



CORN SILAGE

The Minnesota Hybrid Corn Silage Evaluation 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 presentation of hybrid data for 48-hour digestible neutral detergent fiber, (dNDF) and starch concentration. Also, milk production (milk per ton and milk per acre yield) is calculated using the improved “MILK2000” spreadsheet.

Test Sites

Trials were conducted at Rosemount and Waseca in 2001. Locations and maturity categories were:

Southern Zone: Waseca

Early maturity group - Hybrids rated 105-day Relative Maturity (RM) and earlier.

Late maturity group - Hybrids rated later than 105-day RM.

Central Zone: Rosemount

Early maturity group - Hybrids rated earlier than 100-day RM.

Late maturity group - Hybrids rated 100-day RM or later.

Test Procedure

Design: Plots were established at Waseca and Rosemount in randomized block designs with five replications. Hybrids were planted at 33,000 seeds per acre with 30-inch row spacing. Standard check hybrids were included to represent the RM groups at each location.

Harvesting: Plots were harvested and whole-plant (WP) herbage sampled for yield and forage quality determination for each RM group. The WP target maturity was a moisture content of 60% to 65%. Harvest at Waseca was on 24 September for the early RM group and 27 September for the late RM group. Harvest at Rosemount was on 30 August for the early RM group and 4 September for the late RM group. After grain maturation, two rows adjacent to those sampled for silage were harvested for grain and yields adjusted to 15.5% moisture.

Results Provided

Moisture content, grain yield (Grn), whole-plant dry matter (DM) and silage (Sil) yield, crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), *in vitro* digestibility (IVD), 48-hour digestible neutral detergent fiber (dNDF) and starch concentrations are given for entries in each RM group.

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. They approximate 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 lb. body weight and 90 lb/day at 3.8% fat). Hybrid moisture, DM yield, and CP, NDF and dNDF quality concentration are used for the spreadsheet calculations.

Means and least significant difference (LSD) statistical figures at the 10% level of probability are shown for each RM group at each location. Where the difference between two selected hybrids in a table is greater than the LSD value, 9 out of 10 times there is a real difference for that parameter (moisture, yield or quality concentration). Hybrids are ranked by average moisture content.

How to Use Results

Hybrids differ in grain and silage yields, and milk production per acre estimates; however, there was little difference in forage quality parameters (ADF and IVD) and milk production per ton estimates. ADF and NDF are negative indicators of forage digestibility and intake respectively. Lower ADF and NDF numbers are related to better animal performance.

IVD is a laboratory test to estimate digestibility in ruminant livestock, and dNDF estimates digestibility of the cell-wall fraction. IVD, dNDF and starch have a positive effect on animal performance. Starch concentration is associated with corn silage digestion because it is assumed to be 100% digestible.

Grain, silage and milk yields at Rosemount were reduced in 2001 by a prolonged drought.

Companies participating in the 2001 hybrid corn silage trials:

Albert Lea Seed House, 1414 W. Main, P.O. Box 127, Albert Lea, MN 56007

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

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

Moisture, yield and quality traits for early relative maturity (RM) corn hybrids at Waseca, 2001. *

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Pioneer	36R11 (check) ³	102	58	180	7.6	18.4	7.4	21	37	72	48	40	3,451	25,968
Epley Bros	E1505 S	105	60	147	7.0	17.5	7.5	23	40	69	52	36	3,359	23,662
Dahlco	2660	105	61	174	8.8	22.7	7.2	21	38	70	52	40	3,439	30,289
Dahlco	X-100L	100	61	144	7.2	18.5	7.6	22	38	69	50	37	3,349	24,134
Dairyland	Stealth 1406	103	62	174	8.0	21.4	7.3	20	35	69	50	43	3,406	27,324
Trelay	6900	103	62	164	7.4	19.5	7.0	21	36	72	50	40	3,435	25,342
Dairyland	Stealth 1507	105	63	172	8.3	22.2	7.9	20	35	71	58	42	3,884	32,126
Trelay	7095	105	63	180	8.1	22.0	7.3	21	37	69	52	40	3,524	28,768
Early RM Averages			61	167	7.8	20.2	7.4	21	37	70	51	40	3,481	27,202
LSD (0.10)			2	10	1.0	2.6	ns	1	2	ns	ns	3	ns	4,949

*Whole-plant (WP) corn harvested September 24.

Moisture, yield and quality traits for late relative maturity (RM) corn hybrids at Waseca, 2001. *

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Viking	Fodder	110	64	159	7.0	19.4	7.0	25	43	65	45	34	2,994	21,289
Epley Bros	E5112	112	64	161	6.5	18.3	6.5	27	47	63	42	31	2,547	16,622
High Cycle	7638BT	107	65	162	7.3	20.6	6.7	26	45	64	48	30	3,023	21,764
Pioneer	35Y55 (check) ³	106	66	177	6.4	18.9	7.7	26	43	65	48	31	3,064	19,591
Dairyland	Stealth 1611	111	67	161	6.6	20.3	7.0	27	47	61	47	29	2,933	19,456
Late RM Averages			65	164	6.8	19.5	7.0	26	45	63	46	31	2,912	19,744
LSD (0.10)			2	10	ns	ns	0.6	ns	2	2	ns	ns	ns	ns

*Whole-plant (WP) corn harvested September 27.

Moisture, yield and quality traits for early relative maturity (RM) corn hybrids at Rosemount, 2001. *

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Pioneer	38A25 (check) ³	96	60	120	6.1	15.3	7.5	27	49	61	40	30	2,367	14,564
Dairyland	Stealth 1297	97	60	106	5.7	14.2	7.2	30	52	57	44	28	2,473	13,895
Trelay	5600	98	64	98	5.7	16.1	8.3	29	53	58	45	22	2,680	15,364
Early RM Averages			61	108	5.8	15.2	7.7	28	51	58	43	27	2,507	14,608
LSD (0.10)			ns	12	ns	0.9	ns	ns	ns	ns	4	6	ns	719

*Whole-plant (WP) corn harvested August 30.

Moisture, yield and quality traits for late relative maturity (RM) corn hybrids at Rosemount, 2001. *

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Dairyland	DST 10233	100	58	93	5.7	13.7	7.9	25	45	66	46	34	2,691	15,327
Epley Bros	E5105 S	105	59	91	6.5	16.1	8.3	26	47	62	49	29	2,799	18,504
Pioneer	36R11 (check) ³	102	61	113	6.0	15.4	7.9	24	44	63	47	35	2,874	17,287
Dairyland	Stealth 1606	104	62	112	6.5	16.9	7.3	26	46	62	54	30	3,212	20,640
Trelay	6900	103	62	91	5.6	14.8	8.2	26	46	62	49	29	2,925	16,448
Late RM Averages			60	100	6.1	15.4	7.9	25	45	63	49	31	2,900	17,641
LSD (0.10)			ns	11	0.6	1.9	0.6	ns	ns	ns	5	ns	319	2,546

*Whole-plant (WP) corn harvested September 24.

Footnotes for all corn silage tables: ¹ DM yield is WP yield at 100% dry matter. Silage yield is WP yield at harvest moisture. Grain harvested after maturation and yields adjusted to 15.5% moisture. ² Refer to Results Provided text for description. ³ (check) - standard check entry.