



**Table E-44. Fertilizer Placement in Corn Under Zone Tillage.  
Arlington, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Relative Growth Rate	Final Population plants/a	Broken Stalks %	Grain Moist %	Yield bu/a
		P & K		137	156	151	165	179	151	165	179					
None				44.7	85.1	15.7	54.6	143.8	1.9	5.0	9.4	4.6	26048	1.1	21.9	136.0
Zone Builder				54.9	86.6	15.8	52.7	142.7	1.9	4.9	9.3	4.5	27030	1.2	21.5	156.2
	Chisel Plow			53.6	85.8	15.7	53.4	141.2	1.9	4.9	9.5	4.5	26695	1.1	21.0	155.4
	One Coulter			48.1	85.9	16.1	54.9	144.8	1.9	4.9	9.2	4.6	26374	1.2	22.1	142.1
	Three Coulters			47.6	85.7	15.4	52.4	143.6	1.8	4.9	9.2	4.6	26548	1.2	21.9	140.7
None	Chisel Plow			49.7	84.1	15.3	52.8	136.8	1.9	5.0	9.5	4.4	26262	1.1	21.1	150.1
None	One Coulter			41.6	85.2	16.6	57.9	151.6	1.8	5.0	9.3	4.8	25717	1.2	22.5	126.8
None	Three Coulters			42.7	85.9	15.2	53.4	144.1	1.8	4.9	9.1	4.6	26164	1.1	22.1	131.0
Zone Builder	Chisel Plow			57.5	87.5	16.2	53.9	145.1	1.8	4.8	9.5	4.6	27128	1.2	20.9	160.7
Zone Builder	One Coulter			54.7	86.7	15.7	52.6	139.7	1.9	4.9	9.1	4.4	27030	1.1	21.7	157.4
Zone Builder	Three Coulters			52.5	85.4	15.6	51.5	143.3	1.9	5.0	9.2	4.6	26932	1.4	21.8	150.4
		2 x 2		49.8	85.3	15.7	53.3	143.4	1.9	5.0	9.5	4.6	26718	1.2	21.4	147.2
		2 x 15		.	86.3	15.8	53.7	142.9	1.8	4.9	9.2	4.6	26360	1.1	21.9	144.9
None		2 x 2		44.7	84.5	15.9	56.2	148.7	1.9	5.0	9.5	4.8	26090	1.2	21.7	135.9
None		2 x 15		.	85.6	15.5	53.2	139.4	1.8	4.9	9.2	4.4	26006	1.0	22.1	136.0
Zone Builder		2 x 2		54.9	86.1	15.5	51.2	139.5	1.9	5.0	9.4	4.4	27346	1.3	21.2	158.5
Zone Builder		2 x 15		.	87.0	16.1	54.2	145.9	1.8	4.8	9.1	4.6	26713	1.2	21.7	153.8
	Chisel Plow	2 x 2		53.6	84.9	15.5	52.6	140.4	1.9	4.9	9.6	4.5	26820	1.2	20.7	155.5
	Chisel Plow	2 x 15		.	86.7	16.0	54.0	141.9	1.8	4.9	9.5	4.5	26569	1.0	21.4	155.2
	One Coulter	2 x 2		48.1	85.0	16.1	54.8	143.7	2.0	5.1	9.4	4.6	26178	1.4	21.9	141.7
	One Coulter	2 x 15		.	86.9	16.2	55.0	145.8	1.8	4.8	9.0	4.6	26569	0.9	22.3	142.6
	Three Coulters	2 x 2		47.6	86.1	15.5	52.6	146.1	1.9	4.9	9.4	4.7	27155	1.1	21.7	144.5
	Three Coulters	2 x 15		.	85.3	15.3	52.2	141.1	1.8	4.9	9.0	4.5	25941	1.3	22.1	137.0
None	Chisel Plow	2 x 2		49.7	83.3	15.6	54.3	144.7	2.0	5.0	9.6	4.6	26192	1.1	20.6	150.4
None	Chisel Plow	2 x 15		.	84.9	15.0	51.6	130.8	1.9	5.0	9.5	4.2	26332	1.0	21.7	149.8
None	One Coulter	2 x 2		41.6	84.5	17.0	60.4	155.6	1.9	5.1	9.4	5.0	25382	1.7	22.3	124.5
None	One Coulter	2 x 15		.	85.8	16.3	55.4	147.6	1.8	4.9	9.1	4.7	26052	0.7	22.7	129.2
None	Three Coulters	2 x 2		42.7	85.8	15.0	53.7	145.7	1.8	4.9	9.4	4.7	26695	0.8	22.1	132.9
None	Three Coulters	2 x 15		.	86.1	15.3	53.2	142.5	1.7	4.9	8.8	4.5	25634	1.3	22.0	129.1
Zone Builder	Chisel Plow	2 x 2		57.5	86.5	15.4	51.3	137.3	1.8	4.8	9.6	4.4	27449	1.3	20.8	160.6
Zone Builder	Chisel Plow	2 x 15		.	88.6	16.9	56.5	153.0	1.8	4.8	9.5	4.9	26806	1.0	21.0	160.7
Zone Builder	One Coulter	2 x 2		54.7	85.6	15.3	50.5	134.8	2.0	5.1	9.3	4.3	26974	1.1	21.5	158.9
Zone Builder	One Coulter	2 x 15		.	87.9	16.1	54.6	144.5	1.8	4.7	8.9	4.6	27086	1.0	21.9	156.0
Zone Builder	Three Coulters	2 x 2		52.5	86.3	15.8	51.7	146.4	1.9	5.0	9.4	4.7	27616	1.4	21.3	156.0
Zone Builder	Three Coulters	2 x 15		.	84.5	15.3	51.4	140.1	1.9	5.0	9.1	4.5	26248	1.4	22.2	144.8
			Fall	49.6	87.4	15.3	52.8	142.1	1.8	4.9	9.3	4.5	26667	1.3	21.8	145.7
			None	49.4	85.2	16.2	53.9	142.5	1.9	5.0	9.4	4.5	26569	0.9	21.9	144.8
			Starter	50.3	84.9	15.8	53.9	144.9	1.8	4.9	9.3	4.6	26380	1.3	21.4	147.8
None			Fall	50.4	87.1	15.4	54.4	142.8	1.9	5.0	9.4	4.6	26304	1.1	22.1	134.9
None			None	40.0	82.8	16.1	55.2	144.0	1.9	5.0	9.4	4.6	25857	0.8	22.1	137.5
None			Starter	43.6	85.4	15.6	54.2	144.4	1.8	4.9	9.3	4.6	25983	1.4	21.5	135.6
Zone Builder			Fall	48.8	87.7	15.3	51.5	141.4	1.8	4.8	9.2	4.5	27030	1.4	21.5	156.5
Zone Builder			None	58.8	87.5	16.3	52.9	141.4	2.0	5.0	9.4	4.5	27281	1.0	21.6	152.1
Zone Builder			Starter	57.0	84.5	15.9	53.6	145.3	1.8	4.9	9.3	4.6	26778	1.3	21.2	159.9

**Table E-44. Fertilizer Placement in Corn Under Zone Tillage.  
Arlington, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Emergence		Plant Height			Leaf Collars			Relative Growth Rate	Final Population	Broken Stalks	Grain Moist	Yield
				Day of Year	Day of Year	151	165	179	151	165	179					
				%	%	cm						plants/a	%	%	bu/a	
	Chisel Plow	Fall		54.2	87.4	15.7	53.4	142.4	1.8	4.8	9.5	4.5	27121	1.1	21.0	156.4
	Chisel Plow	None		54.8	86.2	16.0	53.6	139.0	1.9	5.0	9.6	4.4	26869	1.0	21.1	155.0
	Chisel Plow	Starter		51.8	84.0	15.5	53.0	142.2	1.9	5.0	9.5	4.6	26094	1.3	21.0	154.7
	One Coulter	Fall		47.0	87.2	15.5	53.7	142.3	1.8	4.9	9.2	4.5	26178	1.6	22.2	141.2
	One Coulter	None		48.0	85.0	16.3	54.4	143.6	1.9	5.0	9.1	4.6	26241	0.9	22.3	135.4
	One Coulter	Starter		49.4	85.7	16.5	56.5	148.4	1.9	4.9	9.3	4.7	26702	1.0	21.7	149.8
	Three Coulters	Fall		47.7	87.5	14.8	51.1	141.5	1.8	5.0	9.1	4.5	26702	1.2	22.2	139.5
	Three Coulters	None		45.3	84.3	16.3	53.8	145.1	1.9	5.0	9.5	4.6	26597	0.8	22.1	143.9
	Three Coulters	Starter		49.7	85.2	15.2	52.2	144.3	1.8	4.8	9.0	4.6	26346	1.8	21.4	138.7
None	Chisel Plow	Fall		55.2	86.9	15.4	53.4	137.8	2.0	4.9	9.6	4.4	26932	1.2	21.2	151.6
None	Chisel Plow	None		42.9	83.5	15.5	53.1	134.7	1.9	5.0	9.6	4.3	26052	0.5	21.1	148.6
None	Chisel Plow	Starter		51.1	82.1	14.9	51.9	137.8	1.9	5.1	9.4	4.4	25801	1.5	21.2	150.2
None	One Coulter	Fall		44.3	85.5	16.3	57.9	151.8	1.8	5.0	9.5	4.9	25592	1.3	22.6	125.9
None	One Coulter	None		40.9	81.7	16.8	56.9	150.2	1.8	5.0	9.1	4.8	25340	1.3	22.8	126.7
None	One Coulter	Starter		39.5	88.2	16.8	58.8	152.8	1.8	4.9	9.2	4.9	26220	1.1	22.1	127.9
None	Three Coulters	Fall		51.8	88.9	14.5	52.1	139.8	1.7	5.0	8.9	4.5	26388	0.9	22.6	127.1
None	Three Coulters	None		36.1	83.1	16.0	55.9	148.7	1.9	4.9	9.4	4.8	26178	0.8	22.4	137.2
None	Three Coulters	Starter		40.2	85.8	15.0	52.3	143.8	1.7	4.7	9.0	4.6	25927	1.5	21.3	128.7
Zone Builder	Chisel Plow	Fall		53.1	87.9	16.0	53.5	146.4	1.6	4.6	9.5	4.7	27309	0.9	20.9	161.3
Zone Builder	Chisel Plow	None		66.8	88.9	16.4	54.0	142.8	2.0	5.0	9.6	4.5	27686	1.5	21.2	161.5
Zone Builder	Chisel Plow	Starter		52.5	85.8	16.1	54.1	146.1	1.8	4.9	9.5	4.7	26387	1.1	20.8	159.2
Zone Builder	One Coulter	Fall		49.7	88.9	14.9	50.6	135.1	1.8	4.8	8.9	4.3	26765	1.9	21.8	156.4
Zone Builder	One Coulter	None		55.2	88.2	15.9	52.4	138.8	2.0	5.0	9.1	4.4	27142	0.6	21.8	144.1
Zone Builder	One Coulter	Starter		59.3	83.1	16.3	54.8	145.1	1.9	4.8	9.3	4.6	27183	0.8	21.4	171.8
Zone Builder	Three Coulters	Fall		43.6	86.2	14.9	50.4	142.8	1.9	5.0	9.2	4.6	27016	1.4	21.8	151.8
Zone Builder	Three Coulters	None		54.5	85.5	16.4	52.2	142.5	2.0	5.0	9.5	4.5	27016	0.8	21.9	150.6
Zone Builder	Three Coulters	Starter		59.3	84.5	15.4	52.1	144.6	1.9	4.9	9.0	4.6	26764	2.1	21.5	148.7
		2 x 2	Fall	49.6	87.2	15.1	51.5	140.3	1.8	5.0	9.3	4.5	26918	1.3	21.5	146.8
		2 x 2	None	49.4	85.6	16.3	54.1	142.8	2.0	5.1	9.6	4.5	26862	1.0	21.6	141.5
		2 x 2	Starter	50.3	83.2	15.6	54.3	147.2	1.9	4.9	9.5	4.7	26374	1.4	21.3	153.3
		2 x 15	Fall	.	87.5	15.6	54.0	143.7	1.8	4.8	9.2	4.6	26416	1.2	22.1	144.6
		2 x 15	None	.	84.7	16.1	53.8	142.3	1.9	4.9	9.3	4.5	26276	0.8	22.2	148.0
		2 x 15	Starter	.	86.6	15.9	53.5	142.7	1.8	4.9	9.0	4.5	26387	1.2	21.5	142.2
None		2 x 2	Fall	50.4	87.9	15.4	55.3	147.1	1.9	5.0	9.3	4.7	26332	1.3	21.8	133.7
None		2 x 2	None	40.0	82.7	16.3	56.9	148.8	2.0	5.1	9.6	4.8	25857	0.9	21.7	134.2
None		2 x 2	Starter	43.6	83.1	15.8	56.2	150.0	1.9	5.0	9.6	4.8	26080	1.4	21.4	140.0
None		2 x 15	Fall	.	86.3	15.3	53.6	139.0	1.9	5.0	9.4	4.4	26276	1.0	22.4	136.1
None		2 x 15	None	.	82.9	15.9	53.7	139.7	1.8	4.9	9.3	4.4	25857	0.7	22.4	140.8
None		2 x 15	Starter	.	87.7	15.3	52.4	139.4	1.8	4.9	8.9	4.5	25885	1.3	21.6	131.2
Zone Builder		2 x 2	Fall	48.8	86.5	14.8	48.6	135.2	1.8	5.0	9.3	4.3	27504	1.3	21.2	159.9
Zone Builder		2 x 2	None	58.8	88.6	16.3	52.0	138.2	2.0	5.1	9.5	4.4	27868	1.1	21.4	148.9
Zone Builder		2 x 2	Starter	57.0	83.3	15.5	52.9	145.1	1.9	4.9	9.4	4.6	26667	1.5	21.1	166.7
Zone Builder		2 x 15	Fall	.	88.8	15.8	54.3	147.6	1.7	4.7	9.1	4.7	26555	1.5	21.8	153.0
Zone Builder		2 x 15	None	.	86.5	16.3	53.8	144.5	2.0	5.0	9.3	4.6	26695	0.8	21.9	155.3
Zone Builder		2 x 15	Starter	.	85.6	16.3	54.4	145.4	1.8	4.9	9.1	4.6	26890	1.2	21.4	153.1
	Chisel Plow	2 x 2	Fall	54.2	85.8	15.3	52.1	141.6	1.8	4.9	9.4	4.5	26765	0.9	20.7	156.8
	Chisel Plow	2 x 2	None	54.8	86.2	15.9	52.4	137.4	2.0	5.1	9.8	4.4	27518	1.0	21.0	155.6
	Chisel Plow	2 x 2	Starter	51.8	82.8	15.3	53.2	142.4	1.9	4.9	9.6	4.6	26178	1.6	20.5	154.1
	Chisel Plow	2 x 15	Fall	.	88.9	16.1	54.6	143.1	1.8	4.7	9.6	4.5	27477	1.2	21.4	156.0
	Chisel Plow	2 x 15	None	.	86.2	16.1	54.6	140.5	1.9	4.9	9.4	4.5	26220	1.0	21.2	154.5
	Chisel Plow	2 x 15	Starter	.	85.2	15.8	52.9	142.1	1.9	5.1	9.4	4.5	26010	1.0	21.5	155.3

**Table E-44. Fertilizer Placement in Corn Under Zone Tillage.  
Arlington, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen		Emergence		Plant Height			Leaf Collars			Relative Growth Rate	Final Population	Broken Stalks	Grain Moist	Yield
		Place-ment	P & K	137	156	151	165	179	151	165	179					
				%		cm						plants/a		%		bu/a
	One Coulter	2 x 2	Fall	47.0	86.5	15.3	51.5	135.6	1.9	5.0	9.3	4.3	26388	1.8	22.0	139.6
	One Coulter	2 x 2	None	48.0	84.1	16.6	55.5	144.2	2.0	5.1	9.3	4.6	25843	1.2	22.0	123.5
	One Coulter	2 x 2	Starter	49.4	84.5	16.3	57.3	151.4	1.9	5.0	9.6	4.8	26304	1.3	21.6	161.9
	One Coulter	2 x 15	Fall	.	87.9	15.7	55.9	148.9	1.7	4.8	9.0	4.8	25969	1.4	22.4	142.7
	One Coulter	2 x 15	None	.	85.8	16.1	53.2	143.1	1.9	4.9	9.0	4.5	26639	0.6	22.6	147.3
	One Coulter	2 x 15	Starter	.	86.9	16.8	55.7	145.4	1.8	4.7	8.9	4.6	27100	0.6	21.9	137.7
	Three Coulters	2 x 2	Fall	47.7	89.2	14.7	50.9	143.8	1.8	5.0	9.3	4.6	27602	1.2	21.9	144.0
	Three Coulters	2 x 2	None	45.3	86.5	16.4	54.3	146.7	1.9	4.9	9.6	4.7	27225	0.8	21.6	145.4
	Three Coulters	2 x 2	Starter	49.7	82.4	15.4	52.4	147.9	1.8	4.9	9.3	4.7	26639	1.4	21.7	143.9
	Three Coulters	2 x 15	Fall	.	85.8	14.8	51.3	139.2	1.8	5.0	8.9	4.5	25801	1.1	22.5	135.0
	Three Coulters	2 x 15	None	.	82.1	16.1	53.3	143.6	1.9	5.0	9.3	4.5	25969	0.8	22.7	142.4
	Three Coulters	2 x 15	Starter	.	87.9	15.1	51.9	140.6	1.8	4.8	8.7	4.5	26053	2.1	21.1	133.5
None	Chisel Plow	2 x 2	Fall	55.2	86.5	16.0	54.8	147.7	2.0	5.0	9.4	4.7	26472	1.3	20.7	148.7
None	Chisel Plow	2 x 2	None	42.9	82.4	15.8	54.7	143.0	2.0	5.1	9.9	4.6	25969	0.6	20.7	148.8
None	Chisel Plow	2 x 2	Starter	51.1	81.1	14.8	53.5	143.3	2.0	5.0	9.6	4.6	26136	1.3	20.4	153.7
None	Chisel Plow	2 x 15	Fall	.	87.2	14.9	52.3	130.4	2.0	4.9	9.8	4.2	27393	1.1	21.6	154.4
None	Chisel Plow	2 x 15	None	.	84.5	15.3	52.0	128.5	1.8	4.9	9.4	4.1	26136	0.4	21.4	148.4
None	Chisel Plow	2 x 15	Starter	.	83.1	15.0	50.6	133.6	1.9	5.1	9.3	4.3	25466	1.6	21.9	146.7
None	One Coulter	2 x 2	Fall	44.3	85.8	16.3	58.5	151.5	1.8	5.0	9.5	4.8	25131	2.0	22.3	122.4
None	One Coulter	2 x 2	None	40.9	81.7	17.0	59.5	153.5	2.0	5.2	9.3	4.9	25215	1.6	22.6	117.8
None	One Coulter	2 x 2	Starter	39.5	85.8	17.7	63.2	161.7	1.8	5.0	9.5	5.1	25801	1.7	21.9	133.3
None	One Coulter	2 x 15	Fall	.	85.2	16.2	57.3	152.0	1.8	5.0	9.5	4.9	26053	0.6	22.8	129.5
None	One Coulter	2 x 15	None	.	81.7	16.7	54.3	146.8	1.7	4.8	9.0	4.6	25466	1.0	23.1	135.6
None	One Coulter	2 x 15	Starter	.	90.6	16.0	54.5	143.8	1.8	4.8	8.8	4.6	26639	0.6	22.2	122.5
None	Three Coulters	2 x 2	Fall	51.8	91.3	14.0	52.7	142.2	1.7	4.8	9.0	4.6	27393	0.6	22.4	129.9
None	Three Coulters	2 x 2	None	36.1	83.8	16.0	56.5	150.0	1.9	4.9	9.5	4.8	26388	0.6	22.0	135.9
None	Three Coulters	2 x 2	Starter	40.2	82.4	15.0	52.0	145.0	1.8	4.9	9.5	4.6	26304	1.2	22.0	133.0
None	Three Coulters	2 x 15	Fall	.	86.5	15.0	51.5	137.5	1.7	5.2	8.8	4.4	25382	1.2	22.7	124.4
None	Three Coulters	2 x 15	None	.	82.4	16.0	55.3	147.3	1.8	5.0	9.3	4.7	25969	0.9	22.8	138.5
None	Three Coulters	2 x 15	Starter	.	89.2	15.0	52.7	142.7	1.7	4.5	8.3	4.6	25550	1.7	20.6	124.5
Zone Builder	Chisel Plow	2 x 2	Fall	53.1	85.2	14.8	50.0	137.0	1.6	4.8	9.5	4.4	27058	0.6	20.7	164.9
Zone Builder	Chisel Plow	2 x 2	None	66.8	89.9	15.9	50.8	133.1	2.0	5.0	9.7	4.2	29068	1.4	21.4	162.5
Zone Builder	Chisel Plow	2 x 2	Starter	52.5	84.5	15.6	53.0	141.6	1.8	4.8	9.5	4.5	26220	1.9	20.5	154.6
Zone Builder	Chisel Plow	2 x 15	Fall	.	90.6	17.3	57.0	155.8	1.5	4.5	9.5	4.9	27561	1.2	21.1	157.7
Zone Builder	Chisel Plow	2 x 15	None	.	87.9	16.9	57.3	152.5	2.0	5.0	9.5	4.9	26304	1.6	21.0	160.5
Zone Builder	Chisel Plow	2 x 15	Starter	.	87.2	16.5	55.1	150.6	1.8	5.0	9.5	4.8	26555	0.3	21.1	163.8
Zone Builder	One Coulter	2 x 2	Fall	49.7	87.2	14.5	46.3	123.6	2.0	5.0	9.1	3.9	27644	1.5	21.7	156.8
Zone Builder	One Coulter	2 x 2	None	55.2	86.5	16.3	52.5	137.3	2.0	5.1	9.3	4.4	26472	0.9	21.5	129.2
Zone Builder	One Coulter	2 x 2	Starter	59.3	83.1	15.3	52.9	143.6	2.0	5.0	9.7	4.6	26806	0.9	21.3	190.6
Zone Builder	One Coulter	2 x 15	Fall	.	90.6	15.4	54.9	146.6	1.6	4.6	8.8	4.7	25885	2.2	22.0	155.9
Zone Builder	One Coulter	2 x 15	None	.	89.9	15.6	52.4	140.3	2.0	4.9	9.0	4.5	27812	0.3	22.1	158.9
Zone Builder	One Coulter	2 x 15	Starter	.	83.1	17.4	56.6	146.5	1.8	4.6	9.0	4.6	27560	0.6	21.5	153.0
Zone Builder	Three Coulters	2 x 2	Fall	43.6	87.2	15.3	49.6	145.0	1.9	5.1	9.4	4.7	27812	1.8	21.3	158.1
Zone Builder	Three Coulters	2 x 2	None	54.5	89.2	16.6	52.6	144.3	2.0	5.0	9.6	4.6	28063	0.9	21.2	154.9
Zone Builder	Three Coulters	2 x 2	Starter	59.3	82.4	15.6	52.8	150.0	1.9	4.9	9.1	4.8	26974	1.5	21.5	154.9
Zone Builder	Three Coulters	2 x 15	Fall	.	85.2	14.6	51.1	140.5	1.9	4.9	9.0	4.5	26220	1.0	22.4	145.5
Zone Builder	Three Coulters	2 x 15	None	.	81.7	16.3	51.8	140.8	2.0	5.0	9.4	4.5	25969	0.6	22.6	146.3
Zone Builder	Three Coulters	2 x 15	Starter	.	86.5	15.1	51.4	139.1	1.9	5.0	8.9	4.4	26555	2.6	21.6	142.5
Mean				49.8	85.8	15.8	53.5	143.2	1.9	4.9	9.3	4.6	26539	1.2	21.7	146.1

**Table E-44. Fertilizer Placement in Corn Under Zone Tillage.  
Arlington, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Relative Growth Rate	Final Population plants/a	Broken Stalks %	Grain Moist %	Yield bu/a
		P & K		137	156	151	165	179	151	165	179					
				%		cm										
<b>Probability %</b>																
Fall Tillage (F)				25.4	13.0	> 50	> 50	36.6	> 50	39.6	> 50	36.9	1.4	> 50	1.9	8.3
Spring Tillage (S)				34.7	> 50	24.7	36.5	> 50	> 50	> 50	6.8	> 50	> 50	> 50	< 0.1	9.8
F x S				> 50	35.4	29.5	39.7	> 50	8.3	12.2	39.1	> 50	> 50	> 50	8.5	36.7
Nitrogen (N)				-	48.8	27.3	> 50	48.2	9.1	12.0	0.7	> 50	37.4	44.3	0.6	> 50
F x N				-	> 50	27.7	1.8	7.5	> 50	> 50	> 50	7.2	49.4	> 50	> 50	> 50
S x N				-	> 50	24.2	40.2	8.9	> 50	39.1	43.9	9.1	27.0	31.6	> 50	> 50
F x S x N				-	> 50	17.8	19.8	21.8	> 50	> 50	> 50	24.2	> 50	35.6	7.5	> 50
P & K Treatment (P)				> 50	9.5	3.3	40.1	40.3	1.4	9.8	22.6	44.9	> 50	26.1	2.9	> 50
F x P				0.8	6.1	> 50	44.4	> 50	6.0	21.9	> 50	> 50	49.5	> 50	> 50	> 50
S x P				> 50	> 50	29.1	35.7	48.3	> 50	6.7	10.7	> 50	37.2	40.1	> 50	> 50
F x S x P				29.8	30.8	> 50	> 50	> 50	10.7	> 50	24.7	> 50	> 50	36.4	> 50	> 50
N x P				-	19.9	> 50	20.0	19.9	> 50	> 50	4.9	18.6	> 50	> 50	> 50	19.6
F x N x P				-	35.6	> 50	> 50	> 50	8.4	2.4	9.7	39.9	42.4	> 50	> 50	> 50
S x N x P				-	42.4	> 50	> 50	31.8	> 50	16.2	> 50	20.2	29.8	> 50	10.7	28.5
F x S x N x P				-	> 50	27.6	> 50	> 50	> 50	23.6	> 50	> 50	24.7	40.4	> 50	> 50
<b>LSD (0.10)</b>																
Fall Tillage (F)				NS	NS	NS	NS	NS	NS	NS	NS	NS	450	NS	0.2	18.6
Spring Tillage (S)				NS	NS	NS	NS	NS	NS	NS	0.3	NS	NS	NS	0.2	12.1
Nitrogen (N)				-	NS	NS	NS	NS	0.1	NS	0.2	NS	NS	NS	0.3	NS
P & K Treatment (P)				NS	2.0	0.5	NS	NS	0.1	0.1	NS	NS	NS	NS	0.3	NS
<b>CV (%)</b>																
				22.2	7.0	9.2	7.9	6.6	10.9	4.7	4.5	6.8	6.0	118.0	4.5	16.2

**Table E-45. Fertilizer Placement in Corn Under Zone Tillage.  
Arlington, WI - 1995**

Fall Tillage	Spring Tillage	Residue Cover		In Row						Between Row						Root and Plant Ratings 30 days after planting									
				Soil Moisture			Soil Bulk Density			Soil Moisture			Soil Bulk Density			Root	Primary Root		Seminal Root		Nodal Root		Leaf		
		Pre-plant	Post-Plant	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	Discolor.	Length	Longevity	Number	Length	Number	Length
%		%			grams/cc			%			grams/cc			/1/	mm	/2/	mm		mm						
None		67.3	58.3	25.4	27.3	28.3	1.1	1.3	1.3	25.0	27.5	28.0	1.2	1.3	1.4	1.1	8.8	2.7	4.6	31.7	4.1	19.0	1.7	3.3	
Zone Builder		62.2	46.0	26.0	28.2	30.1	1.0	1.2	1.2	25.9	28.4	30.7	1.2	1.3	1.3	1.1	9.7	2.9	5.3	40.2	4.1	25.3	1.8	3.4	
	Chisel Plow	33.0	27.1	25.9	28.6	29.1	1.1	1.2	1.3	26.3	28.3	30.0	1.1	1.4	1.3	1.1	9.5	2.6	4.8	36.0	4.1	25.4	1.8	3.4	
	One Coulter	81.1	64.8	25.4	28.5	30.1	1.0	1.2	1.2	24.6	27.7	29.0	1.2	1.3	1.3	1.1	10.1	2.9	4.8	35.4	4.0	20.2	1.8	3.3	
	Three Coulters	80.0	64.6	25.7	26.2	28.5	1.0	1.2	1.3	.	.	.	.	.	.	1.1	8.2	2.9	5.3	36.5	4.1	20.8	1.8	3.3	
None	Chisel Plow	31.3	29.0	25.0	26.9	28.2	1.1	1.3	1.3	25.6	27.7	29.0	1.1	1.4	1.4	1.0	10.4	2.5	4.5	30.5	4.4	24.5	1.8	3.4	
None	One Coulter	84.4	73.5	25.2	27.7	29.8	1.0	1.3	1.2	24.4	27.2	27.3	1.2	1.3	1.4	1.3	7.8	2.8	4.3	31.0	3.5	14.5	1.6	3.1	
None	Three Coulters	86.1	72.4	26.0	27.3	26.8	1.1	1.3	1.3	.	.	.	.	.	.	1.0	8.3	2.8	5.0	33.6	4.1	18.0	1.8	3.3	
Zone Builder	Chisel Plow	34.8	25.3	26.9	30.4	29.9	1.1	1.2	1.3	27.0	28.8	30.7	1.1	1.3	1.3	1.3	8.6	2.8	5.0	41.5	3.8	26.4	1.8	3.4	
Zone Builder	One Coulter	77.9	56.0	25.7	29.3	30.4	0.9	1.2	1.2	24.9	28.0	30.8	1.2	1.3	1.3	1.0	12.4	3.0	5.3	39.9	4.4	25.9	1.9	3.5	
Zone Builder	Three Coulters	73.9	56.8	25.5	25.0	30.1	0.9	1.2	1.2	.	.	.	.	.	.	1.1	8.0	3.0	5.5	39.3	4.1	23.5	1.8	3.3	
Mean		64.7	52.2	25.7	27.8	29.2	1.0	1.2	1.3	25.5	28.0	29.5	1.2	1.3	1.3	1.1	9.2	2.8	4.9	36.0	4.1	22.1	1.8	3.3	

**Probability %**  
 Fall Tillage (F) 16.8 3.2 45.3 > 50 30.6 8.8 1.8 13.8 > 50 > 50 16.4 > 50 > 50 27.5 > 50 40.5 5.8 22.8 7.8 > 50 7.0 > 50 35.4  
 Spring Tillage (S) < 0.1 < 0.1 > 50 33.7 17.6 1.7 > 50 3.8 1.9 > 50 > 50 15.1 27.6 > 50 > 50 > 50 44.9 47.7 > 50 > 50 49.9 > 50 > 50  
 F x S 10.5 20.2 10.3 28.4 27.1 24.3 > 50 32.2 42.5 45.3 > 50 > 50 > 50 > 50 19.8 16.1 > 50 > 50 > 50 13.6 > 50 > 50 22.6

**LSD (0.10)**  
 Fall Tillage (F) NS 7.6 NS NS NS 0.1 < 0.1 NS NS NS NS NS NS NS NS NS NS NS 0.2 NS 7.6 NS 5.3 NS NS  
 Spring Tillage (S) 6.1 6.9 NS NS NS < 0.1 NS < 0.1 1.0 NS NS NS NS NS NS NS NS NS NS NS NS NS NS NS NS NS

**CV (%)** 10.5 14.9 3.9 12.8 5.6 7.7 6.6 4.7 4.1 4.9 15.7 7.8 5.2 6.1 22.6 34.4 23.1 25.3 29.0 19.5 34.4 26.1 8.4

\1\ Root discoloration with 1=none, 2=trace, 3=light, 4=moderate, and 5=severe  
 \2\ Longevity of primary root with 1=living, 2=blighted, 3=dead or pruned

## FIELD EXPERIMENT HISTORY

**Title:** Fertilizer Placement in Corn Under Zone Tillage **Year:** 1995  
**Expt No.:** 9595  
**Personnel:** J.G. Lauer, N.C. Wollenhaupt, T.M Wood, K.D. Hudelson, A.H. Bosworth, K.G. Silveira  
**Location:** Lancaster Research Station, Lancaster, WI  
**Supported by:**

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### FIELD INFORMATION

Field: 603  
Soil Type: Rozetta Silt Loam  
Soil Test Results: Date: 1993 pH: 7.0 P(ppm): 26 K(ppm): 120 OM(%): 2.4  
Previous Crop: Corn

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### EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 94)
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. 94) Starter 25 gpa of 4-10-10 None

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

Planting: Date: May 3  
Row Spacing: 30"  
Equipment: John Deere Max-Emerge  
Depth: 2"  
Rate: 32,000/a  
Hybrid: Pioneer 3769

Harvesting: Date: October 14  
Equipment: Gleaner Plot Combine

Herbicides:	<u>Material</u>	<u>Rate</u>	<u>Method</u>
	Roundup	2 qts/a	pre-plant on May 1
	2,4-D	1 pt/a	pre-plant on May 1
	Dual	2.5 pts/a	pre-plant on April 25
	Banvel	1 pt/a	post on May 26
	Roundup	2 qts/a	post on July 3 w/rope wick

Insecticides: Lorsban 8 oz/1000' planting

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Results: Table E-46,47.

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.  
Lancaster, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population	Broken Stalks	Grain Moist	Yield
		P & K		140	153	153	167	181	153	167	181	153	167	181				
None				64.2	59.6	17.8	51.3	119.5	2.0	4.9	8.6	3.6	7.4	12.8	23105	9.3	16.2	113.8
Zone Builder				59.9	60.1	17.1	48.2	115.6	2.0	4.8	8.6	3.6	7.3	12.5	22598	8.5	16.0	112.1
	Chisel Plow			60.3	58.1	17.6	49.8	119.5	2.0	5.0	8.8	3.7	7.5	12.8	22342	10.1	16.1	110.5
	One Coulter			60.0	59.8	17.3	50.2	116.9	1.9	4.8	8.6	3.6	7.3	12.6	23059	7.9	16.1	116.3
	Three Coulters			65.9	61.8	17.3	49.4	116.3	1.9	4.8	8.5	3.5	7.3	12.5	23154	8.9	16.2	112.1
None	Chisel Plow			61.3	57.2	18.0	50.8	119.6	2.0	4.9	8.8	3.7	7.5	12.8	22575	10.8	16.1	107.1
None	One Coulter			61.1	60.3	17.5	52.5	120.2	1.9	4.8	8.7	3.5	7.3	12.8	23007	7.5	16.2	120.6
None	Three Coulters			70.2	61.4	17.8	50.8	118.9	1.9	4.9	8.5	3.5	7.3	12.6	23733	9.6	16.2	113.6
Zone Builder	Chisel Plow			59.3	59.0	17.3	48.8	119.4	2.0	5.0	8.8	3.6	7.4	12.8	22109	9.4	16.0	113.9
Zone Builder	One Coulter			58.8	59.3	17.2	47.9	113.7	1.9	4.8	8.4	3.6	7.2	12.3	23111	8.2	16.0	111.9
Zone Builder	Three Coulters			61.5	62.1	16.8	48.0	113.8	1.9	4.8	8.5	3.6	7.3	12.4	22575	8.1	16.1	110.6
		2 x 2		62.2	59.8	17.9	50.8	122.8	2.0	4.9	8.7	3.6	7.4	12.9	23209	9.8	16.0	116.7
		2 x 15		58.1	60.0	16.9	48.8	112.4	1.9	4.9	8.4	3.5	7.3	12.3	22495	8.0	16.3	109.2
None		2 x 2		64.7	58.5	18.0	51.7	124.1	2.0	4.9	8.8	3.6	7.4	13.0	23463	9.7	16.0	117.1
None		2 x 15		58.1	60.8	17.5	51.0	115.0	1.9	4.9	8.5	3.5	7.3	12.6	22748	8.9	16.4	110.4
Zone Builder		2 x 2		59.9	61.0	17.8	49.9	121.6	2.0	4.9	8.7	3.7	7.4	12.8	22956	10.0	15.9	116.3
Zone Builder		2 x 15		. 59.3	61.0	16.4	46.5	109.7	1.9	4.8	8.4	3.6	7.2	12.1	22241	7.1	16.1	108.0
	Chisel Plow	2 x 2		60.3	58.8	18.3	50.8	124.3	2.0	5.0	9.0	3.8	7.6	13.1	22800	11.2	15.9	114.6
	Chisel Plow	2 x 15		. 57.5	57.5	17.0	48.7	114.6	2.0	5.0	8.6	3.6	7.4	12.5	21884	9.0	16.2	106.4
	One Coulter	2 x 2		60.2	57.9	17.5	50.3	120.3	1.9	4.7	8.6	3.5	7.3	12.7	23284	8.5	16.0	117.7
	One Coulter	2 x 15		58.1	61.7	17.2	50.2	113.6	2.0	4.9	8.5	3.6	7.3	12.5	22835	7.3	16.2	114.8
	Three Coulters	2 x 2		65.9	62.6	17.9	51.3	123.8	2.0	4.9	8.7	3.6	7.5	12.9	23543	9.9	16.0	117.7
	Three Coulters	2 x 15		. 61.0	61.0	16.7	47.4	108.9	1.9	4.8	8.2	3.5	7.1	12.1	22765	7.8	16.4	106.5
None	Chisel Plow	2 x 2		61.3	55.0	18.5	51.8	125.5	2.0	5.0	9.0	3.9	7.6	13.2	23301	10.6	15.9	111.4
None	Chisel Plow	2 x 15		. 59.5	59.5	17.5	49.8	113.6	2.0	4.9	8.5	3.6	7.5	12.5	21849	11.0	16.3	102.8
None	One Coulter	2 x 2		62.1	57.9	17.5	51.1	121.5	1.9	4.7	8.6	3.5	7.2	12.8	22990	8.4	16.1	121.3
None	One Coulter	2 x 15		58.1	62.7	17.5	53.9	118.8	1.9	4.9	8.8	3.6	7.4	12.9	23025	6.7	16.3	119.9
None	Three Coulters	2 x 2		70.2	62.7	18.0	52.1	125.1	2.0	4.9	8.7	3.5	7.5	13.0	24097	10.2	15.9	118.7
None	Three Coulters	2 x 15		. 60.2	60.2	17.5	49.4	112.7	1.9	4.9	8.3	3.5	7.1	12.3	23370	9.1	16.5	108.5
Zone Builder	Chisel Plow	2 x 2		59.3	62.7	18.1	49.8	123.1	2.0	5.0	8.9	3.7	7.5	13.1	22299	11.8	15.9	117.9
Zone Builder	Chisel Plow	2 x 15		. 55.4	55.4	16.5	47.7	115.7	2.0	5.0	8.6	3.6	7.3	12.5	21919	7.0	16.0	110.0
Zone Builder	One Coulter	2 x 2		58.8	57.9	17.5	49.5	119.1	1.9	4.8	8.5	3.6	7.4	12.6	23578	8.5	15.9	114.2
Zone Builder	One Coulter	2 x 15		. 60.6	60.6	16.8	46.4	108.3	2.0	4.8	8.3	3.6	7.1	12.0	22645	7.8	16.1	109.6
Zone Builder	Three Coulters	2 x 2		61.5	62.4	17.8	50.5	122.5	2.0	4.9	8.8	3.7	7.5	12.9	22990	9.6	16.0	116.7
Zone Builder	Three Coulters	2 x 15		. 61.8	61.8	15.8	45.5	105.0	1.9	4.6	8.2	3.5	7.0	11.8	22160	6.6	16.3	104.4
			Fall	65.1	60.1	17.4	49.7	116.2	2.0	4.9	8.5	3.6	7.3	12.5	23025	9.4	16.1	114.7
			None	60.6	62.2	17.0	47.6	114.8	2.0	4.8	8.5	3.6	7.3	12.5	22990	9.1	16.2	111.4
			Starter	60.4	57.5	17.8	52.1	121.8	2.0	4.9	8.8	3.6	7.5	12.9	22541	8.2	16.0	112.8
None			Fall	67.9	61.3	17.8	50.9	119.8	2.0	4.9	8.6	3.6	7.4	12.6	23215	10.0	16.2	119.3
None			None	62.7	61.3	17.3	49.3	114.8	1.9	4.8	8.5	3.5	7.2	12.5	23509	9.7	16.3	110.6
None			Starter	62.0	56.3	18.2	53.8	124.1	2.0	4.9	8.9	3.6	7.6	13.1	22593	8.2	16.0	111.4
Zone Builder			Fall	62.2	58.8	17.1	48.5	112.6	1.9	4.8	8.5	3.6	7.2	12.3	22835	8.9	16.1	110.0
Zone Builder			None	58.6	63.0	16.7	45.9	114.7	2.0	4.9	8.5	3.6	7.3	12.4	22472	8.5	16.1	112.1
Zone Builder			Starter	58.8	58.6	17.5	50.4	119.6	2.0	4.8	8.7	3.6	7.4	12.8	22489	8.3	16.0	114.3

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.  
Lancaster, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Emergence		Plant Height			Leaf Collars			Leaf No. (Hahn)			Final Population	Broken Stalks	Grain Moist	Yield
				Day of Year	Day of Year	153	167	181	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year				
				%	cm									plants/a	%	%	bu/a	
	Chisel Plow	Fall		61.3	58.6	17.6	50.3	118.5	2.0	5.0	8.8	3.7	7.5	12.8	22558	11.3	16.1	113.3
	Chisel Plow	None		62.3	59.6	17.0	47.3	116.0	2.0	4.9	8.5	3.7	7.4	12.5	22921	9.5	16.1	109.5
	Chisel Plow	Starter		57.2	56.2	18.3	51.7	123.9	2.0	5.0	9.0	3.7	7.6	13.2	21547	9.5	16.0	108.8
	One Coulter	Fall		63.4	60.1	17.7	50.6	117.4	1.9	4.8	8.5	3.6	7.3	12.5	23336	8.2	16.1	116.6
	One Coulter	None		56.2	61.7	16.7	47.5	114.3	1.8	4.7	8.5	3.5	7.1	12.4	22973	7.7	16.2	116.3
	One Coulter	Starter		60.3	57.6	17.7	52.6	119.0	2.0	4.8	8.6	3.6	7.4	12.8	22869	7.8	16.0	115.9
	Three Coulters	Fall		70.5	61.5	17.0	48.2	112.5	1.9	4.8	8.3	3.5	7.1	12.1	23180	8.9	16.2	114.1
	Three Coulters	None		63.4	65.2	17.2	48.0	113.9	2.0	4.9	8.4	3.5	7.3	12.5	23077	10.2	16.3	108.4
	Three Coulters	Starter		63.7	58.6	17.6	52.0	122.5	1.9	4.8	8.7	3.6	7.5	12.9	23206	7.5	16.0	113.7
None	Chisel Plow	Fall		62.0	60.3	17.9	50.7	121.6	2.0	5.0	8.8	3.7	7.6	12.9	22714	12.2	16.1	113.6
None	Chisel Plow	None		66.1	57.9	17.4	48.8	113.8	2.1	4.9	8.4	3.7	7.5	12.5	23699	9.4	16.2	109.2
None	Chisel Plow	Starter		55.9	53.5	18.6	52.8	123.3	1.9	4.9	9.0	3.7	7.6	13.1	21314	10.8	16.0	98.5
None	One Coulter	Fall		61.3	61.3	18.2	53.7	122.3	1.9	4.9	8.7	3.6	7.4	12.8	23388	7.0	16.2	126.8
None	One Coulter	None		58.6	61.7	16.4	48.9	114.3	1.8	4.6	8.5	3.4	7.0	12.5	23543	7.5	16.3	122.0
None	One Coulter	Starter		63.4	57.9	18.0	54.9	123.9	2.0	4.9	8.9	3.5	7.6	13.2	22091	8.1	16.1	113.0
None	Three Coulters	Fall		80.4	62.3	17.2	48.3	115.4	1.9	4.9	8.3	3.4	7.2	12.2	23543	10.8	16.2	117.6
None	Three Coulters	None		63.4	64.4	18.1	50.1	116.3	1.9	4.9	8.4	3.4	7.2	12.6	23284	12.3	16.4	100.7
None	Three Coulters	Starter		66.8	57.6	18.0	53.9	125.0	1.9	4.9	8.7	3.6	7.5	13.0	24373	5.8	16.0	122.5
Zone Builder	Chisel Plow	Fall		60.6	56.9	17.3	49.8	115.4	2.0	4.9	8.7	3.6	7.4	12.6	22402	10.3	16.1	113.0
Zone Builder	Chisel Plow	None		58.6	61.3	16.6	45.8	118.3	2.0	5.0	8.6	3.7	7.3	12.6	22143	9.7	15.9	109.8
Zone Builder	Chisel Plow	Starter		58.6	58.9	17.9	50.7	124.5	2.0	5.0	9.0	3.7	7.6	13.2	21780	8.1	15.9	119.1
Zone Builder	One Coulter	Fall		65.4	58.9	17.1	47.5	112.6	1.9	4.8	8.4	3.5	7.2	12.3	23284	9.3	16.0	106.5
Zone Builder	One Coulter	None		53.8	61.7	17.0	46.1	114.4	1.9	4.8	8.5	3.6	7.3	12.3	22403	7.8	16.0	110.5
Zone Builder	One Coulter	Starter		57.2	57.2	17.4	50.3	114.2	2.0	4.8	8.4	3.6	7.2	12.4	23647	7.5	16.0	118.8
Zone Builder	Three Coulters	Fall		60.6	60.6	16.9	48.1	109.7	1.9	4.7	8.3	3.5	7.1	12.0	22817	7.1	16.2	110.6
Zone Builder	Three Coulters	None		63.4	66.1	16.3	45.8	111.6	2.0	4.9	8.4	3.6	7.3	12.4	22869	8.1	16.2	116.2
Zone Builder	Three Coulters	Starter		60.6	59.6	17.1	50.2	120.0	1.9	4.7	8.7	3.6	7.4	12.7	22039	9.2	16.0	105.0
		2 x 2	Fall	64.9	60.9	17.9	49.9	119.9	2.0	4.8	8.6	3.6	7.3	12.6	23785	9.8	16.0	118.8
		2 x 2	None	60.9	62.1	17.6	49.3	122.5	2.0	4.9	8.7	3.6	7.4	12.9	23612	10.1	16.0	116.6
		2 x 2	Starter	60.8	56.3	18.2	53.2	126.0	2.0	4.9	8.9	3.7	7.6	13.2	22230	9.7	15.9	114.7
		2 x 15	Fall	68.1	59.3	16.9	49.4	112.5	1.9	4.9	8.5	3.5	7.3	12.3	22264	9.1	16.3	110.5
		2 x 15	None	54.5	62.2	16.4	45.8	107.0	1.9	4.8	8.2	3.5	7.1	12.0	22368	8.1	16.4	106.2
		2 x 15	Starter	51.8	58.6	17.5	51.0	117.6	2.0	4.9	8.6	3.6	7.4	12.7	22852	6.8	16.1	110.9
None		2 x 2	Fall	67.9	60.4	18.0	50.1	121.4	2.0	4.8	8.6	3.6	7.3	12.6	23820	9.1	16.0	123.3
None		2 x 2	None	63.4	62.0	17.8	51.5	124.1	2.0	4.8	8.8	3.6	7.4	13.1	24546	11.0	16.0	114.8
None		2 x 2	Starter	62.9	53.1	18.3	53.3	126.7	2.0	4.9	9.0	3.6	7.6	13.2	22022	9.1	16.0	113.3
None		2 x 15	Fall	68.1	62.2	17.6	51.6	118.2	1.9	5.0	8.6	3.6	7.4	12.7	22610	10.9	16.4	115.3
None		2 x 15	None	54.5	60.6	16.8	47.0	105.5	1.9	4.8	8.2	3.4	7.0	12.0	22472	8.5	16.6	106.5
None		2 x 15	Starter	51.8	59.5	18.2	54.3	121.5	2.0	4.9	8.8	3.6	7.5	13.0	23163	7.4	16.1	109.4
Zone Builder		2 x 2	Fall	62.2	61.3	17.9	49.7	118.3	2.0	4.8	8.6	3.6	7.4	12.6	23751	10.4	16.0	114.3
Zone Builder		2 x 2	None	58.6	62.2	17.4	47.1	121.0	2.0	4.9	8.7	3.7	7.4	12.8	22679	9.2	15.9	118.4
Zone Builder		2 x 2	Starter	58.8	59.5	18.1	53.0	125.4	2.0	4.8	8.9	3.7	7.6	13.2	22437	10.2	15.8	116.1
Zone Builder		2 x 15	Fall	.	56.3	16.3	47.3	106.8	1.9	4.8	8.3	3.5	7.1	12.0	21918	7.3	16.1	105.7
Zone Builder		2 x 15	None	.	63.8	15.9	44.6	108.5	2.0	4.8	8.3	3.6	7.2	12.0	22264	7.8	16.2	105.9
Zone Builder		2 x 15	Starter	.	57.7	16.9	47.8	113.7	2.0	4.8	8.5	3.6	7.2	12.4	22541	6.3	16.1	112.4
	Chisel Plow	2 x 2	Fall	61.3	57.9	18.1	50.3	121.1	2.0	4.9	8.8	3.8	7.5	12.8	23388	12.1	16.0	117.5
	Chisel Plow	2 x 2	None	62.3	63.4	18.1	50.4	126.4	2.1	5.1	8.9	3.9	7.6	13.2	23751	11.4	15.8	115.0
	Chisel Plow	2 x 2	Starter	57.2	55.2	18.8	51.7	125.5	2.0	4.9	9.1	3.7	7.6	13.3	21262	10.0	15.9	111.4
	Chisel Plow	2 x 15	Fall	.	59.3	17.1	50.3	115.9	2.0	5.1	8.7	3.6	7.5	12.7	21728	10.4	16.2	109.0
	Chisel Plow	2 x 15	None	.	55.9	16.0	44.2	105.6	1.9	4.8	8.1	3.5	7.2	11.9	22092	7.6	16.3	103.9
	Chisel Plow	2 x 15	Starter	.	57.2	17.8	51.8	122.3	1.9	5.0	8.9	3.7	7.5	13.0	21832	9.0	16.0	106.3

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.  
Lancaster, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population	Broken Stalks	Grain Moist	Yield
		P & K		140	153	153	167	181	153	167	181	153	167	181				
	One Coulter	2 x 2	Fall	62.7	59.3	17.9	50.3	119.8	1.9	4.8	8.6	3.6	7.3	12.7	23647	9.5	16.0	115.9
	One Coulter	2 x 2	None	56.4	58.9	16.8	47.4	117.9	1.8	4.6	8.5	3.5	7.1	12.5	23388	6.8	16.1	118.8
	One Coulter	2 x 2	Starter	61.5	55.5	17.8	53.2	123.3	2.0	4.9	8.6	3.6	7.5	12.9	22817	9.2	15.9	118.6
	One Coulter	2 x 15	Fall	68.1	61.0	17.4	50.9	115.1	1.9	4.9	8.5	3.6	7.3	12.4	23025	6.9	16.2	117.4
	One Coulter	2 x 15	None	54.5	64.4	16.6	47.6	110.8	1.9	4.8	8.5	3.5	7.2	12.3	22558	8.5	16.3	113.7
	One Coulter	2 x 15	Starter	51.8	59.6	17.6	51.9	114.8	2.0	4.8	8.6	3.6	7.3	12.6	22921	6.4	16.1	113.1
	Three Coulters	2 x 2	Fall	70.5	65.4	17.8	49.1	118.7	2.0	4.8	8.4	3.5	7.3	12.3	24321	7.8	16.1	123.0
	Three Coulters	2 x 2	None	63.4	64.0	17.9	50.3	123.3	2.0	5.0	8.8	3.6	7.5	13.1	23699	12.1	16.0	115.9
	Three Coulters	2 x 2	Starter	63.7	58.2	18.0	54.6	129.4	1.9	4.8	9.0	3.7	7.7	13.4	22610	9.8	15.7	114.1
	Three Coulters	2 x 15	Fall	.	57.6	16.3	47.2	106.4	1.8	4.8	8.2	3.4	7.0	11.9	22039	10.0	16.3	105.2
	Three Coulters	2 x 15	None	.	66.4	16.5	45.7	104.6	1.9	4.8	8.1	3.5	7.0	11.9	22454	8.3	16.6	100.9
	Three Coulters	2 x 15	Starter	.	58.9	17.1	49.4	115.6	1.9	4.8	8.4	3.5	7.3	12.4	23803	5.1	16.3	113.4
None	Chisel Plow	2 x 2	Fall	62.0	56.5	18.0	49.8	123.0	2.0	4.9	8.9	3.9	7.5	12.8	24269	10.2	15.9	120.3
None	Chisel Plow	2 x 2	None	66.1	59.3	18.5	53.3	127.1	2.1	5.0	8.9	3.9	7.7	13.3	24995	11.4	15.9	115.9
None	Chisel Plow	2 x 2	Starter	55.9	49.1	19.1	52.3	126.5	2.0	5.0	9.3	3.9	7.7	13.4	20639	10.1	16.0	98.0
None	Chisel Plow	2 x 15	Fall	.	64.0	17.9	51.6	120.3	2.0	5.1	8.8	3.6	7.7	13.0	21158	14.2	16.3	106.8
None	Chisel Plow	2 x 15	None	.	56.5	16.4	44.4	100.4	2.0	4.8	8.0	3.5	7.2	11.7	22403	7.3	16.6	102.5
None	Chisel Plow	2 x 15	Starter	.	57.9	18.1	53.3	120.1	1.9	4.9	8.8	3.6	7.5	12.8	21988	11.5	16.1	99.1
None	One Coulter	2 x 2	Fall	59.0	57.2	18.6	52.9	124.5	2.0	4.8	8.6	3.6	7.4	12.9	22402	9.0	16.1	126.6
None	One Coulter	2 x 2	None	60.0	62.0	16.1	47.8	118.1	1.8	4.5	8.5	3.4	6.9	12.5	25099	6.9	16.1	123.6
None	One Coulter	2 x 2	Starter	67.2	54.5	17.8	52.8	121.9	2.0	4.9	8.8	3.5	7.5	12.9	21469	9.4	16.1	113.6
None	One Coulter	2 x 15	Fall	68.1	65.4	17.8	54.5	120.1	1.9	5.0	8.8	3.7	7.4	12.7	24373	5.1	16.3	126.9
None	One Coulter	2 x 15	None	54.5	61.3	16.6	50.1	110.5	1.9	4.8	8.5	3.4	7.1	12.6	21988	8.2	16.6	120.5
None	One Coulter	2 x 15	Starter	51.8	61.3	18.3	57.0	125.9	2.0	5.0	9.0	3.6	7.6	13.4	22714	6.8	16.1	112.3
None	Three Coulters	2 x 2	Fall	80.4	67.4	17.3	47.8	116.6	2.0	4.8	8.3	3.4	7.2	12.1	24788	8.2	16.0	123.0
None	Three Coulters	2 x 2	None	63.4	64.7	18.9	53.6	127.1	2.0	5.0	8.9	3.5	7.6	13.4	23544	14.6	16.1	104.9
None	Three Coulters	2 x 2	Starter	66.8	55.9	17.9	55.0	131.6	1.9	4.9	8.9	3.5	7.6	13.3	23958	7.7	15.8	128.3
None	Three Coulters	2 x 15	Fall	.	57.2	17.1	48.8	114.1	1.9	5.0	8.3	3.5	7.2	12.3	22299	13.4	16.5	112.2
None	Three Coulters	2 x 15	None	.	64.0	17.4	46.6	105.5	1.9	4.8	8.0	3.4	6.8	11.9	23025	10.0	16.7	96.5
None	Three Coulters	2 x 15	Starter	.	59.3	18.1	52.8	118.4	2.0	4.9	8.5	3.6	7.4	12.6	24788	3.8	16.3	116.8
Zone Builder	Chisel Plow	2 x 2	Fall	60.6	59.3	18.3	50.8	119.3	2.0	4.9	8.8	3.7	7.4	12.9	22506	13.9	16.1	114.7
Zone Builder	Chisel Plow	2 x 2	None	58.6	67.4	17.6	47.5	125.6	2.1	5.1	9.0	3.8	7.5	13.1	22506	11.5	15.8	114.1
Zone Builder	Chisel Plow	2 x 2	Starter	58.6	61.3	18.4	51.1	124.5	2.0	4.9	9.0	3.6	7.6	13.3	21884	9.9	15.9	124.8
Zone Builder	Chisel Plow	2 x 15	Fall	.	54.5	16.3	48.9	111.6	2.0	5.0	8.6	3.5	7.3	12.3	22299	6.6	16.1	111.2
Zone Builder	Chisel Plow	2 x 15	None	.	55.2	15.6	44.0	110.9	1.9	4.9	8.3	3.5	7.2	12.1	21780	7.9	16.0	105.4
Zone Builder	Chisel Plow	2 x 15	Starter	.	56.5	17.5	50.3	124.5	2.0	5.1	9.0	3.7	7.5	13.2	21677	6.4	16.0	113.4
Zone Builder	One Coulter	2 x 2	Fall	65.4	61.3	17.3	47.8	115.0	1.9	4.8	8.5	3.6	7.3	12.4	24892	9.9	15.9	105.1
Zone Builder	One Coulter	2 x 2	None	53.8	55.9	17.5	47.0	117.8	1.8	4.6	8.5	3.6	7.3	12.5	21677	6.6	16.1	114.0
Zone Builder	One Coulter	2 x 2	Starter	57.2	56.5	17.8	53.6	124.6	2.0	4.9	8.5	3.6	7.5	12.9	24166	9.0	15.8	123.6
Zone Builder	One Coulter	2 x 15	Fall	.	56.5	17.0	47.3	110.1	2.0	4.9	8.3	3.5	7.2	12.1	21677	8.6	16.1	107.9
Zone Builder	One Coulter	2 x 15	None	.	67.4	16.5	45.1	111.0	2.0	4.9	8.5	3.7	7.3	12.1	23129	8.9	16.0	107.0
Zone Builder	One Coulter	2 x 15	Starter	.	57.9	17.0	46.9	103.8	2.0	4.6	8.3	3.6	7.0	11.9	23129	6.0	16.2	113.9
Zone Builder	Three Coulters	2 x 2	Fall	60.6	63.4	18.3	50.5	120.8	2.0	4.9	8.5	3.6	7.4	12.5	23855	7.4	16.2	123.1
Zone Builder	Three Coulters	2 x 2	None	63.4	63.4	17.0	46.9	119.5	2.0	5.0	8.6	3.7	7.4	12.7	23855	9.5	16.0	127.0
Zone Builder	Three Coulters	2 x 2	Starter	60.6	60.6	18.1	54.3	127.1	1.9	4.8	9.1	3.8	7.7	13.4	21262	11.9	15.7	100.0
Zone Builder	Three Coulters	2 x 15	Fall	.	57.9	15.5	45.6	98.6	1.8	4.5	8.1	3.4	6.8	11.5	21780	6.7	16.1	98.1
Zone Builder	Three Coulters	2 x 15	None	.	68.8	15.6	44.8	103.6	2.0	4.8	8.1	3.6	7.2	12.0	21884	6.6	16.4	105.4
Zone Builder	Three Coulters	2 x 15	Starter	.	58.6	16.1	46.1	112.9	1.9	4.6	8.3	3.5	7.1	12.1	22817	6.4	16.2	109.9
Mean				62.0	59.9	17.4	49.8	117.6	2.0	4.9	8.6	3.6	7.3	12.6	22852	8.9	16.1	113.0

**Table E-46. Fertilizer Placement in Corn Under Zone Tillage.  
Lancaster, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Emergence		Plant Height			Leaf Collars			Leaf No. (Hahn)			Final Population	Broken Stalks	Grain Moist	Yield
				Day of Year	Day of Year	153	167	181	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year				
				%		cm									plants/a	%	%	bu/a
<b>Probability %</b>																		
Fall Tillage (F)				39.7	> 50	40.8	15.5	30.1	> 50	> 50	40.2	> 50	> 50	19.0	29.7	> 50	48.0	> 50
Spring Tillage (S)				26.5	3.9	25.6	> 50	7.8	< 0.1	0.5	0.8	0.2	9.6	4.2	27.0	35.6	28.3	22.4
F x S				> 50	> 50	37.4	> 50	8.1	43.2	21.4	17.4	2.8	> 50	17.3	49.8	> 50	> 50	8.9
Nitrogen (N)				-	> 50	0.1	3.9	< 0.1	29.9	> 50	< 0.1	1.2	0.6	< 0.1	2.1	0.4	1.3	0.2
F x N				-	16.0	8.0	15.2	24.0	> 50	27.6	> 50	44.0	23.4	4.3	> 50	8.3	42.4	> 50
S x N				-	22.6	21.2	26.8	3.4	7.1	14.8	2.2	3.0	9.2	0.4	> 50	> 50	> 50	25.9
F x S x N				-	14.1	> 50	45.0	10.4	41.3	37.8	30.7	6.2	> 50	10.4	35.8	9.6	> 50	> 50
P & K Treatment (P)				14.2	0.6	1.6	< 0.1	< 0.1	> 50	> 50	0.2	38.2	2.2	< 0.1	38.4	> 50	3.4	49.6
F x P				> 50	19.2	> 50	> 50	6.6	> 50	15.5	43.4	7.5	21.5	> 50	46.9	> 50	43.3	6.0
S x P				> 50	> 50	47.4	> 50	26.1	4.9	34.8	28.1	44.7	> 50	12.0	> 50	> 50	> 50	> 50
F x S x P				14.1	> 50	27.1	> 50	> 50	> 50	> 50	> 50	> 50	47.4	> 50	13.6	19.2	> 50	0.1
N x P				33.9	39.9	> 50	28.8	1.7	> 50	23.3	9.3	> 50	45.8	3.7	1.4	> 50	41.0	47.9
F x N x P				-	10.8	> 50	9.2	3.9	> 50	36.7	43.4	23.1	13.6	9.3	18.0	38.8	13.7	> 50
S x N x P				-	9.0	> 50	47.1	14.9	4.9	15.9	31.7	30.2	48.2	16.0	> 50	23.8	> 50	> 50
F x S x N x P				-	38.8	39.0	> 50	5.6	44.3	44.3	> 50	> 50	32.9	13.2	1.1	> 50	> 50	19.8
<b>LSD (0.10)</b>																		
Fall Tillage (F)				NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Spring Tillage (S)				NS	2.2	NS	NS	2.4	< 0.1	0.1	0.1	0.1	0.2	0.2	NS	NS	NS	NS
Nitrogen (N)				-	NS	0.4	1.6	2.1	NS	NS	0.1	0.1	0.1	0.1	491	1.0	0.2	3.5
P & K Treatment (P)				NS	2.4	0.5	1.6	2.5	NS	NS	0.1	NS	0.1	0.2	NS	NS	0.1	NS
<b>CV (%)</b>																		
				16.3	11.6	8.2	9.4	6.3	8.4	56.0	4.8	5.6	5.3	4.5	8.3	58.5	2.2	12.0

**Table E-47. Fertilizer Placement in Corn Under Zone Tillage.  
Lancaster, WI - 1995**

Fall Tillage	Spring Tillage	Residue Cover		In Row						Between Row					
				Soil Moisture			Soil Bulk Density			Soil Moisture			Soil Bulk Density		
		Pre-plant	Post-Plant	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"
		%		%			grams/cc			%			grams/cc		
None		68.4	64.4	26.5	25.5	24.5	1.2	1.4	1.6	27.3	25.1	24.6	1.3	1.5	1.6
Zone Builder		62.3	53.4	27.0	26.0	25.3	1.2	1.4	1.5	28.0	26.2	25.3	1.2	1.3	1.5
	Chisel Plow	28.0	28.6	26.4	25.8	24.9	1.2	1.3	1.5	-	-	-	-	-	-
	One Coulter	86.4	80.3	26.7	25.2	24.7	1.2	1.4	1.5	-	-	-	-	-	-
	Three Coulters	83.6	68.3	27.2	26.2	25.0	1.2	1.4	1.5	27.7	25.7	25.0	1.3	1.4	1.5
None	Chisel Plow	30.5	35.0	26.8	24.9	24.5	1.2	1.4	1.5	-	-	-	-	-	-
None	One Coulter	90.0	88.0	26.3	25.1	24.3	1.3	1.4	1.5	-	-	-	-	-	-
None	Three Coulters	90.2	72.2	26.5	26.5	24.7	1.2	1.5	1.6	27.3	25.1	24.6	1.3	1.5	1.6
Zone Builder	Chisel Plow	25.5	22.3	25.9	26.7	25.2	1.2	1.3	1.5	-	-	-	-	-	-
Zone Builder	One Coulter	82.8	72.6	27.1	25.3	25.1	1.2	1.4	1.5	-	-	-	-	-	-
Zone Builder	Three Coulters	78.6	65.4	27.9	25.9	25.4	1.2	1.4	1.5	28.0	26.2	25.3	1.2	1.3	1.5
Mean		65.2	58.7	26.7	25.7	24.9	1.2	1.4	1.5	27.7	25.7	25.0	1.3	1.4	1.5
<b>Probability %</b>															
Fall Tillage (F)		12.9	2.3	> 50	35.9	17.6	> 50	0.2	49.9	32.6	9.1	29.0	17.0	2.4	21.5
Spring Tillage (S)		< 0.1	< 0.1	41.4	> 50	> 50	38.6	16.6	> 50	-	-	-	-	-	-
F x S		> 50	> 50	21.6	45.5	> 50	> 50	> 50	> 50	-	-	-	-	-	-
<b>LSD (0.10)</b>															
Fall Tillage (F)		NS	6.2	NS	NS	NS	NS	< 0.1	NS	NS	1.1	NS	NS	0.1	NS
Spring Tillage (S)		5.9	7.0	NS	NS	NS	NS	NS	NS	-	-	-	-	-	-
<b>CV (%)</b>		9.8	12.8	4.7	7.5	4.1	5.2	4.8	4.4	3.1	2.5	3.1	5.7	3.5	5.2

## FIELD EXPERIMENT HISTORY

**Title:** Fertilizer Placement in Corn Under Zone Tillage **Year:** 1995  
**Expt No.:** 9596  
**Personnel:** J.G. Lauer, N.C. Wollenhaupt, M.C. Rankin, K.D. Hudelson, A.H. Bosworth, K.G. Silveira  
**Location:** Bertram Farm, Fond du Lac, WI  
**Supported by:**

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### 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

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### EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 94)
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. 94) Starter 50 gpa of 4-10-10 None

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

Planting: Date: May 19  
Row Spacing: 30"  
Equipment: John Deere Max-Emerge  
Depth: 2"  
Rate: 32,000/a  
Hybrid: Pioneer 3861

Harvesting: Date: October 18  
Equipment: Gleaner Plot Combine

Herbicides:

<u>Material</u>	<u>Rate</u>	<u>Method</u>
Roundup	2 qts/a	preemerge
Dual	1 qts/a	preemerge
Bladex 4L	1.2 qts/a	preemerge
Crop Oil	1 qt/a	preemerge

Insecticides: Lorsban 8 oz/1000' planting

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Results: Table E-48, 49.

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.  
Fond du Lac, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population plants/a	Broken Stalks %	Grain Moist %	Yield bu/a
		P	K	154	164	164	178	191	164	178	191	164	178	191				
				%	%	cm												
None				66.4	74.1	19.4	75.3	119.2	2.1	6.3	9.3	3.9	9.8	13.6	22910	4.5	19.8	141.2
Zone Builder				66.8	76.4	19.8	76.2	123.4	2.1	6.3	9.3	3.9	9.9	13.5	23720	4.5	19.6	145.8
	Chisel Plow			70.7	76.2	20.2	75.9	124.3	2.2	6.4	9.5	4.0	10.0	13.7	23881	5.2	19.6	148.1
	One Coulter			60.7	70.8	18.8	73.9	118.2	2.0	6.2	9.2	3.8	9.6	13.5	22050	4.4	19.8	139.7
	Three Coulters			68.4	78.6	19.7	77.5	121.5	2.1	6.3	9.3	3.9	9.9	13.5	23983	4.0	19.7	142.6
None	Chisel Plow			75.4	77.4	20.5	77.2	125.0	2.2	6.4	9.6	4.0	10.1	13.9	23791	5.3	19.6	150.4
None	One Coulter			56.7	67.8	18.6	73.3	115.6	2.0	6.2	9.3	3.8	9.7	13.5	21241	4.2	19.8	134.4
None	Three Coulters			67.0	77.0	19.1	75.4	117.0	2.1	6.2	9.2	3.9	9.7	13.4	23660	4.0	19.8	138.7
Zone Builder	Chisel Plow			65.9	75.1	20.0	74.6	123.5	2.2	6.4	9.4	3.9	9.9	13.6	23972	5.0	19.5	145.7
Zone Builder	One Coulter			64.7	73.9	19.0	74.5	120.8	2.0	6.2	9.2	3.8	9.6	13.4	22858	4.6	19.7	145.1
Zone Builder	Three Coulters			69.8	80.2	20.3	79.7	125.9	2.2	6.4	9.4	4.0	10.1	13.6	24293	3.9	19.6	146.5
		2 x 2		67.4	75.9	19.8	76.9	123.5	2.1	6.4	9.4	3.9	9.9	13.7	23329	4.2	19.7	148.9
		2 x 15		63.4	74.6	19.3	74.7	119.2	2.1	6.2	9.2	3.9	9.8	13.4	23307	4.9	19.7	138.0
None		2 x 2		66.6	74.6	19.3	74.6	119.2	2.1	6.3	9.3	3.8	9.8	13.6	23140	4.2	19.8	141.6
None		2 x 15		65.4	73.5	19.5	76.0	119.3	2.1	6.3	9.4	4.0	9.9	13.6	22692	4.9	19.7	140.7
Zone Builder		2 x 2		68.1	77.1	20.3	79.1	127.7	2.1	6.5	9.6	3.9	10.1	13.8	23513	4.1	19.6	156.2
Zone Builder		2 x 15		61.5	75.6	19.2	73.4	119.1	2.2	6.2	9.1	3.8	9.6	13.2	23921	4.9	19.6	135.3
	Chisel Plow	2 x 2		71.0	77.5	20.0	75.8	125.4	2.2	6.4	9.6	3.9	10.0	13.8	23791	4.4	19.5	156.0
	Chisel Plow	2 x 15		69.5	74.9	20.5	76.0	123.1	2.2	6.3	9.4	4.0	10.0	13.6	23972	5.9	19.6	140.1
	One Coulter	2 x 2		60.4	70.3	18.9	74.6	119.5	1.9	6.2	9.3	3.7	9.7	13.6	22176	4.1	19.8	143.0
	One Coulter	2 x 15		61.8	71.4	18.7	73.2	116.9	2.1	6.2	9.2	3.8	9.6	13.4	21934	4.7	19.7	136.5
	Three Coulters	2 x 2		70.7	79.8	20.5	80.2	125.5	2.2	6.4	9.5	4.0	10.1	13.8	23951	3.9	19.7	147.8
	Three Coulters	2 x 15		59.0	77.3	18.9	74.9	117.5	2.1	6.2	9.1	3.9	9.7	13.2	24014	4.0	19.8	137.5
None	Chisel Plow	2 x 2		76.5	79.7	19.9	75.2	124.3	2.2	6.3	9.5	3.9	9.9	13.8	24237	5.1	19.6	154.2
None	Chisel Plow	2 x 15		70.8	75.2	21.0	79.2	125.7	2.2	6.5	9.7	4.1	10.3	13.9	23344	5.6	19.6	146.7
None	One Coulter	2 x 2		56.5	66.5	18.5	72.7	115.3	2.0	6.2	9.2	3.7	9.7	13.5	21354	3.2	19.9	132.0
None	One Coulter	2 x 15		57.2	69.0	18.8	74.0	115.9	2.0	6.3	9.3	3.9	9.7	13.5	21138	5.1	19.8	136.8
None	Three Coulters	2 x 2		66.8	77.7	19.6	76.0	117.9	2.2	6.3	9.3	3.8	9.8	13.5	23730	4.2	19.8	138.8
None	Three Coulters	2 x 15		68.1	76.3	18.6	74.9	116.2	2.0	6.1	9.1	3.9	9.7	13.3	23595	3.9	19.8	138.7
Zone Builder	Chisel Plow	2 x 2		65.4	75.4	20.1	76.5	126.5	2.2	6.5	9.7	4.0	10.0	13.8	23344	3.8	19.5	157.8
Zone Builder	Chisel Plow	2 x 15		68.1	74.7	19.9	72.7	120.5	2.2	6.2	9.2	3.9	9.7	13.4	24600	6.2	19.6	133.5
Zone Builder	One Coulter	2 x 2		64.3	74.0	19.3	76.5	123.6	1.9	6.3	9.3	3.8	9.7	13.6	22999	4.9	19.7	154.0
Zone Builder	One Coulter	2 x 15		66.3	73.8	18.6	72.4	117.9	2.1	6.2	9.0	3.7	9.5	13.3	22730	4.2	19.6	136.2
Zone Builder	Three Coulters	2 x 2		74.7	82.0	21.5	84.3	133.0	2.1	6.6	9.7	4.1	10.5	14.1	24154	3.7	19.6	156.8
Zone Builder	Three Coulters	2 x 15		50.0	78.3	19.2	75.0	118.8	2.2	6.2	9.0	3.9	9.7	13.1	24433	4.1	19.7	136.2
			Fall	67.7	77.3	19.4	75.8	121.6	2.1	6.3	9.3	3.9	9.8	13.5	23605	3.9	19.7	142.4
			None	66.6	73.7	19.4	75.0	120.5	2.1	6.3	9.3	3.9	9.8	13.5	23106	5.1	19.7	142.1
			Starter	65.5	74.7	20.0	76.5	121.8	2.1	6.3	9.4	3.9	9.9	13.7	23242	4.5	19.6	146.0
None			Fall	69.4	76.5	19.1	75.0	119.1	2.1	6.2	9.3	3.9	9.7	13.6	23368	3.2	19.8	142.4
None			None	64.5	72.6	19.4	75.5	119.4	2.1	6.3	9.4	3.9	9.9	13.6	22683	5.9	19.7	138.5
None			Starter	65.2	73.1	19.6	75.5	119.1	2.0	6.3	9.4	3.9	9.9	13.7	22688	4.5	19.7	142.7
Zone Builder			Fall	65.9	78.0	19.7	76.7	124.1	2.2	6.4	9.3	3.9	9.9	13.5	23833	4.6	19.7	142.3
Zone Builder			None	68.7	74.8	19.3	74.6	121.6	2.1	6.3	9.3	3.9	9.8	13.5	23511	4.3	19.6	145.7
Zone Builder			Starter	65.8	76.3	20.3	77.5	124.5	2.2	6.4	9.4	3.9	9.9	13.7	23820	4.6	19.5	149.3

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.  
Fond du Lac, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population	Broken Stalks	Grain Moist	Yield
		P & K		154	164	164	178	191	164	178	191	164	178	191				
	Chisel Plow	Fall		73.0	79.0	20.6	78.0	127.2	2.2	6.5	9.5	4.0	10.1	13.9	24901	4.0	19.7	154.9
	Chisel Plow	None		73.3	76.0	20.1	75.0	122.6	2.2	6.3	9.5	3.9	9.9	13.6	23351	6.1	19.4	143.1
	Chisel Plow	Starter		65.7	73.7	20.0	74.7	123.1	2.2	6.3	9.5	3.9	9.9	13.7	23393	5.3	19.5	146.2
	One Coulter	Fall		60.0	70.8	18.4	72.0	116.4	2.0	6.1	9.1	3.7	9.4	13.3	22011	3.9	19.7	137.1
	One Coulter	None		59.1	70.2	18.4	73.2	117.9	1.9	6.2	9.1	3.7	9.6	13.4	22026	5.6	19.8	140.2
	One Coulter	Starter		62.9	71.5	19.6	76.5	120.3	2.1	6.3	9.4	3.8	9.9	13.8	22115	3.7	19.7	141.9
	Three Coulters	Fall		70.0	81.9	19.2	77.5	121.3	2.2	6.3	9.2	3.9	9.8	13.4	23925	3.8	19.8	135.0
	Three Coulters	None		67.3	74.9	19.6	76.8	121.0	2.2	6.3	9.4	4.0	9.9	13.6	23874	3.6	19.8	143.1
	Three Coulters	Starter		67.9	78.9	20.4	78.3	122.2	2.1	6.4	9.3	4.0	10.0	13.5	24147	4.6	19.6	149.8
None	Chisel Plow	Fall		78.5	80.4	20.8	80.3	130.0	2.1	6.5	9.8	4.1	10.3	14.2	24586	3.3	19.7	161.9
None	Chisel Plow	None		74.7	76.6	20.5	76.2	122.8	2.3	6.3	9.4	3.9	10.0	13.6	23079	8.5	19.5	139.9
None	Chisel Plow	Starter		73.0	75.3	20.1	75.1	122.3	2.2	6.4	9.6	4.0	10.0	13.8	23707	4.2	19.6	149.5
None	One Coulter	Fall		60.5	68.8	18.3	71.2	113.5	2.1	6.1	9.1	3.7	9.3	13.3	21487	3.2	19.8	135.2
None	One Coulter	None		49.6	65.1	18.4	74.9	116.6	2.0	6.3	9.3	3.8	9.9	13.5	21062	5.1	19.8	133.3
None	One Coulter	Starter		60.0	69.5	19.3	73.9	116.7	1.9	6.3	9.4	3.9	9.8	13.8	21152	4.4	19.9	134.6
None	Three Coulters	Fall		69.2	80.4	18.3	73.6	113.8	2.1	6.1	9.0	3.8	9.6	13.2	24126	3.0	19.9	130.1
None	Three Coulters	None		69.2	76.0	19.4	75.3	118.9	2.1	6.3	9.4	4.0	9.8	13.6	23707	4.1	19.9	142.2
None	Three Coulters	Starter		62.7	74.6	19.6	77.4	118.4	2.0	6.2	9.2	3.9	9.9	13.5	23204	4.9	19.7	143.9
Zone Builder	Chisel Plow	Fall		67.6	77.7	20.3	75.8	124.3	2.3	6.5	9.3	4.0	10.0	13.5	25215	4.7	19.7	147.9
Zone Builder	Chisel Plow	None		71.9	75.3	19.8	73.8	122.4	2.2	6.3	9.6	4.0	9.8	13.6	23623	3.8	19.4	146.2
Zone Builder	Chisel Plow	Starter		58.3	72.2	19.9	74.3	123.9	2.1	6.3	9.4	3.8	9.7	13.7	23079	6.5	19.5	143.0
Zone Builder	One Coulter	Fall		59.4	72.9	18.6	72.8	119.3	2.0	6.2	9.1	3.8	9.5	13.3	22534	4.6	19.6	139.1
Zone Builder	One Coulter	None		68.7	75.3	18.4	71.6	119.2	1.9	6.2	9.0	3.7	9.4	13.3	22869	6.1	19.8	147.1
Zone Builder	One Coulter	Starter		65.9	73.6	19.9	79.0	123.8	2.2	6.3	9.4	3.8	10.0	13.7	23216	2.8	19.6	149.2
Zone Builder	Three Coulters	Fall		70.8	83.5	20.1	81.4	128.8	2.2	6.4	9.4	4.0	10.1	13.6	23749	4.5	19.7	140.0
Zone Builder	Three Coulters	None		65.4	73.9	19.8	78.4	123.1	2.2	6.3	9.4	4.0	10.1	13.6	24042	3.0	19.7	144.0
Zone Builder	Three Coulters	Starter		73.0	83.1	21.2	79.2	125.9	2.1	6.6	9.4	4.0	10.1	13.6	25089	4.2	19.5	155.6
		2 x 2	Fall	68.0	76.8	19.7	77.9	125.2	2.2	6.4	9.5	3.9	10.0	13.8	23572	3.8	19.7	149.0
		2 x 2	None	67.8	74.9	19.3	75.7	122.5	2.1	6.3	9.4	3.9	9.9	13.7	23033	4.9	19.6	144.3
		2 x 2	Starter	66.3	76.0	20.4	77.0	122.7	2.0	6.4	9.4	3.9	10.0	13.8	23383	3.8	19.7	153.4
		2 x 15	Fall	66.3	77.8	19.0	73.8	118.0	2.1	6.2	9.1	3.9	9.6	13.3	23637	4.0	19.8	135.7
		2 x 15	None	61.8	72.4	19.4	74.4	118.5	2.2	6.2	9.3	3.9	9.8	13.4	23176	5.3	19.7	139.9
		2 x 15	Starter	62.2	73.5	19.6	75.9	120.9	2.2	6.3	9.4	3.9	9.9	13.6	23107	5.3	19.5	138.5
None		2 x 2	Fall	68.8	76.3	19.4	75.4	120.1	2.2	6.3	9.3	3.9	9.8	13.7	23395	3.7	19.8	145.5
None		2 x 2	None	64.9	73.6	18.9	73.8	118.8	2.1	6.2	9.3	3.8	9.8	13.5	22816	5.5	19.7	131.9
None		2 x 2	Starter	66.1	74.0	19.6	74.7	118.7	2.0	6.3	9.3	3.8	9.8	13.7	23204	3.5	19.8	147.5
None		2 x 15	Fall	71.8	76.8	18.8	74.6	118.1	2.0	6.2	9.3	3.9	9.7	13.5	23344	2.8	19.8	139.3
None		2 x 15	None	62.7	71.5	20.0	77.1	120.1	2.1	6.3	9.4	4.0	10.0	13.6	22562	6.3	19.8	145.0
None		2 x 15	Starter	61.8	72.2	19.6	76.3	119.6	2.1	6.3	9.5	4.0	10.0	13.7	22171	5.5	19.6	137.8
Zone Builder		2 x 2	Fall	67.2	77.2	20.0	80.3	130.3	2.2	6.5	9.7	3.9	10.2	13.9	23735	3.9	19.6	152.5
Zone Builder		2 x 2	None	70.6	76.3	19.8	77.5	126.2	2.0	6.5	9.5	3.9	9.9	13.8	23232	4.3	19.6	156.8
Zone Builder		2 x 2	Starter	66.5	77.9	21.1	79.4	126.8	2.0	6.5	9.5	3.9	10.1	13.8	23578	4.1	19.6	159.3
Zone Builder		2 x 15	Fall	60.9	78.8	19.3	73.0	118.0	2.1	6.2	8.9	3.9	9.5	13.1	23930	5.3	19.8	132.1
Zone Builder		2 x 15	None	60.9	73.3	18.8	71.6	117.0	2.2	6.1	9.1	3.8	9.6	13.2	23791	4.3	19.7	134.7
Zone Builder		2 x 15	Starter	62.7	74.7	19.5	75.5	122.3	2.3	6.3	9.3	3.8	9.8	13.5	24042	5.0	19.5	139.2
	Chisel Plow	2 x 2	Fall	71.2	77.0	20.9	79.6	130.9	2.3	6.6	9.8	4.0	10.3	14.1	24545	3.5	19.7	162.3
	Chisel Plow	2 x 2	None	74.9	77.7	19.4	75.5	124.9	2.3	6.4	9.6	3.9	10.0	13.7	23204	5.4	19.3	144.1
	Chisel Plow	2 x 2	Starter	66.8	78.0	19.6	72.4	120.5	2.1	6.3	9.4	3.8	9.7	13.7	23623	4.3	19.5	161.6
	Chisel Plow	2 x 15	Fall	80.4	81.1	20.2	76.5	123.4	2.1	6.4	9.3	4.1	10.0	13.6	25257	4.5	19.7	147.5
	Chisel Plow	2 x 15	None	66.8	74.3	20.8	74.4	120.3	2.2	6.3	9.4	4.0	9.9	13.5	23497	6.8	19.6	142.0
	Chisel Plow	2 x 15	Starter	61.3	69.5	20.4	76.9	125.6	2.3	6.4	9.6	3.9	10.0	13.8	23162	6.3	19.5	130.9

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.  
Fond du Lac, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population plants/a	Broken Stalks %	Grain Moist %	Yield bu/a
		P & K		154	164	164	178	191	164	178	191	164	178	191				
	One Coulter	2 x 2	Fall	58.9	70.5	18.1	73.5	119.3	2.1	6.2	9.3	3.7	9.6	13.5	22241	3.7	19.7	145.2
	One Coulter	2 x 2	None	60.0	69.1	18.5	72.9	117.6	1.8	6.2	9.0	3.7	9.5	13.3	22498	5.8	19.9	141.8
	One Coulter	2 x 2	Starter	62.3	71.2	20.1	77.4	121.5	2.0	6.3	9.5	3.8	10.0	13.9	21780	2.8	19.9	141.9
	One Coulter	2 x 15	Fall	64.0	71.2	18.8	70.5	113.4	2.0	6.1	8.9	3.8	9.2	13.1	21780	4.1	19.8	129.0
	One Coulter	2 x 15	None	55.9	71.2	18.3	73.5	118.2	2.1	6.3	9.3	3.8	9.7	13.5	21613	5.5	19.7	138.6
	One Coulter	2 x 15	Starter	65.4	71.9	19.0	75.6	119.0	2.1	6.3	9.3	3.9	9.8	13.7	22409	4.5	19.6	141.9
	Three Coulters	2 x 2	Fall	73.9	82.8	20.1	80.5	125.3	2.3	6.4	9.4	3.9	10.1	13.7	23982	4.1	19.7	139.5
	Three Coulters	2 x 2	None	68.5	78.0	20.1	78.6	124.9	2.2	6.4	9.7	3.9	10.1	13.9	23330	3.6	19.7	147.1
	Three Coulters	2 x 2	Starter	69.8	78.7	21.4	81.4	126.2	2.0	6.5	9.4	4.0	10.2	13.7	24545	4.1	19.7	156.8
	Three Coulters	2 x 15	Fall	54.5	81.1	18.2	74.4	117.3	2.1	6.1	9.0	3.8	9.6	13.1	23875	3.5	19.9	130.6
	Three Coulters	2 x 15	None	62.7	71.9	19.1	75.1	117.1	2.1	6.1	9.1	4.0	9.8	13.2	24419	3.5	19.9	139.1
	Three Coulters	2 x 15	Starter	60.0	79.0	19.4	75.3	118.1	2.1	6.3	9.2	3.9	9.7	13.3	23749	5.0	19.5	142.7
None	Chisel Plow	2 x 2	Fall	79.0	79.0	21.1	80.0	132.0	2.1	6.5	9.8	4.1	10.2	14.1	24293	5.0	19.7	159.8
None	Chisel Plow	2 x 2	None	75.6	79.0	18.6	72.6	120.6	2.3	6.1	9.4	3.7	9.7	13.5	23875	7.7	19.4	136.8
None	Chisel Plow	2 x 2	Starter	74.9	81.1	19.9	72.9	120.4	2.1	6.4	9.4	3.9	9.9	13.9	24545	2.6	19.7	165.9
None	Chisel Plow	2 x 15	Fall	76.3	81.7	20.5	80.6	128.0	2.1	6.5	9.8	4.1	10.4	14.2	24880	1.7	19.7	164.0
None	Chisel Plow	2 x 15	None	70.8	74.3	22.4	79.8	125.0	2.3	6.5	9.5	4.1	10.2	13.7	22283	9.3	19.6	143.0
None	Chisel Plow	2 x 15	Starter	65.4	69.5	20.3	77.3	124.1	2.3	6.4	9.8	4.0	10.1	13.7	22869	5.8	19.5	133.1
None	One Coulter	2 x 2	Fall	58.6	69.5	17.8	71.5	114.6	2.1	6.1	9.3	3.6	9.5	13.5	21613	2.5	19.8	145.1
None	One Coulter	2 x 2	None	52.5	63.4	18.3	72.3	113.9	1.9	6.1	9.0	3.8	9.7	13.4	21333	4.6	19.8	123.0
None	One Coulter	2 x 2	Starter	58.6	66.8	19.5	74.4	117.4	1.9	6.3	9.4	3.8	9.8	13.8	21110	2.9	20.0	127.8
None	One Coulter	2 x 15	Fall	68.1	68.1	18.8	70.9	112.4	2.0	6.0	9.0	3.8	9.1	13.1	21362	4.0	19.8	125.3
None	One Coulter	2 x 15	None	38.2	66.8	18.5	77.5	119.3	2.1	6.4	9.5	3.9	10.1	13.7	20859	5.5	19.9	143.7
None	One Coulter	2 x 15	Starter	65.4	72.2	19.0	73.5	116.0	2.0	6.4	9.4	4.0	9.8	13.8	21194	5.9	19.8	141.4
None	Three Coulters	2 x 2	Fall	68.8	80.4	19.4	74.8	113.6	2.3	6.1	9.0	3.8	9.6	13.3	24572	3.5	19.8	131.5
None	Three Coulters	2 x 2	None	66.8	78.3	19.9	76.5	121.8	2.3	6.4	9.6	3.8	9.9	13.8	22869	4.1	19.9	136.0
None	Three Coulters	2 x 2	Starter	64.7	74.3	19.5	76.8	118.3	2.0	6.3	9.1	3.8	9.9	13.4	23958	4.9	19.8	148.9
None	Three Coulters	2 x 15	Fall	70.8	80.4	17.1	72.4	113.9	2.0	6.1	9.0	3.7	9.5	13.1	23791	2.6	20.0	128.7
None	Three Coulters	2 x 15	None	79.0	73.6	19.0	74.1	116.0	2.0	6.1	9.1	4.1	9.7	13.3	24545	4.0	19.8	148.4
None	Three Coulters	2 x 15	Starter	54.5	74.9	19.6	78.1	118.6	2.0	6.1	9.3	4.0	9.9	13.5	22450	5.0	19.6	138.9
Zone Builder	Chisel Plow	2 x 2	Fall	63.4	74.9	20.8	79.1	129.9	2.4	6.8	9.9	4.0	10.3	14.1	24796	2.1	19.7	164.7
Zone Builder	Chisel Plow	2 x 2	None	74.3	76.3	20.3	78.4	129.1	2.3	6.6	9.8	4.1	10.2	14.0	22534	3.2	19.3	151.5
Zone Builder	Chisel Plow	2 x 2	Starter	58.6	74.9	19.4	71.9	120.6	2.0	6.3	9.4	3.8	9.5	13.5	22702	6.0	19.4	157.3
Zone Builder	Chisel Plow	2 x 15	Fall	84.5	80.4	19.9	72.4	118.8	2.1	6.3	8.8	4.0	9.6	13.0	25634	7.2	19.7	131.0
Zone Builder	Chisel Plow	2 x 15	None	62.7	74.3	19.3	69.1	115.6	2.1	6.0	9.4	3.8	9.5	13.2	24712	4.4	19.5	140.9
Zone Builder	Chisel Plow	2 x 15	Starter	57.2	69.5	20.5	76.6	127.1	2.3	6.4	9.5	3.9	10.0	13.9	23456	6.9	19.5	128.7
Zone Builder	One Coulter	2 x 2	Fall	59.3	71.5	18.5	75.5	124.0	2.0	6.3	9.4	3.8	9.7	13.5	22870	5.0	19.5	145.3
Zone Builder	One Coulter	2 x 2	None	67.4	74.9	18.8	73.6	121.3	1.6	6.3	9.0	3.6	9.4	13.3	23372	6.7	19.9	160.6
Zone Builder	One Coulter	2 x 2	Starter	66.1	75.6	20.8	80.4	125.6	2.1	6.4	9.6	3.9	10.1	14.0	22674	2.5	19.8	156.0
Zone Builder	One Coulter	2 x 15	Fall	60.0	74.3	18.8	70.1	114.5	2.0	6.1	8.9	3.8	9.3	13.0	22199	4.1	19.8	132.8
Zone Builder	One Coulter	2 x 15	None	73.6	75.6	18.0	69.5	117.1	2.1	6.1	9.0	3.7	9.4	13.2	22367	5.5	19.6	133.5
Zone Builder	One Coulter	2 x 15	Starter	65.4	71.5	19.0	77.6	122.0	2.3	6.3	9.3	3.7	9.8	13.5	23623	3.1	19.4	142.4
Zone Builder	Three Coulters	2 x 2	Fall	79.0	85.2	20.9	86.3	136.9	2.3	6.6	9.8	4.1	10.6	14.1	23539	4.5	19.5	147.6
Zone Builder	Three Coulters	2 x 2	None	70.2	77.7	20.3	80.6	128.1	2.1	6.5	9.8	4.0	10.3	14.1	23791	3.1	19.6	158.2
Zone Builder	Three Coulters	2 x 2	Starter	74.9	83.1	23.3	86.0	134.1	2.0	6.8	9.6	4.2	10.6	14.1	25131	3.4	19.6	164.7
Zone Builder	Three Coulters	2 x 15	Fall	38.2	81.7	19.3	76.5	120.6	2.1	6.1	9.0	3.9	9.7	13.1	23958	4.4	19.9	132.4
Zone Builder	Three Coulters	2 x 15	None	46.3	70.2	19.3	76.1	118.1	2.3	6.1	9.0	3.9	9.8	13.1	24293	3.0	19.9	129.8
Zone Builder	Three Coulters	2 x 15	Starter	65.4	83.1	19.1	72.4	117.6	2.3	6.4	9.1	3.9	9.6	13.1	25047	5.0	19.4	146.4
Mean				66.6	75.2	19.6	75.8	121.3	2.1	6.3	9.3	3.9	9.8	13.6	23318	4.5	19.7	143.5

**Table E-48. Fertilizer Placement in Corn Under Zone Tillage.  
Fond du Lac, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population plants/a	Broken Stalks %	Grain Moist %	Yield bu/a
		P & K		154	164	164	178	191	164	178	191	164	178	191				
<b>Probability %</b>																		
Fall Tillage (F)				36.7	5.6	>50	>50	46.5	>50	>50	>50	>50	>50	>50	16.0	>50	16.8	>50
Spring Tillage (S)				17.9	0.4	14.3	16.7	10.7	11.3	35.5	22.5	4.2	3.3	36.5	0.6	27.6	10.8	12.8
F x S				18.1	11.2	47.4	20.4	17.6	>50	>50	>50	45.2	6.8	>50	41.0	>50	>50	14.1
Nitrogen (N)				-	22.7	27.4	6.7	2.6	45.6	7.6	2.8	>50	7.4	0.7	>50	26.6	>50	1.0
F x N				-	>50	16.2	0.5	2.3	30.0	3.5	1.0	4.8	1.6	2.1	15.2	>50	35.5	1.6
S x N				-	28.4	14.7	15.7	35.6	23.8	35.4	37.7	>50	17.8	25.8	>50	>50	11.0	>50
F x S x N				-	38.6	>50	>50	>50	34.2	>50	>50	>50	>50	>50	25.3	48.0	27.9	>50
P & K Treatment (P)				>50	7.0	31.5	>50	>50	>50	>50	>50	>50	>50	46.2	26.5	16.9	17.5	>50
F x P				41.9	>50	>50	>50	>50	49.7	>50	>50	>50	>50	>50	>50	7.3	>50	>50
S x P				35.4	27.9	47.9	29.6	>50	>50	47.6	>50	33.9	26.3	38.8	9.9	24.0	9.1	12.6
F x S x P				3.6	26.3	>50	42.8	>50	>50	>50	>50	>50	>50	>50	23.4	2.4	>50	>50
N x P				-	43.6	>50	>50	42.6	7.7	>50	32.1	>50	43.4	>50	>50	44.2	4.2	35.0
F x N x P				-	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	33.7	>50	23.4
S x N x P				-	26.6	>50	>50	>50	48.1	>50	46.3	>50	>50	>50	32.4	>50	37.1	37.3
F x S x N x P				-	>50	28.7	33.4	>50	>50	>50	>50	>50	>50	46.3	48.4	26.6	29.5	24.2
<b>LSD (0.10)</b>																		
Fall Tillage (F)				NS	1.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Spring Tillage (S)				NS	3.4	NS	NS	NS	NS	NS	NS	0.1	0.2	NS	918	NS	NS	NS
Nitrogen (N)				-	NS	NS	1.9	3.1	NS	0.1	0.2	NS	0.2	0.2	NS	NS	NS	6.5
P & K Treatment (P)				NS	2.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
<b>CV (%)</b>																		
				15.3	10.2	11.4	9.2	8.3	14.3	6.5	7.0	7.6	6.6	5.1	6.6	65.3	1.4	13.2

**Table E-49. Fertilizer Placement in Corn Under Zone Tillage.  
Fond du Lac, WI - 1995**

Fall Tillage	Spring Tillage	Residue Cover		In Row						Between Row					
				Soil Moisture			Soil Bulk Density			Soil Moisture			Soil Bulk Density		
		Pre-plant	Post-Plant	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"
%		%			grams/cc			%			grams/cc				
None		67.3	47.2	19.5	25.1	29.0	1.1	1.5	1.5	19.4	25.0	26.8	1.1	1.6	1.5
Zone Builder		62.5	52.2	18.4	25.7	29.9	1.0	1.5	1.5	20.6	24.6	27.6	1.2	1.6	1.5
	Chisel Plow	36.6	28.1	20.1	26.1	29.5	1.0	1.5	1.5	.	.	.	.	.	.
	One Coulter	75.2	62.0	19.1	24.8	29.0	1.1	1.5	1.5	19.6	25.1	27.3	1.2	1.6	1.5
	Three Coulters	79.6	55.9	17.7	25.3	29.8	0.9	1.5	1.5	22.5	22.9	26.9	1.0	1.6	1.5
None	Chisel Plow	38.9	25.6	20.2	25.5	27.4	1.1	1.5	1.6	.	.	.	.	.	.
None	One Coulter	80.8	62.4	19.3	24.6	29.5	1.1	1.6	1.5	19.4	25.0	26.8	1.1	1.6	1.5
None	Three Coulters	82.3	53.5	19.0	25.1	30.1	1.0	1.6	1.5	.	.	.	.	.	.
Zone Builder	Chisel Plow	33.7	31.5	19.9	26.8	31.7	1.0	1.5	1.5	.	.	.	.	.	.
Zone Builder	One Coulter	69.6	61.6	18.9	25.0	28.5	1.1	1.5	1.5	20.0	25.2	27.8	1.2	1.6	1.5
Zone Builder	Three Coulters	77.0	58.3	16.3	25.4	29.4	0.8	1.5	1.5	22.5	22.9	26.9	1.0	1.6	1.5
Mean		65.0	49.6	18.9	25.4	29.4	1.0	1.5	1.5	20.0	24.8	27.2	1.1	1.6	1.5
<b>Probability %</b>															
Fall Tillage (F)		23.6	> 50	15.6	31.4	4.5	21.1	25.8	16.4	> 50	> 50	32.3	> 50	> 50	> 50
Spring Tillage (S)		< 0.1	< 0.1	6.0	19.2	> 50	26.7	16.8	28.0	-	-	-	-	-	-
F x S		> 50	> 50	38.0	> 50	27.4	> 50	26.5	36.4	-	-	-	-	-	-
<b>LSD (0.10)</b>															
Fall Tillage (F)		NS	NS	NS	NS	0.6	NS	NS	NS	NS	NS	NS	NS	NS	NS
Spring Tillage (S)		6.7	9.2	1.6	NS	NS	NS	NS	NS	-	-	-	-	-	-
<b>CV (%)</b>		11.5	20.7	9.5	5.5	11.8	17.1	2.4	4.8	12.6	4.8	2.8	7.0	3.6	3.0

# FIELD EXPERIMENT HISTORY

**Title:** Fertilizer Placement in Corn Under Zone Tillage **Year:** 1995  
**Expt. No.:** 9597  
**Personnel:** J.G. Lauer, N.C. Wollenhaupt, F.D. Thompson, K.D. Hudelson, A.H. Bosworth, K.G. Silveira  
**Location:** Darrow Farm, Chippewa Falls, WI  
**Supported by:**

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## 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

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## EXPERIMENTAL PROCEDURE

Exp. Design: RCB Split-Split-Split Plot

Replicates: 4

Factors:

Fall Tillage	No-Till Zone Builder (Oct. 94)
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. 94) Starter 25 gpa of 4-10-10 None

Plot Size: Planted: 10' x 30'  
Harvested: 5' x 26'

Planting: Date: April 28  
Row Spacing: 30"  
Equipment: John Deere Max-Emerge  
Depth: 2"  
Rate: 32,000/a  
Hybrid: Pioneer 3861

Harvesting: Date: Oct. 11  
Equipment: Gleaner Plot Combine

Herbicides:

<u>Material</u>	<u>Rate</u>	<u>Method</u>
Roundup	2 qts/a	planting
Dual	2.5 pts/a	Pre-emerge
Bladex 4L	2.25 pts/a	Pre-emerge

Insecticides: Lorsban 8 oz/1000' planting

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Results: Table E-50, 51.

**Table E-50. Fertilizer Placement in Corn Under Zone Tillage.  
Chippewa Falls, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Emergence		Plant Height			Leaf Collars			Leaf No. (Hahn)			Final Population	Broken Stalks	Grain Moist	Yield
				Day of Year	Day of Year	152	166	180	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year				
				%	%	cm						plants/a	%	%	bu/a			
None				26.3	79.8	12.8	37.9	84.7	1.8	4.2	8.7	3.3	6.7	12.6	24676	0.7	23.5	109.9
Zone Builder				31.3	80.5	13.5	39.8	92.3	1.8	4.4	9.0	3.4	7.0	13.2	24913	1.0	23.3	111.7
	Chisel Plow			42.1	79.2	14.8	43.2	101.1	2.0	4.7	9.2	3.6	7.4	13.6	24604	0.9	22.8	115.4
	One Coulter			19.2	79.6	12.1	36.8	83.1	1.6	4.1	8.5	3.2	6.6	12.5	24938	1.0	23.7	109.1
	Three Coulters			25.1	81.6	12.7	36.7	80.9	1.7	4.2	8.7	3.3	6.6	12.6	24836	0.8	23.7	107.9
None	Chisel Plow			39.5	78.7	14.3	42.8	98.3	2.0	4.7	9.2	3.6	7.3	13.6	24293	0.8	22.6	114.0
None	One Coulter			16.6	79.0	11.8	36.0	79.8	1.6	3.9	8.3	3.1	6.4	12.2	25165	0.8	24.0	108.8
None	Three Coulters			22.7	81.7	12.3	35.0	75.6	1.7	4.2	8.5	3.2	6.5	12.1	24613	0.6	23.9	106.9
Zone Builder	Chisel Plow			44.7	79.7	15.2	43.6	104.0	2.0	4.8	9.3	3.6	7.4	13.6	24947	0.9	22.9	116.7
Zone Builder	One Coulter			21.8	80.2	12.4	37.6	86.5	1.7	4.3	8.8	3.3	6.8	12.9	24712	1.2	23.5	109.4
Zone Builder	Three Coulters			27.5	81.5	13.0	38.3	86.2	1.7	4.3	8.9	3.3	6.7	13.1	25081	0.9	23.5	108.9
		2 x 2		28.8	80.0	13.3	38.1	85.7	1.8	4.3	8.8	3.4	6.8	12.8	24899	0.7	23.9	113.8
		2 x 15		-	80.2	13.1	39.7	91.4	1.8	4.4	8.8	3.3	6.9	13.0	24682	1.1	22.8	107.7
None		2 x 2		26.3	80.2	13.1	38.0	84.0	1.8	4.3	8.7	3.4	6.8	12.6	24838	0.6	24.0	113.3
None		2 x 15		-	79.5	12.5	37.8	85.3	1.8	4.2	8.7	3.3	6.7	12.6	24513	0.9	23.0	106.6
Zone Builder		2 x 2		31.3	79.9	13.4	38.2	87.3	1.8	4.3	8.9	3.4	6.9	13.0	24963	0.8	23.9	114.4
Zone Builder		2 x 15		-	81.0	13.6	41.5	97.5	1.8	4.6	9.0	3.4	7.1	13.4	24863	1.3	22.7	108.9
	Chisel Plow	2 x 2		42.1	80.7	14.8	42.8	98.0	2.0	4.8	9.3	3.6	7.4	13.5	24732	0.5	23.2	116.9
	Chisel Plow	2 x 15		-	77.7	14.7	43.5	104.3	2.0	4.7	9.2	3.5	7.3	13.7	24477	1.2	22.3	113.9
	One Coulter	2 x 2		19.2	77.7	12.3	36.2	80.1	1.7	4.0	8.5	3.2	6.6	12.4	24863	1.1	24.5	110.9
	One Coulter	2 x 15		-	81.5	11.8	37.4	86.5	1.5	4.2	8.6	3.1	6.6	12.7	25014	1.0	23.0	107.3
	Three Coulters	2 x 2		25.1	81.7	12.7	35.2	78.9	1.7	4.0	8.6	3.2	6.5	12.6	25099	0.6	24.1	113.7
	Three Coulters	2 x 15		-	81.5	12.7	38.1	82.9	1.8	4.4	8.8	3.3	6.8	12.6	24573	1.0	23.3	102.1
None	Chisel Plow	2 x 2		39.5	80.4	14.8	43.7	98.4	2.0	4.8	9.3	3.6	7.5	13.7	24735	0.5	23.0	115.2
None	Chisel Plow	2 x 15		-	77.0	13.9	41.8	98.2	2.0	4.6	9.1	3.5	7.1	13.5	23852	1.1	22.2	112.8
None	One Coulter	2 x 2		16.6	77.2	12.0	35.4	78.2	1.6	3.8	8.2	3.2	6.3	12.0	24896	1.0	24.8	114.5
None	One Coulter	2 x 15		-	80.8	11.6	36.5	81.7	1.5	4.0	8.4	3.0	6.4	12.4	25433	0.6	23.1	103.2
None	Three Coulters	2 x 2		22.7	82.9	12.6	34.9	75.6	1.6	4.1	8.5	3.3	6.5	12.2	24887	0.4	24.1	110.1
None	Three Coulters	2 x 15		-	80.6	12.0	35.1	75.7	1.8	4.2	8.5	3.2	6.5	12.1	24339	0.9	23.7	103.7
Zone Builder	Chisel Plow	2 x 2		44.7	81.1	14.8	41.9	97.6	2.0	4.7	9.3	3.6	7.3	13.4	24729	0.5	23.4	118.6
Zone Builder	Chisel Plow	2 x 15		-	78.3	15.5	45.3	110.4	2.0	4.9	9.3	3.6	7.6	13.9	25165	1.3	22.4	114.9
Zone Builder	One Coulter	2 x 2		21.8	78.1	12.7	37.0	82.1	1.7	4.2	8.8	3.3	6.8	12.7	24829	1.1	24.2	107.4
Zone Builder	One Coulter	2 x 15		-	82.2	12.0	38.2	91.3	1.6	4.4	8.7	3.2	6.8	13.1	24595	1.3	22.8	111.4
Zone Builder	Three Coulters	2 x 2		27.5	80.6	12.7	35.5	82.2	1.7	4.0	8.7	3.2	6.5	12.9	25332	0.8	24.1	117.3
Zone Builder	Three Coulters	2 x 15		-	82.4	13.3	41.0	90.2	1.8	4.5	9.1	3.4	7.0	13.2	24830	1.1	22.9	100.5
			Fall	30.2	80.0	13.4	39.3	88.4	1.8	4.4	8.9	3.3	6.9	12.8	24896	0.8	23.5	110.9
			None	29.6	80.0	12.9	37.8	84.7	1.8	4.3	8.7	3.3	6.8	12.7	25057	0.9	23.3	107.6
			Starter	26.6	80.3	13.2	39.5	92.1	1.8	4.4	8.9	3.3	6.9	13.2	24438	0.9	23.4	113.9
None			Fall	26.3	78.7	12.8	38.0	82.7	1.8	4.3	8.6	3.3	6.7	12.4	24857	0.8	23.5	110.8
None			None	29.3	81.3	12.7	37.3	80.4	1.8	4.3	8.5	3.3	6.7	12.4	24896	0.7	23.3	105.4
None			Starter	23.2	79.5	13.0	38.5	90.6	1.8	4.2	8.8	3.3	6.7	13.0	24293	0.7	23.6	113.6
Zone Builder			Fall	34.1	81.4	14.0	40.7	95.5	1.8	4.5	9.1	3.4	7.1	13.3	24945	0.9	23.5	110.9
Zone Builder			None	30.0	78.8	13.2	38.3	88.5	1.8	4.3	8.8	3.4	6.8	13.0	25211	1.1	23.4	109.8
Zone Builder			Starter	30.0	81.2	13.4	40.6	93.5	1.8	4.5	9.0	3.4	7.0	13.3	24589	1.1	23.1	114.2

**Table E-50. Fertilizer Placement in Corn Under Zone Tillage.  
Chippewa Falls, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement		Emergence Day of Year		Plant Height Day of Year			Leaf Collars Day of Year			Leaf No. (Hahn) Day of Year			Final Population	Broken Stalks	Grain Moist	Yield
		P & K		138	152	152	166	180	152	166	180	152	166	180				
	Chisel Plow	Fall	44.6	79.7	14.8	43.7	100.6	2.0	4.7	9.2	3.6	7.4	13.5	24868	1.2	22.9	119.9	
	Chisel Plow	None	41.6	78.9	14.7	42.7	100.0	2.0	4.8	9.3	3.6	7.3	13.7	24652	0.8	22.6	107.4	
	Chisel Plow	Starter	40.2	79.0	14.8	43.2	102.6	2.0	4.7	9.2	3.6	7.4	13.6	24293	0.7	22.8	118.9	
	One Coulter	Fall	20.4	77.2	12.3	36.6	82.0	1.6	4.2	8.5	3.1	6.6	12.4	24987	0.3	23.8	110.2	
	One Coulter	None	19.4	81.9	12.0	36.4	78.6	1.6	4.1	8.4	3.2	6.6	12.3	25710	1.4	23.6	105.0	
	One Coulter	Starter	17.7	79.7	11.9	37.4	87.8	1.6	4.0	8.6	3.2	6.5	12.9	24327	1.4	23.8	112.1	
	Three Coulters	Fall	25.5	83.3	13.0	37.8	80.5	1.7	4.3	8.8	3.3	6.7	12.5	24824	1.1	23.7	102.5	
	Three Coulters	None	27.9	79.4	12.1	34.3	77.5	1.7	4.0	8.5	3.2	6.4	12.3	24963	0.7	23.8	110.4	
	Three Coulters	Starter	21.8	82.3	12.9	38.0	85.4	1.7	4.3	8.9	3.3	6.8	13.0	24700	0.7	23.6	110.8	
None	Chisel Plow	Fall	34.7	77.3	13.9	42.2	93.9	2.0	4.6	9.1	3.5	7.3	13.2	24604	1.4	22.8	116.9	
None	Chisel Plow	None	42.9	80.0	14.4	42.6	98.8	2.0	4.8	9.2	3.6	7.3	13.6	24126	0.2	22.2	100.0	
None	Chisel Plow	Starter	40.9	78.7	14.8	43.5	101.9	2.0	4.7	9.3	3.6	7.4	13.8	24168	0.8	22.8	125.1	
None	One Coulter	Fall	20.4	77.3	11.9	36.3	78.9	1.6	4.0	8.4	3.1	6.5	12.2	24922	0.2	23.9	112.0	
None	One Coulter	None	19.1	83.5	11.9	35.8	72.9	1.6	3.9	8.1	3.2	6.4	11.8	26471	1.2	24.0	108.8	
None	One Coulter	Starter	10.2	76.3	11.4	35.8	86.8	1.5	3.8	8.3	3.0	6.2	12.6	24509	1.2	24.1	105.6	
None	Three Coulters	Fall	23.8	81.4	12.4	35.5	74.8	1.7	4.2	8.4	3.2	6.5	11.8	25035	0.8	23.8	103.4	
None	Three Coulters	None	25.9	80.4	11.6	33.4	73.5	1.6	4.1	8.4	3.2	6.3	12.1	24587	0.9	23.8	107.3	
None	Three Coulters	Starter	18.4	83.5	12.9	36.1	79.2	1.8	4.2	8.7	3.3	6.7	12.4	24221	0.2	24.0	110.1	
Zone Builder	Chisel Plow	Fall	54.5	82.1	15.8	45.3	107.4	2.0	4.8	9.4	3.7	7.5	13.7	25131	1.0	23.0	122.8	
Zone Builder	Chisel Plow	None	40.2	77.7	15.0	42.7	100.9	2.0	4.8	9.3	3.6	7.4	13.8	25179	1.3	23.0	114.8	
Zone Builder	Chisel Plow	Starter	39.5	79.4	14.8	42.8	103.5	2.0	4.8	9.2	3.5	7.4	13.4	24461	0.5	22.7	112.6	
Zone Builder	One Coulter	Fall	20.4	77.0	12.6	36.8	86.9	1.7	4.4	8.7	3.2	6.7	12.6	25075	0.4	23.8	108.3	
Zone Builder	One Coulter	None	19.8	80.4	12.0	37.0	83.4	1.6	4.2	8.7	3.2	6.8	12.7	25075	1.6	23.3	101.2	
Zone Builder	One Coulter	Starter	25.2	83.1	12.4	39.1	88.4	1.7	4.3	8.9	3.3	6.9	13.2	24168	1.6	23.5	118.6	
Zone Builder	Three Coulters	Fall	27.3	85.2	13.5	40.0	87.3	1.8	4.4	9.2	3.3	6.9	13.4	24528	1.4	23.6	101.6	
Zone Builder	Three Coulters	None	30.0	78.3	12.6	35.1	81.4	1.8	3.9	8.6	3.2	6.4	12.5	25340	0.5	23.8	113.5	
Zone Builder	Three Coulters	Starter	25.2	81.1	12.9	39.8	90.8	1.6	4.4	9.0	3.3	6.9	13.5	25179	1.1	23.1	111.5	
		2 x 2	Fall	30.2	81.3	13.4	38.6	87.0	1.8	4.3	8.8	3.3	6.8	12.8	24584	0.5	24.1	110.6
		2 x 2	None	29.6	79.3	13.0	37.2	82.6	1.8	4.3	8.7	3.4	6.8	12.7	25291	0.6	24.0	113.7
		2 x 2	Starter	26.6	79.6	13.3	38.5	87.8	1.7	4.2	8.8	3.4	6.8	13.0	24746	1.1	23.8	117.2
		2 x 15	Fall	-	78.8	13.3	40.1	89.7	1.8	4.5	8.9	3.3	7.0	12.8	25179	1.2	22.9	111.1
		2 x 15	None	-	80.8	12.8	38.3	87.5	1.7	4.3	8.7	3.3	6.7	12.8	24759	1.3	22.7	101.5
		2 x 15	Starter	-	81.1	13.1	40.6	96.1	1.8	4.5	9.0	3.3	6.9	13.4	24170	0.8	23.0	110.7
None		2 x 2	Fall	26.3	78.1	13.0	37.8	81.6	1.8	4.3	8.6	3.3	6.7	12.4	24092	0.5	24.0	108.2
None		2 x 2	None	29.3	82.7	12.9	37.8	81.0	1.8	4.3	8.6	3.4	6.8	12.5	25649	0.5	23.9	112.4
None		2 x 2	Starter	23.2	79.7	13.4	38.5	88.8	1.7	4.2	8.8	3.3	6.8	13.0	24705	0.9	24.0	119.2
None		2 x 15	Fall	-	79.3	12.5	38.2	83.5	1.8	4.3	8.7	3.2	6.8	12.5	25494	1.0	23.0	113.4
None		2 x 15	None	-	79.9	12.4	36.8	79.6	1.7	4.2	8.5	3.2	6.5	12.4	23977	1.0	22.7	98.3
None		2 x 15	Starter	-	79.3	12.7	38.5	92.7	1.8	4.3	8.8	3.3	6.7	13.0	23882	0.6	23.2	108.0
Zone Builder		2 x 2	Fall	34.1	84.5	13.8	39.4	92.4	1.8	4.4	9.1	3.3	6.9	13.2	25131	0.5	24.2	113.0
Zone Builder		2 x 2	None	30.0	75.8	13.1	36.7	84.0	1.8	4.2	8.9	3.3	6.7	12.9	24963	0.7	24.1	115.1
Zone Builder		2 x 2	Starter	30.0	79.5	13.2	38.5	86.6	1.8	4.3	8.9	3.4	6.9	12.9	24796	1.4	23.5	115.1
Zone Builder		2 x 15	Fall	-	78.3	14.1	42.0	98.9	1.8	4.7	9.2	3.4	7.2	13.4	24759	1.3	22.7	108.8
Zone Builder		2 x 15	None	-	81.7	13.3	39.8	94.5	1.8	4.4	8.8	3.4	7.0	13.1	25541	1.6	22.7	104.6
Zone Builder		2 x 15	Starter	-	82.9	13.5	42.7	98.7	1.8	4.7	9.1	3.4	7.2	13.6	24433	0.9	22.7	113.4
	Chisel Plow	2 x 2	Fall	44.6	82.4	15.4	44.6	98.4	2.0	4.8	9.2	3.6	7.5	13.4	24652	0.2	23.3	120.3
	Chisel Plow	2 x 2	None	41.6	77.0	14.6	42.6	97.6	2.0	4.8	9.4	3.6	7.4	13.8	24628	0.5	23.2	116.6
	Chisel Plow	2 x 2	Starter	40.2	82.8	14.4	41.3	97.9	2.0	4.6	9.2	3.6	7.3	13.5	24964	0.9	23.1	113.8
	Chisel Plow	2 x 15	Fall	-	77.0	14.3	42.9	102.9	2.0	4.6	9.2	3.5	7.3	13.6	25083	2.1	22.5	119.4
	Chisel Plow	2 x 15	None	-	80.7	14.8	42.8	103.4	2.0	4.8	9.0	3.5	7.2	13.6	24684	1.1	21.9	98.2
	Chisel Plow	2 x 15	Starter	-	75.3	15.1	45.0	106.1	2.0	4.8	9.3	3.6	7.4	13.8	23791	0.6	22.5	123.9

**Table E-50. Fertilizer Placement in Corn Under Zone Tillage.  
Chippewa Falls, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen		Emergence		Plant Height			Leaf Collars			Leaf No. (Hahn)			Final Population	Broken Stalks	Grain Moist	Yield
		Place-ment	P & K	138	152	152	166	180	152	166	180	152	166	180				
				%		cm						plants/a			%		bu/a	
	One Coulter	2 x 2	Fall	20.4	76.3	12.3	34.9	78.5	1.7	4.1	8.5	3.2	6.5	12.3	24796	0.2	24.8	107.3
	One Coulter	2 x 2	None	19.4	82.4	12.2	36.8	77.4	1.8	4.1	8.4	3.3	6.7	12.1	25322	0.8	24.5	107.4
	One Coulter	2 x 2	Starter	17.7	74.3	12.4	37.0	84.3	1.6	3.9	8.6	3.2	6.5	12.7	24461	2.0	24.3	118.1
	One Coulter	2 x 15	Fall	-	78.0	12.3	38.3	84.9	1.6	4.3	8.6	3.1	6.7	12.4	25131	0.3	22.9	113.1
	One Coulter	2 x 15	None	-	81.4	11.8	36.0	80.9	1.4	4.0	8.5	3.1	6.5	12.7	26388	2.5	22.8	102.6
	One Coulter	2 x 15	Starter	-	85.2	11.4	37.9	91.2	1.6	4.2	8.6	3.2	6.6	13.1	24210	0.9	23.3	106.1
	Three Coulters	2 x 2	Fall	25.5	85.2	12.6	36.3	81.2	1.6	4.1	8.7	3.2	6.5	12.6	24293	1.0	24.2	104.3
	Three Coulters	2 x 2	None	27.9	78.3	12.3	32.3	74.1	1.7	3.8	8.4	3.2	6.1	12.3	25927	0.5	24.2	117.2
	Three Coulters	2 x 2	Starter	21.8	81.7	13.1	37.1	82.6	1.6	4.2	8.7	3.3	6.7	12.9	24844	0.4	23.9	119.6
	Three Coulters	2 x 15	Fall	-	81.4	13.3	39.2	79.9	1.8	4.5	8.8	3.4	6.9	12.5	25355	1.1	23.2	100.7
	Three Coulters	2 x 15	None	-	80.4	11.9	36.2	80.8	1.8	4.1	8.5	3.2	6.6	12.3	24000	0.9	23.4	103.5
	Three Coulters	2 x 15	Starter	-	82.8	12.8	38.9	88.7	1.7	4.4	9.0	3.3	6.8	13.2	24557	0.9	23.2	102.0
None	Chisel Plow	2 x 2	Fall	34.7	77.0	14.4	42.9	92.5	2.0	4.8	9.0	3.5	7.4	13.1	24238	0.5	23.1	110.6
None	Chisel Plow	2 x 2	None	42.9	81.7	15.0	45.0	102.0	2.0	4.9	9.5	3.7	7.7	13.9	24963	0.0	22.7	111.6
None	Chisel Plow	2 x 2	Starter	40.9	82.4	15.0	43.3	100.1	2.0	4.8	9.3	3.7	7.5	14.0	24880	1.0	23.2	123.4
None	Chisel Plow	2 x 15	Fall	-	77.7	13.4	41.5	94.9	2.0	4.5	9.1	3.5	7.2	13.4	24880	2.0	22.4	123.2
None	Chisel Plow	2 x 15	None	-	78.3	13.8	40.3	94.0	2.0	4.6	8.8	3.5	6.8	13.2	23009	0.5	21.7	88.4
None	Chisel Plow	2 x 15	Starter	-	74.9	14.5	43.8	103.6	2.0	4.6	9.3	3.5	7.2	13.7	23456	0.7	22.4	126.8
None	One Coulter	2 x 2	Fall	20.4	73.6	12.4	35.8	78.5	1.8	3.9	8.5	3.4	6.5	12.3	24377	0.4	24.9	116.1
None	One Coulter	2 x 2	None	19.1	84.5	11.9	35.3	71.8	1.8	4.0	7.8	3.3	6.4	11.4	26024	0.9	24.9	113.8
None	One Coulter	2 x 2	Starter	10.2	73.6	11.6	35.1	84.0	1.4	3.6	8.2	2.9	6.1	12.3	24461	1.9	24.7	113.5
None	One Coulter	2 x 15	Fall	-	81.1	11.5	36.9	79.3	1.4	4.1	8.4	2.9	6.4	12.1	25466	0.0	22.9	108.0
None	One Coulter	2 x 15	None	-	82.4	12.0	36.3	74.5	1.5	3.9	8.5	3.1	6.4	12.2	27142	1.7	23.0	103.8
None	One Coulter	2 x 15	Starter	-	79.0	11.3	36.5	89.7	1.6	3.9	8.5	3.1	6.3	12.8	24545	0.7	23.5	97.6
None	Three Coulters	2 x 2	Fall	23.8	83.8	12.4	34.8	71.5	1.5	4.1	8.3	3.2	6.3	11.4	23567	0.6	24.0	97.9
None	Three Coulters	2 x 2	None	25.9	81.7	11.9	33.0	72.1	1.6	4.1	8.4	3.3	6.4	12.2	26053	0.6	24.2	111.8
None	Three Coulters	2 x 2	Starter	18.4	83.1	13.6	37.0	81.0	1.8	4.1	8.8	3.4	6.8	12.6	24712	0.0	24.2	120.7
None	Three Coulters	2 x 15	Fall	-	79.0	12.5	36.3	76.5	1.9	4.3	8.5	3.3	6.7	12.0	26136	1.0	23.6	108.9
None	Three Coulters	2 x 15	None	-	79.0	11.4	33.9	74.9	1.6	4.0	8.4	3.1	6.3	12.1	23121	1.1	23.5	102.8
None	Three Coulters	2 x 15	Starter	-	83.8	12.3	35.3	75.5	1.8	4.3	8.5	3.2	6.6	12.1	23567	0.5	23.9	99.4
Zone Builder	Chisel Plow	2 x 2	Fall	54.5	87.9	16.4	46.3	102.9	2.0	4.9	9.4	3.7	7.5	13.6	24964	0.0	23.5	130.0
Zone Builder	Chisel Plow	2 x 2	None	40.2	72.2	14.1	40.1	94.4	2.0	4.8	9.4	3.6	7.2	13.7	24293	1.0	23.8	121.6
Zone Builder	Chisel Plow	2 x 2	Starter	39.5	83.1	13.9	39.4	93.5	2.0	4.5	9.0	3.5	7.1	12.3	25131	0.6	23.0	104.2
Zone Builder	Chisel Plow	2 x 15	Fall	-	76.3	15.1	44.3	113.5	2.0	4.8	9.3	3.6	7.5	13.9	25354	2.2	22.6	115.7
Zone Builder	Chisel Plow	2 x 15	None	-	83.1	15.9	45.3	109.7	2.0	4.9	9.2	3.6	7.6	13.8	26360	1.7	22.2	108.1
Zone Builder	Chisel Plow	2 x 15	Starter	-	75.6	15.6	46.3	108.5	2.0	5.0	9.3	3.6	7.6	13.9	24126	0.4	22.5	121.0
Zone Builder	One Coulter	2 x 2	Fall	20.4	79.0	12.3	34.0	78.5	1.6	4.3	8.5	3.1	6.5	12.4	25634	0.0	24.7	98.5
Zone Builder	One Coulter	2 x 2	None	19.8	80.4	12.5	38.3	81.5	1.8	4.3	8.8	3.4	7.0	12.5	24796	0.8	24.1	101.0
Zone Builder	One Coulter	2 x 2	Starter	25.2	74.9	13.3	38.9	84.5	1.8	4.1	9.0	3.5	7.0	13.0	24461	2.1	23.8	122.6
Zone Builder	One Coulter	2 x 15	Fall	-	74.9	13.0	39.6	92.5	1.8	4.5	8.8	3.2	6.9	12.8	24796	0.7	22.8	118.2
Zone Builder	One Coulter	2 x 15	None	-	80.4	11.5	35.8	87.3	1.4	4.1	8.5	3.1	6.5	13.1	25634	3.3	22.6	101.4
Zone Builder	One Coulter	2 x 15	Starter	-	91.3	11.6	39.3	92.4	1.6	4.5	8.8	3.2	6.8	13.4	23874	1.1	23.1	114.5
Zone Builder	Three Coulters	2 x 2	Fall	27.3	86.5	12.9	37.9	87.7	1.8	4.1	9.0	3.2	6.8	13.3	25019	1.3	24.4	110.7
Zone Builder	Three Coulters	2 x 2	None	30.0	74.9	12.6	31.6	76.1	1.8	3.5	8.5	3.1	5.9	12.4	25801	0.3	24.3	122.7
Zone Builder	Three Coulters	2 x 2	Starter	25.2	80.4	12.5	37.1	84.8	1.5	4.3	8.7	3.3	6.7	13.2	25019	0.9	23.7	118.4
Zone Builder	Three Coulters	2 x 15	Fall	-	83.8	14.1	42.1	86.8	1.8	4.8	9.5	3.4	7.1	13.6	23791	1.4	22.9	92.6
Zone Builder	Three Coulters	2 x 15	None	-	81.7	12.5	38.5	86.8	1.9	4.3	8.6	3.4	6.8	12.6	24880	0.7	23.2	104.3
Zone Builder	Three Coulters	2 x 15	Starter	-	81.7	13.4	42.5	95.3	1.6	4.6	9.3	3.3	7.1	13.7	25299	1.3	22.6	104.5
Mean				28.8	80.1	13.2	38.9	88.5	1.8	4.3	8.8	3.3	6.9	12.9	24791	0.9	23.4	110.8

**Table E-50. Fertilizer Placement in Corn Under Zone Tillage.  
Chippewa Falls, WI - 1995**

Fall Tillage	Spring Tillage	Nitrogen Placement	P & K	Emergence		Plant Height			Leaf Collars			Leaf No. (Hahn)			Final Population	Broken Stalks	Grain Moist	Yield
				Day of Year	Day of Year	152	166	180	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year	Day of Year				
				%	%	cm									plants/a	%	%	bu/a
<b>Probability %</b>																		
Fall Tillage (F)				31.4	> 50	40.5	36.8	5.0	> 50	27.9	0.8	> 50	21.9	5.9	> 50	33.8	40.7	> 50
Spring Tillage (S)				< 0.1	30.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	43.8	> 50	3.2	29.9
F x S				> 50	> 50	> 50	> 50	> 50	> 50	7.0	35.4	46.1	47.5	21.0	> 50	> 50	> 50	> 50
Nitrogen (N)				-	> 50	48.6	9.4	12.0	> 50	5.6	> 50	48.8	49.0	39.9	> 50	2.7	< 0.1	15.3
F x N				-	> 50	9.7	6.7	3.8	> 50	3.8	34.4	22.8	7.4	21.4	> 50	26.8	> 50	> 50
S x N				-	24.7	> 50	> 50	> 50	43.9	19.1	> 50	40.3	27.5	> 50	> 50	> 50	20.4	> 50
F x S x N				-	> 50	29.3	40.5	> 50	> 50	36.7	> 50	> 50	20.0	> 50	48.0	44.8	40.6	44.5
P & K Treatment (P)				> 50	> 50	29.8	3.0	0.7	> 50	20.0	13.7	> 50	22.6	6.8	1.0	> 50	> 50	24.6
F x P				> 50	22.8	28.0	48.1	37.2	> 50	19.0	49.7	> 50	> 50	30.7	> 50	> 50	3.6	> 50
S x P				> 50	27.7	> 50	24.1	> 50	> 50	10.8	43.4	> 50	30.3	18.4	34.1	5.9	> 50	28.9
F x S x P				31.2	46.2	48.2	43.0	13.2	31.1	> 50	> 50	28.6	48.0	9.1	> 50	31.6	34.9	12.5
N x P				-	35.0	> 50	> 50	> 50	> 50	38.9	> 50	> 50	> 50	> 50	30.5	12.5	7.3	24.0
F x N x P				-	4.4	> 50	> 50	49.4	> 50	> 50	> 50	> 50	> 50	> 50	2.3	> 50	> 50	43.7
S x N x P				-	7.4	23.3	10.8	38.2	> 50	44.7	> 50	> 50	48.0	> 50	8.0	25.9	> 50	28.1
F x S x N x P				-	38.7	17.5	11.7	> 50	16.9	> 50	> 50	3.3	19.9	> 50	> 50	> 50	> 50	41.4
<b>LSD (0.10)</b>																		
Fall Tillage (F)				NS	NS	NS	NS	5.1	NS	NS	0.1	NS	NS	0.4	NS	NS	NS	NS
Spring Tillage (S)				6.5	NS	0.7	1.8	5.0	0.1	0.1	0.2	0.1	0.2	0.4	NS	NS	0.7	NS
Nitrogen (N)				-	NS	NS	1.6	NS	NS	0.1	NS	NS	NS	NS	NS	0.3	0.3	NS
P & K Treatment (P)				NS	NS	NS	1.2	2.7	NS	NS	NS	NS	NS	0.2	510	NS	NS	NS
<b>CV (%)</b>																		
				43.0	9.7	10.6	9.0	7.9	16.3	8.5	5.4	7.5	6.8	4.8	5.6	147.4	2.5	16.5

**Table E-51. Fertilizer Placement in Corn Under Zone Tillage.  
Chippewa Falls, WI - 1995**

Fall Tillage	Spring Tillage	Residue Cover		In Row						Between Row					
				Soil Moisture			Soil Bulk Density			Soil Moisture			Soil Bulk Density		
		Pre-plant	Post-Plant	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"	0-3"	3-6"	6-9"
%		%			grams/cc			%			grams/cc				
None		63.0	54.6	17.3	19.3	18.8	1.2	1.4	1.5	17.8	17.3	18.1	1.3	1.3	1.6
Zone Builder		70.8	58.0	17.8	18.9	18.5	1.2	1.4	1.5	18.6	18.6	17.5	1.1	1.3	1.6
	Chisel Plow	32.1	37.1	16.9	19.5	18.6	1.2	1.4	1.5	16.3	16.4	17.3	1.1	1.1	1.5
	One Coulter	83.6	66.6	18.4	19.4	19.3	1.2	1.4	1.5	19.8	19.1	18.3	1.3	1.5	1.6
	Three Coulters	84.9	65.1	17.4	18.4	18.0	1.2	1.5	1.5	.	.	.	.	.	.
None	Chisel Plow	31.5	40.8	17.0	19.5	19.0	1.2	1.4	1.5	15.8	14.4	17.9	1.2	1.1	1.5
None	One Coulter	76.1	60.1	17.8	19.2	19.3	1.2	1.4	1.5	19.7	19.5	18.3	1.3	1.5	1.6
None	Three Coulters	81.4	62.9	17.2	19.0	18.1	1.2	1.4	1.5	.	.	.	.	.	.
Zone Builder	Chisel Plow	32.8	33.5	16.8	19.4	18.2	1.2	1.4	1.6	17.0	18.5	16.6	0.9	1.0	1.5
Zone Builder	One Coulter	91.1	73.1	18.9	19.6	19.3	1.2	1.4	1.5	19.8	18.6	18.4	1.4	1.5	1.6
Zone Builder	Three Coulters	88.4	67.4	17.6	17.7	17.9	1.2	1.5	1.5	.	.	.	.	.	.
Mean		66.9	56.3	17.5	19.1	18.6	1.2	1.4	1.5	18.2	17.9	17.8	1.2	1.3	1.6
<b>Probability %</b>															
Fall Tillage (F)		28.1	> 50	2.8	> 50	> 50	44.5	12.5	47.3	> 50	33.2	> 50	> 50	> 50	45.5
Spring Tillage (S)		< 0.1	< 0.1	7.6	2.2	5.7	> 50	2.4	7.9	1.0	33.1	19.6	11.2	15.9	2.1
F x S		13.8	2.3	> 50	10.6	> 50	> 50	42.6	> 50	49.6	27.9	36.7	26.4	> 50	49.5
<b>LSD (0.10)</b>															
Fall Tillage (F)		NS	NS	0.2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Spring Tillage (S)		5.7	5.6	1.1	0.7	0.8	NS	< 0.1	< 0.1	1.6	NS	NS	NS	NS	< 0.1
<b>CV (%)</b>															
		9.5	11.2	6.8	3.9	5.0	8.1	3.7	3.9	8.4	21.7	8.1	24.4	37.6	3.7