

FIELD EXPERIMENT HISTORY

Title: Fertilizer Placement in Corn Under Zone Tillage **Year:** 1996
Personnel: J.G. Lauer, T.M Wood, K.D. Hudelson
Location: Lancaster Research Station, Lancaster, WI
Supported by:

FIELD INFORMATION

Field: 603
Soil Type: Rozetta Silt Loam
Soil Test Results: Date: Oct. 1996 pH: 7.0 P(ppm): 36 K(ppm): 158 OM(%): 2.7
Previous Crop: Corn

EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 95)
Spring Tillage	Chisel Plow One Coulter Three Coulters
Nitrogen Placement	2" x 2" 50 gpa of 28-0-0 2" x 15" 50 gpa of 28-0-0
P & K Application	Fall 25 gpa of 4-10-10 (Oct. 95) Starter 25 gpa of 4-10-10 None

Plot Size: Planted: 10' x 25'
Harvested: 5' x 21'

Planting: Date: 18-May
Row Spacing: 30"
Equipment: John Deere Max-Emerge
Depth: 2"
Rate: 32,000/a
Hybrid: Pioneer 3769

Harvesting: Date: 25-Oct
Equipment: Gleaner Plot Combine

Herbicides:

<u>Material</u>	<u>Rate</u>	<u>Method</u>
Roundup Ultra	2 qts/a	pre-plant on 1-May
Dual	2.5 pts/a	pre-plant on 1-May
Banvel	1 pt/a	post on 12-Jun
Accent	0.75 oz/a	post on 12-Jun
28%+ Surfactant		post on 12-Jun
Beacon	0.6 oz/a	post 1-Jul
Buctril	1.5 pt/a	post 1-Jul

Insecticides:

Lorsban	8 oz/1000'	planting
Ambush	10 oz/a	20-Jun for ECB

Note: sprayer lines were contaminated with Poast Plus on 1-Jul. This caused severe corn injury especially in rep 1. Results: Table E-46.

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.
Lancaster, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
None			26936	5.4	24.2	106.6	
Zone Builder			26632	4.2	23.8	99.3	
	Chisel Plow		27276	4.8	24.2	108.6	
	One Coulter		26138	4.1	23.9	97.5	
	Three Coulters		26938	5.6	23.9	102.7	
None	Chisel Plow		27255	5.4	24.4	110.5	
None	One Coulter		26169	4.2	24.4	102.2	
None	Three Coulters		27384	6.6	23.7	107.0	
Zone Builder	Chisel Plow		27298	4.1	23.9	106.8	
Zone Builder	One Coulter		26107	4.0	23.4	92.8	
Zone Builder	Three Coulters		26491	4.5	24.1	98.3	
		2 x 2	26667	3.8	24.1	101.6	
		2 x 15	26901	5.8	23.9	104.3	
None		2 x 2	26666	4.4	24.2	104.4	
None		2 x 15	27207	6.4	24.1	108.7	
Zone Builder		2 x 2	26669	3.2	23.9	98.8	
Zone Builder		2 x 15	26595	5.2	23.7	99.8	
	Chisel Plow	2 x 2	27300	4.2	24.1	106.1	
	Chisel Plow	2 x 15	27253	5.4	24.3	111.2	
	One Coulter	2 x 2	26211	2.7	24.1	97.3	
	One Coulter	2 x 15	26064	5.5	23.7	97.8	
	Three Coulters	2 x 2	26491	4.5	24.0	101.5	
	Three Coulters	2 x 15	27385	6.6	23.8	103.9	
None	Chisel Plow	2 x 2	27398	4.6	24.5	108.7	
None	Chisel Plow	2 x 15	27113	6.3	24.4	112.2	
None	One Coulter	2 x 2	25645	3.3	24.4	98.8	
None	One Coulter	2 x 15	26693	5.2	24.4	105.6	
None	Three Coulters	2 x 2	26954	5.4	23.9	105.7	
None	Three Coulters	2 x 15	27815	7.9	23.5	108.4	
Zone Builder	Chisel Plow	2 x 2	27201	3.8	23.7	103.4	
Zone Builder	Chisel Plow	2 x 15	27394	4.5	24.1	110.1	
Zone Builder	One Coulter	2 x 2	26778	2.2	23.8	95.7	
Zone Builder	One Coulter	2 x 15	25436	5.9	23.0	90.0	
Zone Builder	Three Coulters	2 x 2	26028	3.7	24.1	97.2	
Zone Builder	Three Coulters	2 x 15	26955	5.3	24.1	99.4	
			Fall	26239	4.8	24.0	99.5
			None	26898	4.9	23.9	102.6
			Starter	27215	4.7	24.1	106.7
None			Fall	26498	5.0	24.1	106.3
None			None	26796	6.1	24.0	104.7
None			Starter	27514	5.2	24.3	108.7

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.
Lancaster, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
Zone Builder		Fall	25979	4.6	23.8	92.8	
Zone Builder		None	27001	3.8	23.7	100.5	
Zone Builder		Starter	26916	4.3	23.9	104.6	
	Chisel Plow	Fall	27103	5.0	24.2	105.5	
	Chisel Plow	None	26885	4.8	23.9	105.2	
	Chisel Plow	Starter	27842	4.5	24.4	115.1	
	One Coulter	Fall	25445	4.0	23.8	90.3	
	One Coulter	None	27038	3.9	23.9	102.6	
	One Coulter	Starter	25931	4.5	24.1	99.7	
	Three Coulters	Fall	26168	5.3	23.9	102.8	
	Three Coulters	None	26773	6.1	23.9	100.0	
	Three Coulters	Starter	27873	5.2	23.9	105.2	
None	Chisel Plow	Fall	27522	5.0	24.5	107.9	
None	Chisel Plow	None	26602	6.9	24.1	108.7	
None	Chisel Plow	Starter	27642	4.5	24.7	114.8	
None	One Coulter	Fall	25340	4.1	24.3	96.2	
None	One Coulter	None	26586	3.8	24.3	100.9	
None	One Coulter	Starter	26580	4.8	24.5	109.5	
None	Three Coulters	Fall	26633	5.9	23.6	114.7	
None	Three Coulters	None	27200	7.7	23.7	104.5	
None	Three Coulters	Starter	28320	6.2	23.8	101.9	
Zone Builder	Chisel Plow	Fall	26684	5.1	23.9	103.0	
Zone Builder	Chisel Plow	None	27168	2.7	23.7	101.8	
Zone Builder	Chisel Plow	Starter	28041	4.5	24.2	115.5	
Zone Builder	One Coulter	Fall	25551	3.9	23.2	84.3	
Zone Builder	One Coulter	None	27489	4.0	23.4	104.3	
Zone Builder	One Coulter	Starter	25281	4.2	23.6	89.9	
Zone Builder	Three Coulters	Fall	25702	4.7	24.2	91.0	
Zone Builder	Three Coulters	None	26345	4.6	24.1	95.5	
Zone Builder	Three Coulters	Starter	27427	4.2	24.0	108.5	
		2 x 2	Fall	25469	4.4	24.0	95.7
		2 x 2	None	27024	4.0	23.9	100.7
		2 x 2	Starter	27509	3.1	24.3	108.4
		2 x 15	Fall	27009	5.2	23.9	103.4
		2 x 15	None	26772	5.9	23.9	104.5
		2 x 15	Starter	26921	6.4	24.0	105.0
None		2 x 2	Fall	25445	4.4	24.1	98.0
None		2 x 2	None	27119	4.9	24.0	103.6
None		2 x 2	Starter	27434	3.9	24.7	111.7
None		2 x 15	Fall	27552	5.6	24.2	114.5
None		2 x 15	None	26473	7.3	24.1	105.8
None		2 x 15	Starter	27595	6.4	24.0	105.8
Zone Builder		2 x 2	Fall	25492	4.5	24.0	93.4
Zone Builder		2 x 2	None	26929	3.0	23.7	97.9
Zone Builder		2 x 2	Starter	27585	2.2	23.8	105.1
Zone Builder		2 x 15	Fall	26465	4.7	23.5	92.2
Zone Builder		2 x 15	None	27072	4.5	23.7	103.2
Zone Builder		2 x 15	Starter	26247	6.4	24.0	104.1

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.
Lancaster, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Final Stand	Broken Stalks	Grain Moist	Yield
				plants/A	%	%	bu/a
	Chisel Plow	2 x 2	Fall	25765	5.2	24.1	94.6
	Chisel Plow	2 x 2	None	27532	4.0	23.8	99.8
	Chisel Plow	2 x 2	Starter	28602	3.4	24.4	123.7
	Chisel Plow	2 x 15	Fall	28441	4.9	24.3	116.3
	Chisel Plow	2 x 15	None	26237	5.6	24.0	110.6
	Chisel Plow	2 x 15	Starter	27081	5.6	24.5	106.5
	One Coulter	2 x 2	Fall	25619	3.3	23.9	92.6
	One Coulter	2 x 2	None	26198	2.3	24.0	100.5
	One Coulter	2 x 2	Starter	26817	2.6	24.3	98.7
	One Coulter	2 x 15	Fall	25272	4.8	23.7	87.9
	One Coulter	2 x 15	None	27877	5.4	23.8	104.7
	One Coulter	2 x 15	Starter	25044	6.4	23.8	100.7
	Three Coulters	2 x 2	Fall	25022	4.8	24.2	99.9
	Three Coulters	2 x 2	None	27343	5.5	23.8	101.8
	Three Coulters	2 x 2	Starter	27109	3.2	24.0	102.7
	Three Coulters	2 x 15	Fall	27314	5.8	23.6	105.8
	Three Coulters	2 x 15	None	26202	6.8	24.0	98.2
	Three Coulters	2 x 15	Starter	28638	7.2	23.7	107.7
None	Chisel Plow	2 x 2	Fall	26697	5.5	24.3	94.8
None	Chisel Plow	2 x 2	None	27103	5.9	24.1	105.5
None	Chisel Plow	2 x 2	Starter	28395	2.3	25.0	125.9
None	Chisel Plow	2 x 15	Fall	28348	4.4	24.7	121.0
None	Chisel Plow	2 x 15	None	26100	7.9	24.2	111.9
None	Chisel Plow	2 x 15	Starter	26890	6.6	24.4	103.6
None	One Coulter	2 x 2	Fall	24238	4.1	24.1	93.1
None	One Coulter	2 x 2	None	26246	1.7	24.2	99.2
None	One Coulter	2 x 2	Starter	26450	4.0	24.8	104.1
None	One Coulter	2 x 15	Fall	26441	4.2	24.5	99.3
None	One Coulter	2 x 15	None	26927	5.8	24.4	102.5
None	One Coulter	2 x 15	Starter	26711	5.6	24.3	115.0
None	Three Coulters	2 x 2	Fall	25399	3.6	23.8	106.0
None	Three Coulters	2 x 2	None	28007	7.2	23.6	106.0
None	Three Coulters	2 x 2	Starter	27456	5.3	24.3	105.0
None	Three Coulters	2 x 15	Fall	27867	8.3	23.4	123.3
None	Three Coulters	2 x 15	None	26392	8.2	23.7	103.1
None	Three Coulters	2 x 15	Starter	29184	7.0	23.3	98.8
Zone Builder	Chisel Plow	2 x 2	Fall	24834	4.9	23.8	94.4
Zone Builder	Chisel Plow	2 x 2	None	27961	2.1	23.6	94.2
Zone Builder	Chisel Plow	2 x 2	Starter	28810	4.4	23.8	121.5
Zone Builder	Chisel Plow	2 x 15	Fall	28533	5.3	24.0	111.7
Zone Builder	Chisel Plow	2 x 15	None	26375	3.3	23.9	109.4
Zone Builder	Chisel Plow	2 x 15	Starter	27273	4.7	24.5	109.4
Zone Builder	One Coulter	2 x 2	Fall	26999	2.4	23.7	92.1
Zone Builder	One Coulter	2 x 2	None	26149	3.0	23.7	101.8
Zone Builder	One Coulter	2 x 2	Starter	27185	1.2	23.9	93.4
Zone Builder	One Coulter	2 x 15	Fall	24102	5.5	22.8	76.5
Zone Builder	One Coulter	2 x 15	None	28828	5.0	23.1	106.9
Zone Builder	One Coulter	2 x 15	Starter	23377	7.2	23.2	86.5

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.
Lancaster, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield
			plants/A	%	%	bu/a
Zone Builder	Three Coulters 2 x 2	Fall	24644	6.1	24.5	93.7
Zone Builder	Three Coulters 2 x 2	None	26678	3.9	23.9	97.7
Zone Builder	Three Coulters 2 x 2	Starter	26761	1.0	23.8	100.3
Zone Builder	Three Coulters 2 x 15	Fall	26760	3.3	23.8	88.3
Zone Builder	Three Coulters 2 x 15	None	26012	5.3	24.2	93.3
Zone Builder	Three Coulters 2 x 15	Starter	28092	7.4	24.2	116.6
Mean			26784	4.8	24.0	102.9

Probability %

Fall Tillage (F)	> 50	16.1	20.9	40.7
Spring Tillage (S)	46.0	31.2	40.5	14.8
F x S	> 50	> 50	5.3	> 50
Nitrogen (N)	> 50	7.7	42.0	> 50
F x N	> 50	> 50	> 50	> 50
S x N	> 50	> 50	35.0	> 50
F x S x N	> 50	> 50	19.3	> 50
P & K Treatment (P)	35.3	> 50	8.1	18.3
F x P	> 50	32.3	> 50	37.8
S x P	> 50	> 50	35.2	44.6
F x S x P	> 50	> 50	> 50	17.2
N x P	25.6	16.3	28.1	34.7
F x N x P	> 50	> 50	0.6	26.7
S x N x P	24.5	> 50	> 50	10.4
F x S x N x P	> 50	6.9	> 50	> 50

LSD (0.10)

Fall Tillage (F)	NS	NS	NS	NS
Spring Tillage (S)	NS	NS	NS	NS
Nitrogen (N)	NS	1.9	NS	NS
P & K Treatment (P)	NS	NS	0.2	NS

CV (%)

10.8	59.0	1.8	15.8
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FIELD EXPERIMENT HISTORY

Title: Fertilizer Placement in Corn Under Zone Tillage **Year:** 1996
Personnel: J.G. Lauer, M.C. Rankin, K.D. Hudelson
Location: Bertram Farm, Fond du Lac, WI
Supported by:

FIELD INFORMATION

Soil Type: Kewaunee Red Clay
Soil Test Results: Date: Oct. 1994 pH: 7.1 P(ppm): 28 K(ppm): 150 OM(%): 3.2
Previous Crop: Corn

EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 95)
Spring Tillage	Chisel Plow (w/Soil Finisher) One Coulter Three Coulters
Nitrogen Placement	2" x 2" 50 gpa of 28-0-0 2" x 15" 50 gpa of 28-0-0
P & K Application	Fall 50 gpa of 4-10-10 (Oct. 95) Starter 50 gpa of 4-10-10 None

Plot Size: Planted: 10' x 25'
Harvested: 5' x 17.5

Planting: Date: 27-May
Row Spacing: 30"
Equipment: John Deere Max-Emerge
Depth: 2"
Rate: 32,000/a
Hybrid: Pioneer 3861

Harvesting: Date: 12-Nov
Equipment: Gleaner Plot Combine

Herbicides:

<u>Material</u>	<u>Rate</u>	<u>Method</u>
Roundup	2 qts/a	preemerg
Banvel	1.5 pt/a	preemerg
Accent	0.67 oz/a	post
Buctril	1.5 pts/a	post

Insecticides: Lorsban 8 oz/1000' planting

Results: Table E-47.

**Table E-47. Fertilizer Placement in Corn Under Zone Tillage.
Fond du Lac, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
None			31571	21.0	23.4	120.7	
Zone Builder			29960	34.5	23.2	121.9	
	Chisel Plow		29413	34.3	23.1	116.5	
	One Coulter		31446	23.8	23.5	123.9	
	Three Coulters		31436	25.2	23.4	123.6	
None	Chisel Plow		30430	35.0	23.1	121.4	
None	One Coulter		32546	12.0	23.8	115.7	
None	Three Coulters		31737	16.1	23.4	125.1	
Zone Builder	Chisel Plow		28397	33.6	23.1	111.6	
Zone Builder	One Coulter		30347	35.7	23.3	132.4	
Zone Builder	Three Coulters		31135	34.2	23.4	122.0	
		2 x 2	30859	33.5	23.7	107.6	
		2 x 15	30672	22.0	23.0	134.8	
None		2 x 2	31612	22.9	23.8	105.0	
None		2 x 15	31529	19.1	23.0	136.5	
Zone Builder		2 x 2	30105	44.1	23.6	110.3	
Zone Builder		2 x 15	29814	24.9	22.9	133.1	
	Chisel Plow	2 x 2	29476	40.4	23.4	102.8	
	Chisel Plow	2 x 15	29351	28.1	22.8	130.2	
	One Coulter	2 x 2	31674	30.1	24.0	107.6	
	One Coulter	2 x 15	31218	17.6	23.1	139.5	
	Three Coulters	2 x 2	31426	30.1	23.7	112.3	
	Three Coulters	2 x 15	31446	20.3	23.1	134.8	
None	Chisel Plow	2 x 2	30368	39.7	23.2	109.5	
None	Chisel Plow	2 x 15	30492	30.2	23.0	133.3	
None	One Coulter	2 x 2	32857	12.2	24.4	98.0	
None	One Coulter	2 x 15	32234	11.7	23.2	133.4	
None	Three Coulters	2 x 2	31612	16.9	23.9	107.4	
None	Three Coulters	2 x 15	31861	15.4	22.8	142.7	
Zone Builder	Chisel Plow	2 x 2	28584	41.1	23.6	96.2	
Zone Builder	Chisel Plow	2 x 15	28210	26.0	22.6	127.0	
Zone Builder	One Coulter	2 x 2	30492	48.0	23.7	118.1	
Zone Builder	One Coulter	2 x 15	30202	23.4	22.9	145.5	
Zone Builder	Three Coulters	2 x 2	31239	43.3	23.4	117.3	
Zone Builder	Three Coulters	2 x 15	31031	25.2	23.3	126.8	
			Fall	31083	26.1	23.4	126.3
			None	30648	25.6	23.4	116.7
			Starter	30565	31.6	23.2	120.8
None			Fall	32131	19.5	23.6	126.9
None			None	31405	20.1	23.4	120.8
None			Starter	31177	23.5	23.2	114.5
Zone Builder			Fall	30036	32.7	23.2	125.6
Zone Builder			None	29891	31.1	23.4	112.4
Zone Builder			Starter	29953	39.7	23.2	127.1

**Table E-47. Fertilizer Placement in Corn Under Zone Tillage.
Fond du Lac, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
	Chisel Plow	Fall	29248	35.4	23.2	122.4	
	Chisel Plow	None	29994	28.7	23.0	114.7	
	Chisel Plow	Starter	28999	38.8	23.0	112.5	
	One Coulter	Fall	32328	20.3	23.6	134.0	
	One Coulter	None	30710	23.9	23.6	114.1	
	One Coulter	Starter	31301	27.3	23.4	122.8	
	Three Coulters	Fall	31674	22.7	23.4	122.4	
	Three Coulters	None	31239	24.2	23.5	121.2	
	Three Coulters	Starter	31394	28.7	23.3	127.1	
None	Chisel Plow	Fall	29870	35.7	23.3	119.0	
None	Chisel Plow	None	31177	30.1	22.9	128.9	
None	Chisel Plow	Starter	30243	39.1	23.0	116.4	
None	One Coulter	Fall	33604	10.0	24.1	125.9	
None	One Coulter	None	32110	13.1	23.8	113.9	
None	One Coulter	Starter	31923	12.8	23.5	107.3	
None	Three Coulters	Fall	32919	12.8	23.5	135.7	
None	Three Coulters	None	30928	17.0	23.4	119.7	
None	Three Coulters	Starter	31363	18.6	23.3	119.8	
Zone Builder	Chisel Plow	Fall	28625	35.0	23.0	125.7	
Zone Builder	Chisel Plow	None	28812	27.3	23.1	100.5	
Zone Builder	Chisel Plow	Starter	27754	38.4	23.1	108.7	
Zone Builder	One Coulter	Fall	31052	30.5	23.1	142.1	
Zone Builder	One Coulter	None	29310	34.8	23.4	114.4	
Zone Builder	One Coulter	Starter	30679	41.8	23.3	138.4	
Zone Builder	Three Coulters	Fall	30430	32.6	23.4	109.0	
Zone Builder	Three Coulters	None	31550	31.3	23.5	122.7	
Zone Builder	Three Coulters	Starter	31426	38.8	23.3	134.4	
		2 x 2	Fall	31011	30.6	23.9	113.9
		2 x 2	None	30886	29.8	23.7	102.7
		2 x 2	Starter	30679	40.2	23.5	106.0
		2 x 15	Fall	31156	21.6	22.9	138.6
		2 x 15	None	30409	21.4	23.0	130.1
		2 x 15	Starter	30451	22.9	22.9	135.7
None		2 x 2	Fall	32442	19.7	24.1	109.1
None		2 x 2	None	31239	21.5	23.8	102.1
None		2 x 2	Starter	31156	27.5	23.6	103.8
None		2 x 15	Fall	31820	19.3	23.2	144.7
None		2 x 15	None	31571	18.6	23.0	139.6
None		2 x 15	Starter	31197	19.5	22.9	125.2
Zone Builder		2 x 2	Fall	29579	41.5	23.6	118.7
Zone Builder		2 x 2	None	30534	38.0	23.7	103.4
Zone Builder		2 x 2	Starter	30202	52.9	23.4	108.1
Zone Builder		2 x 15	Fall	30492	23.9	22.7	132.5
Zone Builder		2 x 15	None	29248	24.3	23.1	120.7
Zone Builder		2 x 15	Starter	29704	26.4	23.0	146.2

**Table E-47. Fertilizer Placement in Corn Under Zone Tillage.
Fond du Lac, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Final Stand	Broken Stalks	Grain Moist	Yield
				plants/A	%	%	bu/a
	Chisel Plow	2 x 2	Fall	29683	36.1	23.5	103.8
	Chisel Plow	2 x 2	None	30243	34.6	23.4	101.9
	Chisel Plow	2 x 2	Starter	28501	50.4	23.2	102.8
	Chisel Plow	2 x 15	Fall	28812	34.6	22.8	140.9
	Chisel Plow	2 x 15	None	29745	22.7	22.6	127.4
	Chisel Plow	2 x 15	Starter	29496	27.1	22.8	122.3
	One Coulter	2 x 2	Fall	32297	26.8	24.0	126.5
	One Coulter	2 x 2	None	30865	28.0	24.4	89.4
	One Coulter	2 x 2	Starter	31861	35.5	23.8	104.7
	One Coulter	2 x 15	Fall	32359	13.7	23.1	141.6
	One Coulter	2 x 15	None	30554	19.9	23.0	135.8
	One Coulter	2 x 15	Starter	30741	19.1	23.1	141.0
	Three Coulters	2 x 2	Fall	31052	28.9	24.0	111.4
	Three Coulters	2 x 2	None	31550	26.7	23.5	115.2
	Three Coulters	2 x 2	Starter	31674	34.7	23.6	110.4
	Three Coulters	2 x 15	Fall	32297	16.5	22.9	133.4
	Three Coulters	2 x 15	None	30928	21.7	23.4	127.2
	Three Coulters	2 x 15	Starter	31114	22.6	23.0	143.7
None	Chisel Plow	2 x 2	Fall	30741	32.9	23.4	100.3
None	Chisel Plow	2 x 2	None	30865	36.2	23.0	112.5
None	Chisel Plow	2 x 2	Starter	29496	50.1	23.1	115.8
None	Chisel Plow	2 x 15	Fall	28999	38.6	23.3	137.8
None	Chisel Plow	2 x 15	None	31488	23.9	22.8	145.3
None	Chisel Plow	2 x 15	Starter	30990	28.2	22.8	117.0
None	One Coulter	2 x 2	Fall	33977	9.4	24.7	105.9
None	One Coulter	2 x 2	None	32110	13.3	24.5	89.2
None	One Coulter	2 x 2	Starter	32483	13.9	23.9	98.9
None	One Coulter	2 x 15	Fall	33230	10.7	23.5	146.0
None	One Coulter	2 x 15	None	32110	12.8	23.1	138.6
None	One Coulter	2 x 15	Starter	31363	11.7	23.1	115.6
None	Three Coulters	2 x 2	Fall	32608	16.9	24.2	121.2
None	Three Coulters	2 x 2	None	30741	15.1	23.8	104.5
None	Three Coulters	2 x 2	Starter	31488	18.6	23.8	96.6
None	Three Coulters	2 x 15	Fall	33230	8.6	22.7	150.3
None	Three Coulters	2 x 15	None	31114	19.0	23.0	134.9
None	Three Coulters	2 x 15	Starter	31239	18.5	22.8	143.0
Zone Builder	Chisel Plow	2 x 2	Fall	28625	39.4	23.7	107.4
Zone Builder	Chisel Plow	2 x 2	None	29621	33.1	23.8	91.4
Zone Builder	Chisel Plow	2 x 2	Starter	27505	50.7	23.3	89.7
Zone Builder	Chisel Plow	2 x 15	Fall	28625	30.6	22.4	144.0
Zone Builder	Chisel Plow	2 x 15	None	28003	21.4	22.5	109.6
Zone Builder	Chisel Plow	2 x 15	Starter	28003	26.0	22.8	127.6
Zone Builder	One Coulter	2 x 2	Fall	30617	44.3	23.4	147.1
Zone Builder	One Coulter	2 x 2	None	29621	42.7	24.2	89.5
Zone Builder	One Coulter	2 x 2	Starter	31239	57.1	23.6	110.4
Zone Builder	One Coulter	2 x 15	Fall	31488	16.8	22.7	137.1
Zone Builder	One Coulter	2 x 15	None	28999	27.0	22.8	133.0
Zone Builder	One Coulter	2 x 15	Starter	30119	26.6	23.1	166.4

**Table E-47. Fertilizer Placement in Corn Under Zone Tillage.
Fond du Lac, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield
			plants/A	%	%	bu/a
Zone Builder	Three Coulters 2 x 2	Fall	29496	40.9	23.8	101.6
Zone Builder	Three Coulters 2 x 2	None	32359	38.2	23.2	125.9
Zone Builder	Three Coulters 2 x 2	Starter	31861	50.8	23.4	124.3
Zone Builder	Three Coulters 2 x 15	Fall	31363	24.3	23.0	116.4
Zone Builder	Three Coulters 2 x 15	None	30741	24.4	23.9	119.5
Zone Builder	Three Coulters 2 x 15	Starter	30990	26.8	23.2	144.5
Mean			30765	27.8	23.3	121.3

Probability %

Fall Tillage (F)	< 0.1	14.0	27.5	> 50
Spring Tillage (S)	< 0.1	1.1	7.8	40.3
F x S	11.0	0.4	33.5	11.9
Nitrogen (N)	> 50	0.4	< 0.1	< 0.1
F x N	> 50	4.3	> 50	39.2
S x N	> 50	> 50	> 50	> 50
F x S x N	> 50	> 50	13.3	43.2
P & K Treatment (P)	39.0	5.3	18.6	17.8
F x P	> 50	> 50	2.0	11.9
S x P	19.8	> 50	> 50	> 50
F x S x P	15.9	> 50	49.1	8.3
N x P	> 50	18.7	20.8	> 50
F x N x P	14.7	> 50	> 50	9.8
S x N x P	35.8	45.3	2.5	30.1
F x S x N x P	> 50	> 50	33.2	34.4

LSD (0.10)

Fall Tillage (F)	280	NS	NS	NS
Spring Tillage (S)	678	5.5	0.3	NS
Nitrogen (N)	NS	6.1	0.3	8.8
P & K Treatment (P)	NS	4.5	NS	NS

CV%

	6.4	47.2	2.0	20.3
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FIELD EXPERIMENT HISTORY

Title: Fertilizer Placement in Corn Under Zone Tillage **Year:** 1996
Expt. No.: 9597
Personnel: J.G. Lauer, F.D. Thompson, K.D. Hudelson
Location: Darrow Farm, Chippewa Falls, WI
Supported by:

FIELD INFORMATION

Soil Type: Burkhardt Sandy Loam
Soil Test Results: Date: 1993 pH: 6.3 P(ppm): 45 K(ppm): 127 OM(%): 2.5
Previous Crop: Corn

EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 95)
Spring Tillage	Chisel Plow (and Disk) One Coulter Three Coulters
Nitrogen Placement	2" x 2" 50 gpa of 28-0-0 2" x 15" 50 gpa of 28-0-0
P & K Application	Fall 25 gpa of 4-10-10 (Oct. 95) Starter 25 gpa of 4-10-10 None

Plot Size: Planted: 10' x 30'
Harvested: 5' x 27'

Planting: Date: 8-May
Row Spacing: 30"
Equipment: John Deere Max-Emerge
Depth: 2"
Rate: 32,000/a
Hybrid: Pioneer 3861

Harvesting: Date: 1-Nov
Equipment: Gleaner Plot Combine

Herbicides:

<u>Material</u>	<u>Rate</u>	<u>Method</u>
Frontier	14 oz/a	preemerge
Marksman	2.5 pt/a	preemerge
Accent	0.33 oz/a	post
Aqua-Gene	3.2 oz/a	post
Ammonium Sulfate	2 lbs/a	post

Insecticides: Lorsban 8 oz/1000' planting

Results: Table E-48.

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.
Chippewa Falls, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
None			24694	0.5	21.6	138.0	
Zone Builder			25574	0.6	20.8	148.9	
	Chisel Plow		24887	0.7	20.3	153.9	
	One Coulter		25194	0.4	21.8	137.2	
	Three Coulters		25375	0.5	21.8	137.3	
None	Chisel Plow		25141	0.4	20.2	154.7	
None	One Coulter		24265	0.4	22.6	127.7	
None	Three Coulters		24576	0.7	22.3	128.1	
Zone Builder	Chisel Plow		24621	1.0	20.3	153.2	
Zone Builder	One Coulter		26226	0.4	20.9	147.8	
Zone Builder	Three Coulters		26059	0.4	21.3	145.2	
		2 x 2	25092	0.5	21.4	141.3	
		2 x 15	25179	0.5	21.0	145.8	
None		2 x 2	24644	0.7	21.7	137.1	
None		2 x 15	24749	0.3	21.5	138.8	
Zone Builder		2 x 2	25541	0.4	21.1	145.3	
Zone Builder		2 x 15	25609	0.8	20.5	152.8	
	Chisel Plow	2 x 2	24635	0.4	20.3	154.5	
	Chisel Plow	2 x 15	25128	0.9	20.2	153.4	
	One Coulter	2 x 2	25539	0.5	21.8	136.7	
	One Coulter	2 x 15	24810	0.3	21.7	137.8	
	Three Coulters	2 x 2	25168	0.7	22.2	131.8	
	Three Coulters	2 x 15	25616	0.3	21.3	143.7	
None	Chisel Plow	2 x 2	24496	0.5	20.3	158.0	
None	Chisel Plow	2 x 15	25786	0.3	20.2	151.6	
None	One Coulter	2 x 2	24875	0.7	22.5	129.4	
None	One Coulter	2 x 15	23519	0.0	22.7	125.6	
None	Three Coulters	2 x 2	24559	1.0	22.6	121.1	
None	Three Coulters	2 x 15	24594	0.4	21.9	135.1	
Zone Builder	Chisel Plow	2 x 2	24787	0.3	20.4	151.0	
Zone Builder	Chisel Plow	2 x 15	24469	1.5	20.2	155.2	
Zone Builder	One Coulter	2 x 2	26351	0.3	21.0	145.6	
Zone Builder	One Coulter	2 x 15	26100	0.5	20.8	150.1	
Zone Builder	Three Coulters	2 x 2	25625	0.5	21.8	139.9	
Zone Builder	Three Coulters	2 x 15	26638	0.2	20.7	152.4	
			Fall	25283	0.3	21.1	144.1
			None	25345	0.9	21.2	140.2
			Starter	24757	0.5	21.4	146.3
None			Fall	24338	0.3	21.6	137.5
None			None	25214	0.7	21.6	136.8
None			Starter	24523	0.5	21.7	139.6

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.
Chippewa Falls, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield	
			plants/A	%	%	bu/a	
Zone Builder		Fall	26228	0.2	20.6	150.6	
Zone Builder		None	25475	1.0	20.8	143.3	
Zone Builder		Starter	24991	0.6	21.0	153.1	
	Chisel Plow	Fall	24745	0.3	20.2	154.7	
	Chisel Plow	None	25188	1.2	20.2	152.0	
	Chisel Plow	Starter	24716	0.4	20.5	155.0	
	One Coulter	Fall	25664	0.0	21.8	139.6	
	One Coulter	None	25565	0.4	21.6	131.4	
	One Coulter	Starter	24281	0.8	22.0	140.9	
	Three Coulters	Fall	25565	0.4	21.6	135.4	
	Three Coulters	None	25317	0.9	21.8	135.2	
	Three Coulters	Starter	25242	0.3	21.9	141.4	
None	Chisel Plow	Fall	24482	0.2	20.3	153.4	
None	Chisel Plow	None	25612	0.7	20.0	156.9	
None	Chisel Plow	Starter	25329	0.3	20.5	154.0	
None	One Coulter	Fall	24292	0.0	22.6	131.7	
None	One Coulter	None	24938	0.4	22.4	121.7	
None	One Coulter	Starter	23447	0.9	22.8	130.0	
None	Three Coulters	Fall	24200	0.7	22.2	123.2	
None	Three Coulters	None	25007	1.2	22.4	131.1	
None	Three Coulters	Starter	24523	0.3	22.2	129.9	
Zone Builder	Chisel Plow	Fall	25007	0.5	20.1	156.0	
Zone Builder	Chisel Plow	None	24765	1.8	20.3	147.8	
Zone Builder	Chisel Plow	Starter	24016	0.6	20.4	156.1	
Zone Builder	One Coulter	Fall	27265	0.0	20.8	148.9	
Zone Builder	One Coulter	None	26297	0.4	20.7	142.9	
Zone Builder	One Coulter	Starter	25114	0.8	21.1	151.8	
Zone Builder	Three Coulters	Fall	26735	0.2	21.1	145.8	
Zone Builder	Three Coulters	None	25583	0.6	21.3	138.7	
Zone Builder	Three Coulters	Starter	25859	0.4	21.6	151.2	
		2 x 2	Fall	25608	0.3	21.3	143.2
		2 x 2	None	25007	0.8	21.5	137.5
		2 x 2	Starter	24619	0.6	21.5	143.2
		2 x 15	Fall	24926	0.2	21.0	145.0
		2 x 15	None	25717	1.0	20.8	143.0
		2 x 15	Starter	24894	0.4	21.2	149.4
None		2 x 2	Fall	24845	0.2	21.6	142.3
None		2 x 2	None	24581	1.1	21.8	132.5
None		2 x 2	Starter	24490	0.8	21.9	136.1
None		2 x 15	Fall	23781	0.3	21.6	132.3
None		2 x 15	None	25910	0.4	21.3	141.1
None		2 x 15	Starter	24555	0.1	21.5	143.1
Zone Builder		2 x 2	Fall	26371	0.3	21.0	144.0
Zone Builder		2 x 2	None	25432	0.5	21.3	142.0
Zone Builder		2 x 2	Starter	24749	0.4	21.1	150.4

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.
Chippewa Falls, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Final Stand	Broken Stalks	Grain Moist	Yield
				plants/A	%	%	bu/a
Zone Builder		2 x 15	Fall	26071	0.1	20.3	157.8
Zone Builder		2 x 15	None	25523	1.6	20.3	144.8
Zone Builder		2 x 15	Starter	25233	0.7	21.0	155.8
	Chisel Plow	2 x 2	Fall	25087	0.5	20.0	157.7
	Chisel Plow	2 x 2	None	24563	0.4	20.4	152.3
	Chisel Plow	2 x 2	Starter	24200	0.4	20.6	153.1
	Chisel Plow	2 x 15	Fall	24402	0.2	20.3	151.7
	Chisel Plow	2 x 15	None	25813	2.1	20.0	151.8
	Chisel Plow	2 x 15	Starter	25168	0.5	20.3	156.6
	One Coulter	2 x 2	Fall	26090	0.0	21.8	139.6
	One Coulter	2 x 2	None	25721	0.7	21.8	132.2
	One Coulter	2 x 2	Starter	24684	0.9	21.8	138.5
	One Coulter	2 x 15	Fall	25168	0.0	21.8	139.7
	One Coulter	2 x 15	None	25383	0.0	21.4	130.6
	One Coulter	2 x 15	Starter	23877	0.8	22.1	143.2
	Three Coulters	2 x 2	Fall	25721	0.4	22.1	130.1
	Three Coulters	2 x 2	None	24799	1.2	22.3	127.9
	Three Coulters	2 x 2	Starter	24984	0.6	22.1	137.4
	Three Coulters	2 x 15	Fall	25383	0.4	21.0	141.5
	Three Coulters	2 x 15	None	25921	0.4	21.3	143.7
	Three Coulters	2 x 15	Starter	25544	0.0	21.6	146.0
None	Chisel Plow	2 x 2	Fall	24603	0.4	20.0	161.6
None	Chisel Plow	2 x 2	None	24119	0.8	19.9	157.9
None	Chisel Plow	2 x 2	Starter	24765	0.3	20.7	154.4
None	Chisel Plow	2 x 15	Fall	24361	0.0	20.5	145.1
None	Chisel Plow	2 x 15	None	27104	0.6	20.1	156.0
None	Chisel Plow	2 x 15	Starter	25894	0.3	20.2	153.7
None	One Coulter	2 x 2	Fall	25087	0.0	22.4	137.0
None	One Coulter	2 x 2	None	25329	0.6	22.4	123.7
None	One Coulter	2 x 2	Starter	23985	1.7	22.8	126.8
None	One Coulter	2 x 15	Fall	23232	0.0	22.9	124.6
None	One Coulter	2 x 15	None	24415	0.0	22.4	118.9
None	One Coulter	2 x 15	Starter	22909	0.0	22.8	133.2
None	Three Coulters	2 x 2	Fall	24845	0.4	22.5	123.6
None	Three Coulters	2 x 2	None	24200	2.0	22.8	118.8
None	Three Coulters	2 x 2	Starter	24630	0.5	22.6	120.9
None	Three Coulters	2 x 15	Fall	23555	0.9	21.9	122.9
None	Three Coulters	2 x 15	None	25813	0.4	21.9	143.5
None	Three Coulters	2 x 15	Starter	24415	0.0	21.9	138.9
Zone Builder	Chisel Plow	2 x 2	Fall	25571	0.6	20.0	153.8
Zone Builder	Chisel Plow	2 x 2	None	25007	0.0	20.7	148.0
Zone Builder	Chisel Plow	2 x 2	Starter	23447	0.5	20.5	151.3
Zone Builder	Chisel Plow	2 x 15	Fall	24442	0.4	20.1	158.3
Zone Builder	Chisel Plow	2 x 15	None	24523	3.5	20.0	147.5
Zone Builder	Chisel Plow	2 x 15	Starter	24442	0.7	20.4	159.6
Zone Builder	One Coulter	2 x 2	Fall	27427	0.0	21.1	143.0
Zone Builder	One Coulter	2 x 2	None	26244	0.8	21.1	143.5

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.
Chippewa Falls, WI - 1996**

Fall Tillage	Spring Tillage	Nitrogen Placement P & K	Final Stand	Broken Stalks	Grain Moist	Yield
			plants/A	%	%	bu/a
Zone Builder	One Coulter	2 x 2 Starter	25383	0.0	20.9	150.3
Zone Builder	One Coulter	2 x 15 Fall	27104	0.0	20.6	154.7
Zone Builder	One Coulter	2 x 15 None	26351	0.0	20.3	142.3
Zone Builder	One Coulter	2 x 15 Starter	24845	1.5	21.3	153.2
Zone Builder	Three Coulters	2 x 2 Fall	26378	0.3	21.8	135.1
Zone Builder	Three Coulters	2 x 2 None	25249	0.7	21.9	134.8
Zone Builder	Three Coulters	2 x 2 Starter	25249	0.6	21.7	149.7
Zone Builder	Three Coulters	2 x 15 Fall	27212	0.0	20.2	160.2
Zone Builder	Three Coulters	2 x 15 None	26028	0.5	20.6	143.9
Zone Builder	Three Coulters	2 x 15 Starter	26674	0.0	21.4	153.2
Mean			25134	0.5	21.2	143.5

Probability %

Fall Tillage (F)	33.2	> 50	3.0	16.6
Spring Tillage (S)	> 50	> 50	0.2	0.3
F x S	9.5	39.9	11.1	11.7
Nitrogen (N)	> 50	> 50	9.6	29.9
F x N	> 50	19.1	43.4	44.4
S x N	> 50	32.5	20.9	35.7
F x S x N	> 50	> 50	> 50	> 50
P & K Treatment (P)	2.0	19.6	1.8	25.7
F x P	1.9	> 50	40.3	45.3
S x P	13.0	> 50	> 50	> 50
F x S x P	> 50	> 50	> 50	> 50
N x P	5.3	> 50	8.0	> 50
F x N x P	24.1	34.0	0.7	4.9
S x N x P	> 50	28.9	16.8	> 50
F x S x N x P	42.2	32.8	> 50	> 50

LSD (0.10)

Fall Tillage (F)	NS	NS	0.5	12.5
Spring Tillage (S)	NS	NS	0.6	8.4
Nitrogen (N)	NS	NS	0.3	5.9
P & K Treatment (P)	498	NS	0.2	5.2

<u>CV%</u>	5.4	269.6	2.1	9.8
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