FIELD EXPERIMENT HISTORY

Title: **Plant Density, Planting Date, and Hybrid Influence on Corn Grain and Silage**

Experiment: 04PDxDOP **Trial ID** 2348 **Year:** 2002

Personnel: J. G. Lauer, K.D. Kohn, P.J. Flannery

Location: Arlington, WI **County:** Columbia

Supported By: HATCH

Site Information

Field: 406 **Previous Crop:** Soybean **Soil Type:** Plano

Soil Test: **Date:** 11/01/02 **pH** 6.2 **OM (%)** 3.3 **P (ppm)** 79 **K (ppm)** 247

Plot Management

Tillage Operations: Fall Chisel Plow Field Cultivator Soil Finisher Cultivated

		Analysis:	Rate lbs/A:	Date:
Fertilizer:	**Preplant :**	46-0-0	325	4 /14/02
	Starter :	6-24-24	150	Each DOP
	Post plant :	N/A	N/A	N/A
	Manure:	N/A	None	

Herbicide: Harness 2.5 pt/A
Hornet 3.0 oz/A

Insecticide: None
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: 9/25
G: 10/22

Harvest Method: S:New Holland Plot Chopper
G:Kincaid Plot Combine

Notes:

Experimental Design

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

Plot Size Seeded: 22' x 20' **Experiment Size:** 1.15 Acre

Harvest Plot Size: S: 22' x 2.5'
G: 22 'x 5'

Harvest Plant Density: Varies

Factors/Treatments:

Planting Dates:	Plant Densities: (plants/A)	Hybrids:
April 30, May 20, and June 10	15000, 30000, and 45000	Cargill 4521Bt Dekalb DKC4442

Results: Table C-31.

Table C-31. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain Arlington, WI - 2002

Date of planting	Target plant density	Hybrid	Grain Yield	Grain Moisture	Grain Test Wt	Grain Lodging	Grower return	50% Silk date	Seeds planted	Stand Emerged	Stand Harvest	Harvest ears
			bu/A	%	lbs/bu	%	$/A	DOY	seeds/A	seeds/A	plants/A	ears/A
		Cargill 4521Bt	169	22.6	54	12	352	211	42240	37257	30081	31064
		Dekalb DKC4442	203	21.2	53	21	425	208	42240	36205	29055	31900
	15000		157	21.9	53	2	329	209	23760	20631	15972	20702
	30000		208	21.6	54	11	436	209	43560	38104	30030	30734
	45000		192	22.1	54	36	401	210	59400	51458	42702	43010
	15000	Cargill 4521Bt	144	23.4	53	3	298	211	23760	20955	16588	18656
	15000	Dekalb DKC4442	171	20.5	53	1	360	207	23760	20306	15356	22748
	30000	Cargill 4521Bt	196	22.1	55	10	409	210	43560	38643	30844	31416
	30000	Dekalb DKC4442	221	21.0	54	11	463	208	43560	37565	29216	30052
	45000	Cargill 4521Bt	167	22.1	56	21	349	211	59400	52173	42812	43120
	45000	Dekalb DKC4442	217	22.1	53	51	452	209	59400	50743	42592	42900
April 30			193	19.1	55	11	412	204	42240	29348	27962	29986
May 20			196	19.7	55	26	415	207	42240	40849	30822	32494
June 10			168	26.9	52	11	339	217	42240	39996	29920	31966
April 30		Cargill 4521Bt	184	19.6	55	9	391	206	42240	30591	29216	30492
April 30		Dekalb DKC4442	202	18.5	55	14	432	203	42240	28105	26708	29480
May 20		Cargill 4521Bt	180	20.1	56	23	380	209	42240	40843	30932	31460
May 20		Dekalb DKC4442	212	19.2	54	29	450	206	42240	40854	30712	33528
June 10		Cargill 4521Bt	143	28.0	52	2	285	218	42240	40337	30096	31240
June 10		Dekalb DKC4442	194	25.8	51	20	393	216	42240	39655	29744	32692
April 30	15000		153	19.4	53	3	325	204	23760	15527	16038	21384
April 30	30000		205	18.8	55	6	436	204	43560	30410	27786	28314
April 30	45000		222	19.0	57	25	474	204	59400	42108	40062	40260
May 20	15000		177	19.7	54	3	375	207	23760	23397	16236	20196
May 20	30000		222	19.5	56	24	472	207	43560	42290	30888	31482
May 20	45000		188	19.8	54	52	398	208	59400	56859	45342	45804
June 10	15000		142	26.8	51	0	287	216	23760	22968	15642	20526
June 10	30000		198	26.4	52	2	401	217	43560	41613	31416	32406
June 10	45000		165	27.5	52	31	330	218	59400	55407	42702	42966

continued

Table C-31. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
(continued) **Arlington, WI - 2002**

Date of planting	Target plant density	Hybrid	Grain Yield	Grain Moisture	Grain Test Wt	Grain Lodging	Grower return	50% Silk date	Seeds planted	Stand Emerged	Stand Harvest	Harvest ears
			bu/A	%	lbs/bu	%	$/A	DOY	seeds/A	seeds/A	plants/A	ears/A
April 30	15000	Cargill 4521Bt	152	20.4	53	4	321	207	23760	16797	17292	20460
April 30	15000	Dekalb DKC4442	153	18.4	53	2	328	202	23760	14256	14784	22308
April 30	30000	Cargill 4521Bt	201	19.3	54	5	427	205	43560	31680	28908	29568
April 30	30000	Dekalb DKC4442	208	18.3	56	8	446	203	43560	29139	26664	27060
April 30	45000	Cargill 4521Bt	200	19.2	57	18	425	205	59400	43296	41448	41448
April 30	45000	Dekalb DKC4442	245	18.8	56	32	523	203	59400	40920	38676	39072
May 20	15000	Cargill 4521Bt	164	20.6	53	4	346	209	23760	22968	16500	17160
May 20	15000	Dekalb DKC4442	189	18.7	55	2	404	205	23760	23826	15972	23232
May 20	30000	Cargill 4521Bt	210	20.2	56	27	443	208	43560	42504	31020	31416
May 20	30000	Dekalb DKC4442	235	18.9	56	21	500	206	43560	42075	30756	31548
May 20	45000	Cargill 4521Bt	165	19.5	57	39	350	209	59400	57057	45276	45804
May 20	45000	Dekalb DKC4442	211	20.1	51	65	446	206	59400	56661	45408	45804
June 10	15000	Cargill 4521Bt	115	29.3	52	0	227	218	23760	23100	15972	18348
June 10	15000	Dekalb DKC4442	169	24.3	50	0	347	215	23760	22836	15312	22704
June 10	30000	Cargill 4521Bt	178	26.9	53	0	357	218	43560	41745	32604	33264
June 10	30000	Dekalb DKC4442	219	25.8	51	4	444	216	43560	41481	30228	31548
June 10	45000	Cargill 4521Bt	136	27.6	52	7	272	218	59400	56166	41712	42108
June 10	45000	Dekalb DKC4442	194	27.4	51	55	389	217	59400	54648	43692	43824
Mean			186	21.9	54	16	389	209	42240	36731	29568	31482
Probability(%)												
Date of Planting (D)			5.1	0.0	13.5	4.9	2.0	0.0	-	0.0	4	15.4
Plant Density (P)			0.0	9.3	3.5	0.0	0.0	4.1	-	0.0	0.0	0.0
D x P			0.0	33.3	10.0	13.8	0.0	4	-	0.0	5.2	1.0
Hybrid (H)			0.0	0.0	5.5	1.5	0.0	0.0	-	0.0	10.4	20.3
D x H			0.4	3.9	51.6	30.0	0.6	2.4	-	0.1	24.6	13.4
P x H			1.9	0.0	6.9	0.2	3.4	0.1	-	43.8	63.0	0.4
D x P x H			51.5	4.1	7.3	54.0	40.5	20.8	-	68.8	73.2	84.1
LSD(0.10)												
Date of Planting (D)			17	0.4	NS	10	37	0.6	-	578	1603	NS
Plant Density (P)			8	0.4	1	8	16	0.4	-	509	1272	1334
D x P			13	NS	NS	NS	28	1	-	882	2203	2310
Hybrid (H)			6	0.3	0.9	6	13	0.3	-	416	NS	NS
D x H			11	0.6	NS	NS	23	0.5	-	720	NS	NS
P x H			11	1	2	11	23	1	-	NS	NS	1886
D x P x H			NS	1.0	2.6	NS	NS	NS	-	NS	NS	NS
CV(%)			7	3.3	4	83	7	0	-	2	8	7

continued

Table C-31. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
(continued) **Arlington, WI - 2002**

			Whole Plant												
Date			Dry Matter		Kernel milk	Harvest		Crude			*In Vitro*	Cell Wall		Milk per	
of planting	Density	Hybrid	yield	Moisture	stage	plants	ears	protien	ADF	NDF	Digest	Digest	Starch	Ton	Acre
			tons/A	%	%	plants/A	ears/A	%	%	%	%	%	%	lbs/T	lbs/A
		Cargill 4521Bt	8.1	63.1	34.3	29509	32208	8.2	25.4	49.1	82.5	64.3	29.0	3522	28522
		Dekalb DKC4442	8.4	56.0	22.0	29128	32531	7.1	23.1	46.5	84.7	67.1	35.7	3598	30128
	15000		6.9	61.9	33.1	15048	22968	8.3	24.0	47.6	83.6	65.6	30.4	3607	24935
	30000		9.0	58.4	28.9	29700	32208	7.3	23.9	47.3	83.9	66.1	33.7	3571	32078
	45000		8.9	58.2	22.5	43208	41932	7.2	24.8	48.4	83.2	65.5	32.9	3501	31012
	15000	Cargill 4521Bt	7.3	64.9	43.3	15312	22704	9.1	24.7	48.3	82.8	64.4	27.2	3577	26106
	15000	Dekalb DKC4442	6.5	59.0	22.8	14784	23232	7.5	23.2	46.9	84.5	66.8	33.5	3637	23764
	30000	Cargill 4521Bt	8.4	62.6	33.3	29568	32120	7.7	25.2	48.6	82.7	64.5	30.8	3542	29787
	30000	Dekalb DKC4442	9.5	54.2	24.4	29832	32296	6.9	22.6	46.0	85.1	67.7	36.6	3600	34370
	45000	Cargill 4521Bt	8.6	61.7	26.1	43648	41800	7.7	26.3	50.3	81.9	64.1	29.0	3446	29675
	45000	Dekalb DKC4442	9.2	54.7	18.9	42768	42064	6.8	23.3	46.5	84.6	66.9	36.8	3557	32515
April 30			8.3	56.9	24.2	26664	29744	7.5	23.9	47.5	84.0	66.3	32.5	3545	29568
May 20			8.9	57.9	25.3	30448	33616	7.4	23.6	47.0	84.3	66.6	33.2	3590	31904
June 10			7.5	63.7	35.0	30844	33748	7.9	25.2	48.8	82.5	64.3	31.3	3544	26603
April 30		Cargill 4521Bt	8.1	61.1	30.6	26752	29920	8.1	24.5	47.9	83.2	65.0	30.2	3549	28683
April 30		Dekalb DKC4442	8.6	52.7	17.8	26576	29568	6.9	23.3	47.1	84.8	67.7	34.9	3542	30453
May 20		Cargill 4521Bt	8.8	61.8	31.1	31152	33352	7.9	24.4	47.7	83.4	65.2	30.7	3586	31613
May 20		Dekalb DKC4442	9.0	54.0	19.4	29744	33880	6.9	22.8	46.4	85.1	68.0	35.6	3594	32232
June 10		Cargill 4521Bt	7.4	66.3	41.1	30624	33352	8.5	27.3	51.6	80.8	62.8	26.1	3430	25272
June 10		Dekalb DKC4442	7.6	61.2	28.9	31064	34144	7.4	23.1	45.9	84.3	65.8	36.5	3658	27934
April 30	15000		6.5	59.3	27.5	13200	20724	8.2	23.2	46.9	84.3	66.5	31.4	3610	23651
April 30	30000		8.8	57.4	24.2	27456	30888	7.3	24.4	48.1	83.6	66.0	31.8	3530	31293
'April 30	45000		9.7	53.9	20.8	39336	37620	7.0	24.0	47.6	84.0	66.4	34.4	3496	33758
May 20	15000		7.9	62.0	32.5	16104	24024	8.1	23.9	47.5	83.8	65.9	30.2	3627	28682
May 20	30000		9.7	55.4	24.2	30360	31680	7.0	22.7	45.7	85.1	67.4	35.6	3610	35149
May 20	45000		9.1	56.3	19.2	44880	45144	7.1	24.3	47.8	83.9	66.5	33.7	3533	31876
June 10	15000		6.3	64.5	39.2	15840	24156	8.6	24.7	48.4	82.8	64.5	29.5	3584	22471
June 10	30000		8.3	62.3	38.3	31284	34056	7.5	24.7	48.1	83.1	65.0	33.7	3574	29792
June 10	45000		7.9	64.5	27.5	45408	43032	7.6	26.1	49.8	81.7	63.5	30.7	3475	27545

continued

Table C-31. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
(continued) **Arlington, WI - 2002**

			Whole Plant												
Date			Dry Matter		Kernel milk	Harvest		Crude			*In Vitro*	Cell Wall		Milk per	
of planting	Density	Hybrid	yield	Moisture	stage	plants	ears	protien	ADF	NDF	Digest	Digest	Starch	Ton	Acre
			tons/A	%	%	plants/A	ears/A	%	%	%	%	%	%	lbs/T	lbs/A
April 30	15000	Cargill 4521Bt	7.1	63.6	36.7	13992	20592	9.0	23.7	47.1	83.5	65.0	28.4	3622	25678
April 30	15000	Dekalb DKC4442	6.0	55.1	18.3	12408	20856	7.4	22.8	46.6	85.1	68.0	34.4	3598	21625
April 30	30000	Cargill 4521Bt	7.5	63.3	28.3	26136	29568	7.8	25.9	49.7	82.2	64.2	28.3	3501	26344
April 30	30000	Dekalb DKC4442	10.2	51.5	20.0	28776	32208	6.9	22.9	46.5	85.0	67.8	35.3	3558	36242
April 30	45000	Cargill 4521Bt	9.7	56.4	26.7	40128	39600	7.6	23.8	47.0	83.9	65.7	33.7	3524	34026
April 30	45000	Dekalb DKC4442	9.6	51.4	15.0	38544	35640	6.5	24.1	48.2	84.2	67.2	35.0	3469	33490
May 20	15000	Cargill 4521Bt	8.0	65.0	41.7	16368	22968	8.8	24.5	47.7	83.0	64.2	28.0	3593	28578
May 20	15000	Dekalb DKC4442	7.9	58.9	23.3	15840	25080	7.4	23.3	47.3	84.7	67.6	32.4	3661	28787
May 20	30000	Cargill 4521Bt	9.6	59.5	30.0	31416	32472	7.5	23.0	45.7	84.4	66.0	34.1	3634	34917
May 20	30000	Dekalb DKC4442	9.9	51.4	18.3	29304	30888	6.6	22.3	45.7	85.7	68.8	37.1	3586	35381
May 20	45000	Cargill 4521Bt	8.9	60.9	21.7	45672	44616	7.5	25.6	49.6	82.8	65.4	30.1	3530	31343
May 20	45000	Dekalb DKC4442	9.4	51.7	16.7	44088	45672	6.6	22.9	46.0	85.0	67.6	37.3	3537	32675
June 10	15000	Cargill 4521Bt	6.8	66.1	51.7	15576	24552	9.4	25.9	50.1	81.9	63.9	25.2	3515	24061
June 10	15000	Dekalb DKC4442	5.7	62.9	26.7	16104	23760	7.8	23.6	46.7	83.6	65.0	33.8	3653	20881
June 10	30000	Cargill 4521Bt	8.0	64.9	41.7	31152	34320	7.9	26.6	50.5	81.5	63.4	29.9	3492	28098
June 10	30000	Dekalb DKC4442	8.6	59.7	35.0	31416	33792	7.1	22.7	45.8	84.6	66.5	37.4	3656	31486
June 10	45000	Cargill 4521Bt	7.2	67.9	30.0	45144	41184	8.1	29.4	54.2	79.0	61.1	23.1	3283	23657
June 10	45000	Dekalb DKC4442	8.6	61.1	25.0	45672	44880	7.2	22.9	45.3	84.5	65.8	38.2	3667	31433
Mean			8.2	59.5	28.1	29319	32369	7.6	24.2	47.8	83.6	65.7	32.3	3560	29310
Probability(%)															
Date of Planting (D)			1.6	0.2	2.2	0.7	1.1	2.0	0.3	4.6	0.3	2.5	2.1	0.6	1.4
Plant Density (P)			0.0	0.1	0.0	0.0	0.0	0.0	38.4	58.4	45.2	37.7	1.5	0.9	0.0
D x P			19.8	2.4	44.3	58.3	9.2	65.4	62.3	76.4	49.2	33.0	22.9	88.3	26.6
Hybrid (H)			16.9	0.0	0.0	62.2	68.2	0.0	0.0	0.5	0.0	0.0	0.0	0.7	9.8
D x H			89.4	17.9	96.9	61.0	82.3	91.8	8.2	5.5	17.8	96.6	2.6	0.1	78.8
P x H			1.4	42.1	1.0	82.4	98.2	1.6	56.5	54.6	62.1	75.7	65.5	64.0	2.5
D x P x H			11.0	31.4	66.4	71.5	13.3	96.7	36.9	44.8	28.3	22.8	15.5	15.9	7.7
LSD(0.10)															
Date of Planting (D)			1	2	5.3	1503	1640	0.2	0.4	1.0	0	1	0.8	15.8	2080
Plant Density (P)			0.5	2	4	1592	1622	0.2	NS	NS	NS	NS	1.9	55	2120
D x P			NS	3	NS	NS	2809	NS	NS	NS	NS	NS	NS	NS	NS
Hybrid (H)			NS	1.3	3.1	NS	NS	0.2	1.0	1.5	1	0.7	1.6	44.6	1733
D x H			NS	NS	NS	NS	NS	NS	1.7	2.5	NS	NS	2.7	77.3	NS
P x H			1	NS	5	NS	NS	0.3	NS	NS	NS	NS	NS	NS	3002
D x P x H			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5200
CV(%)			12	5	24	10	9	5	9	7	2	2	10	3	13