

FIELD EXPERIMENT HISTORY

Title: Plant Density and Hybrid Influence on Silage and Corn Grain Performance
Experiment: 02Plant Density **Trial ID:** 3368 **Year:** 2010
Personnel: J. G. Lauer, K. D. Kohn and T. H. Diallo
Location: Arlington, WI **County:** Columbia
Supported By: Pioneer

Site Information

Field: ARS411 **Previous Crop:** Alfalfa **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 10/21/10 **pH:** 6.2 **OM (%)** 3.9 **P (ppm)** 65 **K (ppm)** 129

Plot Management

Tillage Operations: Fall Chisel Plow Field Cultivator 2x

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	NA	NA	NA
Starter :	10-34-0	3.0 gal/A	4 /30/10
Post plant :	N/A	N/A	N/A

Herbicide: Dual II Mag 24 oz/A **Insecticide:** Force 3G 4.4 lb/A
 Hornet 4 oz/A **Hybrid:** See Factors

Irrigation: None

Planting Date: 4/30/10 **Planting Depth:** 1.5" **Row Width:** 30"

Target Plant Density: See Factors **Planting Method:** Almaco Precision Planter

Harvest Date: S:8/31/10 **Harvest Method:** S: New Holland 707
 G:10/5/10 G: Massey Ferguson 8XP

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 20' x 25' **Experiment Size:** 1.2 A
Harvest Plot Size: S: 2.5' x 23' **Harvest Plant Density:** See Factors

Factors/Treatments:

<u>Target Plant Density: (plants/A)</u>	<u>Hybrid:</u>
14000 20000 26000	Pioneer 33F88 Pioneer 34A89
32000 38000 44000	Pioneer 35F38 Pioneer 35F44
50000 56000	

Results: Table C-26.

Table C-26. Plant Density and Hybrid Influence on Corn Grain.

Arlington, WI - 2010.

Target density plants/A	Hybrid	Grain																
		Harvest		V4		Test		Lodged			Grower	Si k	Plant	Grain Composition			Ethanol	
		plants/A	ears/A	population plants/A	Yield bu/A	Moisture %	weight lbs/bu	Total %	Stalk %	Root %	return \$/A	date doy	height inches	Oil %	Starch %	Protein %	per bu gallons	per A gallons
	Pioneer 33F88	30445	30839	34643	248	22.7	53	1	0	1	1077	199	108	1.9	60.5	7.2	2.91	722
	Pioneer 34A89	30792	30823	35479	233	21.5	53	1	0	0	1020	200	113	2.2	59.7	7.6	2.90	676
	Pioneer 35F38	29955	31218	36126	239	17.6	56	2	0	2	1061	195	104	2.1	59.5	7.6	2.92	696
	Pioneer 35F44	30997	31691	35022	235	17.8	57	0	0	0	1046	195	102	2.2	60.3	7.6	2.91	685
14000		14425	18245	14457	178	19.7	54	0	0	0	783	196	104	2.1	59.9	7.7	2.89	513
20000		21433	22474	21086	225	20.4	54	0	0	0	990	196	108	2.1	59.6	7.6	2.89	652
26000		26988	27241	27430	246	20.5	55	0	0	0	1078	197	107	2.2	60.3	7.5	2.90	713
32000		32828	32828	33333	266	20.1	55	1	0	1	1170	197	104	2.1	60.2	7.4	2.91	775
38000		35195	35195	40940	256	19.7	55	1	0	1	1129	197	108	2.1	59.9	7.5	2.91	747
44000		36773	36489	46653	242	19.6	55	2	0	2	1065	198	106	2.1	59.8	7.4	2.92	705
50000		38131	37973	49273	243	19.6	55	2	0	2	1073	197	107	2.1	59.9	7.5	2.92	711
56000		38604	38699	49368	255	19.7	55	2	0	2	1123	198	109	2.0	60.1	7.4	2.92	743
14000	Pioneer 33F88	14394	16666	14899	177	22.0	52	0	0	0	772	198	107	2.0	59.3	7.6	2.88	510
20000	Pioneer 33F88	20707	21338	20707	229	22.7	53	0	0	0	996	198	111	1.8	59.7	7.4	2.89	662
26000	Pioneer 33F88	25757	25757	26136	247	23.5	53	0	0	0	1070	199	105	1.8	60.5	7.2	2.91	718
32000	Pioneer 33F88	33207	33207	32575	279	22.7	54	1	0	1	1212	199	106	1.9	61.0	7.1	2.93	816
38000	Pioneer 33F88	34848	34848	40403	265	22.8	54	2	0	2	1151	198	111	1.9	60.5	7.2	2.91	771
44000	Pioneer 33F88	37878	37878	46590	257	22.8	54	2	1	1	1115	198	108	1.8	61.5	7.1	2.92	750
50000	Pioneer 33F88	38636	38636	47979	264	23.1	54	4	0	3	1145	199	111	1.9	60.6	7.1	2.92	771
56000	Pioneer 33F88	38131	38383	47853	266	22.3	54	3	0	3	1156	198	108	1.9	60.8	7.2	2.92	775
14000	Pioneer 34A89	14773	16919	14267	191	22.1	52	0	0	0	831	200	110	2.2	60.0	7.8	2.87	547
20000	Pioneer 34A89	21717	21843	21464	235	23.0	52	0	0	0	1021	199	113	2.4	60.3	7.6	2.87	676
26000	Pioneer 34A89	27020	27272	27777	252	22.3	53	0	0	0	1097	199	117	2.3	59.8	7.6	2.89	730
32000	Pioneer 34A89	34217	33964	34722	265	22.1	53	0	0	0	1153	200	110	2.2	60.1	7.6	2.90	766
38000	Pioneer 34A89	35353	34974	40909	242	20.8	54	1	0	1	1059	200	115	2.2	60.0	7.6	2.91	703
44000	Pioneer 34A89	35984	35101	47853	222	20.4	54	1	0	1	973	200	109	2.3	58.8	7.6	2.92	646
50000	Pioneer 34A89	38383	37752	49242	218	20.6	54	1	0	0	957	200	113	2.2	59.2	7.6	2.90	633
56000	Pioneer 34A89	38888	38762	47600	244	20.7	54	0	0	0	1069	200	114	2.2	59.2	7.6	2.91	710
14000	Pioneer 35F38	14773	20833	14394	182	17.3	56	0	0	0	809	193	102	2.1	59.8	7.6	2.91	529
20000	Pioneer 35F38	21843	24621	20581	222	18.0	56	0	0	0	985	193	105	2.1	58.6	7.7	2.91	646
26000	Pioneer 35F38	28156	28787	28787	247	18.1	56	1	0	1	1095	195	106	2.3	60.5	7.6	2.90	716
32000	Pioneer 35F38	32070	32323	32954	265	17.7	56	1	0	1	1178	195	100	2.0	59.6	7.6	2.92	773
38000	Pioneer 35F38	33838	34090	41792	253	17.6	56	2	0	1	1124	194	104	2.0	59.4	7.5	2.92	738
44000	Pioneer 35F38	34217	34343	46590	245	17.3	57	6	1	5	1090	197	109	2.0	58.2	7.5	2.92	716
50000	Pioneer 35F38	36111	36111	51641	238	17.0	56	4	1	3	1060	194	98	2.2	59.5	7.5	2.92	693
56000	Pioneer 35F38	38636	38636	52272	259	17.8	57	2	0	2	1152	197	107	2.0	60.2	7.5	2.92	756
14000	Pioneer 35F44	13762	18560	14267	162	17.2	56	0	0	0	720	193	99	2.2	60.7	7.8	2.88	466
20000	Pioneer 35F44	21464	22096	21591	215	17.9	56	0	0	0	956	193	103	2.3	59.9	7.7	2.90	624
26000	Pioneer 35F44	27020	27146	27020	236	18.0	57	0	0	0	1050	194	101	2.2	60.5	7.5	2.90	686
32000	Pioneer 35F44	31818	31818	33080	256	17.9	57	0	0	0	1139	194	102	2.2	60.1	7.5	2.91	747
38000	Pioneer 35F44	36742	36868	40656	266	17.8	57	0	0	0	1182	195	101	2.3	59.7	7.6	2.91	774
44000	Pioneer 35F44	39015	38636	45580	243	18.0	57	0	0	0	1079	195	97	2.3	60.6	7.5	2.91	707
50000	Pioneer 35F44	39393	39393	48232	254	17.9	57	0	0	0	1129	196	107	2.3	60.3	7.5	2.92	747
56000	Pioneer 35F44	38762	39015	49747	251	17.9	56	0	0	0	1113	198	105	2.0	60.3	7.4	2.92	733
Mean		30547	31143	35318	239	19.9	55	1	0	1	1051	197	107	2.1	60.0	7.5	2.91	695
Probability(%)																		
Plant Density (D)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	12.9	67.5	51.4	0.0	0.0	0.0
Hybrid (H)		28.1	32.5	1.8	0.4	0.0	0.0	0.0	41.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.7	0.3
D x H		46.0	3.1	24.2	3.2	0.0	33.1	0.2	95.9	0.1	4.8	0.2	12.9	74.6	4.8	0.1	89.5	5.3
LSD (0.10)																		
Plant Density (D)		1332	1257	1124	10	0.3	0	1	NS	1	42	1	NS	NS	NS	0.1	0.01	29
Hybrid (H)		NS	NS	795	7	0.2	0	1	NS	0	30	1	2	0.1	0.4	0.0	0.01	20
D x H		NS	2514	NS	19	0.7	NS	1	NS	1	84	1	NS	NS	1.2	0.1	NS	58

continued

Table C-26. Plant Density and Hybrid Influence on Silage Performance.

(continued) **Arlington, WI - 2010.**

Target density plants/A	Hybrid	Whole Plant																					
		Harvest			Dry Matter		Kerne KMR			SMR			VMR			Crude			<i>in vitro</i>			Milk per	
		plants/A	ears/A	lodged %	Yield T/A	Moisture %	mi k %	0-5	0-5	0-10	protein %	ADF %	NDF %	Digest %	NDFD %	Starch %	Ton lbs/T	Acre lbs/A					
	Pioneer 33F88	35574	35858	1	9.6	71.3	73	3.7	2.4	6.0	8.0	27.8	48.8	77.4	53.8	28.3	2950	28415					
	Pioneer 34A89	35700	36079	1	9.4	71.0	73	3.6	1.9	5.6	7.9	29.5	51.2	76.0	53.2	25.9	2851	26676					
	Pioneer 35F38	36016	38068	1	9.9	67.3	61	3.0	1.5	4.6	7.7	25.8	45.1	79.0	53.5	32.1	3076	30272					
	Pioneer 35F44	35290	35479	1	9.2	67.7	63	3.2	2.0	5.1	7.7	25.2	44.7	79.2	53.5	32.6	3091	28565					
14000		14899	22474	0	7.4	66.0	62	3.1	2.7	5.8	7.8	24.4	44.9	80.1	55.8	31.9	3141	23297					
20000		22033	25000	0	8.4	70.3	66	3.3	2.3	5.6	7.8	27.6	48.6	77.9	54.6	28.2	2981	24950					
26000		27588	28093	0	9.1	70.6	66	3.3	2.0	5.3	7.9	26.8	46.9	78.2	53.6	30.0	3014	27335					
32000		34343	34027	2	9.7	69.5	69	3.4	1.8	5.2	7.8	27.1	47.4	77.7	53.0	29.9	2982	29077					
38000		40719	39962	0	10.4	68.8	68	3.4	1.6	5.0	7.7	26.9	46.6	78.0	52.8	31.0	3007	31307					
44000		45706	45580	1	10.3	70.2	67	3.4	1.8	5.2	7.8	27.6	48.1	77.1	52.4	29.4	2941	30433					
50000		50568	47853	3	10.5	68.7	70	3.5	1.8	5.3	7.8	27.5	47.8	77.7	53.3	29.7	2975	31432					
56000		49305	47979	2	10.3	70.5	72	3.6	1.7	5.3	7.8	28.8	49.3	76.5	52.3	27.7	2895	30025					
14000	Pioneer 33F88	15404	22727	0	8.0	69.3	75	3.8	2.9	6.7	8.3	25.7	46.4	79.3	55.2	29.5	3075	24616					
20000	Pioneer 33F88	23737	24495	0	8.5	72.0	70	3.5	2.8	6.3	8.1	28.1	49.6	77.6	54.9	26.3	2951	25165					
26000	Pioneer 33F88	26767	27777	0	8.6	72.2	77	3.8	2.6	6.4	8.1	28.0	49.6	76.5	52.7	28.0	2893	24983					
32000	Pioneer 33F88	33838	34596	1	9.7	71.2	70	3.5	2.2	5.7	7.7	27.5	48.7	77.8	54.5	28.8	2974	28829					
38000	Pioneer 33F88	40656	39393	0	10.3	71.6	73	3.7	1.9	5.6	7.8	28.3	48.7	76.9	52.5	29.2	2922	30155					
44000	Pioneer 33F88	46464	44191	4	10.0	71.6	68	3.4	2.1	5.6	7.8	27.7	48.7	77.4	53.6	28.9	2952	29495					
50000	Pioneer 33F88	49494	45706	3	11.4	70.6	75	3.8	2.2	6.0	7.9	28.0	48.6	77.4	53.6	28.9	2952	33736					
56000	Pioneer 33F88	48232	47979	2	10.5	72.1	78	3.9	2.1	6.0	8.1	29.3	50.3	76.4	53.1	27.1	2877	30341					
14000	Pioneer 34A89	15151	22474	0	7.5	70.0	53	2.7	2.9	5.6	8.2	27.0	49.5	78.1	55.7	27.0	2977	22459					
20000	Pioneer 34A89	21212	23990	0	8.7	70.4	70	3.5	2.3	5.8	7.7	28.8	51.3	77.0	55.2	26.4	2900	25190					
26000	Pioneer 34A89	27525	27525	0	9.0	71.2	72	3.6	1.8	5.4	7.9	27.6	48.2	77.6	53.6	28.5	2969	26802					
32000	Pioneer 34A89	35353	34848	1	9.4	70.4	78	3.9	1.8	5.7	7.5	28.7	50.2	76.1	52.5	27.1	2866	27058					
38000	Pioneer 34A89	41414	41161	0	10.5	70.7	77	3.8	1.4	5.2	7.8	28.5	49.4	76.4	52.2	28.0	2889	30283					
44000	Pioneer 34A89	46969	44949	0	10.1	70.6	72	3.6	1.9	5.5	7.8	30.8	52.6	74.3	51.2	25.1	2744	27585					
50000	Pioneer 34A89	49999	47222	5	10.2	71.3	80	4.0	1.7	5.7	8.2	29.8	50.8	76.1	52.9	25.6	2854	29053					
56000	Pioneer 34A89	47979	46464	4	9.6	73.3	78	3.9	1.7	5.6	7.8	34.7	57.1	72.7	52.3	19.8	2608	24978					
14000	Pioneer 35F38	14646	23737	0	7.0	61.7	60	3.0	2.1	5.1	7.2	22.7	42.0	82.0	57.2	36.1	3280	22986					
20000	Pioneer 35F38	21969	27020	0	8.1	69.8	63	3.2	1.8	4.9	7.8	27.0	47.6	78.4	54.6	29.8	3019	24516					
26000	Pioneer 35F38	28788	30050	0	9.6	69.5	57	2.8	1.6	4.5	8.1	25.2	44.2	79.6	53.9	32.3	3119	30061					
32000	Pioneer 35F38	34596	33333	4	10.4	67.7	65	3.3	1.3	4.6	7.8	26.3	45.2	78.4	52.2	32.0	3041	31787					
38000	Pioneer 35F38	40909	40404	0	10.6	65.4	58	2.9	1.2	4.1	7.5	26.1	44.8	79.1	53.4	32.7	3089	32766					
44000	Pioneer 35F38	43434	47474	2	11.8	70.5	63	3.2	1.3	4.4	7.9	26.8	46.5	78.1	52.9	30.6	3012	35525					
50000	Pioneer 35F38	53282	52777	2	10.5	64.3	62	3.1	1.7	4.8	7.4	26.6	46.1	77.7	51.6	31.9	2996	31480					
56000	Pioneer 35F38	50504	49747	2	10.8	69.5	58	2.9	1.1	4.0	7.8	25.8	44.8	78.5	52.1	31.3	3053	33050					
14000	Pioneer 35F44	14394	20959	0	7.2	63.0	58	2.9	2.7	5.6	7.6	22.2	41.7	81.1	54.8	35.2	3231	23125					
20000	Pioneer 35F44	21212	24495	0	8.1	69.0	60	3.0	2.2	5.2	7.8	26.3	45.9	78.7	53.7	30.1	3054	24931					
26000	Pioneer 35F44	27272	27020	0	8.9	69.6	60	3.0	1.8	4.8	7.7	26.3	45.7	79.1	54.2	31.3	3075	27492					
32000	Pioneer 35F44	33585	33333	2	9.4	68.5	62	3.1	1.8	4.9	8.0	25.8	45.6	78.6	53.1	31.7	3048	28633					
38000	Pioneer 35F44	39898	38888	0	10.2	67.3	65	3.3	2.0	5.3	7.7	24.7	43.6	79.6	53.3	34.2	3126	32022					
44000	Pioneer 35F44	45959	45706	0	9.5	68.2	65	3.3	2.0	5.3	7.6	25.2	44.7	78.6	52.1	33.2	3058	29128					
50000	Pioneer 35F44	49494	45706	2	10.1	68.6	63	3.2	1.5	4.7	7.7	25.6	45.5	79.5	55.0	32.4	3098	31457					
56000	Pioneer 35F44	50504	47727	0	10.4	67.0	73	3.7	1.7	5.4	7.5	25.5	45.0	78.3	51.8	32.6	3042	31729					
Mean		35645	36371	1	9.5	69.3	68	3.4	1.9	5.3	7.8	27.1	47.5	77.9	53.5	29.7	2992	28482					
Probability(%)																							
Plant Density (D)		0.0	0.0	1.4	0.0	0.0	5.2	5.2	0.0	13.8	79.0	0.0	0.3	0.0	0.0	1.4	0.0	0.0					
Hybrid (H)		74.3	0.2	65.0	1.9	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	66.1	0.0	0.0	0.1					
D x H		65.0	68.1	87.0	14.4	17.9	13.4	13.4	96.1	87.8	4.8	18.7	40.3	53.9	27.0	61.3	52.2	30.2					
LSD (0.10)																							
Plant Density (D)		1561	1634	2	0.5	1.5	5	0.3	0.3	NS	NS	1.2	1.7	1.0	1.0	2.0	73	1933					
Hybrid (H)		NS	1155	NS	0.3	1.1	4	0.2	0.2	0.3	0.2	0.8	1.2	0.7	NS	1.4	51	1367					
D x H		NS	NS	NS	NS	NS	NS	NS	NS	NS	0.4	NS	NS	NS	NS	NS	NS	NS					

**Table C-27. Plant Density and Hybrid Influence on Silage Performance.
Fond du Lac, WI - 2010.**

Target density plants/A	Hybrid	Whole Plant																		
		Harvest			V4	Dry Matter		Kernel	Plant	KMR	SMR	VMR	Crude			<i>in vitro</i>			Mi k per	
		plants/A	ears/A	lodged	population	Yield	Moist	milk	height	0-5	0-5	0-10	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre
	Pioneer 33F88	32733	33080	1	33254	8.1	70.5	76	107	3.8	2.0	5.8	5.6	30.7	52.1	76.0	54.0	24.2	2839	23198
	Pioneer 34A89	35448	35606	5	36300	8.1	71.3	79	113	3.9	1.7	5.6	5.8	32.7	54.5	74.9	54.1	22.0	2752	22581
	Pioneer 35F44	33901	34375	0	34674	8.4	68.0	70	100	3.5	1.7	5.2	5.8	29.4	49.7	76.4	52.7	27.9	2896	24464
14000		14141	19192	0	14057	7.9	72.5	77	108	3.9	3.4	7.3	7.2	29.7	51.6	76.4	54.3	24.2	2869	22863
20000		19865	21464	0	19192	8.4	67.4	76	104	3.8	2.2	6.0	5.5	27.1	47.1	79.2	56.0	29.0	3079	25867
26000		26851	27020	1	29461	8.3	69.9	76	106	3.8	1.9	5.7	5.7	30.0	50.7	76.9	54.6	26.8	2912	24419
32000		34427	33754	0	35858	8.2	70.4	74	108	3.7	1.7	5.4	5.7	31.0	52.1	75.8	53.5	25.1	2811	23177
38000		38973	38720	4	40025	7.9	69.0	72	107	3.6	1.3	4.9	5.4	31.7	53.0	75.1	53.0	24.1	2768	21909
44000		45454	43939	6	44907	8.2	70.0	78	109	3.9	1.1	5.0	5.5	32.9	54.8	73.8	52.2	21.8	2697	22099
50000		47558	45875	0	45875	7.8	70.8	73	108	3.7	1.4	5.1	5.5	33.1	54.4	73.9	52.0	23.0	2709	21273
56000		44949	44865	4	48568	9.1	69.2	74	104	3.7	1.1	4.8	5.3	31.9	53.3	75.1	53.4	23.6	2786	25708
14000	Pioneer 33F88	13889	18939	0	13889	7.8	72.5	78	108	3.9	3.6	7.5	7.1	29.2	51.2	76.8	54.8	24.1	2895	22822
20000	Pioneer 33F88	18182	20202	0	18560	9.1	67.7	77	104	3.8	2.4	6.2	5.4	27.1	47.5	78.9	55.7	27.9	3057	27995
26000	Pioneer 33F88	26515	27020	0	26010	7.5	69.4	77	106	3.8	1.8	5.6	5.2	29.8	51.3	77.9	56.9	25.0	2959	22200
32000	Pioneer 33F88	34090	33333	0	33838	8.0	70.7	70	110	3.5	2.1	5.6	5.7	29.9	51.1	76.9	54.7	26.8	2908	23472
38000	Pioneer 33F88	36363	36111	0	37373	8.3	70.2	78	107	3.9	1.6	5.5	5.3	31.8	53.4	74.7	52.7	21.8	2705	22653
44000	Pioneer 33F88	44696	43686	5	46085	8.9	70.5	78	110	3.9	1.4	5.4	5.4	32.2	53.8	73.8	51.4	22.6	2714	24356
50000	Pioneer 33F88	44696	42676	0	44696	6.7	73.0	75	106	3.8	1.8	5.6	5.6	34.2	56.3	73.1	52.4	20.5	2648	17821
56000	Pioneer 33F88	43434	42676	0	45580	8.5	69.8	75	105	3.8	1.1	4.8	5.1	31.2	52.5	75.6	53.5	24.6	2825	24260
14000	Pioneer 34A89	13889	18687	0	14141	7.9	73.3	77	114	3.8	3.2	7.0	7.0	31.3	53.7	75.4	54.3	22.6	2795	22382
20000	Pioneer 34A89	21464	21969	0	19065	9.4	66.4	75	108	3.8	1.6	5.3	4.9	27.0	46.8	80.4	58.1	28.9	3148	29447
26000	Pioneer 34A89	27020	26767	2	27146	8.8	73.5	80	114	4.0	2.2	6.2	6.4	33.3	54.5	74.1	52.8	23.1	2721	24148
32000	Pioneer 34A89	37121	35353	0	38762	8.3	70.1	78	113	3.9	1.2	5.1	4.8	33.1	55.4	75.4	55.7	19.9	2703	22731
38000	Pioneer 34A89	41919	41161	11	42297	7.2	70.8	75	113	3.8	1.4	5.2	5.6	33.9	56.1	73.8	53.3	22.1	2688	19396
44000	Pioneer 34A89	47222	45706	14	47853	6.9	73.1	82	116	4.1	1.1	5.2	6.2	34.7	58.0	72.2	52.1	18.8	2579	17738
50000	Pioneer 34A89	49242	48737	0	50883	8.5	71.5	80	113	4.0	1.3	5.3	5.4	34.9	56.7	73.4	53.1	19.5	2659	22692
56000	Pioneer 34A89	45706	46464	11	50252	8.1	71.5	82	111	4.1	1.4	5.5	6.2	33.3	55.3	74.3	53.6	21.2	2719	22115
14000	Pioneer 35F44	14646	19949	0	14141	8.0	71.8	77	101	3.8	3.5	7.3	7.4	28.6	49.9	76.9	53.9	25.8	2916	23385
20000	Pioneer 35F44	19949	22222	0	19949	6.7	68.0	75	99	3.8	2.8	6.6	6.3	27.2	47.1	78.4	54.1	30.1	3030	20159
26000	Pioneer 35F44	27020	27272	0	35227	8.7	66.9	72	99	3.6	1.6	5.2	5.6	27.0	46.3	78.7	54.0	32.2	3057	26908
32000	Pioneer 35F44	32070	32575	0	34974	8.3	70.6	73	101	3.7	1.9	5.6	6.5	30.1	49.9	75.1	50.2	28.5	2823	23328
38000	Pioneer 35F44	38636	38888	0	40403	8.2	66.1	62	101	3.1	1.0	4.1	5.2	29.3	49.6	76.6	53.0	28.5	2910	23676
44000	Pioneer 35F44	44444	42424	0	40782	8.7	66.3	73	99	3.7	0.9	4.5	4.9	31.9	52.6	75.3	53.0	24.2	2798	24204
50000	Pioneer 35F44	48737	46211	0	42045	8.3	68.0	65	105	3.3	1.0	4.3	5.5	30.2	50.3	75.1	50.4	28.9	2820	23305
56000	Pioneer 35F44	45706	45454	0	49873	10.7	66.3	65	97	3.3	0.9	4.1	4.8	31.2	52.2	75.3	53.1	25.0	2816	30747
Mean		34027	34353	2	34743	8.2	69.9	75	107	3.7	1.8	5.5	5.7	30.9	52.1	75.8	53.6	24.7	2829	23414
Probability(%)																				
Plant Density (D)		0.0	0.0	24.4	0.0	80.0	5.8	37.2	46.0	37.2	0.0	0.0	0.3	0.0	0.0	0.2	10.2	0.2	0.0	61.7
Hybrid (H)		1.6	2.6	2.3	9.7	77.7	0.1	0.0	0.0	0.0	9.3	2.0	72.2	0.0	0.0	12.8	18.2	0.0	1.8	54.7
D x H		88.7	86.1	58.6	34.4	54.3	48.7	19.5	97.2	19.5	11.5	10.6	26.7	88.2	80.1	87.2	69.5	41.6	77.8	65.9
LSD (0.10)																				
Plant Density (D)		2484	2464	NS	3768	NS	2.4	NS	NS	NS	0.4	0.5	0.7	2.1	2.7	2.1	NS	2.7	134	NS
Hybrid (H)		1521	1509	3	2307	NS	1.5	3	3	0.1	0.2	0.3	NS	1.3	1.6	NS	NS	1.7	82	NS
D x H		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

FIELD EXPERIMENT HISTORY

Title: Plant Density and Hybrid Influence on Silage Performance
Experiment: 02Plant Density **Trial ID:** 3366 **Year:** 2010
Personnel: J. G. Lauer, K. D. Kohn and T. H. Diallo
Location: Galesville, WI **County:** Trempealeau
Supported By: Pioneer

Site Information

Field: **Previous Crop:** Soybean **Soil Type:** Downs Silt Loam
Soil Test: **Date:** 10/21/10 **pH:** 5.9 **OM (%)** 3.8 **P (ppm)** 25 **K (ppm)** 152

Plot Management

Tillage Operations: Fall Zone

		<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer:	Preplant :	28-0-0	70	N/A
	Starter :	21-0-0-24s 10-34-0	63 3.0 gal/A	4 /27/10
	Post plant :	N/A	N/A	N/A

Herbicide: Callisto 3.0oz/A **Insecticide:** None
 Harness 2.75 pt/A **Hybrid:** See Factors

Irrigation: None

Planting Date: 4/27/10 **Planting Depth:** 1.5" **Row Width:** 30"

Target Plant Density: See Factors **Planting Method:** Almaco Precision Planter

Harvest Date: 9/17/10 **Harvest Method:** New Holland 707

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 10' x 25' **Experiment Size:** 0.45 A
Harvest Plot Size: 2.5' x 23' **Harvest Plant Density:** See Factors

Factors/Treatments:

<u>Target Plant Density: (plants/A)</u>	<u>Hybrid:</u>
14000 20000 26000	Pioneer 33F88
32000 38000 44000	Pioneer 34A89
50000 56000	

Results: Table C-28.

**Table C-28. Plant Density and Hybrid Influence on Silage Performance.
Galesville, WI - 2010.**

Target density plants/A	Hybrid	Whole Plant																		
		Harvest			V4	Dry Matter		Kernel	Plant	KMR	SMR	VMR	Crude		<i>in vitro</i>			Mi k per		
		plants/A	ears/A	lodged	population	Yield	Moist	milk	height	0-5	0-5	0-10	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre
	Pioneer 33F88	32102	27714	29	33491	8.4	69.5	54	116	2.7	2.5	5.1	7.2	28.8	49.3	76.0	51.3	26.3	2841	23997
	Pioneer 34A89	35448	23895	64	36663	6.6	69.1	62	105	3.1	2.6	5.7	7.3	27.9	48.4	76.7	52.1	26.4	2892	19183
	Pioneer 35F44	33301	31407	12	35116	8.6	67.6	48	113	2.4	2.0	4.4	7.3	28.2	48.0	75.9	49.9	28.1	2852	24562
14000		15067	16919	1	15320	7.0	68.7	58	118	2.9	2.5	5.4	7.6	26.9	47.2	77.5	52.3	27.5	2944	20656
20000		21212	21212	10	20412	8.4	66.3	49	120	2.4	2.5	5.0	7.2	26.1	45.9	78.1	52.3	29.4	2994	25155
26000		26599	25505	18	28956	8.6	69.4	48	122	2.4	2.1	4.4	7.1	29.2	49.6	75.3	50.2	26.0	2798	24382
32000		31818	26767	32	34806	8.9	69.0	47	116	2.3	2.5	4.8	7.3	30.0	51.1	75.0	51.1	25.1	2765	24569
38000		38467	30134	44	39898	7.1	68.8	55	104	2.8	2.2	4.9	7.5	28.2	48.7	76.0	50.8	26.9	2846	20092
44000		44107	36868	49	45201	7.7	70.0	59	103	3.0	2.3	5.2	7.2	30.5	51.2	74.2	49.8	24.3	2723	21257
50000		44275	34427	68	46674	7.8	69.4	60	105	3.0	2.2	5.2	7.3	27.3	47.0	77.1	51.5	28.1	2929	23188
56000		47390	29545	58	49452	7.4	68.2	60	103	3.0	2.5	5.5	7.2	28.0	47.6	76.6	50.9	28.6	2893	21347
14000	Pioneer 33F88	16414	17929	3	16666	7.3	69.7	58	122	2.9	2.5	5.4	7.3	28.9	50.1	76.4	53.1	24.7	2854	21017
20000	Pioneer 33F88	21212	21464	0	19065	9.2	66.5	50	122	2.5	3.2	5.7	7.2	25.9	45.5	78.5	52.7	28.7	3021	27748
26000	Pioneer 33F88	26262	24747	7	26515	9.0	69.1	38	121	1.9	2.0	3.9	7.1	29.4	50.3	75.2	50.7	25.3	2789	25226
32000	Pioneer 33F88	32575	29798	14	34343	9.7	70.0	43	120	2.2	2.6	4.7	7.2	29.5	50.2	75.9	52.1	26.2	2827	27545
38000	Pioneer 33F88	37121	29798	25	37752	7.3	70.1	62	103	3.1	2.2	5.3	7.1	30.1	51.0	74.2	49.4	24.4	2727	19920
44000	Pioneer 33F88	40151	35606	58	42676	7.8	70.4	58	97	2.9	2.3	5.3	7.5	29.7	50.9	74.8	50.4	24.3	2757	21285
50000	Pioneer 33F88	41161	33080	63	45075	8.7	70.5	60	123	3.0	2.2	5.2	7.3	28.8	49.2	76.4	52.2	26.6	2866	25519
56000	Pioneer 33F88	41919	29293	62	45833	8.1	69.6	58	122	2.9	2.6	5.5	6.8	27.8	46.9	76.3	49.7	30.6	2889	23717
14000	Pioneer 34A89	14646	16414	0	14899	7.3	70.7	67	123	3.3	2.1	5.5	7.6	27.2	47.2	77.2	51.7	27.3	2931	21326
20000	Pioneer 34A89	22727	22222	29	22348	8.2	68.0	45	125	2.3	2.1	4.4	7.0	27.4	48.0	77.6	53.4	28.0	2945	24236
26000	Pioneer 34A89	26010	24242	46	31060	9.0	70.4	57	125	2.8	2.3	5.1	7.1	29.2	49.4	75.9	51.3	26.4	2833	26099
32000	Pioneer 34A89	31565	20202	80	37499	8.2	68.4	57	112	2.8	2.9	5.8	7.6	28.1	49.3	76.4	52.4	25.8	2865	23232
38000	Pioneer 34A89	40151	25252	98	40530	4.4	67.3	67	96	3.3	2.8	6.1	7.9	26.2	47.5	77.7	53.4	27.3	2953	13337
44000	Pioneer 34A89	48737	34595	86	47979	4.7	72.0	70	92	3.5	2.7	6.2	7.1	32.3	53.0	72.7	49.1	21.8	2627	13341
50000	Pioneer 34A89	45454	31313	88	45959	6.3	68.9	63	92	3.2	2.5	5.6	7.3	26.8	46.7	77.4	51.6	27.1	2949	18791
56000	Pioneer 34A89	54292	16919	86	53030	4.3	66.8	68	75	3.4	3.2	6.6	7.4	25.9	46.3	78.9	54.4	27.9	3033	13105
14000	Pioneer 35F44	14141	16414	0	14394	6.4	65.6	50	108	2.5	2.8	5.3	7.8	24.6	44.3	78.8	52.1	30.6	3049	19625
20000	Pioneer 35F44	19697	19949	1	19823	7.7	64.5	52	113	2.6	2.3	4.9	7.3	25.2	44.3	78.2	50.7	31.5	3017	23481
26000	Pioneer 35F44	27525	27525	1	29293	7.9	68.7	48	120	2.4	1.9	4.3	7.2	29.0	49.2	74.7	48.6	26.3	2773	21822
32000	Pioneer 35F44	31313	30303	3	32575	8.8	68.7	40	117	2.0	1.9	3.9	7.2	32.4	53.7	72.5	48.8	23.2	2605	22929
38000	Pioneer 35F44	38131	35353	10	41414	9.5	68.9	37	113	1.8	1.5	3.3	7.6	28.2	47.7	76.0	49.6	29.0	2857	27021
44000	Pioneer 35F44	43434	40403	4	44949	10.5	67.5	50	119	2.5	1.8	4.3	7.1	29.4	49.9	75.0	50.0	26.6	2785	29146
50000	Pioneer 35F44	46211	38888	55	48989	8.4	68.6	57	99	2.8	2.0	4.8	7.3	26.3	45.3	77.6	50.8	30.6	2973	25253
56000	Pioneer 35F44	45959	42424	26	49494	9.9	68.2	53	112	2.7	1.7	4.4	7.3	30.4	49.6	74.5	48.6	27.3	2757	27220
Mean		33617	27672	35	35090	7.9	68.7	55	111	2.7	2.3	5.1	7.3	28.3	48.6	76.2	51.1	27.0	2862	22581
Probability(%)																				
Plant Density (D)		0.0	0.0	0.0	0.0	58.2	12.9	3.2	5.5	3.2	22.5	5.6	30.1	6.7	6.7	9.7	36.6	30.1	8.4	71.8
Hybrid (H)		4.5	0.1	0.0	0.0	0.6	2.9	0.1	8.5	0.1	0.0	0.0	38.7	62.6	55.2	56.3	1.1	35.2	66.2	2.9
D x H		43.7	22.6	9.2	8.4	28.1	51.7	41.3	16.6	41.3	0.8	1.0	56.8	50.9	74.7	73.8	56.1	92.7	75.1	48.4
LSD (0.10)																				
Plant Density (D)		3606	5278	19	1920	NS	NS	9	14	0.4	NS	0.6	NS	2.5	3.2	2.3	NS	NS	161	NS
Hybrid (H)		2208	3232	12	1176	1.1	1.2	5	8	0.3	0.2	0.3	NS	NS	NS	NS	1.2	NS	NS	3585
D x H		NS	NS	33	3325	NS	NS	NS	NS	NS	0.6	1.0	NS	NS	NS	NS	NS	NS	NS	NS

FIELD EXPERIMENT HISTORY

Title: Plant Density and Hybrid Influence on Silage Performance
Experiment: 02Plant Density **Trial ID:** 3367 **Year:** 2010
Personnel: J. G. Lauer, K. D. Kohn and T. H. Diallo
Location: Lancaster, WI **County:** Grant
Supported By: Pioneer

Site Information

Field: **Previous Crop:** Soybean **Soil Type:** Fayette Silt Loam
Soil Test: **Date:** 10/21/10 **pH:** 7.3 **OM (%)** 1.9 **P (ppm)** 31 **K (ppm)** 78

Plot Management

Tillage Operations: Soil Finisher Cultivate 6/10/10

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	46-0-0	160	N/A
Starter :	10-34-0	3.0 gal/A	4 /29/10
Post plant :	N/A	N/A	N/A

Herbicide: Lumax 3.0 qt/A **Insecticide:** Force 3G 4.4 lb/A
Irrigation: None **Hybrid:** See Factors
Planting Date: 4/29/10 **Planting Depth:** 1.5" **Row Width:** 30"
Target Plant Density: See Factors **Planting Method:** Almaco Precision Planter
Harvest Date: 9/7/10 **Harvest Method:** New Holland 707

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 10' x 25' **Experiment Size:** 0.45 A
Harvest Plot Size: 2.5' x 23' **Harvest Plant Density:** See Factors

Factors/Treatments:

<u>Target Plant Density: (plants/A)</u>	<u>Hybrid:</u>
14000 20000 26000	Pioneer 33F88
32000 38000 44000	Pioneer 34A89
50000 56000	

Results: Table C-29.

**Table C-29. Plant Density and Hybrid Influence on Silage Performance.
Lancaster, WI - 2010.**

Target density plants/A	Hybrid	Whole Plant																		
		Harvest			V4	Dry Matter		Kernel	Plant	KMR	SMR	VMR	Crude			<i>in vitro</i>			Mi k per	
		plants/A	ears/A	lodged	population	Yield	Moist	milk	height	0-5	0-5	0-10	protein	ADF	NDF	Digest	NDFD	Starch	Ton	Acre
	Pioneer 33F88	31250	32197	0	33159	9.3	68.1	59	120	2.9	2.4	5.4	7.0	27.8	48.7	78.1	54.9	26.5	2992	27736
	Pioneer 34A89	31944	32859	3	33617	9.3	67.5	57	122	2.9	1.9	4.7	6.9	28.4	49.3	77.3	54.0	27.3	2951	27298
	Pioneer 35F44	31691	33869	0	32702	9.1	64.0	52	113	2.6	1.7	4.3	6.9	26.1	46.0	78.5	53.3	30.7	3049	27744
14000		13299	20875	0	12879	6.9	68.3	59	117	3.0	2.6	5.6	7.7	26.2	47.6	79.2	56.3	26.0	3053	20930
20000		18602	23905	0	19192	7.7	67.1	54	117	2.7	2.3	5.0	7.0	26.5	46.9	78.7	54.6	27.9	3051	23528
26000		24579	27609	0	25715	9.3	66.3	61	119	3.1	2.3	5.4	6.9	26.5	46.5	79.2	55.2	29.1	3080	28535
32000		32491	31986	0	32702	9.6	67.0	53	120	2.6	1.9	4.5	6.9	28.8	49.7	77.1	54.0	26.8	2935	28257
38000		34764	34006	0	37247	9.4	66.0	56	117	2.8	1.6	4.4	6.7	27.5	47.7	78.0	53.8	29.0	3007	28161
44000		39478	38636	2	42424	10.3	65.4	53	119	2.7	1.7	4.4	6.6	28.0	48.3	77.3	53.0	29.2	2960	30891
50000		45286	43686	5	47348	10.0	66.0	58	119	2.9	1.7	4.6	6.9	27.9	48.6	77.3	53.3	28.8	2959	29624
56000		44528	43097	1	47769	10.5	65.8	53	120	2.7	1.7	4.4	6.9	28.1	48.6	76.8	52.4	28.5	2932	30815
14000	Pioneer 33F88	13384	22474	0	13510	7.1	69.5	60	119	3.0	3.1	6.1	7.9	26.7	49.3	79.3	57.9	22.3	3008	21273
20000	Pioneer 33F88	19949	21464	0	18813	7.9	68.5	53	121	2.7	2.9	5.6	7.1	26.8	47.2	79.0	55.5	26.3	3063	24151
26000	Pioneer 33F88	24242	24495	0	26136	8.5	68.1	72	122	3.6	2.9	6.5	6.8	27.2	47.5	79.6	57.0	27.3	3093	26272
32000	Pioneer 33F88	30555	30555	0	32197	9.8	68.5	52	119	2.6	2.1	4.7	6.7	29.7	51.3	75.7	52.7	25.4	2845	27907
38000	Pioneer 33F88	35606	33080	0	38383	10.2	67.1	55	119	2.8	2.1	4.8	6.6	28.3	48.7	77.3	53.3	27.6	2957	30107
44000	Pioneer 33F88	39898	41161	0	42929	10.1	66.8	55	119	2.8	1.9	4.7	6.5	27.8	48.4	77.6	53.7	29.4	2977	30220
50000	Pioneer 33F88	44191	42676	0	47600	10.3	68.3	67	122	3.3	2.2	5.5	7.3	28.4	49.4	78.0	55.4	26.2	2985	30889
56000	Pioneer 33F88	42171	41666	0	45706	10.3	67.6	58	121	2.9	2.4	5.3	6.9	27.7	47.9	78.0	54.1	28.0	3005	31065
14000	Pioneer 34A89	14141	20707	0	13131	6.9	69.3	65	117	3.3	2.9	6.2	7.3	27.0	48.2	78.8	56.0	26.7	3041	20903
20000	Pioneer 34A89	17424	19949	0	18687	7.9	68.0	58	121	2.9	1.8	4.7	6.9	27.1	47.3	78.3	54.1	29.2	3024	23918
26000	Pioneer 34A89	24242	28282	0	25252	9.6	68.0	62	125	3.1	2.5	5.6	6.9	28.1	48.5	78.1	55.0	27.0	3000	28763
32000	Pioneer 34A89	30808	31313	0	33080	9.6	67.1	55	125	2.8	1.8	4.6	6.9	29.0	49.8	77.0	53.8	26.7	2928	28103
38000	Pioneer 34A89	36363	35858	0	37499	9.5	68.0	60	119	3.0	1.5	4.5	6.9	29.0	49.9	77.8	55.5	25.6	2971	28196
44000	Pioneer 34A89	40656	38383	6	44065	10.7	66.6	55	123	2.8	1.8	4.6	6.6	29.6	51.1	75.9	53.1	26.5	2859	30846
50000	Pioneer 34A89	46211	44696	14	48105	9.8	66.1	50	124	2.5	1.4	3.9	6.6	27.9	48.4	77.2	52.8	29.8	2953	29004
56000	Pioneer 34A89	45706	43686	3	49115	10.1	66.6	52	126	2.6	1.2	3.8	6.9	29.5	50.9	75.4	51.6	26.8	2829	28654
14000	Pioneer 35F44	12374	19444	0	11995	6.6	66.2	53	114	2.7	1.9	4.5	7.8	24.9	45.4	79.5	55.0	29.0	3109	20614
20000	Pioneer 35F44	18434	30303	0	20075	7.4	64.8	52	110	2.6	2.1	4.7	7.0	25.7	46.2	78.8	54.1	28.2	3064	22516
26000	Pioneer 35F44	25252	30050	0	25757	9.7	63.0	50	109	2.5	1.6	4.1	7.0	24.1	43.5	79.8	53.6	33.0	3148	30570
32000	Pioneer 35F44	36111	34090	1	32828	9.5	65.2	52	116	2.6	1.8	4.4	7.0	27.7	48.0	78.6	55.4	28.4	3032	28762
38000	Pioneer 35F44	32323	33080	0	35858	8.5	62.9	52	113	2.6	1.3	3.9	6.5	25.4	44.3	79.0	52.5	33.9	3094	26181
44000	Pioneer 35F44	37878	36363	0	40277	10.1	62.8	50	115	2.5	1.5	4.0	6.6	26.4	45.5	78.2	52.3	31.8	3042	31607
50000	Pioneer 35F44	45454	43686	0	46338	9.8	63.6	57	113	2.8	1.6	4.4	6.8	27.4	48.0	76.9	51.8	30.3	2940	28979
56000	Pioneer 35F44	45706	43939	0	48484	10.9	63.2	50	113	2.5	1.6	4.1	6.8	27.2	47.0	77.0	51.4	30.7	2960	32727
Mean		31628	32975	1	33159	9.2	66.5	56	118	2.8	2.0	4.8	6.9	27.4	48.0	77.9	54.1	28.2	2997	27593
Probability(%)																				
Plant Density (D)		0.0	0.0	27.6	0.0	0.0	5.5	25.7	68.7	25.7	0.0	0.1	0.0	13.3	40.7	6.1	1.4	46.2	13.9	0.0
Hybrid (H)		78.0	21.0	4.0	37.3	76.1	0.0	1.2	0.0	1.2	0.0	0.0	55.3	0.2	0.1	12.3	4.0	0.1	5.1	91.6
D x H		61.6	3.5	19.9	64.9	89.5	98.3	35.1	66.4	35.1	9.7	13.9	24.1	98.4	91.3	91.7	54.3	66.0	92.2	97.8
LSD (0.10)																				
Plant Density (D)		2726	2570	NS	1767	0.9	1.5	NS	NS	NS	0.3	0.6	0.3	NS	NS	1.6	1.8	NS	NS	3362
Hybrid (H)		NS	NS	2	NS	NS	0.9	4	2	0.2	0.2	0.3	NS	1.1	1.5	NS	1.1	1.7	65.7	NS
D x H		NS	4451	NS	NS	NS	NS	NS	NS	NS	0.6	NS	NS	NS	NS	NS	NS	NS	NS	NS

FIELD EXPERIMENT HISTORY

Title: Plant Density Influence on Corn Stover Performance
Experiment: 02Plant Density **Trial ID:** 3395 **Year:** 2010
Personnel: J. G. Lauer, K. D. Kohn, T. H. Diallo and S. Wilkens
Location: Arlington, WI **County:** Columbia
Supported By: Monsanto

Site Information

Field: ARS 411 **Previous Crop:** Alfalfa **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 10/21/10 **pH** 6.2 **OM (%)** 3.9 **P (ppm)** 65 **K (ppm)** 129

Plot Management

Tillage Operations: Fall Chisel Plow Field Cultivator 2x

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	NA	NA	NA
Starter :	10-34-0	3.0 gal/A	5 /3 /10
Post plant :	NA	NA	NA
Manure:	N/A	N/A	N/A

Herbicide: Duall II Mag 24 oz/A **Insecticide:** Force 3G 4.4lb/A
 Hornet 4 oz/A **Hybrid:** Dekalb DKC52-59

Irrigation: None

Planting Date: 5/3/10 **Planting Depth:** 1.5" **Row Width:** 30"

Target Plant Density: See Factors **Planting Method:** Almaco Precision Planter

Harvest Date: 10/5/10 **Harvest Method:** Massey Ferguson 8XP

Notes: Plant Segment (inches from the base of plant): Low, 6-23; Mid, 24-41; High, 41-97.

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 10' x 25' **Experiment Size:** 0.09 acre
Harvest Plot Size: 5' x 22' **Harvest Plant Density:** See Factors

Factors/Treatments:

Target Plant Density: (plants/A)

26000 32000
 38000 44000
 56000

Results: Tables C-22 and C-23

Table C-22. Plant Density Influence on Corn Stover Agronomic and Biofuel Measurements. Arlington, WI - 2010. †

Density		Moisture	Yield					CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem
Target	Harvest		Stover	TEP	TE	Etoh											
-----plants/A-----		%	g/plant	T/A	G/T	G/A	g/L	-----%-----									
26000	28900	12.3	83	2.7	97.5	259	3.40	5.6	56.7	78.9	44.7	5.8	19.0	36.1	19.9	50.6	25.5
32000	37100	12.6	71	2.9	98.9	286	3.29	5.1	56.8	79.6	45.4	5.8	19.5	36.7	20.1	50.7	26.1
38000	42100	13.0	68	3.1	98.0	307	3.49	5.2	56.5	76.3	45.1	5.8	19.0	36.4	19.9	50.6	26.0
44000	46100	13.2	66	3.3	97.4	324	3.66	5.7	56.1	78.8	43.9	5.9	19.2	36.1	19.7	50.1	25.7
56000	51200	14.9	59	3.3	98.7	327	3.59	5.0	56.8	77.7	45.8	6.1	19.3	37.0	20.0	50.7	26.4
Mean	41100	13.2	69	3.1	98.1	300	3.49	5.3	56.6	78.2	45.0	5.9	19.2	36.4	19.9	50.5	25.9
Probability (%)																	
Plant Density (D)	0.01	77.6	4.8	18.2	80.2	11.1	88.2	30.3	91.9	3.4	72.7	76.7	87.8	54.9	92.6	89.6	13.2
LSD (0.05)																	
Plant Density (D)	5060	NS	14.8	NS	NS	NS	NS	NS	NS	2.0	NS	NS	NS	NS	NS	NS	NS

† TEP, Theoretical ethanol potential; TE, Theoretical ethanol; Etoh, ethanol; CP, crude protein; ADF, acid detergent fiber; NDF; neutral detergent fiber; NDFD, neutral detergent fiber digestibility; ADL, acid detergent lignin; Cell, cellulose; Hem, hemicellulose

Table C-23. Plant Density and Plant Segment Influence on Corn Stover Agronomic and Biofuel Measurements. Arlington, WI - 2010. †

Density	Plant Part	Moisture	Yield					CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem
			Stover	TEP	TE	Etoh											
plants/A		%	g/plant	T/A	G/T	G/A	g/L	-----%									
26000		12.5	27.7	2.0	97.7	197	3.42	5.5	57.3	78.8	43.5	6.0	19.2	36.3	19.7	51.0	25.0
32000		12.8	23.6	2.2	98.9	217	3.31	5.1	57.2	79.7	44.7	6.0	19.8	36.8	19.9	51.0	25.6
38000		13.2	22.7	2.4	98.0	233	3.51	5.2	56.9	76.8	44.3	5.9	19.2	36.5	19.8	51.0	25.6
44000		13.5	21.9	2.5	97.6	247	3.80	5.5	57.0	78.6	43.0	6.2	19.5	36.4	19.5	50.7	25.0
56000		15.1	19.6	2.5	98.8	248	3.53	5.0	57.3	77.9	44.9	6.3	19.6	37.1	19.8	51.1	25.9
	Low	17.0	20.6	2.1	101	209	3.27	4.6	61.9	75.6	24.4	5.2	21.1	38.6	19.4	55.3	21.5
	Mid	12.7	18.5	1.9	96.8	181	3.86	5.5	57.2	81.6	52.0	7.7	19.9	36.4	19.1	50.5	24.7
	High	10.6	30.3	3.0	96.7	294	3.42	5.8	52.3	77.9	55.8	5.3	17.4	34.9	20.7	47.1	30.0
26000	Low	15.2	24.4	1.8	101	178	3.17	4.6	61.9	75.5	23.9	5.1	20.5	38.2	19.6	55.4	21.4
26000	Mid	12.3	22.0	1.6	96.3	154	3.77	5.6	57.4	81.1	51.1	7.4	19.9	36.3	19.0	50.4	24.4
26000	High	10.1	36.9	2.7	95.9	256	3.35	6.4	52.6	79.8	55.6	5.3	17.3	34.4	20.6	47.3	29.1
32000	Low	15.0	22.0	2.0	103	210	2.96	4.5	61.8	76.3	25.4	5.4	21.4	39.2	19.8	54.9	21.8
32000	Mid	12.7	19.1	1.8	96.5	171	3.68	5.4	57.4	82.1	52.4	7.2	20.4	36.2	19.2	51.0	24.9
32000	High	10.6	29.8	2.8	97.3	269	3.29	5.5	52.4	80.6	56.4	5.3	17.5	35.1	20.8	47.2	30.3
38000	Low	16.8	20.7	2.2	100	218	3.30	4.8	61.0	75.3	23.4	5.0	21.1	38.4	19.2	54.8	21.5
38000	Mid	12.4	18.6	2.0	96.7	189	3.83	5.4	57.4	81.9	52.2	7.4	19.5	36.4	19.1	50.9	24.7
38000	High	10.3	28.7	3.0	97.2	292	3.41	5.3	52.5	73.2	57.3	5.3	17.1	34.7	21.0	47.2	30.4
44000	Low	19.0	18.2	2.1	99.9	210	3.90	4.5	62.3	75.2	25.7	5.4	20.6	38.1	19.2	55.6	21.4
44000	Mid	10.7	16.7	1.9	97.2	187	4.40	5.6	56.8	81.3	51.2	8.2	20.0	36.4	19.0	49.7	24.3
44000	High	10.6	31.0	3.6	95.8	341	3.12	6.6	51.8	79.5	52.2	5.0	17.7	34.6	20.3	46.8	29.3
56000	Low	18.9	17.5	2.3	102	230	3.02	4.6	62.7	75.6	23.9	5.2	21.7	39.0	19.3	55.9	21.4
56000	Mid	15.1	16.1	2.1	97.4	202	3.65	5.3	57.2	81.7	53.2	8.2	19.5	36.8	19.1	50.7	25.1

continued

Table C-23. Plant Density and Plant Segment Influence on Corn Stover Agronomic and Biofuel Measurements.
(continued) **Arlington, WI - 2010. †**

Density	Plant Part	Moisture %	Yield					CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem
			Stover g/plant	TEP T/A	TE G/T	EtoH G/L	-----%-----										
56000	High	11.4	25.1	3.2	97.3	312	3.93	5.2	52.1	76.3	57.6	5.3	17.5	35.5	21.0	46.8	31.1
Mean		13.4	23.1	2.3	98.2	228	3.52	5.3	57.2	78.4	44.1	6.1	19.5	36.6	19.7	51.0	25.4
Probability (%)																	
Plant Density (PD)		75.4	0.0	0.0	61.9	0.0	57.9	22.9	90.2	0.2	49.9	74.1	67.1	32.7	67.5	89.5	0.0
Plant Part (PP)		0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PD x PP		97.7	69.3	72.6	94.0	72.9	58.8	36.5	73.2	0.0	42.3	71.0	83.3	97.7	89.7	64.9	9.1
LSD (0.05)																	
Plant Density (PD)		NS	2.4	0.3	NS	29.6	NS	NS	NS	1.3	NS	NS	NS	NS	NS	NS	0.4
Plant Part (PP)		4.3	3.1	0.3	1.7	23.1	0.5	0.6	1.0	1.6	2.5	0.7	0.7	0.7	0.5	0.9	0.5
PD x PP		NS	NS	NS	NS	NS	NS	NS	NS	2.8	NS	NS	NS	NS	NS	NS	NS

† TEP, Theoretical ethanol potential; TE, Theoretical ethanol; EtoH, ethanol; CP, crude protein; ADF, acid detergent fiber; NDF; neutral detergent fiber; NDFD, neutral detergent fiber digestibility; ADL, acid detergent lignin; Cell, cellulose; Hem, hemicellulose

FIELD EXPERIMENT HISTORY

Title: Plant Density Influence on Corn Stover Performance
Experiment: 02Plant Density **Trial ID:** 3387 **Year:** 2010
Personnel: J. G. Lauer, K. D. Kohn, T. H. Diallo and S. Wilkens
Location: Hancock, WI **County:** Columbia
Supported By: Monsanto

Site Information

Field: K21 **Previous Crop:** Potatoes **Soil Type:** Plainfield Sand
Soil Test: **Date:** 10/21/10 **pH** 6.8 **OM (%)** 0.8 **P (ppm)** 76 **K (ppm)** 85

Plot Management

Tillage Operations: Disk Cultivate

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	0-0-60	100 lb/A	3 /31/10
Starter :	10-34-0	3.0 gal/A	4 /30/10
Post plant :	46-0-0	200 lb/A	5/27 and 6/22/10
Manure:	N/A	N/A	N/A

Herbicide: Prallel 1.33 pt/A **Insecticide:** Force 3G 4.4lb/A
 Callisto 3.0 oz/A **Hybrid:** Dekalb DKC52-59

Irrigation: 8 inches

Planting Date: 5/3/10 **Planting Depth:** 1.5" **Row Width:** 30"

Target Plant Density: See Factors **Planting Method:** Almaco Precision Planter

Harvest Date: 10/11/10 **Harvest Method:** Massey Ferguson 8XP

Notes: Plant Segment (inches from base of plant): Low, 6-18; Mid, 19-37; High, 37-82

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 10' x 25' **Experiment Size:** 0.09 acre
Harvest Plot Size: 5' x 22' **Harvest Plant Density:** See Factors

Factors/Treatments:

Target Plant Density: (plants/A)

26000 32000
 38000 44000
 56000

Results: Tables C-24 and C-25

Table C-24. Plant Density Influence on Corn Stover Agronomic and Biofuel Measurements. Hancock, WI-2010. †

Density		Moisture	Yield															
Target	Harvest		Stover	TEP	TE	Etoh	CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem		
-----plants/A-----		%	g/plant	T/A	G/T	G/A	g/L	-----%-----										
26000	29400	48.6	71	2.3	98.3	225	4.71	3.7	53.0	81.2	48.3	7.7	17.9	36.9	19.5	45.5	28.2	
32000	36100	50.3	73	2.9	96.8	281	5.39	3.6	52.3	80.4	47.5	7.5	18.3	36.0	19.5	44.1	28.5	
38000	44800	45.9	59	2.9	98.9	285	4.63	4.3	52.8	81.0	47.9	7.7	18.1	37.1	19.6	45.4	28.2	
44000	50200	52.3	63	3.5	97.8	341	4.29	4.0	53.3	80.9	48.6	7.8	18.0	36.8	19.3	45.6	27.5	
56000	56000	46.5	54	3.3	98.3	323	5.02	4.4	52.2	81.5	49.1	7.7	17.4	36.6	19.6	45.0	28.1	
Mean	43300	48.7	64	3.0	98.0	291	4.81	4.0	52.7	81.0	48.3	7.7	17.9	36.7	19.5	45.1	28.1	
Probability (%)																		
Plant Density (D)	0.00	42.4	4.0	2.2	53.2	2.3	73.9	14.3	48.1	78.0	86.2	81.8	30.0	22.5	89.5	19.9	32.2	
LSD (0.05)																		
Plant Density (D)	7120	NS	13.1	1.5	NS	144	NS	NS	NS	NS	NS	NS	NS	NS	0.8	NS	NS	

† TEP, Theoretical ethanol potential; TE, Theoretical ethanol; Etoh, ethanol; CP, crude protein; ADF, acid detergent fiber; NDF; neutral detergent fiber; NDFD, neutral detergent fiber digestibility; ADL, acid detergent lignin; Cell, cellulose; Hem, hemicellulose

**Table C-25. Plant Density and Plant Segment Influence on Corn Stover Agronomic and Biofuel Measurements.
Hancock, WI - 2010. †**

Density	Plant Part	Moisture	Yield					CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem
			Stover	TEP	TE	Etoh											
plants/A		%	g/plant	T/A	G/T	G/A	g/L	-----%									
26000		47.5	23.7	1.7	98.0	171	4.72	3.8	52.6	81.0	48.6	7.7	17.8	19.5	36.7	45.3	28.4
32000		49.5	24.4	2.2	96.7	213	5.37	3.7	52.0	80.3	47.8	7.5	18.2	19.5	36.0	44.1	28.6
38000		45.4	19.6	2.2	98.7	216	4.62	4.4	52.7	80.8	48.2	7.8	18.1	19.6	37.1	45.3	28.3
44000		50.4	21.0	2.6	97.5	258	4.17	4.2	52.5	80.7	49.4	7.7	17.9	19.4	36.6	45.2	28.0
56000		43.3	17.9	2.5	97.9	245	4.82	4.7	51.3	81.2	49.5	7.4	17.3	19.7	36.4	44.4	28.7
	Low	65.7	17.7	1.9	99.3	188	5.19	2.7	58.4	81.9	43.3	9.5	19.1	18.6	38.3	48.0	24.0
	Mid	48.4	15.8	1.7	96.6	162	4.60	4.2	52.1	79.6	48.8	8.6	17.9	19.0	36.4	45.0	27.7
	High	27.5	30.5	3.2	97.4	312	4.43	5.6	46.2	80.9	54.1	4.8	16.6	20.9	34.9	41.5	33.4
26000	Low	65.5	19.8	1.5	99.9	145	5.15	2.7	58.5	82.3	43.0	9.6	19.1	18.6	38.8	48.4	23.9
26000	Mid	49.0	16.7	1.2	96.9	119	5.08	4.2	52.4	79.9	48.2	8.6	17.5	19.0	36.7	45.4	27.5
26000	High	28.1	34.6	2.5	97.2	247	3.92	4.7	46.9	80.7	54.7	4.9	16.7	21.0	34.8	42.1	33.9
32000	Low	68.4	18.3	1.7	98.0	162	4.85	2.7	57.9	81.1	42.2	9.2	19.7	18.5	37.7	45.7	24.2
32000	Mid	51.0	19.0	1.7	96.0	165	4.74	4.1	52.0	79.4	48.3	8.6	17.9	19.3	35.8	45.0	27.6
32000	High	29.0	36.0	3.2	96.1	312	6.53	4.4	46.2	80.6	52.7	4.6	17.0	20.8	34.3	41.7	34.0
38000	Low	61.9	16.2	1.8	100	182	4.92	2.6	59.2	82.5	42.7	9.7	19.5	18.8	38.7	49.2	23.8
38000	Mid	47.0	14.4	1.6	97.6	157	4.76	4.1	52.6	79.9	48.5	8.9	18.4	19.0	37.0	45.3	27.4
38000	High	27.3	28.0	3.1	98.3	308	4.17	6.3	46.1	80.1	53.3	4.7	16.5	20.9	35.5	41.4	33.6
44000	Low	69.4	17.3	2.2	98.8	215	5.10	2.8	59.0	81.6	42.3	9.2	19.2	18.3	38.4	48.4	24.0
44000	Mid	53.8	15.5	2.0	95.7	187	3.86	4.1	51.6	79.3	49.1	8.8	17.9	18.8	36.2	44.5	27.9
44000	High	28.0	30.3	3.8	97.9	373	3.56	5.6	47.0	81.2	56.7	5.1	16.5	21.0	35.2	42.5	31.9
56000	Low	63.2	16.9	2.4	99.7	236	5.93	2.7	57.4	81.9	46.1	9.6	18.2	18.8	38.0	48.4	24.1
56000	Mid	41.3	13.4	1.9	96.6	181	4.54	4.3	51.6	79.5	49.6	7.9	17.5	19.4	36.1	44.6	28.3

continued

Table C-25. Plant Density and Plant Segment Influence on Corn Stover Agronomic and Biofuel Measurements.
(continued) **Hancock, WI - 2010. †**

Density	Plant Part	Moisture	Yield					CP	ADF	NDF	NDFD	ADL	Lignin	Glucan	Xylan	Cell	Hem
			Stover	TEP	TE	Etoh											
		%	g/plant	T/A	G/T	G/A	g/L	-----%-----									
56000	High	25.3	23.4	3.3	97.5	319	3.98	7.0	44.9	82.3	52.9	4.6	16.3	20.9	35.0	40.1	33.8
Mean		47.2	21.3	2.3	97.8	221	4.74	4.2	52.2	80.8	48.7	7.6	17.8	19.5	36.5	44.8	28.4
Probability (%)																	
Plant Density (PD)		1.4	0.0	0.0	19.2	0.0	29.1	0.0	7.0	84.1	42.0	68.4	6.8	71.6	2.6	14.5	7.9
Plant Part (PP)		0.0	0.0	0.0	0.0	0.0	47.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PD x PP		72.0	8.1	50.8	97.8	45.8	44.3	0.0	73.5	87.4	35.4	80.6	72.1	94.2	93.6	12.0	2.9
LSD (0.05)																	
Plant Density (PD)		4.4	2.6	0.3	NS	23	NS	0.4	NS	NS	NS	NS	NS	NS	0.7	NS	NS
Plant Part (PP)		3.4	2.0	0.2	1.3	30	NS	0.5	1.1	1.6	2.2	0.7	0.5	0.4	0.5	1.2	5.7
PD x PP		NS	NS	NS	NS	NS	NS	0.9	NS	NS	NS	NS	NS	NS	NS	NS	9.1

† TEP, Theoretical ethanol potential; TE, Theoretical ethanol; Etoh, ethanol; CP, crude protein; ADF, acid detergent fiber; NDF; neutral detergent fiber; NDFD, neutral detergent fiber digestibility; ADL, acid detergent lignin; Cell, cellulose; Hem, hemicellulose