

## FIELD EXPERIMENT HISTORY

**Exp. Number:** 04 Plant Density \* Date of Planting **Year: 1997**  
**Title:** Plant Density \* Planting Date on Corn Grain and Silage Yield and Quality  
**Location:** Arlington Research Station  
**Personnel:** J.G. Lauer, K.D. Kohn, P.J. Flannery, K.D. Hudelson and H.M. Darby  
**Supported by:** Hatch

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### FIELD INFORMATION

**Field:** 427  
**Soil Type:** Plano Silt Loam  
**Soil Test Results:** Test Date: 7/96 pH: 6.3 P (ppm): 40 K (ppm): 150 O.M. 2.9%  
**Tillage Operations:** Chisel Plow, Field Cultivator  
Field Cultivate prior to each planting  
**Fertilizer:** 24- April 150 lbs N/a 46-0-0  
Each Planting Date: 150 lbs/a 6-24-24 starter  
**Herbicide:** Application varies with Planting Date  
Frontier @ 20oz/A & Bladex 90DF @ 2.2lbs/A - Preemerge  
**Previous Crop:** Soybean  
**Irrigation:** None

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### EXPERIMENTAL PROCEDURE

**Exp. Design:** RCB Split Plot  
**Replicates:** 3  
**Variables:** 2 Planting Dates: 5-May, 20-May  
3 Plant Densities: 20,000, 30,000, & 40,000 plants/a  
2 Hybrids: Dairyland Seeds 1407 (105 RM); Dekalb 493 (95RM)  
**Row Spacing:** 30"  
**Planting Date:** 5-May, 20-May  
**Area Planted:** 20' x 25'  
**Planting Equip:** Kinze Plot Planter w/seed cones  
**Date Harvested:** Varied - Silage  
5-Nov. - Grain  
**Area Harvested:** 5' x 22' - Grain  
2.5' x 22' - Silage  
**Harvesting Equip:** Kincaid Plot Combine - Grain  
New Holland One-Row Chopper - Silage

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Results: Table E-20.

**Table E-20. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain  
Arlington, WI - 1997**

Plant Date	Day Of Year	Hybrid	Density	Harvest Population	Broken Stalks %	Grain			Silage									
						Yield bu/a	Moist %	Test Weight lbs/bu	Yield tons	Moist %	Kernel Milk %	Crude Protein %	ADF %	NDF %	In Vitro Digest %	Cell Wall Digest %	Milk Per	
														Ton lbs/T	Acre Lbs/A			
		Dairyland 1407		28248	9.8	148.1	27.0	51	6.4	64.1	38	7.0	23.9	43.1	75.7	43.8	2010	13067
		Dekalb 493		28655	11.8	162.1	24.1	54	6.5	60.7	29	6.7	21.4	40.7	78.0	45.9	2246	14714
			20000	20625	3.6	159.6	24.9	53	6.0	62.1	33	7.0	21.2	39.9	78.0	44.9	2282	13751
			30000	28892	6.1	164.0	25.4	52	6.7	62.1	33	6.7	23.0	42.7	76.8	45.6	2089	14160
			40000	35838	22.7	141.7	26.4	51	6.8	63.1	36	6.8	24.0	43.4	75.6	43.8	1990	13734
		Dairyland 1407	20000	19833	3.4	166.2	26.3	52	6.1	64.1	38	7.2	22.7	41.7	76.8	44.3	2131	12938
		Dekalb 493	20000	21417	3.7	153.0	23.4	54	5.9	60.2	27	6.8	19.7	38.1	79.2	45.5	2432	14564
		Dairyland 1407	30000	28776	6.0	156.6	26.8	51	6.7	63.1	37	6.8	23.7	43.2	76.0	44.6	2026	13811
		Dekalb 493	30000	29007	6.3	171.4	24.1	54	6.7	61.0	30	6.6	22.3	42.2	77.5	46.6	2151	14509
		Dairyland 1407	40000	36135	20.0	121.5	27.9	50	6.6	65.3	40	7.0	25.7	44.8	74.1	42.2	1846	12329
		Dekalb 493	40000	35541	25.5	162.0	24.8	53	7.0	60.9	32	6.7	22.4	42.0	77.1	45.5	2135	15139
May 01	121			28226	14.2	155.1	25.3	53	6.9	64.3	50	6.8	21.4	39.7	78.1	44.9	2295	15866
May 20	140			28677	7.4	155.1	25.8	52	6.1	60.6	18	6.9	23.7	43.9	75.7	44.8	1979	12134
May 01	121	Dairyland 1407		27720	11.8	145.6	27.1	51	6.8	65.4	54	6.9	22.6	41.0	77.2	44.3	2191	14997
May 01	121	Dekalb 493		28732	16.7	164.6	23.5	54	6.9	63.2	46	6.7	20.2	38.5	79.0	45.4	2399	16735
May 20	140	Dairyland 1407		28776	7.8	150.6	26.9	51	6.1	62.8	22	7.0	25.1	45.1	74.4	43.3	1850	11350
May 20	140	Dekalb 493		28578	7.0	159.7	24.8	53	6.1	58.3	13	6.7	22.4	42.6	77.1	46.3	2109	12917
May 01	121		20000	20691	3.4	158.3	24.9	53	6.2	64.3	50	6.9	20.5	38.4	78.6	44.4	2382	15014
May 01	121		30000	28974	7.1	170.4	24.3	53	7.2	64.3	50	6.7	21.8	40.8	78.0	45.8	2243	16062
May 01	121		40000	35013	32.2	136.6	26.7	52	7.2	64.3	51	6.8	22.2	40.2	77.5	44.2	2244	16851
May 20	140		20000	20559	3.7	160.9	24.8	53	5.7	59.9	15	7.1	21.9	41.4	77.4	45.4	2182	12488
May 20	140		30000	28809	5.2	157.5	26.6	52	6.2	59.9	17	6.7	24.1	44.6	75.5	45.3	1935	12257
May 20	140		40000	36663	13.3	146.9	26.1	51	6.4	61.9	21	6.9	25.2	45.6	74.3	43.6	1822	11656
May 01	121	Dairyland 1407	20000	20130	1.3	165.8	27.1	53	6.0	65.9	55	7.0	22.1	40.6	77.6	44.9	2232	13437
May 01	121	Dekalb 493	20000	21252	5.5	150.8	22.7	54	6.5	62.8	45	6.8	18.9	36.3	79.6	43.9	2531	16591
May 01	121	Dairyland 1407	30000	28512	7.8	163.9	25.0	51	7.4	64.2	55	6.8	22.2	41.0	77.6	45.3	2210	16443
May 01	121	Dekalb 493	30000	29436	6.3	176.9	23.6	54	6.9	64.4	45	6.7	21.5	40.5	78.3	46.4	2275	15682
May 01	121	Dairyland 1407	40000	34518	26.2	107.0	29.3	50	6.9	66.3	53	7.0	24.1	41.4	76.0	41.9	2099	15170
May 01	121	Dekalb 493	40000	35508	38.2	166.1	24.1	54	7.5	62.3	48	6.6	20.3	38.9	79.1	46.4	2388	18532
May 20	140	Dairyland 1407	20000	19536	5.6	166.6	25.6	52	6.1	62.3	22	7.3	23.3	42.9	75.9	43.7	2030	12438
May 20	140	Dekalb 493	20000	21582	1.8	155.2	24.1	53	5.4	57.5	8	6.8	20.5	39.9	78.9	47.1	2333	12538
May 20	140	Dairyland 1407	30000	29040	4.1	149.2	28.6	50	5.9	62.0	18	6.8	25.2	45.4	74.5	43.9	1841	11178
May 20	140	Dekalb 493	30000	28578	6.2	165.9	24.6	53	6.5	57.7	15	6.6	23.1	43.9	76.6	46.8	2028	13336
May 20	140	Dairyland 1407	40000	37752	13.7	135.9	26.6	50	6.2	64.2	27	7.0	26.8	47.0	72.9	42.3	1677	10435
May 20	140	Dekalb 493	40000	35574	12.9	157.9	25.5	52	6.5	59.6	15	6.8	23.7	44.1	75.7	44.9	1966	12877
<b>Mean</b>				28452	10.8	155.1	25.6	52.21	6.5	62.4	34	6.9	22.6	41.9	76.8	44.8	2128	13890
<b>Probability(%)</b>																		
Date of Planting (DOP)				28.0	3.0	99.7	54.7	2.0	0.0	0.0	0.0	53.4	0.0	0.0	0.0	93.4	0.0	0.0
Hybrid (H)				32.0	48.0	1.0	0.0	0.0	68.1	0.0	1.0	2.0	0.0	1.0	0.0	0.0	0.0	7.0
Plant Density (PD)				0.0	0.0	1.0	40.0	2.0	2.0	39.0	64.6	20.0	2.0	1.0	3.0	15.0	2.0	88.3
H x PD				11.0	68.8	0.0	97.6	26.0	60.6	36.0	78.8	83.3	48.0	42.0	57.9	40.0	50.0	66.8
DOP x H				15.0	32.0	35.0	41.0	46.0	82.5	11.0	85.5	87.5	94.7	96.1	49.9	23.0	71.8	91.3
DOP x PD				13.0	2.0	21.0	39.0	93.3	74.9	41.0	78.8	80.5	55.0	47.0	33.0	49.0	38.0	41.0
DOP x H x PD				14.0	49.0	21.0	29.0	78.5	13.0	50.7	64.6	76.8	79.3	82.2	86.7	21.0	92.2	35.0
<b>LSD(0.10)</b>																		
Date of Planting (DOP)				NS	7.2	NS	NS	0.9	0.1	2.0	7.3	NS	1.7	2.2	1.1	NS	154	546
Hybrid (H)				NS	NS	6.9	1.2	0.6	NS	0.9	4.0	0.1	0.9	1.0	0.7	0.8	85	1090
Plant Density (PD)				652	4.6	8.5	NS	0.7	0.4	NS	NS	NS	1.1	1.3	0.9	NS	104.2	NS
<b>CV(%)</b>				4	79	10	11	2	11	3	27	5	9	6	2	4	9	18

**Table E-20. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain  
Arlington, WI - 1997**

Plant Date	Day Of Year	Hybrid	Density	Leaf Development (DOY 171)				Leaf Development (DOY 192)				Leaf Development (DOY 207)				Leaf Dev. (DOY 220)	
				Leaf Collars	Hail Method	Total Leaves	Plant Height inches	Leaf Collars	Hail Method	Total Leaves	Plant Height inches	Leaf Collars	Hail Method	Total Leaves	Plant Height inches	Total Leaves	Plant Height inches
		Dairyland 1407		4.2	6.3	7.5	11.1	8.8	13.4	15.4	48.6	8.8	13.4	15.4	95.1	18.8	106.9
		Dekalb 493		4.3	6.3	7.6	10.6	9.4	12.8	15.8	47.6	9.4	12.8	15.8	93.1	19.8	105.4
			20000	4.3	6.3	7.5	10.4	9.2	13.5	15.8	45.3	9.2	13.5	15.8	91.9	19.3	105.8
			30000	4.3	6.3	7.6	11.2	9.1	13.0	15.6	48.4	9.1	13.0	15.6	95.1	19.3	108.5
			40000	4.2	6.2	7.5	11.0	9.1	12.9	15.3	50.4	9.1	12.9	15.3	95.3	19.2	104.2
		Dairyland 1407	20000	4.3	6.3	7.5	10.5	8.9	13.8	15.7	45.7	8.9	13.8	15.7	91.5	19.0	107.2
		Dekalb 493	20000	4.3	6.3	7.4	10.3	9.5	13.3	16.0	45.0	9.5	13.3	16.0	92.2	19.7	104.5
		Dairyland 1407	30000	4.3	6.3	7.6	12.0	8.8	13.3	15.3	49.3	8.8	13.3	15.3	97.8	18.9	109.3
		Dekalb 493	30000	4.3	6.2	7.7	10.3	9.4	12.8	15.9	47.5	9.4	12.8	15.9	92.5	19.8	107.7
		Dairyland 1407	40000	4.0	6.1	7.4	10.8	8.8	13.3	15.2	50.7	8.8	13.3	15.2	96.1	18.5	104.3
		Dekalb 493	40000	4.3	6.3	7.7	11.2	9.4	12.5	15.3	50.2	9.4	12.5	15.3	94.5	19.8	104.0
May 01	121			4.5	6.5	7.8	11.8	9.3	13.4	15.9	49.6	9.3	13.4	15.9	95.7	19.4	104.4
May 20	140			4.0	6.0	7.3	9.9	8.9	12.9	15.2	46.6	8.9	12.9	15.2	92.5	19.2	107.9
May 01	121	Dairyland 1407		4.4	6.5	7.6	12.1	8.8	13.6	15.6	50.4	8.8	13.6	15.6	97.1	18.8	104.4
May 01	121	Dekalb 493		4.6	6.6	7.9	11.4	9.8	13.2	16.2	48.7	9.8	13.2	16.2	94.3	20.0	104.4
May 20	140	Dairyland 1407		4.0	6.0	7.4	10.1	8.8	13.3	15.1	46.7	8.8	13.3	15.1	93.2	18.8	109.4
May 20	140	Dekalb 493		4.0	6.0	7.2	9.8	9.1	12.5	15.3	46.4	9.1	12.5	15.3	91.9	19.5	106.3
May 01	121		20000	4.7	6.7	7.7	11.3	9.3	13.6	15.8	46.7	9.3	13.6	15.8	92.8	19.4	104.7
May 01	121		30000	4.5	6.5	7.8	12.0	9.4	13.2	16.1	49.8	9.4	13.2	16.1	96.5	19.7	107.0
May 01	121		40000	4.3	6.4	7.9	12.0	9.3	13.3	15.8	52.2	9.3	13.3	15.8	97.8	19.1	101.7
May 20	140		20000	4.0	6.0	7.3	9.5	9.1	13.4	15.9	44.0	9.1	13.4	15.9	90.9	19.3	107.0
May 20	140		30000	4.0	6.0	7.5	10.3	8.8	12.8	15.1	47.0	8.8	12.8	15.1	93.8	19.0	110.0
May 20	140		40000	4.0	6.0	7.2	10.0	8.9	12.4	14.7	48.7	8.9	12.4	14.7	92.8	19.3	106.7
May 01	121	Dairyland 1407	20000	4.7	6.7	7.7	11.0	8.7	13.5	15.3	47.0	8.7	13.5	15.3	91.9	19.2	105.0
May 01	121	Dekalb 493	20000	4.7	6.7	7.7	11.7	10.0	13.7	16.2	46.3	10.0	13.7	16.2	93.8	19.7	104.3
May 01	121	Dairyland 1407	30000	4.5	6.7	7.7	13.3	9.0	13.5	15.8	51.7	9.0	13.5	15.8	99.7	18.8	107.7
May 01	121	Dekalb 493	30000	4.5	6.3	7.8	10.7	9.8	12.8	16.3	48.0	9.8	12.8	16.3	93.2	20.5	106.3
May 01	121	Dairyland 1407	40000	4.0	6.2	7.5	12.0	8.8	13.7	15.7	52.7	8.8	13.7	15.7	99.7	18.3	100.7
May 01	121	Dekalb 493	40000	4.7	6.7	8.3	12.0	9.7	13.0	16.0	51.7	9.7	13.0	16.0	95.8	19.8	102.7
May 20	140	Dairyland 1407	20000	4.0	6.0	7.3	10.0	9.2	14.0	16.0	44.3	9.2	14.0	16.0	91.2	18.8	109.3
May 20	140	Dekalb 493	20000	4.0	6.0	7.2	9.0	9.0	12.8	15.8	43.7	9.0	12.8	15.8	90.6	19.7	104.7
May 20	140	Dairyland 1407	30000	4.0	6.0	7.5	10.7	8.7	13.0	14.7	47.0	8.7	13.0	14.7	95.8	19.0	111.0
May 20	140	Dekalb 493	30000	4.0	6.0	7.5	10.0	9.0	12.7	15.5	47.0	9.0	12.7	15.5	91.9	19.0	109.0
May 20	140	Dairyland 1407	40000	4.0	6.0	7.3	9.7	8.7	12.8	14.7	48.7	8.7	12.8	14.7	92.5	18.7	108.0
May 20	140	Dekalb 493	40000	4.0	6.0	7.0	10.3	9.2	12.0	14.7	48.7	9.2	12.0	14.7	93.2	19.8	105.3
<b>Mean</b>				4.3	6.3	7.5	10.9	9.1	13.1	15.6	48.1	9.1	13.1	15.6	94.1	19.3	106.2
<b>Probability(%)</b>																	
Date of Planting (DOP)				0.0	0.0	1.0	0.0	1.0	6.0	0.4	0.1	1.0	6.0	0.4	0.5	17.0	1.0
Hybrid (H)				29.0	75.5	60.2	20.0	0.0	2.0	7.0	19.0	0.0	2.0	7.0	5.0	0.0	23.0
Plant Density (PD)				43.0	51.0	69.2	30.0	73.1	10.0	9.0	0.0	73.1	10.0	9.0	2.0	61.0	3.0
H x PD				33.0	18.0	69.2	10.0	95.6	88.4	60.8	73.0	95.6	88.4	60.8	7.0	22.0	75.0
DOP x H				29.0	75.5	13.0	67.2	1.0	42.0	43.0	31.0	1.0	42.0	43.0	45.0	9.0	23.0
DOP x PD				43.0	50.8	43.0	94.1	56.3	41.0	3.0	89.0	56.3	41.0	3.0	46.0	12.0	67.0
DOP x H x PD				33.0	18.0	34.0	17.0	17.0	36.0	43.0	58.9	17.0	36.0	43.0	33.0	5.0	78.0
<b>LSD(0.10)</b>																	
Date of Planting (DOP)				0.1	0.1	0.1	0.4	0.1	0.1	0.3	2.7	0.1	0.1	0.1	1.1	NS	1.0
Hybrid (H)				NS	NS	NS	NS	0.2	0.3	0.3	NS	0.2	0.3	0.3	1.3	0.2	NS
Plant Density (PD)				NS	NS	NS	NS	NS	NS	0.3	1.2	NS	NS	0.3	1.6	NS	2.0
<b>CV(%)</b>				7	4	6	11	4	5	4	5	4	5	4	3	2	4