

FIELD EXPERIMENT HISTORY

Title: Plant Density, Planting Date, and Hybrid Influence on Corn Grain and Silage
Experiment: 04 PD x DOP **Trial ID:** 2594 **Year:** 2004
Personnel: J. G. Lauer, K.D. Kohn, P.J. Flannery
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: ARS392 **Previous Crop:** Soybean **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 10/01/04 **pH** 6.9 **OM (%)** 3.1 **P (ppm)** 89 **K (ppm)** 268

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 /21/04
Starter :	6-24-24	150	Each DOP
Post plant :	N/A	N/A	N/A
Manure:	N/A	N/A	N/A

Herbicide: Harness 2.5 pt/A **Insecticide:** None
 Hornet 3.0 oz/A **Hybrid:** See Factors

Irrigation: None

Planting Date: See Factors **Planting Depth:** 1.5" **Row Width:** 30"

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

Harvest Date: S: 9/27/04 **Harvest Method:** S:New Holland Plot Chopper
 G: 11/02/04 G:Kincaid Plot Combine

Notes:

Experimental Design

Design: RCB split plot **Replications:** 3

Plot Size Seeded: 20' x 25' **Experiment Size:** 1.19 Acre

Harvest Plot Size: S: 2.5' x 22' **Harvest Plant Density:** Varies

Factors/Treatments:

<u>Planting Dates:</u>	<u>Plant Densities: (plants/A)</u>	<u>Hybrids:</u>
April 30, May 20, and June 15	15000, 30000, and 45000	Dekalb DKC5878(YGCB) Pioneer 37R71

Results: Table C-57.

**Table C-57. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
Arlington, WI - 2004**

Hybrid	Date of planting	Target plant density	Grain				Grower return	Seeds planted	Stand		Harvest ears	Silking Date
			Yield	Moisture	Test Wt	Lodging			Emerg	Harvest		
			bu/A	%	lbs/bu	%			\$/A	seeds/A		
		15000	143	33.0	46	3	222	23760	22110	15642	24772	218
		30000	165	32.9	46	3	258	43560	39721	29766	33528	220
		45000	169	32.9	45	13	266	59400	53031	43450	45166	220
	April 30		202	24.9	51	13	338	42240	39930	30052	37246	205
	May 20		189	30.1	49	3	296	42240	35926	29612	33440	215
	June 15		86	43.7	36	4	111	42240	39006	29194	32780	238
	April 30	15000	184	24.7	52	5	308	23760	23199	15378	28380	204
	April 30	30000	210	24.9	51	7	351	43560	42735	29832	35640	205
	April 30	45000	212	25.2	51	27	355	59400	53856	44946	47718	205
	May 20	15000	164	30.6	48	4	254	23760	20790	15576	21450	215
	May 20	30000	195	30.1	49	0	307	43560	36366	29568	33660	215
	May 20	45000	207	29.7	49	3	328	59400	50622	43692	45210	215
	June 15	15000	80	43.6	37	0	104	23760	22341	15972	24486	236
	June 15	30000	89	43.7	36	1	115	43560	40062	29898	31284	239
	June 15	45000	88	43.9	34	11	115	59400	54615	41712	42570	239
Dekalb DKC5878(YGCB)			150	35.8	43	6	226	42240	39087	30023	36579	221
Pioneer 37R71			167	30.0	48	7	272	42240	37488	29216	32399	217
Dekalb DKC5878(YGCB)		15000	149	35.6	44	1	224	23760	22946	16280	27984	220
Pioneer 37R71		15000	136	30.3	47	5	220	23760	21274	15004	21560	216
Dekalb DKC5878(YGCB)		30000	154	35.9	43	3	231	43560	39666	29876	35068	221
Pioneer 37R71		30000	175	29.8	48	2	285	43560	39776	29656	31988	218
Dekalb DKC5878(YGCB)		45000	148	35.8	42	13	222	59400	54648	43912	46684	221
Pioneer 37R71		45000	190	30.0	48	13	310	59400	51414	42988	43648	218
Dekalb DKC5878(YGCB)	April 30		193	28.3	51	14	309	42240	40260	30228	39248	207
Pioneer 37R71	April 30		211	21.5	51	12	367	42240	39600	29876	35244	203
Dekalb DKC5878(YGCB)	May 20		188	34.9	49	1	277	42240	36740	29744	35904	217
Pioneer 37R71	May 20		190	25.3	49	4	316	42240	35112	29480	30976	213
Dekalb DKC5878(YGCB)	June 15		71	44.1	29	4	91	42240	40260	30096	34584	240
Pioneer 37R71	June 15		101	43.3	43	4	131	42240	37752	28292	30976	236

continued

Table C-57. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
Arlington, WI - 2004

(continued)

Hybrid	Date of planting	Target plant density	Grain				Grower return	Seeds planted	Stand		Harvest ears	Silking Date
			Yield	Moisture	Test Wt	Lodging			Emerg	Harvest		
			bu/A	%	lbs/bu	%	\$/A	seeds/A	seeds/A	plants/A	ears/A	doy
Dekalb DKC5878(YGCB)	April 30	15000	193	28.2	51	3	309	23760	23496	15576	30096	206
Pioneer 37R71	April 30	15000	176	21.2	52	7	307	23760	22902	15180	26664	202
Dekalb DKC5878(YGCB)	April 30	30000	199	27.9	51	8	322	43560	40854	29964	38016	207
Pioneer 37R71	April 30	30000	220	21.8	51	7	381	43560	44616	29700	33264	204
Dekalb DKC5878(YGCB)	April 30	45000	186	28.8	51	31	297	59400	56430	45144	49632	207
Pioneer 37R71	April 30	45000	237	21.6	51	23	413	59400	51282	44748	45804	204
Dekalb DKC5878(YGCB)	May 20	15000	182	34.7	49	2	268	23760	22374	16104	25872	217
Pioneer 37R71	May 20	15000	147	26.5	48	7	240	23760	19206	15048	17028	213
Dekalb DKC5878(YGCB)	May 20	30000	191	35.7	49	0	279	43560	36960	29304	35244	217
Pioneer 37R71	May 20	30000	200	24.4	50	1	336	43560	35772	29832	32076	213
Dekalb DKC5878(YGCB)	May 20	45000	191	34.3	49	1	283	59400	50886	43824	46596	217
Pioneer 37R71	May 20	45000	223	25.0	49	5	373	59400	50358	43560	43824	213
Dekalb DKC5878(YGCB)	June 15	15000	74	44.0	31	0	95	23760	22968	17160	27984	238
Pioneer 37R71	June 15	15000	86	43.2	42	1	113	23760	21714	14784	20988	234
Dekalb DKC5878(YGCB)	June 15	30000	73	44.2	30	3	93	43560	41184	30360	31944	240
Pioneer 37R71	June 15	30000	105	43.2	43	0	137	43560	38940	29436	30624	237
Dekalb DKC5878(YGCB)	June 15	45000	66	44.2	26	9	85	59400	56628	42768	43824	241
Pioneer 37R71	June 15	45000	111	43.5	43	12	144	59400	52602	40656	41316	236
Mean			159	32.9	45	7	249	42240	38287	29619	34489	219
Probability(%)												
Hybrid (H)			5.3	1.3	0.2	49.7	3.3	-	0.1	5.2	1.4	0.5
Date of Planting (P)			0.0	0.0	0.0	1.8	0.0	-	0.2	27.4	0.2	0.0
H x P			7.9	0.0	0.0	69.3	56.0	-	48.4	26.9	76.3	64.1
Plant Density (D)			0.0	95.9	23.8	0.0	0.0	-	0.0	0.0	0.0	0.0
P x D			6.0	46.3	24.5	0.6	2.5	-	61.2	1.0	1.1	0.0
H x D			0.0	47.3	14.8	57.2	0.0	-	40.3	45.0	3.5	61.3
H x P x D			44.7	15.9	26.2	71.8	17.4	-	50.2	95.0	19.6	14.4
LSD(0.10)												
Hybrid (H)			12	1.9	1	NS	25	-	154	562	1478	1
Date of Planting (P)			10	0.9	1	6	17	-	1363	NS	1686	0
H x P			14	1.2	2	NS	NS	-	NS	NS	NS	NS
Plant Density (D)			8	NS	NS	4	12	-	2084	716	1196	0
P x D			13	NS	NS	7	21	-	NS	1240	2072	1
H x D			11	NS	NS	NS	18	-	NS	NS	1692	NS
H x P x D			NS	NS	NS	NS	NS	-	NS	NS	NS	NS
CV(%)												
			8	3	4	104	9	-	9	4	6	0

continued

Table C-57. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
Arlington, WI - 2004

(continued)

Hybrid	Date of planting	Target plant density	Whole Plant												
			Dry Matter		Kernel milk stage	Harvest		Crude protien	Whole Plant			In Vitro		Milk per	
			yield	Moisture		plants/A	ears/A		ADF	NDF	Digest	NDFD	Starch	Ton	Acre
tons/A	%	%	plants/A	ears/A	%	%	%	%	%	%	lbs/T	lbs/A			
		15000	7.5	62.9	58.6	15180	27016	8.0	21.6	46.3	82.8	62.8	30.0	3547	26693
		30000	9.1	62.7	61.4	30448	34232	7.5	22.7	47.6	82.0	62.1	29.7	3482	31824
		45000	10.0	60.7	58.3	43208	44880	7.4	22.9	47.7	81.5	61.1	30.2	3406	34229
	April 30		10.3	56.4	36.4	30360	37664	7.0	20.1	43.4	83.3	61.5	36.1	3472	35869
	May 20		9.5	61.7	49.4	28776	33968	7.6	21.3	45.3	82.7	61.7	31.7	3535	33649
	June 15		6.8	68.1	92.5	29700	34496	8.3	25.8	52.8	80.4	62.8	22.0	3429	23228
	April 30	15000	9.0	57.1	35.8	15708	28380	7.3	19.6	42.9	84.0	62.6	35.8	3540	31792
	April 30	30000	10.5	58.5	36.7	30756	37752	7.0	20.6	43.9	83.2	61.6	35.5	3518	37101
	April 30	45000	11.5	53.7	36.7	44616	46860	6.8	20.1	43.6	82.7	60.2	37.1	3359	38714
	May 20	15000	8.1	63.1	48.3	14784	26664	8.1	20.8	44.8	83.3	62.8	30.6	3623	29227
	May 20	30000	9.7	61.3	55.0	30756	33132	7.4	21.3	45.3	82.6	61.6	32.1	3511	34145
	May 20	45000	10.8	60.8	45.0	40788	42108	7.3	21.9	45.9	82.1	60.8	32.5	3469	37575
	June 15	15000	5.5	68.6	91.7	15048	26004	8.5	24.3	51.2	81.1	63.0	23.5	3479	19061
	June 15	30000	7.1	68.1	92.5	29832	31812	8.2	26.3	53.7	80.2	63.0	21.5	3418	24225
	June 15	45000	7.8	67.6	93.3	44220	45672	8.2	26.6	53.6	79.9	62.4	21.0	3390	26398
Dekalb DKC5878(YGCB)			9.2	64.3	68.1	29568	37253	7.9	23.3	48.7	82.1	63.2	28.6	3510	32398
Pioneer 37R71			8.5	59.9	50.7	29656	33499	7.4	21.5	45.6	82.1	60.8	31.3	3448	29433
Dekalb DKC5878(YGCB)		15000	8.1	64.0	65.6	15752	30448	8.0	21.6	46.4	83.4	64.2	31.1	3605	29192
Pioneer 37R71		15000	6.9	61.9	51.7	14608	23584	7.9	21.6	46.2	82.1	61.4	28.8	3490	24194
Dekalb DKC5878(YGCB)		30000	9.4	65.4	70.6	30448	36520	7.9	23.7	49.2	81.9	63.1	27.7	3515	33065
Pioneer 37R71		30000	8.9	59.9	52.2	30448	31944	7.1	21.8	46.1	82.1	61.0	31.6	3450	30583
Dekalb DKC5878(YGCB)		45000	10.2	63.4	68.3	42504	44792	7.8	24.7	50.6	81.0	62.3	27.1	3409	34936
Pioneer 37R71		45000	9.9	58.0	48.3	43912	44968	7.1	21.1	44.7	82.1	59.9	33.3	3402	33522
Dekalb DKC5878(YGCB)	April 30		10.9	57.1	48.3	30624	40920	7.2	20.6	44.2	83.6	62.8	35.9	3519	38407
Pioneer 37R71	April 30		9.8	55.7	24.4	30096	34408	6.9	19.6	42.7	83.0	60.1	36.4	3426	33331
Dekalb DKC5878(YGCB)	May 20		9.8	64.9	62.8	28160	34936	7.8	22.3	47.1	82.5	62.8	30.8	3584	35265
Pioneer 37R71	May 20		9.2	58.6	36.1	29392	33000	7.3	20.3	43.6	82.8	60.6	32.6	3485	32033
Dekalb DKC5878(YGCB)	June 15		6.9	70.7	93.3	29920	35904	8.6	27.0	55.0	80.2	64.0	19.2	3426	23520
Pioneer 37R71	June 15		6.7	65.5	91.7	29480	33088	8.0	24.6	50.6	80.5	61.5	24.8	3432	22936

continued

Table C-57. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
Arlington, WI - 2004

(continued)

Hybrid	Date of planting	Target plant density	Whole Plant												
			Dry Matter		Kernel milk	Harvest		Crude			In Vitro		Milk per		
			yield	Moisture	stage	plants	ears	protien	ADF	NDF	Digest	NDFD	Starch	Ton	Acre
			tons/A	%	%	plants/A	ears/A	%	%	%	%	%	%	lbs/T	lbs/A
Dekalb DKC5878(YGCB)	April 30	15000	9.9	56.4	45.0	16632	32736	7.1	19.4	42.3	84.6	63.6	38.5	3573	35444
Pioneer 37R71	April 30	15000	8.0	57.8	26.7	14784	24024	7.6	19.7	43.5	83.3	61.6	33.0	3508	28141
Dekalb DKC5878(YGCB)	April 30	30000	11.1	59.6	50.0	30888	43032	7.2	20.8	44.5	83.8	63.5	34.6	3606	40128
Pioneer 37R71	April 30	30000	9.9	57.4	23.3	30624	32472	6.7	20.3	43.3	82.6	59.7	36.4	3429	34074
Dekalb DKC5878(YGCB)	April 30	45000	11.7	55.4	50.0	44352	46992	7.2	21.6	45.7	82.3	61.2	34.6	3377	39649
Pioneer 37R71	April 30	45000	11.3	52.0	23.3	44880	46728	6.4	18.7	41.5	83.0	59.1	39.7	3340	37778
Dekalb DKC5878(YGCB)	May 20	15000	8.6	65.1	60.0	15312	29832	8.2	20.9	45.3	83.7	64.1	32.1	3687	31565
Pioneer 37R71	May 20	15000	7.6	61.2	36.7	14256	23496	7.9	20.7	44.3	82.9	61.5	29.1	3560	26889
Dekalb DKC5878(YGCB)	May 20	30000	9.9	65.4	68.3	30624	34056	7.8	22.9	47.8	81.8	62.0	29.6	3528	35089
Pioneer 37R71	May 20	30000	9.5	57.2	41.7	30888	32208	7.0	19.7	42.8	83.4	61.1	34.6	3495	33201
Dekalb DKC5878(YGCB)	May 20	45000	11.1	64.2	60.0	38544	40920	7.5	23.1	48.0	81.9	62.3	30.6	3538	39142
Pioneer 37R71	May 20	45000	10.6	57.4	30.0	43032	43296	7.0	20.6	43.7	82.2	59.3	34.3	3400	36008
Dekalb DKC5878(YGCB)	June 15	15000	5.8	70.4	91.7	15312	28776	8.9	24.3	51.6	81.9	64.9	22.6	3555	20568
Pioneer 37R71	June 15	15000	5.1	66.8	91.7	14784	23232	8.2	24.4	50.7	80.2	61.0	24.5	3403	17554
Dekalb DKC5878(YGCB)	June 15	30000	7.0	71.3	93.3	29832	32472	8.5	27.3	55.3	80.0	63.8	19.0	3409	23976
Pioneer 37R71	June 15	30000	7.1	65.0	91.7	29832	31152	7.8	25.4	52.2	80.3	62.3	23.9	3426	24473
Dekalb DKC5878(YGCB)	June 15	45000	7.8	70.5	95.0	44616	46464	8.5	29.3	58.2	78.7	63.4	16.1	3313	26017
Pioneer 37R71	June 15	45000	7.7	64.7	91.7	43824	44880	8.0	24.0	48.9	81.1	61.3	26.0	3467	26780
Mean			8.9	62.1	59.4	29612	35376	7.6	22.4	47.2	82.1	62.0	30.0	3479	30915
Probability(%)															
Hybrid (H)			2.2	0.9	2.3	80.3	1.9	2.4	1.2	0.4	85.3	1.5	3.4	5.9	0.5
Date of Planting (P)			0.0	0.0	0.0	5.2	9.4	0.0	0.0	0.0	0.0	1.9	0.0	0.4	0.0
H x P			10.0	1.7	0.9	24.4	35.4	31.9	2.9	0.3	2.8	81.6	0.3	7.5	5.3
Plant Density (D)			0.0	0.3	32.1	0.0	0.0	0.0	3.1	14.9	0.7	0.0	84.4	0.0	0.0
P x D			92.0	3.8	30.8	9.0	14.5	49.1	59.8	80.9	99.9	26.7	31.7	22.4	93.2
H x D			14.9	1.6	36.8	18.1	0.5	3.8	0.7	0.5	1.0	53.5	0.0	14.5	13.5
H x P x D			85.3	86.9	97.3	44.8	26.1	12.0	46.8	47.5	21.3	8.4	61.6	4.6	76.1
LSD(0.10)															
Hybrid (H)			0.3	1.2	7.9	NS	1544	0.2	0.6	0.6	NS	0.9	1.4	46	636
Date of Planting (P)			0.4	1.3	6.0	1002	2932	0.2	0.4	0.6	0.3	0.7	0.9	41	1429
H x P			NS	1.8	8.5	NS	NS	NS	0.5	0.8	0.4	NS	1.3	58	2020
Plant Density (D)			0.4	1.1	NS	1141	1665	0.2	0.9	NS	0.6	0.6	NS	45	1508
P x D			NS	1.9	NS	1976	NS	NS	NS	2.3	NS	NS	NS	NS	NS
H x D			NS	1.5	NS	NS	2354	0.3	1.2	1.9	0.9	NS	2.3	NS	NS
H x P x D			NS	NS	NS	NS	NS	NS	NS	NS	NS	1.5	NS	110	NS
CV(%)															
			7	3	11	7	8	5	7	5	1	2	9	2	9

**Table C-57b. Plant Density, Planting Date, and Hybrid Influence on Corn Quality.
Yield and Quality and Corn Grain - Arlington, WI - 2004**

Hybrid	Date of planting	Target plant density	Grain Composition			Ethanol	
			Oil %	Starch %	Protein %	per bu gallons	per A gallons
		15000	8.3	60.1	3.5	2.81	472
		30000	8.2	60.4	3.6	2.81	548
		45000	7.9	60.5	3.6	2.82	573
	April 30		7.7	60.3	3.7	2.84	574
	May 20		8.4	60.2	3.5	2.79	527
	June 15		9.3	61.1	3.4	2.76	292
	April 30	15000	7.8	60.2	3.6	2.84	524
	April 30	30000	7.8	60.3	3.7	2.83	594
	April 30	45000	7.5	60.5	3.7	2.85	604
	May 20	15000	8.6	60.0	3.4	2.79	458
	May 20	30000	8.4	60.2	3.6	2.79	545
	May 20	45000	8.1	60.4	3.6	2.80	579
	June 15	15000	9.8	60.6	3.4	2.74	240
	June 15	30000	9.4	61.5	3.3	2.78	286
	June 15	45000	8.7	61.3	3.4	2.78	349
Dekalb DKC5878(YGCB)			8.0	60.3	3.4	2.83	538
Pioneer 37R71			8.2	60.4	3.8	2.80	524
Dekalb DKC5878(YGCB)		15000	8.0	60.3	3.4	2.84	531
Dekalb DKC5878(YGCB)		30000	8.1	60.4	3.4	2.83	552
Dekalb DKC5878(YGCB)		45000	8.0	60.3	3.4	2.83	533
Pioneer 37R71		15000	8.6	60.0	3.6	2.79	421
Pioneer 37R71		30000	8.3	60.4	3.8	2.79	544
Pioneer 37R71		45000	7.8	60.7	3.8	2.81	607
Dekalb DKC5878(YGCB)	April 30		7.8	60.1	3.5	2.85	549
Dekalb DKC5878(YGCB)	May 20		8.3	60.5	3.2	2.81	528
Dekalb DKC5878(YGCB)	June 15		-	-	-	-	-
Pioneer 37R71	April 30		7.6	60.6	3.9	2.84	599
Pioneer 37R71	May 20		8.5	59.9	3.8	2.77	526
Pioneer 37R71	June 15		9.3	61.1	3.4	2.76	292

continued

Table C-57b. Plant Density, Planting Date, and Hybrid Influence on Corn Quality.(continued) **Yield and Quality and Corn Grain - Arlington, WI - 2004**

Hybrid	Date of planting	Target plant density	Grain Composition			Ethanol	
			Oil %	Starch %	Protein %	per bu gallons	per A gallons
Dekalb DKC5878(YGCB)	April 30	15000	7.7	60.2	3.5	2.86	551
Dekalb DKC5878(YGCB)	April 30	30000	7.8	60.2	3.6	2.85	568
Dekalb DKC5878(YGCB)	April 30	45000	7.9	60.0	3.5	2.84	528
Dekalb DKC5878(YGCB)	May 20	15000	8.4	60.3	3.2	2.81	511
Dekalb DKC5878(YGCB)	May 20	30000	8.5	60.6	3.2	2.81	536
Dekalb DKC5878(YGCB)	May 20	45000	8.0	60.6	3.3	2.82	537
Dekalb DKC5878(YGCB)	June 15	15000	-	-	-	-	-
Dekalb DKC5878(YGCB)	June 15	30000	-	-	-	-	-
Dekalb DKC5878(YGCB)	June 15	45000	-	-	-	-	-
Pioneer 37R71	April 30	15000	8.0	60.2	3.8	2.82	497
Pioneer 37R71	April 30	30000	7.8	60.5	3.9	2.82	620
Pioneer 37R71	April 30	45000	7.1	61.1	3.9	2.86	679
Pioneer 37R71	May 20	15000	8.8	59.7	3.6	2.76	405
Pioneer 37R71	May 20	30000	8.4	59.9	4.0	2.77	554
Pioneer 37R71	May 20	45000	8.2	60.1	3.9	2.78	620
Pioneer 37R71	June 15	15000	9.8	60.6	3.4	2.74	240
Pioneer 37R71	June 15	30000	9.4	61.5	3.3	2.78	286
Pioneer 37R71	June 15	45000	8.7	61.3	3.4	2.78	349
Mean			8.1	60.3	3.6	2.81	531
Probability(%)							
Hybrid (H)			86.6	56.0	0.1	2.8	30.3
Date of Planting (P)			0.1	14.0	0.0	0.0	0.1
H x P			10.0	4.8	0.3	2.5	10.6
Plant Density (D)			0.0	0.2	8.0	3.4	0.2
P x D			44.4	12.7	7.3	22.0	42.1
H x D			0.2	0.2	0.7	0.2	0.0
H x P x D			0.4	2.6	2.5	1.9	88.9
LSD(0.10)							
Hybrid (H)			NS	NS	0.0	0.01	NS
Date of Planting (P)			0.2	NS	0.0	0.01	26
H x P			NS	0.6	0.1	0.01	NS
Plant Density (D)			0.1	0.1	0.0	0.01	24
P x D			NS	NS	0.1	NS	NS
H x D			0.2	0.2	0.1	0.01	34
H x P x D			0.3	0.3	0.1	0.01	NS
CV(%)							
			2	0	2	0	8