9	0.0	5.9	30750	3.4	60.9	7.1	2.92	652
SC	T3	238	17.6	57.4	741	0.0	0.0	0.0	32000	3.5	60.6	7.2	2.91	692
SC	T4	224	18.4	56.4	694	0.0	0.0	0.0	31000	3.4	60.9	7.0	2.93	655
Mean		217	19.4	55.5	668	7.2	0.1	7.1	31000	3.4	60.8	7.2	2.92	632
Probability(%)														
Rotation (R)		18.4	1.2	1.7	12.8	82.8	18.2	87.7	35.8	45.7	10.7	74.4	18.4	16.7
Tillage (T)		0.3	0.0	0.0	0.1	1.3	59.2	1.3	4.3	90.1	20.5	54.2	48.4	0.5
R x T		44.3	0.0	0.3	44.3	66.6	59.2	68.5	72.6	82.6	11.0	43.9	25.9	44.4
LSD (0.10)														
Rotation (R)		NS	0.7	0.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Tillage (T)		10	0.4	0.5	31	12.9	NS	12.9	1935	NS	NS	NS	NS	28.8
R x T		NS	0.5	0.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV(%)		5	2	1	5	211	506	216	7	2	0	3	0	5

**Table C-68. Tillage in Corn and Soybean Production Systems - Soybean.
Arlington, WI - 2006.**

Rotation	Tillage treatment	Yield	Moisture	Grower return
		bu/A	%	\$/A
SC	CP	53.2	14.2	327
SC	NT	52.8	13.7	324
SC	T1	54.1	14.1	332
SC	T2	54.4	13.9	334
SC	T3	55.1	14.4	338
SC	T4	51.7	14.1	317
Mean		53.5	14.1	329
<u>Probability(%)</u>				
	Tillage	3.2	13.7	3.2
<u>LSD (0.10)</u>				
	Tillage	1.7	NS	10
<u>CV(%)</u>				
		3	2	3

**Table C-69. Tillage in Corn and Soybean Production Systems - Corn Quality.
Arlington, WI - 2005.**

Rotation	Tillage treatment	Grain Composition			Ethanol	
		Oil %	Starch %	Protein %	per bu gallons	per A gallons
	CP	3.4	60.8	7.6	2.90	497
	NT	3.4	60.2	8.1	2.86	450
	T1	3.4	60.3	8.2	2.85	447
	T2	3.3	60.6	8.0	2.87	486
	T3	3.4	60.9	7.8	2.88	519
	T4	3.4	60.9	7.6	2.89	513
CC		3.4	60.5	8.0	2.87	443
CS		3.4	60.7	7.8	2.88	528
CC	CP	3.4	60.8	7.6	2.90	475
CC	NT	3.4	59.9	8.4	2.84	372
CC	T1	3.4	60.1	8.3	2.85	411
CC	T2	3.3	60.5	8.2	2.86	434
CC	T3	3.3	61.0	7.7	2.88	524
CC	T4	3.4	60.9	7.7	2.88	444
CS	CP	3.4	60.8	7.7	2.89	520
CS	NT	3.4	60.6	7.7	2.88	528
CS	T1	3.4	60.6	8.0	2.86	494
CS	T2	3.4	60.7	7.9	2.88	537
CS	T3	3.4	60.7	7.9	2.88	515
CS	T4	3.4	60.9	7.5	2.90	566
Mean		3.4	60.6	7.9	2.88	486
Probability(%)						
Rotation (R)		24.0	32.5	20.0	19.4	9.4
Tillage (T)		41.2	2.7	0.0	0.1	3.5
R x T		59.5	35.0	1.8	12.8	1.6
LSD (0.10)						
Rotation (R)		NS	NS	NS	NS	40
Tillage (T)		NS	0.2	0.1	0.01	19
R x T		NS	NS	1.5	NS	27
CV(%)		2	1	3	1	9

**Table C-70. Tillage in Corn/Soybean Production Systems - Corn Quality
Arlington, WI - 2004.**

Rotation	Tillage treatment	Grain Composition			Ethanol	
		Oil	Starch	Protein	per bu	per A
		%	%	%	gallons	gallons
	CP	3.3	60.5	7.6	2.86	451
	NT	3.3	60.8	7.2	2.87	390
	T1	3.3	60.9	7.3	2.87	415
	T2	3.3	60.8	7.0	2.88	434
	T3	3.3	60.7	7.4	2.87	431
	T4	3.3	60.7	7.7	2.86	432
CC		3.3	60.9	7.3	2.87	391
SC		3.3	60.6	7.4	2.87	462
CC	CP	3.3	60.6	7.6	2.85	422
CC	NT	3.3	61.1	7.1	2.88	365
CC	T1	3.4	61.0	7.1	2.87	373
CC	T2	3.3	61.0	7.1	2.88	405
CC	T3	3.3	60.8	7.5	2.86	392
CC	T4	3.3	60.8	7.6	2.85	384
SC	CP	3.3	60.5	7.6	2.87	479
SC	NT	3.3	60.5	7.3	2.87	424
SC	T1	3.3	60.8	7.4	2.87	446
SC	T2	3.4	60.6	7.0	2.88	463
SC	T3	3.3	60.6	7.3	2.87	470
SC	T4	3.3	60.5	7.8	2.86	480
Mean		3.3	60.7	7.4	2.87	427
Probability(%)						
Rotation (R)		55.8	10.5	54.5	60.8	0.9
Tillage (T)		93.1	57.1	0.0	0.7	1.2
R x T		3.8	82.5	35.8	13.0	69.1
LSD (0.10)						
Rotation (R)		NS	NS	NS	NS	13
Tillage (T)		NS	NS	0.1	0.00	13
R x T		0.0	NS	NS	NS	NS
CV(%)		1.9	0.63	3.5	0.4	6.9

FIELD EXPERIMENT HISTORY

Title: Corn Tillage Study
Experiment: 17 Corn Tillage Study **Trial ID:** 06C53 **Year:** 2006
Personnel: M.G. Bertram
Location: Marshfield, WI **County:** Wood
Supported by: Marshfield Ag. Research Station

Site Information

Field: 4 **Soil Type:** Withee silt loam
Soil Test : **Date:** 10/13/04 **pH** 6.2 **SOM (%)** 3.5 **P (ppm)** 65 **K (ppm)** 145

Plot Management

Tillage Operations: varies Cultivate 6/14/06
Fertilizer:

	<u>Analysis</u>	<u>Rate</u>	<u>Date</u>
Preplant	none	N/A	N/A
Starter	9-11-30	150 lb/A	5/5/2006
Post plant	28-0-0	27 gal/A	6/14/2006
Manure	none	N/A	N/A

Herbicide: Outlook 14 oz/A
 Hornet 2.4 oz/A
 Atrazine 1 qt/A **Insecticide:** None

Irrigation: None **Hybrid:** Dekalb DKC37-14
Planting Date: 5/5/2006 **Planting Depth:** 1.5" **Row Width:** 30"
Target Plant Density: 35,000 plants per acre **Planting Method:** John Deere 1750 planter
Harvest Date: 11/15/2006 **Harvest Method:** John Deere combine
Notes:

Experimental Design

Design: RCB **Replications:** 4
Plot Size Seeded: 600' x 30' **Experiment Size:** 10.12 A
Harvest Plot size: 580' x 30'

Factors/Treatments:

<u>Tillage</u>	Fall	Spring
Fall chisel	Chisel plow	Field Cultivator
Fall strip till	Strip Till	Field Cultivator
Spring chisel	None	Chisel plow, Field Cultivator
Spring field cultivate	None	Field Cultivator

Results: Table C-71.

**Table C-71. Corn Tillage Study
Marshfield, WI - 2006.**

Tillage	Emergence Population				Harvest Population ppa	Broken Stalks %	Test Weight lb/bu	Grain		Partial Return*
	24-May	26-May	30-May	1-Jun				Moisture %	Yield	
			--- ppa ---							
Fall chisel	21,954	31,102	32,234	32,409	32,409	5	57	20.6	154	438
Fall strip till	17,947	30,579	32,583	32,583	33,106	5	56	20.7	154	437
Spring chisel	20,386	30,928	32,844	33,018	33,280	5	57	20.5	153	437
Spring field cultivate	23,261	32,147	33,541	33,541	33,803	4	56	20.8	152	447
Mean	20,887	31,189	32,801	32,888	33,149	5	57	20.6	153	440
Probability (%)										
Tillage	38.9	>50	43.9	>50	22.7	>50	17.1	>50	>50	42.2
LSD 10%										
Tillage	NS	NS	NS	NS	NS	NS	1	NS	NS	NS
C.V. (%)										
	21	6	3	4	3	64	1	2	2	2

* Partial return after tillage assumes \$3/bu corn price. Tillage prices from 2004 WI Ag. Custom Rate Guide
Chisel plow- \$13.30/A; Strip till- \$14.90-A; Field cultivate- \$10.20/A