



## CORN SILAGE

Results for this year's Minnesota Hybrid Corn Silage Evaluation Program are presented in this bulletin. The program was initiated as a test to evaluate corn hybrids intended for use as silage. Unbiased forage yield and quality information provided by this program will be useful in education activities and in marketing corn hybrids grown for silage. The program is financed in part by entry fees from private seed companies that chose to enter hybrids for testing. New results this year include relocating the corn silage performance trials from previous research sites at Rosemount and Waseca to two regions of extensive corn silage use. Locations were chosen in each of the state's primary dairy regions of southeastern and central Minnesota. Entries increased to 30 or more hybrids tested at each test site.

### Test Sites

Trials were conducted in southeastern and central Minnesota in 2002. Silage hybrids entered in each region were tested at both sites. Region locations are categorized as follows:

#### Southeast Dairy Region:

LaCrescent (Houston County)  
Potsdam (Olmsted County)

#### Central Dairy Region:

St. Martin (Stearns County)  
Melrose (Stearns County)

### Test Procedure

**Design:** Research plots were established at LaCrescent, Potsdam, St. Martin and Melrose in randomized block designs with four replications. Hybrids were planted at 33,000 seeds per acre with 30-inch row spacing. Plant nutrients, manure or inorganic fertilizer were applied to maximize plant yield. Cultivation and herbicides were used to control weeds.

**Harvesting:** Plots were harvested and whole-plant herbage sampled for yield and forage quality at each site. The whole-plant target harvest timing was a moisture content of 65% across entries at a site. Harvest at LaCrescent, Potsdam, St. Martin and Melrose was on September 3, September 10, September 18 and September 24, respectively.

### Results Provided

Relative maturity (RM), moisture content, whole-plant dry matter (DM) yield and silage yield are listed with hybrids ranked in descending order by RM followed by average moisture content. Quality concentration traits listed include crude protein (CP), neutral detergent fiber (NDF), *in vitro*

digestibility (IVD), 48-hour neutral detergent fiber digestibility (NDFD) and starch percent. Milk parameter estimates of milk per ton (Ton) and milk per acre (Acre) were calculated using a model from the spreadsheet entitled, "MILK2000" developed at the University of Wisconsin. MILK2000 approximates animal performance using pounds of milk per ton of silage and per acre of cropland for a given hybrid based on standard cow weight and milk production level (1,350-pound body weight and 90 lb/day at 3.8% fat). Values based on field calculations for hybrid moisture and DM yield; lab-determined values for CP, NDF, NDFD, starch and ash concentration; and book values for NDFCP (1.3%) and ether extract (3.2%) concentration were used for spreadsheet calculations. For MILK2000 predictions we assumed that kernel processing occurred.

Means and least significant difference (LSD) statistical figures at the 10% level of probability are shown at each location. Where the difference between two selected hybrids in a table is greater than the LSD value, nine out of ten times there is a real difference for that parameter (moisture, yield, quality concentration or milk estimate).

### Companies participating in the 2002 hybrid corn silage performance trials:

**Agventure**, 65064 250 Ave., Kasson, MN 55944

**Dahlco Seeds, Inc.**, 14730 15th St. SW, Cokato, MN 55321

**Dairyland Seed Company, Inc.**, P.O. Box 958, West Bend, WI 53095-0958

**Epley Brothers Hybrids Inc.**, 22494 Yale Avenue, P.O. Box 310, Shell Rock, IA 50670

**Garst Seed Company**, S366 Lee Lane, Coon Valley, WI 54623

**Hyland Seeds**, 2 Hyland Dr., Box 130, Blenheim, Ontario, Canada N0P 1A0

**Johnson Seeds Inc.**, 72700 185th St., Dassel, MN 55325

**Land O' Lakes, Inc.**, P.O. Box 64281, St. Paul, MN 55164

**Monsanto**, 3100 Sycamore Road, De Kalb, IL 60115

**Monsanto**, 800 N. Lindberg Blvd., St. Louis, MO 63167

**Mycogen Seed**, 9330 Zionsville Road, Indianapolis, IN 46268

**Pioneer Hi-Bred, International, Inc.**, 99 Navaho Ave., Suite 101A, Mankato, MN 56001

**Producers Hybrids**, P.O. Box C, Battle Creek, NE 68715

**Syngenta Seeds**, 7500 Olson Memorial Hwy., Golden Valley, MN 55427

**Trelay Seed Company**, 11623 Hwy. 80, Livingston, WI 53554-9799

## How to Use Results

Hybrids differ in dry matter and silage yield, silage quality and milk estimates at all locations. NDF is a negative indicator of forage intake and relates to better

animal performance. IVD is a laboratory test to estimate digestibility in ruminant livestock and NDFD estimates digestibility of the cell-wall fraction. IVD, NDFD and starch have a positive effect on ani-

mal performance. Starch concentration is associated with corn silage digestion because it is assumed to be 100-percent digestible. Milk per acre represents the combined impact of yield and quality.

## Relative maturity (RM), moisture, silage yield and silage quality traits for corn hybrids planted at LaCrescent in 2002.

Brand	Hybrid	RM,		Yield, Ton/Acre <sup>1</sup>		Concentration, Percent <sup>2</sup>					Milk Yield <sup>3</sup>	
		Rating	Moisture, %	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/Ton	Lb/Acre
Croplan Genetics	DS740	114	68.8	10.1	32.4	8.6	44	77	49	27	3,117	31,473
Mycogen	F697	112	73.0	9.5	35.0	8.9	45	79	52	25	3,249	30,805
Epley Bros	E5112	112	68.2	9.9	31.2	7.6	40	81	52	34	3,451	34,090
Producers Hybrids	SS110	110	67.5	11.4	34.9	8.1	47	74	45	25	2,883	32,897
Epley Bros	E 5110 S	110	66.1	10.2	30.2	7.9	42	79	51	30	3,300	33,520
Pioneer	34M95	110	65.9	11.4	33.3	7.2	46	77	49	27	3,083	34,995
Gold Country Seed	110SLS RR	110	64.8	9.6	27.3	7.1	46	78	52	25	3,185	30,651
Dekalb	DKC58-78 YG	108	67.8	10.3	32.1	7.4	45	77	49	28	3,105	32,049
Garst	8523 IT	108	66.7	10.0	30.2	8.2	41	81	54	28	3,370	33,913
Mycogen	TMF108	108	63.5	10.7	29.3	7.6	43	77	47	30	3,108	33,206
NK Brand	N59-Q9	107	67.6	9.2	28.2	7.8	41	80	50	30	3,284	29,927
Croplan Genetics	DS107 RR	107	67.2	10.4	31.7	7.8	44	78	50	27	3,152	32,748
Agventure	AV696	107	66.2	9.7	28.8	7.8	41	79	49	33	3,268	31,640
NK Brand	N58-F4	107	63.8	10.6	29.3	7.9	39	81	50	33	3,412	36,101
Producers Hybrids	EX10611	106	69.7	9.7	32.0	7.9	41	80	52	30	3,367	32,659
Dairyland	HiDF 4200	106	66.2	8.4	25.0	7.8	41	79	50	33	3,279	27,656
Garst	8590 IT	106	64.7	9.1	25.8	6.9	42	80	52	31	3,384	31,040
Hyland	HL S067	105	67.7	10.5	32.5	7.9	44	77	49	28	3,151	32,981
High Cycle	7638BT	105	67.4	10.7	32.8	8.0	42	80	52	30	3,392	36,289
Trelay	7012	105	67.1	10.4	31.7	7.9	44	77	49	29	3,156	32,738
Golden Harvest	8250	105	66.9	9.4	28.2	7.9	41	80	52	30	3,353	31,519
Agventure	AV600	105	66.2	8.6	25.4	7.9	39	80	49	36	3,389	28,903
Dahlco	2660	105	66.1	8.5	24.9	8.1	43	80	53	30	3,403	28,795
Pioneer	35R58	105	64.3	10.4	29.2	7.6	41	80	52	31	3,396	35,149
NK Brand	N48-K2	104	68.7	6.6	21.0	8.7	43	78	49	26	3,138	20,545
Pioneer	35D45	104	68.7	11.2	35.6	7.5	46	76	48	26	3,052	34,035
Hyland	HL S058	104	65.6	9.6	27.9	7.4	45	78	51	25	3,136	29,721
Trelay	6900	103	68.6	8.8	28.2	7.9	42	79	50	28	3,192	28,298
Croplan Genetics	DS103 RR	103	59.9	10.2	25.4	7.1	47	75	45	27	2,870	29,385
Dekalb	DKC51-43	101	65.3	8.7	25.1	7.4	39	80	50	35	3,389	29,470
NK Brand	N45-A6	101	63.4	9.8	26.9	7.8	40	80	51	31	3,379	33,276
Dahlco	X-0012	100	63.4	10.3	28.1	7.2	44	76	45	32	3,005	30,886
Agventure	AV495	98	64.0	9.2	25.5	7.7	42	78	49	32	3,264	29,970
Dahlco	2475	95	61.2	8.4	21.4	7.0	44	77	47	31	3,092	25,893
<b>Means</b>			<b>66.2</b>	<b>9.7</b>	<b>29.0</b>	<b>7.8</b>	<b>43</b>	<b>78</b>	<b>50</b>	<b>29</b>	<b>3,228</b>	<b>31,389</b>
<b>LSD (0.10)</b>			<b>1.9</b>	<b>1.2</b>	<b>3.5</b>	<b>0.5</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>278</b>	<b>5,030</b>

<sup>1</sup> DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture. <sup>2</sup> Quality concentration description: All quality parameters except NDFD are expressed as a % of dry matter. NDF digestibility (NDFD) is expressed as a % of NDF. Refer to "Results Provided" text for additional information. <sup>3</sup> Milk estimate values calculated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to "Results Provided" for additional information.

**Relative maturity (RM), moisture, silage yield and silage quality traits for corn hybrids planted at Potsdam in 2002.**

Brand	Hybrid	RM,		Yield, Ton/Acre <sup>1</sup>		Concentration, Percent <sup>2</sup>					Milk Yield <sup>3</sup>	
		Rating	Moisture, %	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/Ton	Lb/Acre
Croplan Genetics	DS740	114	68.3	9.4	29.4	8.5	49	73	45	22	2,766	25,743
Mycogen	F697	112	70.6	7.2	24.5	9.0	48	76	49	20	2,872	20,873
Epley Bros	E 5112	112	68.7	8.5	27.2	7.7	45	77	48	29	3,108	26,369
Producers Hybrids	SS110	110	68.8	8.9	28.0	7.8	53	70	43	17	2,401	21,780
Gold Country Seed	110SLS RR	110	66.7	9.9	29.6	7.8	48	74	46	22	2,801	27,526
Epley Bros	E 5110 S	110	65.9	8.6	25.1	8.4	49	73	45	19	2,632	22,800
Pioneer	34M95	110	63.4	10.1	27.6	7.2	48	73	44	26	2,811	28,360
Dekalb	DKC58-78 YG	108	66.7	8.4	24.9	7.9	42	79	49	31	3,263	27,470
Garst	8523 IT	108	65.5	9.7	27.9	8.2	41	79	50	31	3,274	31,651
Mycogen	TMF108	108	64.3	9.4	26.2	7.5	43	77	45	30	3,055	28,637
Croplan Genetics	DS107 RR	107	68.2	9.5	29.7	8.3	48	75	48	21	2,916	27,678
NK Brand	N59-Q9	107	65.7	8.6	25.1	7.4	41	78	47	34	3,205	27,522
NK Brand	N58-F4	107	63.9	10.3	28.5	7.9	42	78	47	30	3,158	32,534
Agventure	AV696	107	63.3	9.1	24.8	7.4	42	78	48	32	3,192	29,019
Producers Hybrids	EX10611	106	67.5	8.3	25.4	8.2	43	78	49	28	3,163	26,250
Dairyland	HiDF 4200	106	67.4	8.0	24.7	7.9	43	77	48	32	3,130	25,023
Garst	8590 IT	106	66.3	7.1	21.1	6.9	42	77	46	34	3,166	22,453
Hyland	HL S067	105	67.5	9.5	29.1	7.8	50	73	45	22	2,758	25,851
Golden Harvest	8250	105	67.0	7.4	22.2	8.2	43	78	49	27	3,112	23,156
High Cycle	7638BT	105	66.3	8.9	26.5	8.0	46	76	48	27	3,067	27,489
Agventure	AV600	105	66.1	8.8	25.9	7.8	39	80	49	38	3,393	29,639
Trelay	7012	105	65.3	7.5	21.4	7.2	43	77	48	32	3,159	23,596
Dahlco	2660	105	64.9	9.4	26.6	7.7	44	77	48	31	3,119	29,138
Pioneer	35R58	105	63.1	9.6	26.1	7.8	43	78	48	30	3,152	30,119
Hyland	HL S058	104	66.6	10.4	31.0	7.7	48	75	48	23	2,939	30,656
Pioneer	35D45	104	65.4	10.4	30.1	7.7	45	76	46	28	3,011	31,420
NK Brand	N48-K2	104	64.1	6.8	19.1	8.4	42	77	46	30	3,076	20,960
Croplan Genetics	DS103 RR	103	66.2	9.8	29.0	7.3	47	74	46	26	2,919	28,404
Trelay	6900	103	66.0	7.0	20.4	8.0	44	77	48	27	3,080	21,329
Dekalb	DKC51-43	101	64.0	9.1	25.3	7.5	40	78	46	33	3,215	29,146
NK Brand	N45-A6	101	63.0	9.1	24.6	7.1	42	78	48	33	3,212	29,027
Dahlco	X-0012	100	63.6	8.4	23.0	7.7	43	77	46	32	3,090	25,994
Agventure	AV495	98	63.0	8.8	23.8	7.7	42	77	46	33	3,113	27,527
Dahlco	2475	95	62.7	8.6	23.0	7.7	45	75	46	29	2,981	25,631
<b>Means</b>			<b>65.7</b>	<b>8.8</b>	<b>25.8</b>	<b>7.8</b>	<b>44</b>	<b>76</b>	<b>47</b>	<b>28</b>	<b>3,038</b>	<b>26,787</b>
<b>LSD (0.10)</b>			<b>2.5</b>	<b>1.5</b>	<b>3.9</b>	<b>0.5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>240</b>	<b>5,339</b>

<sup>1</sup>DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture. <sup>2</sup>Quality concentration description: All quality parameters except NDFD are expressed as a % of dry matter. NDF digestibility (NDFD) is expressed as a % of NDF. Refer to "Results Provided" text for additional information. <sup>3</sup>Milk estimate values calculated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to "Results Provided" for additional information.

**Relative maturity (RM), moisture, silage yield and silage quality traits for corn hybrids planted at St. Martin in 2002.**

Brand	Hybrid	RM, Rating	Moisture, %	Yield, Ton/Acre <sup>1</sup>		Concentration, Percent <sup>2</sup>					Milk Yield <sup>3</sup>	
				DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/Ton	Lb/Acre
NK	N59-Q9	107	67.5	9.8	30.2	7.0	43	77	47	29	3,075	30,267
NK	N58-F4	107	66.1	10.2	30.2	7.1	44	75	44	27	2,916	29,848
Epley Bros	E 5105 S	105	67.5	8.1	25.0	8.1	48	73	45	21	2,707	21,918
Johnson Seeds	JSC-5450	105	66.5	9.1	27.0	7.7	41	79	48	29	3,165	28,715
Dairyland	Stealth 1606	104	68.3	9.9	31.3	6.9	45	75	44	28	2,897	28,684
NK	N48-K2	104	67.3	9.1	27.9	8.1	41	78	46	31	3,146	28,714
Trelay	6900	103	70.0	8.6	28.7	7.2	47	75	46	25	2,893	24,809
Gold Country Seed	102 SLS	102	66.1	8.0	23.5	7.4	47	74	44	24	2,763	21,984
Mycogen	X3104BM	101	71.5	7.5	26.0	8.3	48	75	47	20	2,794	20,780
NK	N45-A6	101	62.7	9.9	26.6	7.3	43	77	45	30	2,978	29,497
Trelay	5600	100	67.4	7.8	24.0	7.3	46	73	43	25	2,738	21,469
Croplan Genetics	DS 100 RR	100	66.5	10.1	30.1	7.5	49	73	45	24	2,755	27,867
Hyland	HL S054	100	64.5	8.4	23.9	7.6	45	76	46	26	2,950	24,824
Johnson Seeds	JSC-5350	100	64.0	8.7	24.1	7.3	46	74	44	26	2,840	25,148
Producers Hybrids	547 RR	99	61.7	8.1	21.0	6.9	44	74	41	29	2,767	22,333
Hyland	HL S041	98	66.7	8.2	24.8	7.8	41	78	47	30	3,131	25,866
NK	N43-C4	98	63.5	7.7	21.2	7.1	42	77	45	31	3,065	23,771
Hyland	HL 2505	98	63.1	8.4	22.6	7.3	45	74	44	28	2,878	24,202
Dekalb	DKC48-83	98	62.9	8.5	22.8	7.2	43	75	43	30	2,916	25,073
Pioneer	37D03	97	61.8	9.3	24.3	6.4	45	75	44	29	2,910	27,165
Mycogen	TMF2450	96	63.4	9.4	25.6	7.4	43	76	45	29	2,989	27,902
Pioneer	38T28	96	61.1	9.8	25.4	7.3	40	77	43	33	2,995	29,403
Gold Country Seed	96 SLS RR	96	59.8	9.6	24.1	6.2	52	70	42	22	2,467	23,636
Dahlco	2475	95	62.0	8.2	21.7	7.2	45	75	44	28	2,872	23,695
Croplan Genetics	DS 94 RR	94	66.4	9.8	29.4	7.3	45	75	45	27	2,940	28,945
NK	N32-L9	94	60.4	9.3	23.5	6.9	43	77	46	32	3,018	28,102
NK	N3030Bt	94	60.2	8.3	20.8	6.7	41	77	46	32	3,078	25,517
Dekalb	DKC44-46 RR/YG	94	56.6	9.3	21.7	6.5	44	75	43	30	2,781	26,049
Dahlco	X-1871	88	57.7	7.5	17.8	6.9	43	75	42	30	2,814	21,007
Dahlco	2288	85	59.9	8.1	20.1	7.4	43	75	43	30	2,832	22,802
<b>Means</b>			<b>64.1</b>	<b>8.8</b>	<b>24.8</b>	<b>7.2</b>	<b>44</b>	<b>75</b>	<b>44</b>	<b>28</b>	<b>2,902</b>	<b>25,666</b>
<b>LSD (0.10)</b>			<b>3.1</b>	<b>0.9</b>	<b>2.2</b>	<b>0.7</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>271</b>	<b>4,127</b>

<sup>1</sup>DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture. <sup>2</sup>Quality concentration description: All quality parameters except NDFD are expressed as a % of dry matter. NDF digestibility (NDFD) is expressed as a % of NDF. Refer to "Results Provided" text for additional information. <sup>3</sup>Milk estimate values calculated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to "Results Provided" for additional information.

**Relative maturity (RM), moisture, silage yield and silage quality traits for corn hybrids planted at Melrose in 2002.**

Brand	Hybrid	RM,		Yield, Ton/Acre <sup>1</sup>		Concentration, Percent <sup>2</sup>					Milk Yield <sup>3</sup>	
		Rating	Moisture, %	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/Ton	Lb/Acre
NK	N58-F4	107	67.5	5.9	17.9	8.1	43	79	51	25	3,119	18,513
NK	N59-Q9	107	65.7	6.2	18.1	7.9	40	81	53	30	3,413	20,984
Epley Bros	E 5105 S	105	66.4	6.2	18.2	8.6	45	78	52	23	3,102	19,429
Johnson Seeds	JSC-5450	105	65.3	6.9	19.8	8.3	41	81	53	28	3,335	23,012
Dairyland	Stealth 1606	104	66.2	6.4	19.0	8.1	40	82	55	31	3,561	22,878
NK	N48-K2	104	65.6	4.3	12.4	8.4	40	81	52	30	3,419	14,519
Trelay	6900	103	65.3	7.1	20.6	7.9	41	81	53	29	3,359	23,818
Gold Country Seed	102 SLS	102	67.1	5.7	17.2	8.7	43	80	53	26	3,292	18,635
Mycogen	X3104BM	101	65.6	6.1	17.7	8.7	39	82	55	32	3,563	21,664
NK	N45-A6	101	59.9	6.0	15.0	7.6	37	83	54	35	3,540	21,318
Hyland	HL S054	100	68.5	5.4	17.4	9.0	45	79	54	23	3,209	17,424
Johnson Seeds	JSC-5350	100	63.3	5.6	15.3	8.3	41	79	50	30	3,275	18,250
Trelay	5600	100	62.4	6.3	16.8	7.7	40	81	50	34	3,360	21,316
Croplan Genetics	DS 100 RR	100	62.3	6.7	17.7	7.8	45	78	51	26	3,176	21,074
Producers Hybrids	547 RR	99	61.1	6.6	16.7	8.3	39	81	50	32	3,297	21,688
Hyland	HL S041	98	66.2	6.1	18.2	8.4	42	80	53	27	3,321	20,428
NK	N43-C4	98	62.5	6.2	16.4	8.0	38	81	50	33	3,394	20,928
Hyland	HL 2505	98	61.4	6.3	16.2	8.3	41	80	51	32	3,336	20,878
Dekalb	DKC48-83	98	60.6	6.8	17.2	7.5	37	82	51	35	3,449	23,261
Pioneer	37D03	97	60.4	7.3	18.4	7.7	36	82	50	37	3,469	25,260
Mycogen	TMF2450	96	62.7	8.6	23.2	8.0	42	80	51	29	3,312	28,607
Gold Country Seed	96 SLS RR	96	61.5	7.1	18.5	7.5	43	79	50	29	3,243	22,904
Pioneer	38T28	96	59.9	6.9	17.0	7.9	38	81	50	34	3,400	17,882
Dahlco	2475	95	58.6	6.7	16.0	8.1	39	80	48	35	3,254	21,689
Croplan Genetics	DS 94 RR	94	64.8	6.4	18.3	8.5	46	77	50	23	3,031	19,522
NK	N3030Bt	94	62.7	4.7	12.5	8.1	36	84	56	36	3,713	17,319
NK	N32-L9	94	58.0	6.4	14.9	8.1	35	84	53	38	3,544	22,437
Dekalb	DKC44-46 RR/YG	94	57.8	7.4	17.6	7.1	38	81	50	36	3,335	24,811
Dahlco	X-1871	88	59.4	4.6	11.4	8.0	39	80	49	33	3,250	14,976
Dahlco	2288	85	54.8	6.8	15.1	8.4	37	81	48	34	3,205	21,702
<b>Means</b>			<b>62.8</b>	<b>6.3</b>	<b>17.0</b>	<b>8.1</b>	<b>40</b>	<b>80</b>	<b>51</b>	<b>31</b>	<b>3,342</b>	<b>20,904</b>
<b>LSD (0.10)</b>			<b>2.8</b>	<b>1.3</b>	<b>3.1</b>	<b>0.5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>205</b>	<b>5,151</b>

<sup>1</sup>DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture. <sup>2</sup>Quality concentration description: All quality parameters except NDFD are expressed as a % of dry matter. NDF digestibility (NDFD) is expressed as a % of NDF. Refer to "Results Provided" text for additional information. <sup>3</sup>Milk estimate values calculated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to "Results Provided" for additional information.