

FIELD EXPERIMENT HISTORY

Title: Plant Density, Planting Date, and Hybrid Influence on Corn Grain and Silage
Experiment: 04PDxDOP **Trial ID** 2502 **Year:** 2003
Personnel: J. G. Lauer, K.D. Kohn, P.J. Flannery
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: 412 **Previous Crop:** Soybean **Soil Type:** Plano Silt Loam
Soil Test: **Date:** 11/01/03 **pH** 7.1 **OM (%)** 4.1 **P (ppm)** 69 **K (ppm)** 236

Plot Management

Tillage Operations: Fall Chisel Plow Field Cultivator Soil Finisher Cultivated

	<u>Analysis:</u>	<u>Rate lbs/A:</u>	<u>Date:</u>
Fertilizer:			
Preplant :	46-0-0	325	4 /21/03
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 Hornet 3.0 oz/A Callisto 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: 10/3/03 G: 10/17/03	Harvest Method:	S:New Holland Plot Chopper G:Kincaid Plot Combine

Large number of lodged plants hindered Grain Harvest Stand count totals.

Experimental Design

Design: RCB split plot **Replications:** 3
Plot Size Seeded: 20' x 25' **Experiment Size:** 1.15 Acre
Harvest Plot Size: S: 2.5' x 22'
G: 5' x 22' **Harvest Plant Density:** Varies

Factors/Treatments:

<u>Planting Dates:</u>	<u>Plant Densities: (plants/A)</u>	<u>Hybrids:</u>
May 03, May 19, and June 13	15000, 30000, and 45000	Mycogen 4521Bt Pioneer 38A25

Results: Table C-61.

**Table C-61. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
Arlington, WI - 2003**

Date of planting	Target plant density	Hybrid	Grain				Grower return	Seeds planted	Stand		Harvest ears
			Yield	Moisture	Test Wt	Lodging			Emerg	Harvest	
			bu/A	%	lbs/bu	%	\$/A	seeds/A	seeds/A	plants/A	ears/A
		Mycogen 4521Bt	125	24.7	54	41	232	42240	39112	26884	28145
		Pioneer 38A25	145	23.6	55	36	270	42240	34206	24757	26781
	15000		130	25.0	54	14	238	23760	20834	17336	21208
	30000		146	23.1	55	45	274	43560	37725	27082	27588
	45000		130	24.4	54	56	241	59400	51420	33044	33594
	15000	Mycogen 4521Bt	122	25.2	54	25	226	23760	21912	18304	20900
	15000	Pioneer 38A25	137	24.9	55	4	251	23760	19756	16368	21516
	30000	Mycogen 4521Bt	136	23.5	55	48	255	43560	40645	27940	28424
	30000	Pioneer 38A25	156	22.7	56	42	293	43560	34804	26224	26752
	45000	Mycogen 4521Bt	116	25.3	52	51	217	59400	54780	34408	35112
	45000	Pioneer 38A25	143	23.4	55	61	265	59400	48059	31680	32076
May 03			151	18.5	58	39	294	42240	35184	24706	26994
May 19			144	20.8	57	62	274	42240	36762	25696	26664
June 13			111	33.2	49	15	185	42240	38033	27060	28732
May 03		Mycogen 4521Bt	145	17.5	57	49	285	42240	38060	25608	27632
May 03		Pioneer 38A25	157	19.6	58	30	302	42240	32307	23804	26356
May 19		Mycogen 4521Bt	138	20.7	56	70	263	42240	38775	25872	26488
May 19		Pioneer 38A25	150	20.9	58	53	285	42240	34749	25520	26840
June 13		Mycogen 4521Bt	93	35.8	47	5	150	42240	40502	29172	30316
June 13		Pioneer 38A25	129	30.5	50	25	221	42240	35563	24948	27148
May 03	15000		145	19.7	58	13	279	23760	19536	16236	21582
May 03	30000		157	18.0	58	49	307	43560	36366	26796	27522
May 03	45000		150	17.9	58	56	295	59400	49649	31086	31878
May 19	15000		144	22.0	57	29	271	23760	21467	19074	21582
May 19	30000		158	20.1	58	68	303	43560	37554	26862	27126
May 19	45000		129	20.2	56	88	248	59400	51266	31152	31284
June 13	15000		99	33.4	49	1	165	23760	21500	16698	20460
June 13	30000		124	31.2	50	20	211	43560	39254	27588	28116
June 13	45000		110	35.0	48	24	180	59400	53345	36894	37620

continued

Table C-61. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain

(continued) **Arlington, WI - 2003**

Date of planting	Target plant density	Hybrid	Grain				Grower return	Seeds planted	Stand		Harvest ears
			Yield	Moisture	Test Wt	Lodging			Emerg	Harvest	
			bu/A	%	lbs/bu	%	\$/A	seeds/A	seeds/A	plants/A	ears/A
May 03	15000	Mycogen 4521Bt	144	18.5	57	24	280	23760	20625	17424	21648
May 03	15000	Pioneer 38A25	146	20.9	58	3	278	23760	18447	15048	21516
May 03	30000	Mycogen 4521Bt	144	17.2	58	64	285	43560	39600	27324	28116
May 03	30000	Pioneer 38A25	169	18.8	58	34	328	43560	33132	26268	26928
May 03	45000	Mycogen 4521Bt	146	16.8	57	59	289	59400	53955	32076	33132
May 03	45000	Pioneer 38A25	155	18.9	58	52	301	59400	45342	30096	30624
May 19	15000	Mycogen 4521Bt	137	22.1	56	50	258	23760	22341	19008	20328
May 19	15000	Pioneer 38A25	151	21.8	57	9	285	23760	20592	19140	22836
May 19	30000	Mycogen 4521Bt	152	19.3	59	74	293	43560	40623	27192	27456
May 19	30000	Pioneer 38A25	164	20.9	57	61	312	43560	34485	26532	26796
May 19	45000	Mycogen 4521Bt	124	20.6	54	87	237	59400	53361	31416	31680
May 19	45000	Pioneer 38A25	135	19.8	59	89	259	59400	49170	30888	30888
June 13	15000	Mycogen 4521Bt	86	34.9	48	1	139	23760	22770	18480	20724
June 13	15000	Pioneer 38A25	113	31.8	49	1	190	23760	20229	14916	20196
June 13	30000	Mycogen 4521Bt	113	33.9	48	7	186	43560	41712	29304	29700
June 13	30000	Pioneer 38A25	135	28.4	51	32	237	43560	36795	25872	26532
June 13	45000	Mycogen 4521Bt	80	38.6	46	6	124	59400	57024	39732	40524
June 13	45000	Pioneer 38A25	140	31.3	50	41	237	59400	49665	34056	34716
Mean			135	24.2	55	38	251	42240	36659	25821	27463
Probability(%)											
Date of Planting (D)			0.0	0.0	0.0	0.1	0.0	-	0.1	6.3	17.8
Plant Density (P)			0.0	0.2	1.8	0.0	0.0	-	0.0	0.0	0.0
D x P			0.6	0.9	80.5	2.8	1.1	-	18.6	0.8	0.6
Hybrid (H)			0.0	1.6	0.0	11.2	0.0	-	0.0	0.5	5.2
D x H			0.0	0.0	14.8	0.0	0.0	-	8.5	9.6	12.0
P x H			15.1	22.1	3.5	0.5	11.7	-	0.0	83.0	9.9
D x P x H			1.0	24.8	21.4	38.3	1.3	-	8.6	96.1	93.5
LSD(0.10)											
Date of Planting (D)			4	2.1	1	10	5	-	544	1459	NS
Plant Density (P)			5	0.8	1	7	9	-	633	1475	1401
D x P			9	1	NS	13	16	-	NS	2555	2427
Hybrid (H)			4	0.7	0.7	NS	8	-	517	1204	1144
D x H			7	1.2	NS	10	13	-	896	2086	NS
P x H			NS	NS	1	10	NS	-	896	NS	1981
D x P x H			13	NS	NS	NS	23	-	1551	NS	NS
CV(%)											
			7	6	3	33	7	-	3	10	9

continued

Table C-61. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
 (continued) **Arlington, WI - 2003**

Date of planting	Density	Hybrid	Whole Plant													
			Dry Matter		Kernel milk		Harvest		Crude			<i>In Vitro</i>	Cell Wall		Milk per	
			yield	Moisture	stage	plants	ears	protien	ADF	NDF	Digest	Digest	Starch	Ton	Acre	
			tons/A	%	%	plants/A	ears/A	%	%	%	%	%	%	lbs/T	lbs/A	
		Mycogen 4521Bt	7.3	64.7	44.3	30419	32736	8.3	28.9	53.9	80.4	63.7	26.7	3393	24612	
		Pioneer 38A25	7.8	58.6	35.0	27955	30272	7.8	25.3	49.5	83.2	66.1	33.1	3542	27524	
	15000		6.6	63.5	53.9	16852	22484	8.3	25.7	49.7	83.2	66.1	29.7	3619	24079	
	30000		7.7	61.5	33.6	29392	30360	7.9	27.1	51.4	81.8	64.7	30.8	3457	26575	
	45000		8.2	60.0	31.4	41316	41668	7.9	28.6	53.9	80.4	63.9	29.1	3331	27360	
	15000	Mycogen 4521Bt	6.5	65.7	52.2	17512	23408	8.6	26.9	51.2	82.3	65.5	28.0	3567	23270	
	15000	Pioneer 38A25	6.8	61.3	55.6	16192	21560	8.1	24.3	47.9	84.1	66.8	31.7	3678	24988	
	30000	Mycogen 4521Bt	7.5	65.1	38.9	31504	32296	8.2	29.0	53.7	80.3	63.4	27.8	3395	25440	
	30000	Pioneer 38A25	7.9	57.9	28.3	27280	28424	7.7	25.2	49.1	83.2	65.9	33.8	3519	27710	
	45000	Mycogen 4521Bt	7.8	63.4	41.7	42240	42504	8.1	30.8	56.7	78.4	62.1	24.3	3216	25127	
	45000	Pioneer 38A25	8.6	56.6	21.1	40392	40832	7.7	26.4	51.2	82.4	65.7	33.8	3445	29592	
May 03			7.9	57.9	21.1	29260	32516	7.6	27.5	51.9	80.6	62.9	32.4	3318	26541	
May 19			7.4	63.7	40.8	29480	32032	7.9	28.8	53.9	80.9	64.7	29.5	3441	25506	
June 13			7.2	63.4	56.9	28820	29964	8.7	25.2	49.3	83.6	66.9	27.7	3632	26103	
May 03		Mycogen 4521Bt	7.7	59.7	19.4	31504	34760	7.7	28.7	53.0	79.5	61.5	31.3	3268	25111	
May 03		Pioneer 38A25	8.2	56.0	22.8	27016	30272	7.4	26.2	50.7	81.9	64.3	33.7	3374	28149	
May 19		Mycogen 4521Bt	7.2	67.0	43.3	30712	33528	8.1	30.5	56.1	79.7	64.0	26.6	3380	24299	
May 19		Pioneer 38A25	7.6	60.5	38.3	28248	30536	7.6	27.0	51.7	82.2	65.5	32.5	3501	26714	
June 13		Mycogen 4521Bt	6.9	67.4	70.0	29040	29920	9.1	27.6	52.5	81.8	65.5	22.1	3531	24428	
June 13		Pioneer 38A25	7.4	59.4	43.9	28600	30008	8.3	22.8	46.1	85.4	68.4	33.3	3734	27778	
May 03	15000		6.9	61.5	32.5	17688	25212	7.9	25.6	49.1	82.5	64.3	32.1	3551	24790	
May 03	30000		8.4	58.1	19.2	29436	30888	7.5	27.3	51.6	81.0	63.2	33.3	3354	28246	
May 03	45000		8.5	54.0	11.7	40656	41448	7.4	29.3	54.7	78.7	61.2	31.8	3088	26295	
May 19	15000		7.0	65.0	65.8	16896	23100	8.0	26.9	51.3	82.8	66.5	30.8	3621	25487	
May 19	30000		7.3	63.5	28.3	28908	29832	7.8	28.7	53.4	80.8	64.0	30.4	3413	24839	
May 19	45000		7.9	62.8	28.3	42636	43164	7.8	30.8	57.0	79.2	63.7	27.5	3288	26193	
June 13	15000		6.0	64.0	63.3	15972	19140	9.0	24.6	48.5	84.1	67.2	26.7	3676	22078	
June 13	30000		7.4	62.9	53.3	29832	30360	8.6	25.3	49.3	83.5	66.7	28.6	3604	26641	
June 13	45000		8.2	63.2	54.2	40656	40392	8.5	25.8	50.2	83.3	66.9	27.8	3616	29590	

continued

Table C-61. Plant Density, Planting Date, and Hybrid Influence on Corn Silage Yield and Quality and Corn Grain
 (continued) **Arlington, WI - 2003**

Date of planting	Density	Hybrid	Whole Plant													
			Dry Matter		Kernel milk		Harvest		Crude			<i>In Vitro</i>	Cell Wall		Milk per	
			yield tons/A	Moisture %	stage %	plants plants/A	ears ears/A	protien %	ADF %	NDF %	Digest %	Digest %	Starch %	Ton lbs/T	Acre lbs/A	
May 03	15000	Mycogen 4521Bt	6.9	62.2	26.7	20328	27984	7.9	26.1	49.9	82.0	64.1	32.5	3524	24506	
May 03	15000	Pioneer 38A25	6.9	60.8	38.3	15048	22440	7.7	24.7	47.9	83.1	64.8	31.6	3590	25216	
May 03	30000	Mycogen 4521Bt	8.0	60.8	23.3	31680	33000	7.6	29.2	53.6	79.4	61.7	31.6	3290	26456	
May 03	30000	Pioneer 38A25	8.8	55.5	15.0	27192	28776	7.4	25.4	49.5	82.6	64.8	35.0	3418	30037	
May 03	45000	Mycogen 4521Bt	8.1	56.1	8.3	42504	43296	7.5	30.6	55.6	77.0	58.8	29.8	2989	24372	
May 03	45000	Pioneer 38A25	8.9	51.8	15.0	38808	39600	7.2	27.9	53.7	80.4	63.6	33.9	3186	28218	
May 19	15000	Mycogen 4521Bt	6.9	67.2	65.0	16896	24552	8.3	27.7	52.0	82.5	66.4	29.8	3599	24708	
May 19	15000	Pioneer 38A25	7.2	62.7	66.7	16896	21648	7.8	26.0	50.6	83.2	66.7	31.9	3642	26266	
May 19	30000	Mycogen 4521Bt	7.3	66.5	21.7	32472	32736	8.0	29.9	54.7	79.8	63.2	29.2	3384	24730	
May 19	30000	Pioneer 38A25	7.3	60.5	35.0	25344	26928	7.5	27.4	52.1	81.7	64.8	31.5	3443	24947	
May 19	45000	Mycogen 4521Bt	7.4	67.3	43.3	42768	43296	8.0	34.0	61.5	76.9	62.4	20.9	3159	23457	
May 19	45000	Pioneer 38A25	8.5	58.3	13.3	42504	43032	7.7	27.6	52.5	81.6	65.0	34.0	3417	28929	
June 13	15000	Mycogen 4521Bt	5.8	67.6	65.0	15312	17688	9.4	26.9	51.7	82.5	66.1	21.6	3579	20596	
June 13	15000	Pioneer 38A25	6.2	60.5	61.7	16632	20592	8.5	22.2	45.3	85.6	68.3	31.7	3773	23559	
June 13	30000	Mycogen 4521Bt	7.2	67.9	71.7	30360	31152	9.1	27.9	52.9	81.6	65.2	22.5	3512	25134	
June 13	30000	Pioneer 38A25	7.6	57.8	35.0	29304	29568	8.0	22.6	45.8	85.5	68.2	34.8	3697	28147	
June 13	45000	Mycogen 4521Bt	7.9	66.7	73.3	41448	40920	8.8	27.9	53.0	81.5	65.0	22.2	3501	27552	
June 13	45000	Pioneer 38A25	8.5	59.8	35.0	39864	39864	8.2	23.7	47.3	85.2	68.7	33.4	3732	31628	
Mean			7.5	61.7	39.6	29187	31504	8.0	27.1	51.7	81.8	64.9	29.9	3466	26041	
Probability(%)																
Date of Planting (D)			20.1	0.1	1.9	85.1	4.9	0.2	3.6	5.5	1.7	0.6	4.8	0.4	88.3	
Plant Density (P)			0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	26.4	0.0	0.1	
D x P			6.2	0.9	0.5	29.2	2.2	73.4	42.5	38.0	15.0	18.2	47.6	0.2	0.6	
Hybrid (H)			0.9	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
D x H			98.9	1.7	0.0	2.5	2.1	1.7	14.9	7.6	38.8	38.8	0.1	41.2	75.3	
P x H			43.6	13.0	0.4	10.5	31.3	74.1	17.8	30.9	5.7	6.4	2.6	14.8	15.7	
D x P x H			71.0	48.2	0.6	11.1	26.9	78.4	24.8	20.1	54.7	86.3	13.9	81.0	54.1	
LSD(0.10)																
Date of Planting (D)			NS	1.2	15.3	NS	1539	0.3	1.9	2.7	1.3	1.2	2.5	82	NS	
Plant Density (P)			0.4	1.2	5.5	1190	1334	0.2	1.0	1.5	0.9	0.9	NS	61	1407	
D x P			0.6	2.1	13.6	NS	2311	NS	NS	NS	NS	NS	NS	106	2437	
Hybrid (H)			0.3	1.0	4.5	972	1090	0.1	0.8	1.2	0.7	0.8	1.4	50	1149	
D x H			NS	1.8	7.8	1683	1887	0.2	NS	2.1	NS	NS	2.5	NS	NS	
P x H			NS	NS	7.8	NS	NS	NS	NS	NS	1.2	1.3	2.5	NS	NS	
D x P x H			NS	NS	13.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
CV(%)																
			8	4	25	7	7	4	6	5	2	3	10	3	10	