

FIELD EXPERIMENT HISTORY

Title: Plant Density and Row Spacing Effects on Corn Grain and Silage
Experiment: 06 RS x PD **Trial ID:** 2927 **Year:** 2006
Personnel: J.G. Lauer, P.J. Flannery and K.D. Kohn
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: ARS427 **Previous Crop:** Soybean **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 11/1 /06 **pH** 7.1 **OM (%)** 4 **P (ppm)** 88 **K (ppm)** 278

Plot Management

Tillage Operations: Fall Chisel Plow Field Cultivator Soil Finisher

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer: Preplant :	46-0-0	325	4 /20/06
Starter :	N/A	N/A	N/A
Post plant :	N/A	N/A	N/A
Manure:	N/A	N/A	N/A

Herbicide: Outlook 20.0 oz/A **Insecticide:** None
 Hornet 4.0 oz/A **Hybrid:** Dekalb DKC50-20(YGRR)
Irrigation: None

Planting Date: 5/22/07 **Planting Depth:** 1.5" **Row Width:** See Factors
Target Plant Density: See Factors **Planting Method:** Kinze 2000 Inter-Row Planter
Harvest Date: S: 9/13/06 **Harvest Method:** S: NH 707
 G: 10/24/06 G: Massey Ferguson 8XP

Notes: Silk DOY for all treatments = 202.

Experimental Design

Design: See Factors **Replications:** 3
Plot Size Seeded: 10' x 100' **Experiment Size:** 0.6 Acre
Harvest Plot Size: S: 5' x 8.75' **Harvest Plant Density:** See Factors
 G: 5' x 91.25'
Factors/Treatments:

<u>Row Spacing:</u>	<u>Plant Density: (plants/A)</u>
15 inch	25000, 30000,
30 inch	35000 and 40000

Results: Table C-41.

**Table C-41. Plant Density and Row Spacing Effects on Corn Grain and Silage Yield and Quality
Arlington, WI - 2006**

		Grain													
		Yield Components @ 0% moisture									Grain Composition			Ethanol	
Row spacing	Density	Harvest population	Broken stalks	Yield	Moisture	Test weight	Grower return	Ear number	Kernels number	100 Kernel wt	Oil	Starch	Protein	per bu	per A
inches	plants/A	plants/A	%	bu/A	%	lbs/bu	\$/A	ears/A	no./ear	grams	%	%	%	gallons	gallons
	25000	28044	0	222	21.7	54	675	28044	676	25.5	3.2	7.2	59.1	2.9	648.0
	30000	31695	1	235	20.9	54	716	31695	675	23.6	3.2	7.0	59.2	2.9	686.4
	35000	36839	3	234	21.1	54	714	36673	581	23.8	3.2	7.1	59.0	2.9	684.1
	40000	41984	6	232	20.8	54	710	42149	506	23.5	3.2	7.2	59.0	2.9	677.2
15 inches		34931	3	232	21.2	54	708	34931	598	24.4	3.2	7.1	59.1	2.9	679.0
30 inches		34350	2	230	21.1	54	700	34350	621	23.8	3.2	7.1	59.1	2.9	668.9
15 inches	25000	28542	0	218	21.8	54	660	28542	611	27.0	3.2	7.2	58.9	2.9	633.5
15 inches	30000	31861	1	242	21.0	54	738	31861	700	23.4	3.2	7.0	59.2	2.9	708.5
15 inches	35000	36839	3	236	21.2	55	719	36507	565	24.7	3.2	7.0	59.1	2.9	691.0
15 inches	40000	42481	8	233	20.9	54	713	42813	517	22.6	3.2	7.1	59.2	2.9	682.9
30 inches	25000	27547	0	227	21.6	54	690	27547	741	24.1	3.2	7.1	59.2	2.9	662.5
30 inches	30000	31529	1	227	20.9	54	693	31529	650	23.8	3.2	7.0	59.2	2.9	664.2
30 inches	35000	36839	3	233	21.0	54	709	36839	596	22.9	3.2	7.1	58.9	2.9	677.3
30 inches	40000	41486	4	232	20.8	54	707	41486	495	24.3	3.3	7.2	58.8	2.9	671.6
Mean		34641	3	231	21.1	54	704	34641	610	24.1	3.2	7.1	59.1	2.9	673.9
Probability(%)															
Row Space (S)		41.1	37.3	49.1	31.6	7.0	53.9	44.3	26.2	19.7	19.3	59.4	61.0	12.8	41.6
Plant Density (D)		0.0	0.1	13.3	0.6	65.0	10.5	0.0	0.0	3.0	77.7	4.1	58.3	35.8	13.6
S x D		93.9	27.1	23.2	97.3	85.6	25.0	86.0	2.4	1.9	40.3	51.9	27.2	20.1	24.3
LSD(0.10)															
Row Space (S)		NS	NS	NS	NS	1	NS	NS	NS	NS	NS	NS	NS	NS	NS
Plant Density (D)		1206	2	NS	0.3	NS	NS	4482	34	0.9	NS	0.1	NS	NS	NS
S x D		NS	NS	NS	NS	NS	NS	NS	67	2	NS	NS	NS	NS	NS
CV(%)															
		5	84	4	2	1	4	5	8	5	2	2	0	0	4

continued

Table C-41. Plant Density and Row Spacing Effects on Corn Grain and Silage Yield and Quality
(continued) **Arlington, WI - 2006**

Row spacing	Whole Plant												
	Density	Harvest population	Yield	Moisture	Kernel milk	Crude protein	ADF	NDF	In Vitro		Milk per		
inches	plants/A	plants/A	tons/A	%	%	%	%	%	%	%	%	Ton	Acre
	25000	26833	7.6	75.2	52	7.3	27.2	49.2	76.7	52.7	32.7	2895	22102
	30000	30833	7.3	76.9	51	6.7	32.3	56.4	72.6	51.6	25.3	2595	19097
	35000	36500	8.7	74.1	53	7.0	27.3	49.7	76.2	52.4	32.4	2864	25207
	40000	43333	8.8	74.7	54	7.0	29.0	51.8	75.2	52.2	30.2	2785	24761
15 inches		34333	7.8	77.1	53	6.9	31.2	54.5	73.5	51.5	27.8	2664	20915
30 inches		34417	8.4	73.4	52	7.2	26.7	49.1	76.9	53.0	32.5	2906	24668
15 inches	25000	26333	7.3	76.3	52	7.1	28.6	50.7	75.9	52.5	31.5	2837	20902
15 inches	30000	30667	7.2	77.8	52	6.5	34.1	58.8	71.1	50.8	22.8	2486	17863
15 inches	35000	36667	8.2	77.0	52	6.7	30.5	53.7	73.7	51.4	28.6	2685	22443
15 inches	40000	43667	8.5	77.3	55	7.1	31.5	54.8	73.3	51.2	28.1	2647	22451
30 inches	25000	27333	7.9	74.1	52	7.4	25.7	47.7	77.5	52.8	33.8	2952	23302
30 inches	30000	31000	7.4	76.0	50	6.9	30.4	54.1	74.2	52.4	27.8	2704	20330
30 inches	35000	36333	9.2	71.2	53	7.3	24.2	45.7	78.7	53.4	36.2	3043	27971
30 inches	40000	43000	9.2	72.1	53	7.0	26.5	48.9	77.1	53.3	32.3	2923	27070
Mean		34375	8.1	75.2	52	7.0	28.9	51.8	75.2	52.2	30.2	2785	22791
Probability(%)													
Row Space (S)		90.6	13.7	0.4	73.6	7.6	1.9	2.6	2.9	9.6	2.6	2.7	6.0
Plant Density (D)		0.0	3.4	33.5	28.9	13.6	16.4	11.9	20.9	82.0	5.7	17.9	11.6
S x D		83.5	90.5	46.9	73.1	47.9	89.7	86.3	84.3	86.3	79.7	84.7	90.7
LSD(0.10)													
Row Space (S)		NS	NS	2.7	NS	0.4	4.2	5.4	3.5	2.1	4.8	244	4572.5
Plant Density (D)		1219	0.7	NS	NS	NS	NS	NS	NS	NS	3.4	NS	NS
S x D		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV(%)													
		5	12	4	6	6	14	10	5	4	16	9	2

**Table C-42. Plant Density and Row Spacing Effects on Corn Grain Quality
Arlington, WI - 2005**

Row spacing inches	Density plants/A	Grain Composition			Ethanol	
		Oil %	Starch %	Protein %	per bu gallons	per A gallons
	15000	3.9	59.3	8.3	2.80	456
	25000	3.9	59.6	7.9	2.83	500
	35000	3.9	60.5	7.5	2.84	515
	45000	3.8	60.3	7.5	2.84	476
15 inches		3.9	59.7	7.7	2.83	462
30 inches		3.9	60.2	7.9	2.83	511
15 inches	15000	3.9	59.3	8.2	2.81	452
15 inches	25000	3.9	58.7	7.8	2.84	470
15 inches	35000	3.9	60.4	7.6	2.84	507
15 inches	45000	3.8	60.4	7.3	2.85	420
30 inches	15000	3.9	59.3	8.4	2.79	459
30 inches	25000	3.9	60.6	7.9	2.82	530
30 inches	35000	3.9	60.7	7.4	2.85	522
30 inches	45000	3.8	60.2	7.7	2.84	532
Mean		3.9	59.9	7.8	2.83	487
Probability(%)						
	Row Space (S)	62.7	30.1	9.1	20.1	0.4
	Plant Density (D)	40.7	19.5	0.0	0.0	5.0
	S x D	95.5	36.2	7.3	66.1	7.4
LSD(0.10)						
	Row Space (S)	NS	NS	0.1	NS	26
	Plant Density (D)	NS	NS	0.2	0.01	36
	S x D	NS	NS	0.3	NS	51
CV(%)						
		3	2	3	1	8