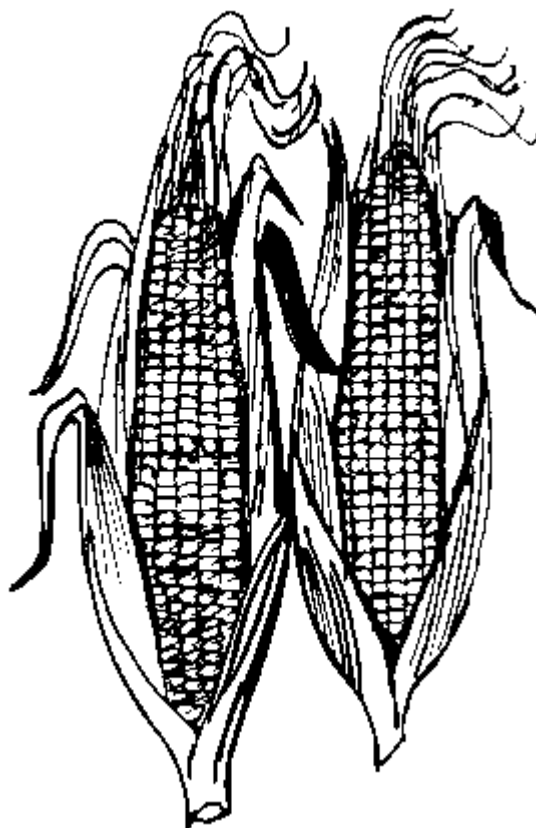


2005  
Northwest Vermont Corn Hybrid  
Performance Trial Results



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**2005 NORTHWEST VERMONT CORN SILAGE HYBRID PERFORMANCE TRIALS**  
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This year, the University of Vermont Extension conducted a hybrid corn evaluation program, in cooperation with local farmers and seed companies. The purpose of the program is to provide unbiased performance comparisons of hybrid corn available in the northern part of Vermont. It is important to remember, however, that the data presented are from a single test at only a few locations. Hybrid-performance data from additional tests in different locations and often over several years should be compared before you make conclusions.

**TESTING PROCEDURE**

In 2005, silage performance trials were planted at three locations in Northwest Vermont. Local farmers were asked to host the trials on their farms and seed companies submitted hybrids for evaluation in each location. Companies and contact names are listed in Table 1.

Table 1. Participating Companies Contact Information

<b>Mycogen</b>	<b>Pioneer</b>	<b>Seedway</b>
Claude Fortin Highgate, VT District Sales Manager 802-363-2803	Jacob Bourdeau Bourdeau Bros. Sheldon, VT 802-933-2277	Tony Rossier 1125 Sheldon Rd St. Albans, 05478 802-363-7121 District Sales Manager
Rich Bennek Mycogen Seeds Animal Nutritionist 919-946-5145	David Kosztyo 41 Orchardview Drive Clifton Park, NY 12065 800-803-4309 District Sales Manager  Donald Specker 38 Woodcrest Ave Ithaca, NY 14850 800-676-1822 Field Sales Agronomist	Greg Davis P.O. Box 250 Hall, NY 14463 800-836-3710

Location trials were either early or late maturity trials, based on the hybrid Relative Maturities **provided by the companies**. The specific hybrids and relative maturities are listed for each trial location in Table 2.

Table 2. Hybrids evaluated at three Northwest locations

Company	Westford – Early Trial			Sheldon – Late Trial			Grand Isle – Late Trial		
	Hybrid	RM	Traits	Hybrid	RM	Traits	Hybrid	RM	Traits
Mycogen	F2F444	98	BMR	F697	112	BMR	F697	112	BMR
Mycogen	TMF94	97	Leafy	F2F581	105	BMR	F2F581	105	BMR
Mycogen	TMF2M405	96	BT	TMF2T497	99	Leafy	TMF2T497	99	Leafy
Pioneer	36N70	101		34B23	108		34B23		
Pioneer	38H67	97		33D11	109		34A86		
Pioneer	38B85	95		34B39	111		35A30		
Seedway	SW 3001L	90	Leafy	E409L	100	Leafy	E409L	100	Leafy
Seedway	E375RR	95	Roundup	SW 4704RR	102	Roundup	SW 4704RR	102	Roundup
Seedway	E390L	98		SW 6601L	108	Leafy	SW 6601L	108	Leafy

Seasonal precipitation and temperature recorded at weather stations close in proximity to the 2005 sites are shown in Table 3. This season brought above average temperatures June through September. In general, silage yields were above average for most locations most likely due to above average temperatures.

Table 3. 2005 Temperature and Precipitation Summary

Location		May		June		July		August		September	
		Temp.	Average	Departure*	Average	Departure	Average	Departure	Average	Departure	Average
	Precip.	Total	Departure	Total	Departure	Total	Departure	Total	Departure	Total	Departure
Westford	Temp.	52	-4	70	+5	72	+3	70	+3	64	+5
	Precip.	1.9	-1.3	4.0	+0.2	+1.8	3.9	3.5	-1.2	4.2	-0.2
Sheldon	Temp.	53	-4	70	+6	73	+4	70	+4	63	+5
	Precip.	1.7	-2.2	5.0	+1.2	4.9	-0.5	3.5	-1.3	3.3	-1.0
Grand Isle	Temp.	53	-4	70	+4	72	+1	72	+3	65	+5
	Precip.	1.8	-1.1	5.6	+2.4	4.9	+1.5	3.4	-0.2	2.7	-0.8

\* Departure from 29 year average (1971-2000)

### CULTURAL PRACTICES

The seedbed at each location was prepared by conventional tillage methods. Fertilizer and herbicides were applied. Plots were planted with a four row corn planter. Plots were planted the length of the field and averaged 450 feet in length. The four row plots were harvested with a self propelled corn chopper. Yield was measured by weighing wagons on drive-up platform scales. A subsample of corn was taken and analyzed for forage quality by the DairyOne Forage Laboratory in New York. Information for each location is summarized in Table 4.

Table 4. Individual Trial Information - 2005

Trial Information	Trial Location & Cooperator		
	Westford Don Pouliot & Sons	Sheldon Andy Brouillette & Family	Grand Isle Dwight Bullis & Family
Soil type	Silt loam	Sandy loam	Silt loam
Previous Crop	Corn	Corn	Corn
Row Width (in.)	30	30	30
Planting date	11-May	11-May	18-May
Harvest date	23-Sep	22-Sep	21-Sep
Average final stand (plants/A)	29,500	29,500	29,750
Tillage operations	Spring Chisel	Spring chisel	Fall plowed Spring wheel harrow
Manure (gal/acre)	Spring applied – 5000 gal/acre	Spring applied - 8000 gal/acre	Fall applied – 3700 gal/acre
Starter fertilizer (lbs/A)	10-20-20 @ 150 lbs/a	10-20-20 @ 150 lbs/a	10-20-20 @ 150 lbs/a
Other fertilizer (lbs/A)	80 lbs N/acre sidedressed	45 lbs N/acre sidedressed	65 lbs N/acre sidedressed

## SILAGE QUALITY

Silage quality was analyzed using wet chemistry techniques at the DairyOne Forage Laboratory in New York. Plot samples were dried, ground and analyzed for crude protein (CP), neutral detergent fiber (NDF), 30h *in vitro* digestibility (IVD), and 30h digestible NDF (dNDF). Mixtures of true proteins, composed of amino acids, and nonprotein nitrogen make up the CP content of forages. The CP content of forages is determined by measuring the amount of N and multiplying by 6.25. The bulky characteristics of forage come from fiber. Forage feeding values are negatively associated with fiber since the less digestible portions of plants are contained in the fiber fraction. The detergent fiber analysis system separates forages into two parts: cell contents, which include sugars, starches, proteins, nonprotein nitrogen, fats and other highly digestible compounds; and the less digestible components found in the fiber fraction. The total fiber content of forage is contained in the neutral detergent fiber (NDF). Chemically, this fraction includes cellulose, hemicellulose, and lignin. Because of these chemical components and their association with the bulkiness of feeds, NDF is closely related to feed intake and rumen fill in cows. Recently, forage testing laboratories have begun to evaluate forages for NDF digestibility. Evaluation of forages and other feedstuffs for NDF digestibility is being conducted to aid prediction of feed energy content and animal performance. Research has demonstrated that lactating dairy cows will eat more dry matter and produce more milk when fed forages with optimum NDF digestibility. Forages with increased NDF digestibility will result in higher energy values, and perhaps more importantly, increased forage intakes. Forage NDF digestibility can range from 20 – 80%.

The silage performance indices of milk per acre and milk per ton were calculated using a model derived from the spreadsheet entitled, "MILK2000" developed by researchers at the University of Wisconsin. Milk per ton measures the pounds of milk that could be produced from a ton of silage. This value is generated by approximating a balanced ration meeting animal energy, protein, and fiber needs based on silage quality. The value is based on a standard cow weight and level of milk production. Milk per acre is calculated by multiplying the milk per ton value by silage dry matter yield. Therefore milk per ton is an overall indicator of forage quality and milk per acre an indicator of forage yield and quality. Milk per ton and milk per acre calculations provide relative rankings of forage samples, but should not be considered as predictive of actual milk responses in specific situations for the following reasons:

- 1) equations and calculations are simplified to reduce inputs for ease of use.
- 2) farm to farm differences exist.
- 3) genetic, dietary, and environmental differences affecting feed utilization are not considered.

## PRESENTATION OF DATA

Results for individual locations are listed in Table 5, 6, and 7. Dry matter yields were calculated and then adjusted to 30% dry matter for the report. Within each trial, hybrids are ranked by dry matter at harvest. The numbers presented in the tables are an average of two replications. For each location, there is a figure displaying the relationship between milk per ton and milk per acre. The dotted lines dividing the figure into four quadrants represent the mean milk per ton and acre for the location. Therefore hybrids that fall above the lines performed higher than the average and hybrids below the lines performed below average. Lastly, a table has been included for each location to report yields. Hybrids with the same letter were not statistically different in yield.

## LEAST SIGNIFICANT DIFFERENCE (LSD)

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine, whether a difference among hybrids is real or whether it might have occurred due to other variations in the field. At the bottom of each table a LSD value is presented for each variable (i.e. yield). Least Significant differences (LSD's) at the 10% level of probability are shown. Where the difference between two hybrids within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in 9 out of 10 chances that there is a real difference between the two hybrids. Hybrids that were not significantly lower in performance than the highest hybrid in a particular column are indicated with an asterisk. In the example below hybrid A is significantly different from hybrid C but not from hybrid B. The difference between A and B is equal to 1.5 which is less than the LSD value of 2.0. This means that these hybrids did not differ in yield. The difference between A and C is equal to 3.0 which is greater than the LSD value of 2.0. This means that the yields of these hybrids were significantly different from one another. The asterisk indicates that hybrid B was not significantly lower than the highest yielding hybrid.

Hybrid	Yield
A	6.0
B	7.5*
C	9.0
LSD	2.0

## RESULTS

**Table 5. Westford – Early Maturity Silage Trial**

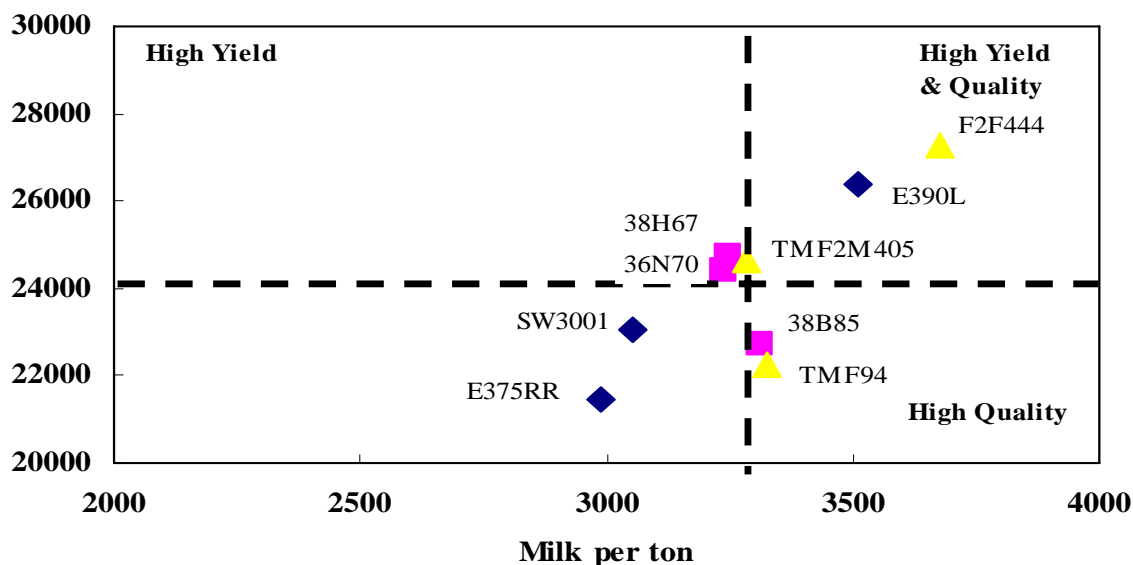
Company	Hybrid	DM at harvest %	Yield 30 % DM T/A	Forage Quality Characteristics					Milk Yield	
				CP %	NDF %	IVD %	dNDF %	Nel %	per Ton lb/ton	per Acre lb/A
Seedway	SW3001	34*	24.0	7.60*	48.0*	74.5	47.5	0.67	2990	21468
Seedway	E375RR	29*	25.1	6.95	47.6*	75.5*	47.5	0.68	3052	23039
Seedway	E390L	29*	25.1	7.40	44.9	80.5*	56.0	0.74*	3510*	26387
Pioneer	38H67	29*	25.4	7.10	46.4*	77.5*	51.0	0.70*	3249*	24721
Mycogen	TMF94	29*	22.2	7.60*	44.7	78.5*	51.5	0.72*	3324*	22247
Pioneer	36N70	28	24.8	7.65*	44.5	77.5*	49.0	0.71*	3236*	24402
Pioneer	38B85	27	23.1	7.85*	46.1*	78.0*	52.0	0.71*	3312*	22707
Mycogen	F2F444	27	24.9	7.10	47.1*	81.5*	61.5*	0.73*	3678*	27254
Mycogen	TMF2M405	27	24.9	7.50*	49.8*	77.0*	54.5	0.70*	3285*	24642
Mean		29	24.4	7.42	46.5	77.8	52.3	0.70	3293	24097
LSD (0.10)**		5.0	NS	0.4	4.0	6.8	5.0	0.05	553	NS

\* - Hybrids which did not perform significantly less than the highest hybrid in the test.

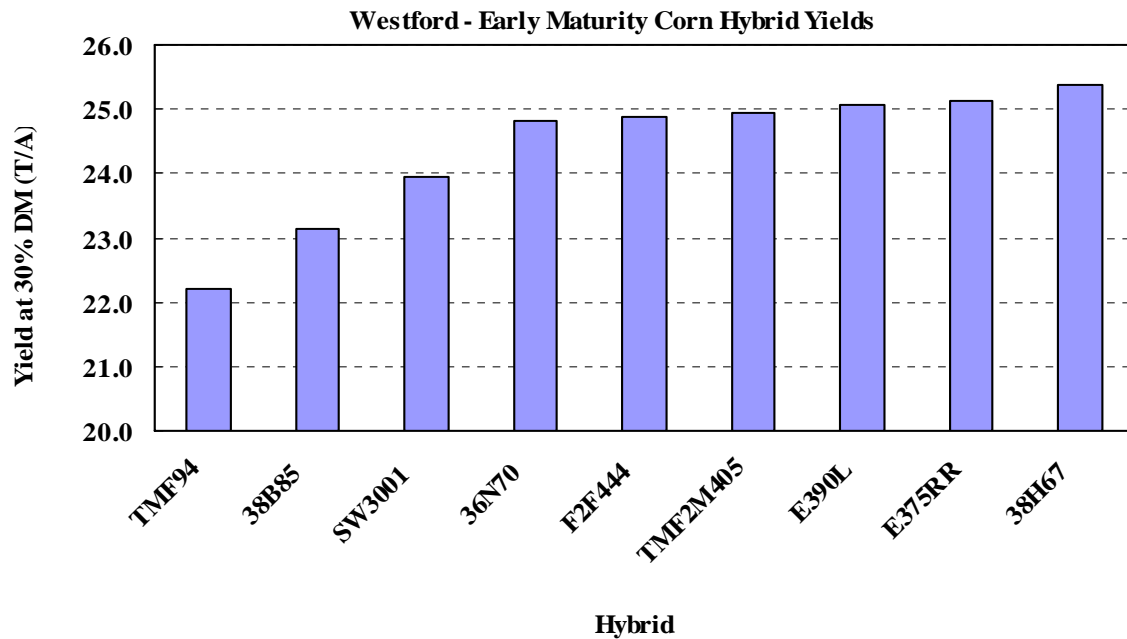
\*\* - See text for further explanation.

NS - none of the hybrids were significantly different from one another.

**Westford - Relationship between Milk per Ton and Milk per Acre**



Dotted lines represent the mean milk per ton and milk per acre at the Westford location.



Hybrids at this location did not differ significantly in yield.

**Table 6. Sheldon – Early Maturity Silage Trial**

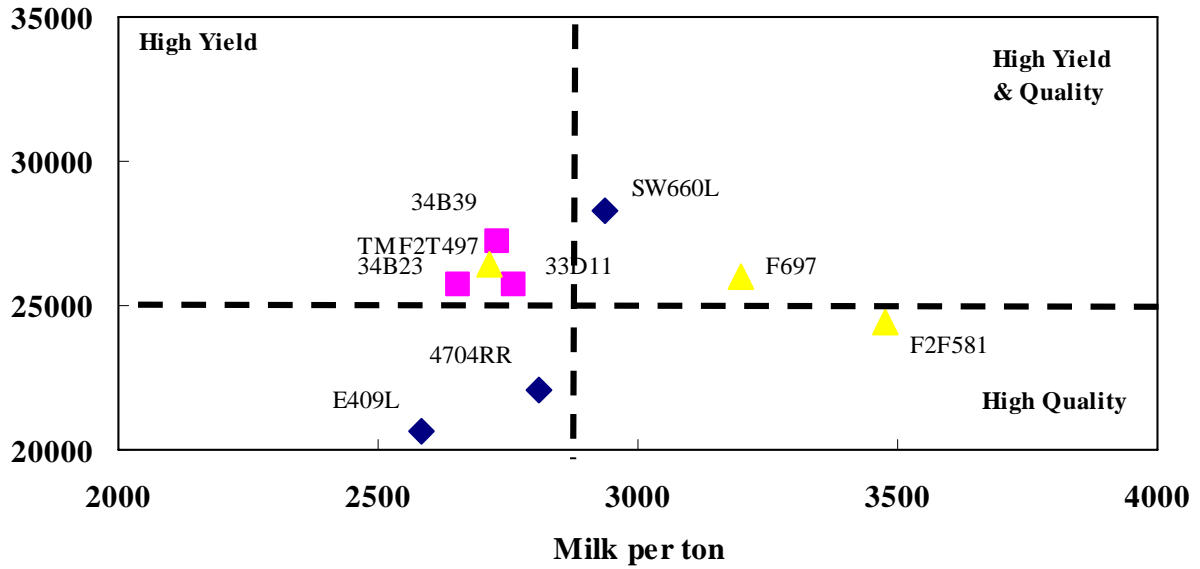
Company	Hybrid	DM at harvest %	Yield 30 % DM T/A	Forage Quality Characteristics					Milk per	
				CP %	NDF %	IVD %	dNDF %	Nel %	ton	acre
Mycogen	TMF2T497	39.0	32.4*	7.8*	45.0	74.5	42.5*	0.68	2715	26414*
Seedway	SW660LL	34.9	32.0*	7.9*	47.8	74.5	46.5*	0.67	2937	28253*
Seedway	E409L	34.4	26.8	7.5*	48.6	70.5	39.5*	0.64	2582	20659
Seedway	4704RR	34.0	26.2	7.5*	47.7	72.5	42.5*	0.65	2808	22090
Pioneer	33D11	33.4	31.0*	7.3	43.8	72.5	37.5	0.67	2760	25705*
Pioneer	34B23	32.7	32.4*	7.1	45.9	71.5	37.5	0.66	2656	25746*
Mycogen	F2F581	31.8	23.5	8.0*	40.4	80.5	51.5*	0.75*	3477*	24453*
Pioneer	34B39	31.6	33.2*	7.2	44.9	72.0	37.5	0.66	2729	27208*
Mycogen	F697	28.1	27.0	8.1*	43.7	77.0	47.5*	0.70*	3197*	25980*
Mean		33.3	29.4	7.6	45.3	73.9	42.5	0.67	2873	25167
LSD (0.10)**		3.2	4.0	0.65	NS	2.7	11.0	0.05	296	3904

\* - Hybrids which did not perform significantly less than the highest hybrid in the test.

\*\* - See text for further explanation.

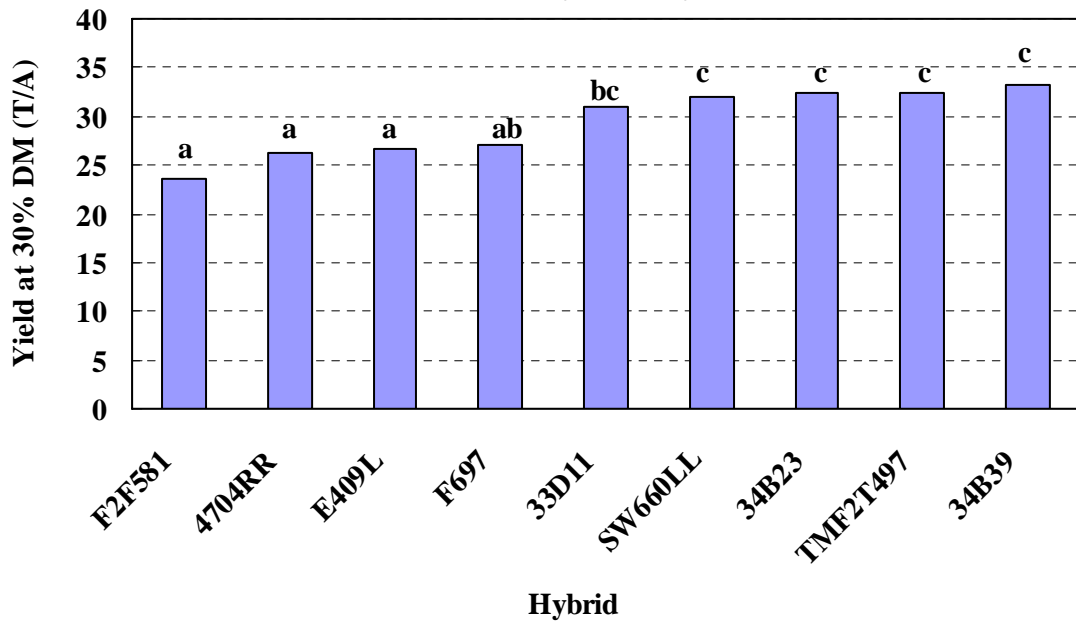
NS - none of the hybrids were significantly different from one another.

### Sheldon - Relationship between Milk per ton and Milk per acre



Dotted lines represent the mean milk per ton and milk per acre at the Sheldon location.

### Sheldon - Late Maturity Corn Hybrid Yields



Hybrids with the same letter did not differ in yield at the Sheldon location.

**Table 7. Grand Isle – Late Maturity Silage Trial**

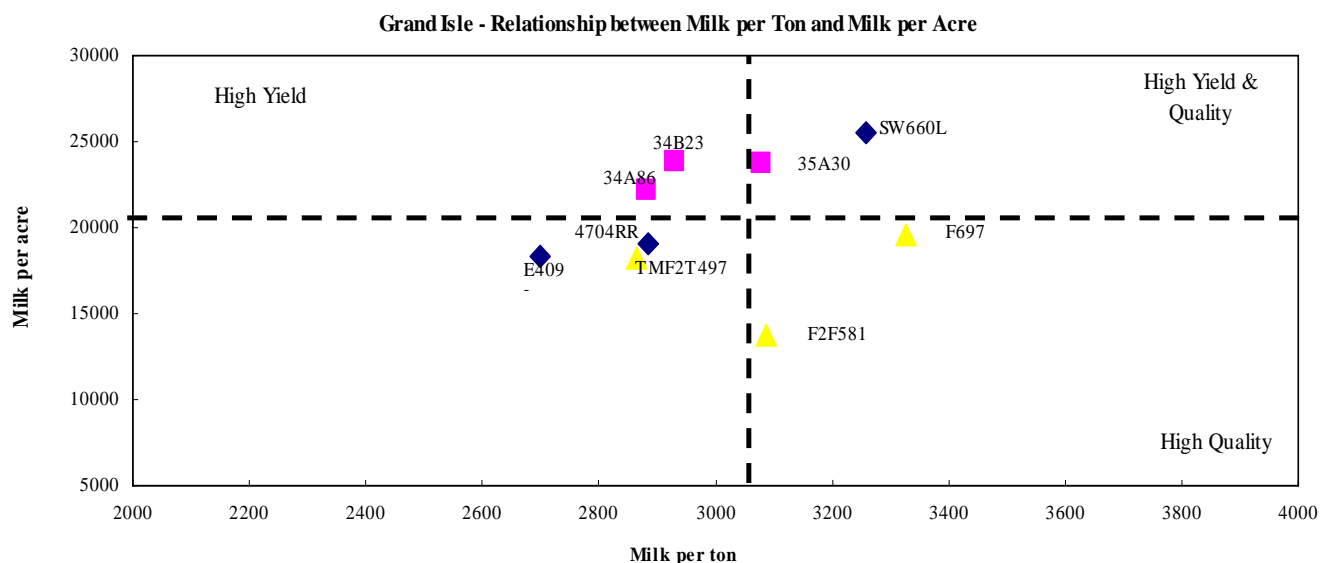
Company	Hybrid	DM at harvest %	Yield 30 % DM T/A	Forage Quality Characteristics					Milk per	
				CP %	NDF %	IVD %	dNDF %	Nel %	ton	acre
Seedway	E409L	44*	22.7	7.1	46.2*	75.5	47.0	0.68	2699	18334
Pioneer	34B23	42*	26.4	7.5	43.3*	78.5*	49.5	0.71*	2930*	23960
Pioneer	35A30	42*	25.7	6.8	38.4	81.0*	50.5	0.75*	3077*	25490
Mycogen	TMF2T497	42*	21.2	7.2	46.0*	76.5*	49.0	0.70*	2864	22166
Mycogen	F2F581	41*	13.6	7.3	42.3*	79.5*	52.0	0.74*	3086*	13735
Pioneer	34A86	41*	25.7	7.4	41.8	77.5*	46.5	0.71*	2882*	23776
Seedway	4704RR	40	21.9	7.9	40.5	77.5*	44.5	0.72*	2884*	18228
Seedway	SW660L	37	25.6	7.6	45.5*	79.0*	53.5	0.72*	3259*	25490
Mycogen	F697	36	18.6	7.6	41.4	80.0*	52.0	0.75*	3326*	19633
Mean		40	22.7	7.4	42.8	78.3	49.4	0.72	3001	20475
LSD (0.10)**		3.6	NA	NS	4.0	5.5	NS	0.06	460	NA

\* - Hybrids which did not perform significantly less than the highest hybrid in the test.

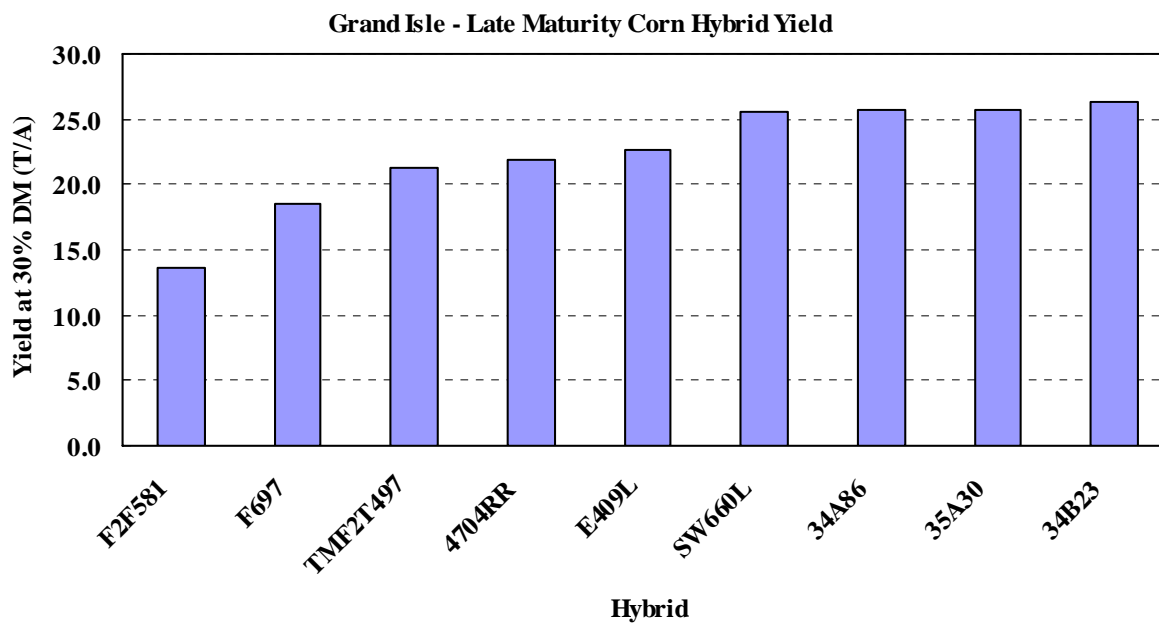
\*\* - See text for further explanation.

NS - none of the hybrids were significantly different from one another.

NA – statistics were not calculated due to missing data.



**Dotted lines represent the mean milk per ton and milk per acre at the Grand Isle location.**



**Yield statistics were not calculated at this location due to missing data.**

The corn grown at the Grand Isle location exhibited signs of corn borer damage. Although all locations had some level of damage from corn borers this location appeared to be most impacted. In some cases corn borer had an extreme impact on overall hybrid yield due to a significant number of plants lodged. This was especially true for F2F581 which appeared to be more susceptible to corn borer than the other hybrids. The percentage of corn borer damage of each hybrid is reported in the table below.

Company	Hybrid	Corn Borer % damage
Pioneer	34B23	0
Pioneer	35A30	0
Pioneer	34A86	2
Mycogen	F697	2
Seedway	SW660L	2
Seedway	4704RR	8
Seedway	E409L	10
Mycogen	TMF2T497	12
Mycogen	F2F581	40

UVM Extension would like to thank the Brouillette, Bullis, and Pouliot families for their generous help with the trials and Roger and Natasha Rainville for assisting with planting and harvesting.

