

FIELD EXPERIMENT HISTORY

Title: Plant Density and Hybrid Influence on Corn Grain and Silage Performance
Experiment: 02 Plant Density **Trial ID:** 2922 **Year:** 2006
Personnel: J. G. Lauer, P. J. Flannery and K. D. Kohn
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: ARS413 **Previous Crop:** Soybean **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 11/1 /06 **pH** 7.2 **OM (%)** 3.6 **P (ppm)** 41 **K (ppm)** 141

Plot Management

Tillage Operations: Chisel Plow Field Cultivator Soil Finisher Cultivated 6/14/06

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	46-0-0	324 lbs/A	4 /20/06
Starter :	9-23-30	150 lbs/A	4 /27/06
Post plant :	N/A	N/A	N/A
Manure:	N/A	N/A	N/A

Herbicide: Outlook 20 oz/A **Insecticide:** Force 3G 4.4 lb/A
 Hornet 4 oz/A **Hybrid:** See Factors
 Callisto 3oz/A

Irrigation: None

Planting Date: 4/27/06 **Planting Depth:** 1.5" **Row Width:** 30"

Target Plant Density: See Factors **Planting Method:** Kinze Plot Planter

Harvest Date: S: 9/18/06 **Harvest Method:** S: New Holland 707
 G: 10/17/06 G: Massey Ferguson 8XP

Notes:

Experimental Design

Design: RCB **Replications:** 3
Plot Size Seeded: 20' x 25' **Experiment Size:** 0.92 Acre
Harvest Plot Size: S: 2.5' x 22' **Harvest Plant Density:** N/A plants per acre
 G: 5' x 22'

Factors/Treatments:

Target Plant Density: (plants/A)

14000 20000 26000
 32000 38000 44000
 50000 56000

Hybrids:

Dekalb DKC58-78
 Pioneer 37R71

Results: Tables C-29.

**Table C-29. Plant Density and Hybrid Influence on Corn Grain.
Arlington, WI - 2006.**

Target Density	Hybrid	Grain																	
		Yield	Moisture	Test Weight	Lodged			Grower Return	Harvest		Seeds planted	Plants emerged	Plant height	Silk Date	Grain Composition			Ethanol	
					Total	Stalk	Root		plants/A	ears/A					Oil	Starch	Protein	per bu	per A
plants/A		bu/A	%	lbs/bu	%	%	%	\$/A	plants/A	ears/A	seeds/A	plants/A	inches	doy	%	%	%	gallons	gallons
	Dekalb DKC58-78	208	26.0	52	1	0	1	615	26961	28133	47619	28512	96	201	3.5	58.9	7.9	2.84	592
	Pioneer 37R71	159	20.5	52	4	0	4	487	23315	24338	47619	25340	94	198	3.6	59.4	7.8	2.86	455
14000		120	23.3	52	0	0	0	360	13266	17094	19008	15048	91	200	3.4	59.4	8.1	2.85	343
20000		150	23.1	52	0	0	0	450	14586	18150	26928	17391	97	200	3.5	58.2	8.0	2.83	424
26000		159	22.8	52	0	0	0	477	18480	22110	35640	18711	96	200	3.6	59.1	8.0	2.85	452
32000		175	23.4	52	2	0	2	523	23298	23760	43560	23694	96	200	3.6	59.1	7.8	2.86	499
38000		210	22.9	52	2	0	2	630	27786	28248	51480	28215	99	200	3.6	59.7	7.9	2.85	597
44000		218	23.4	52	5	0	5	654	31878	30690	60192	30525	95	200	3.6	59.0	7.8	2.86	634
50000		217	23.6	52	3	0	3	648	33462	32736	68112	38544	95	200	3.6	59.8	7.7	2.85	613
56000		222	23.5	52	8	1	7	663	38346	37092	76032	43280	94	201	3.6	59.1	7.4	2.86	634
14000	Dekalb DKC58-78	148	25.7	53	0	0	0	438	13464	19800	19008	15873	90	201	3.4	59.2	7.9	2.86	423
14000	Pioneer 37R71	92	20.9	52	1	0	1	282	13068	14388	19008	14223	91	198	3.5	59.5	8.2	2.84	262
20000	Dekalb DKC58-78	178	25.9	52	0	0	0	527	15840	21120	26928	17028	102	201	3.5	57.8	8.1	2.81	501
20000	Pioneer 37R71	121	20.3	52	0	0	0	372	13332	15180	26928	17754	91	198	3.6	58.6	7.9	2.86	347
26000	Dekalb DKC58-78	193	25.4	52	0	0	0	571	20592	23364	35640	20691	98	201	3.5	58.1	8.1	2.84	548
26000	Pioneer 37R71	125	20.1	51	0	0	0	384	16368	20856	35640	16731	94	198	3.6	60.0	8.0	2.85	356
32000	Dekalb DKC58-78	205	25.8	52	3	0	2	605	25740	25872	43560	26433	95	201	3.6	58.8	7.9	2.85	583
32000	Pioneer 37R71	145	21.1	52	2	0	2	441	20856	21648	43560	20955	97	199	3.7	59.5	7.6	2.87	415
38000	Dekalb DKC58-78	228	25.6	52	3	0	3	676	28908	28908	51480	31416	99	201	3.6	59.9	7.8	2.84	650
38000	Pioneer 37R71	191	20.3	52	0	0	0	585	26664	27588	51480	25014	98	198	3.7	59.5	8.0	2.85	544
44000	Dekalb DKC58-78	229	26.5	53	0	0	0	672	31944	31020	60192	28446	95	201	3.6	58.5	7.9	2.86	692
44000	Pioneer 37R71	208	20.3	52	10	0	10	637	31812	30360	60192	32604	95	199	3.6	59.3	7.8	2.86	596
50000	Dekalb DKC58-78	239	26.4	53	0	0	0	702	37224	34848	68112	42174	97	202	3.6	59.7	7.8	2.84	696
50000	Pioneer 37R71	194	20.7	51	6	0	6	594	29700	30624	68112	34914	93	199	3.7	59.8	7.7	2.86	557
56000	Dekalb DKC58-78	248	27.0	52	4	0	3	727	41976	40128	76032	46035	95	203	3.6	59.1	7.5	2.85	706
56000	Pioneer 37R71	195	19.9	52	12	1	11	600	34716	34056	76032	40524	93	199	3.6	59.1	7.4	2.88	562
Mean		184	23.2	52	3	0	2	551	25138	26235	47619	26926	95	200	3.6	59.2	7.8	2.85	520
Probability(%)																			
Plant Density (D)		0.0	60.6	54.0	9.6	4.9	15.7	0.0	0.0	0.0	-	0.0	41.5	0.0	1.2	1.4	65.4	4.8	0.1
Hybrid (H)		0.1	0.0	7.8	0.6	61.3	1.2	0.2	11.8	2.0	-	4.0	51.7	2.9	11.5	1.6	2.6	23.8	0.0
D x H		74.4	21.5	49.0	24.2	28.6	31.5	67.2	83.2	89.3	-	5.1	69.3	94.3	82.5	17.9	71.7	15.5	94.5
LSD (0.10)																			
Plant Density (D)		23	NS	NS	5	0	NS	70	4862	3957	-	3116	NS	0	0.0	0.7	NS	0.01	35
Hybrid (H)		12	0.5	1	1	NS	1	36	NS	2169	-	2259	NS	1	NS	0.3	0.4	NS	66
D x H		NS	NS	NS	NS	NS	NS	NS	NS	NS	-	4407	NS	NS	NS	NS	NS	NS	NS
CV(%)		13	3	1	194	276	206	13	20	15	-	12	6	0	4	1	4	1	13

**Table C-29. Plant Density and Hybrid Influence on Silage Performance.
Arlington, WI - 2006.**

Target Density	Hybrid	Yield tons/A	Whole Plant											Milk per		Harvest		
			Moist %	Kernel milk %	KMR 0-5	SMR 0-5	VMR 0-10	Crude protein %	ADF %	NDF %	In Vitro Digest %	NDFD %	Starch %	Ton lbs/T	Acre lbs/A	plants plants/A	ears ears/A	
plants/A																		
	Dekalb DKC58-78	8.0	60.9	53	2.6	2.5	5.2	7.5	21.4	43.2	81.2	56.4	33.2	3241	26038	26169	29898	
	Pioneer 37R71	6.4	55.4	17	0.8	1.7	2.5	7.4	18.6	39.6	82.3	55.3	37.1	3340	21274	25311	27423	
14000		4.6	57.9	32	1.6	1.7	3.3	7.9	19.2	41.1	82.5	57.4	34.2	3333	15492	11748	17556	
20000		6.1	58.8	36	1.8	2.1	3.9	7.7	19.9	42.0	82.1	57.3	34.0	3303	20284	20592	20988	
26000		7.1	57.5	34	1.7	2.6	4.3	7.6	19.0	40.5	82.5	56.7	35.7	3339	23842	17688	24024	
32000		6.9	59.9	33	1.7	2.5	4.2	7.7	20.8	42.9	81.7	57.3	32.5	3271	22362	22308	26532	
38000		7.6	58.4	36	1.8	2.1	3.8	7.3	20.3	41.6	81.1	54.6	35.2	3255	24544	27192	29700	
44000		7.9	58.6	34	1.7	2.1	3.8	7.5	19.6	40.4	81.8	55.0	36.5	3304	26114	29304	30624	
50000		9.2	56.3	33	1.7	1.9	3.6	7.1	20.4	41.5	81.3	54.7	36.5	3265	29933	39468	40392	
56000		8.2	57.4	38	1.9	1.8	3.7	7.0	20.5	41.1	81.1	53.9	36.4	3257	26680	37620	39468	
14000	Dekalb DKC58-78	5.9	59.2	50	2.5	2.4	4.9	7.9	19.3	40.7	82.5	57.0	34.6	3341	19557	12408	19008	
14000	Pioneer 37R71	3.4	56.6	13	0.7	1.0	1.7	7.9	19.1	41.6	82.4	57.7	33.8	3324	11426	11088	16104	
20000	Dekalb DKC58-78	7.4	60.7	57	2.8	2.7	5.5	7.6	20.7	42.4	82.0	57.4	34.3	3292	24236	17688	22704	
20000	Pioneer 37R71	4.9	56.9	15	0.8	1.6	2.4	7.9	19.2	41.6	82.2	57.1	33.8	3313	16331	23496	19272	
26000	Dekalb DKC58-78	7.6	60.9	57	2.8	2.7	5.5	7.7	20.7	42.7	81.8	57.4	32.9	3281	24894	16368	22440	
26000	Pioneer 37R71	6.7	54.0	12	0.6	2.5	3.1	7.5	17.4	38.3	83.1	55.9	38.5	3396	22790	19008	25608	
32000	Dekalb DKC58-78	7.9	62.7	47	2.3	2.5	4.8	7.6	23.1	46.4	80.4	57.7	29.1	3167	25016	23760	28248	
32000	Pioneer 37R71	5.8	57.1	20	1.0	2.5	3.5	7.7	18.4	39.5	82.9	56.8	35.8	3375	19708	20856	24816	
38000	Dekalb DKC58-78	8.0	61.3	50	2.5	2.4	4.9	7.3	22.7	45.0	79.9	55.2	31.9	3155	25273	27456	30096	
38000	Pioneer 37R71	7.1	55.5	22	1.1	1.7	2.8	7.3	18.0	38.3	82.4	53.9	38.5	3356	23816	26928	29304	
44000	Dekalb DKC58-78	8.7	61.9	55	2.8	2.7	5.4	7.7	20.8	42.1	81.3	55.5	35.1	3257	28228	27456	29568	
44000	Pioneer 37R71	7.2	55.4	13	0.7	1.5	2.2	7.3	18.3	38.8	82.4	54.5	38.0	3351	23999	31152	31680	
50000	Dekalb DKC58-78	9.9	60.1	55	2.8	2.5	5.3	7.5	22.3	44.1	80.5	55.7	32.7	3193	31503	42768	44088	
50000	Pioneer 37R71	8.5	52.6	12	0.6	1.3	1.9	6.7	18.5	38.8	82.1	53.8	40.2	3337	28363	36168	36696	
56000	Dekalb DKC58-78	9.1	60.2	50	2.5	2.4	4.9	7.1	21.5	42.2	81.0	55.1	35.0	3246	29600	41448	43032	
56000	Pioneer 37R71	7.3	54.6	27	1.3	1.2	2.5	6.8	19.5	40.1	81.1	52.8	37.9	3268	23760	33792	35904	
Mean		7.2	58.1	35	1.7	2.1	3.8	7.5	20.0	41.4	81.7	55.9	35.1	3291	23656	25740	28661	
Probability(%)																		
Plant Density (D)		1.1	24.7	84.3	84.3	0.1	7.2	0.0	46.0	78.4	9.3	0.0	26.6	40.8	0.0	0.0	0.0	
Hybrid (H)		0.8	0.0	0.1	0.1	0.2	0.0	21.0	0.2	0.1	3.4	11.8	0.1	1.4	2.9	61.2	21.5	
D x H		86.7	60.3	8.1	8.1	0.6	2.1	16.6	22.0	15.6	14.8	42.3	15.5	14.4	71.4	20.1	27.8	
LSD (0.10)																		
Plant Density (D)		0.8	NS	NS	NS	0.3	0.5	0.3	NS	NS	1.0	1.1	NS	NS	3742	4684	4031	
Hybrid (H)		1.1	0.6	8	0.4	0.2	0.5	NS	0.6	0.9	0.8	NS	1	51	3042	NS	NS	
D x H		NS	NS	10	0.5	0.5	0.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
CV(%)																		
		16	4	21	21	16	14	4	8	6	1	2	9	2	16	19	14	

**Table C-30. Plant Density and Hybrid Influence on Corn Grain.
Arlington, WI - 2005.**

Target Density plants/A	Hybrid	Trait	Grain Composition			Ethanol	
			Oil %	Starch %	Protein %	per bu gallons	per A gallons
	Pioneer 34M94		3.2	59.0	8.1	2.90	584
	Pioneer 34M95	Bt	3.3	58.6	8.1	2.89	603
14000			3.2	57.6	9.1	2.84	441
20000			3.2	58.1	8.7	2.86	554
26000			3.3	58.3	8.3	2.87	628
32000			3.2	58.8	8.1	2.90	644
38000			3.2	59.1	7.9	2.91	648
44000			3.2	59.4	7.7	2.92	594
50000			3.2	59.6	7.5	2.94	628
56000			3.2	59.6	7.5	2.94	611
14000	Pioneer 34M94		3.1	57.8	9.1	2.84	452
14000	Pioneer 34M95	Bt	3.2	57.4	9.2	2.83	431
20000	Pioneer 34M94		3.1	58.1	8.7	2.86	544
20000	Pioneer 34M95	Bt	3.2	58.0	8.7	2.85	563
26000	Pioneer 34M94		3.2	58.3	8.4	2.88	616
26000	Pioneer 34M95	Bt	3.3	58.3	8.3	2.87	639
32000	Pioneer 34M94		3.2	58.9	8.2	2.90	619
32000	Pioneer 34M95	Bt	3.3	58.7	8.1	2.90	669
38000	Pioneer 34M94		3.2	59.1	8.0	2.90	604
38000	Pioneer 34M95	Bt	3.2	59.0	7.8	2.92	691
44000	Pioneer 34M94		3.2	59.6	7.7	2.93	588
44000	Pioneer 34M95	Bt	3.3	59.1	7.7	2.91	600
50000	Pioneer 34M94		3.1	60.1	7.4	2.97	655
50000	Pioneer 34M95	Bt	3.3	59.2	7.7	2.92	602
56000	Pioneer 34M94		3.2	59.7	7.5	2.94	591
56000	Pioneer 34M95	Bt	3.3	59.4	7.6	2.93	631
Mean			3.2	58.8	8.1	2.90	593
Probability(%)							
Plant Density (D)			32.1	0.0	0.0	0.0	0.0
Hybrid (H)			0.5	0.3	81.8	8.4	50.9
D x H			75.6	29.5	13.4	2.0	37.7
LSD (0.10)							
Plant Density (D)			NS	0.3	0.2	0.0	49
Hybrid (H)			0.0	0.1	NS	0.1	NS
D x H			NS	NS	NS	0.0	NS
CV(%)							
			2	0	2	0	8