View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by ScholarWorks @ UVM

University of Vermont
ScholarWorks @ UVM

Northwest Crops & Soils Program | UVM Extension

2015

Long Season Corn Silage Variety Trial

Heather Darby
University of Vermont, heather.darby@uvm.edu

Sara Ziegler
University of Vermont

Lily Calderwood
University of Vermont

Erica Cummings
University of Vermont

Abha Gupta
University of Vermont

See next page for additional authors

Follow this and additional works at: https://scholarworks.uvm.edu/nwcsp

Part of the Agricultural Economics Commons

Recommended Citation

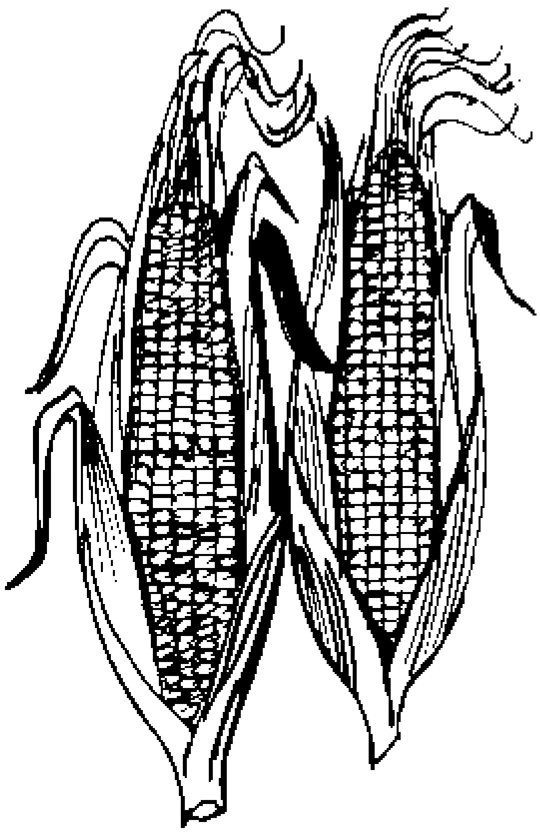
Darby, Heather; Ziegler, Sara; Calderwood, Lily; Cummings, Erica; Gupta, Abha; and Post, Julian, "Long Season Corn Silage Variety Trial" (2015). *Northwest Crops & Soils Program*. 126.
https://scholarworks.uvm.edu/nwcsp/126

This Report is brought to you for free and open access by the UVM Extension at ScholarWorks @ UVM. It has been accepted for inclusion in Northwest Crops & Soils Program by an authorized administrator of ScholarWorks @ UVM. For more information, please contact donna.omalley@uvm.edu.

Authors
Heather Darby, Sara Ziegler, Lily Calderwood, Erica Cummings, Abha Gupta, and Julian Post

This report is available at ScholarWorks @ UVM: https://scholarworks.uvm.edu/nwcsp/126

2015 Long Season
Corn Silage Variety Trial



Dr. Heather Darby, UVM Extension Agronomist
Sara Ziegler, Lily Calderwood, Erica Cummings, Abha Gupta, and Julian Post
UVM Extension Crops and Soils Technicians
(802) 524-6501

Visit us on the web at http://www.uvm.edu/extension/cropsoil

© November 2015, University of Vermont Extension

UNIVERSITY OF VERMONT EXTENSION
CULTIVATING HEALTHY COMMUNITIES

2015 LONG SEASON CORN SILAGE VARIETY TRIAL

Dr. Heather Darby, University of Vermont Extension
heather.darby[at]uvm.edu

In 2015, the University of Vermont Extension Northwest Crops and Soils Team evaluated yield and quality of 54 long season corn silage varieties at Borderview Research Farm in Alburgh, VT. Long season corn can be difficult to grow in Vermont due to limited Growing Degree Days (GDDs) accumulated throughout the growing season. In addition, wet springs and falls are becoming more common, delaying corn planting and complicating harvest timing. However if planted early, long season corn can produce high yield and quality by maximizing the entire growing season. While the information presented can begin to describe the yield and quality performance of these long season corn silage varieties in this region, it is important to note that the data represent results from only one season and one location. Compare other hybrid performance data before making varietal selections.

MATERIALS AND METHODS

In 2015, 54 varieties were evaluated from nine seed companies (Table 1) at Borderview Research Farm in Alburgh, VT. The plot design was a randomized complete block with three replications. Treatments were 54 corn silage varieties with relative maturities of 96 days and greater. These varieties were evaluated for silage yield and quality. Relative maturity and varietal characteristics are provided in Table 2.

Table 1. Participating companies and local contact information.

Albert Lea/Viking	Chemgro	Mycogen	Syngenta	Brownseed Genetics
Mac Ehrhardt Albert Lea, MN (507) 383-1070	Donald Upton Clayton, NY (800) 346-4769	Claude Fortin Highgate, VT (802) 363-2803	Alvin Winslow New Glouster, ME (207) 740-8248	Charlie Brown Bay City, WI (715) 594-3355

Seedway	T.A. Seeds	DEKALB	Spectrum
Ed Schillawski Shoreham, VT (802) 897-2281	Cory Chelko Jersey Shore, PA (866) 813-7333	Klaus Busch Knox, NY (518) 320-2462	Scott Johnson Linden, IN (866) 400-9468

Table 2. Fifty-four long season silage corn varieties evaluated in Alburgh, VT.

Variety	Company	Relative Maturity (RM)	Traits
4655	Spectrum Seeds	96	NonGMO
DKC46-20	DEKALB	96	VT3PRIB
TMF2Q413	Mycogen	96	Herculex / LL / RR2
CB4825VP	Brown's Genetics	97	NonGMO
O.71-97N	Albert Lea/Viking	97	NonGMO
TA477-00	TA Seeds	97	NonGMO
4725	Spectrum Seeds	98	NonGMO
CB4800	Brown's Genetics	98	NonGMO
O.58-98N	Albert Lea/Viking	98	NonGMO
O.6710	Albert Lea/Viking	98	NonGMO
SW3854RR	Seedway	98	RR
SW3904LRR	Seedway	98	RR
F2F499	Mycogen	99	SSX / LL / RR2 / Refuge Advanced
O.35-99N	Albert Lea/Viking	99	NonGMO
O.69-99N	Albert Lea/Viking	99	NonGMO
5045	Spectrum Seeds	100	NonGMO
DKC50-84	DEKALB	100	VT2PRIB
SW4018	Seedway	100	Genutiy / SSX / RIB
TA100-00	TA Seeds	100	NonGMO
TA506-22PRIB	TA Seeds	100	Genuity / VT2P / RIB
TMF2L505	Mycogen	100	HXT / LL / RR2
35-01N	Albert Lea/Viking	101	NonGMO
6169RSX	Chemgro	101	Genuity / SSX
N46T-5122	Syngenta	101	Agrisure Duracade 5122 E-Z Refuge
TMF2L538	Mycogen	101	SSX / LL / RR2
6258G3A	Chemgro	102	Agrisure Artesian 3011A
N49W-3000GT	Syngenta	102	Agrisure 3000GT
5452	Spectrum Seeds	104	NonGMO
TA545-00	TA Seeds	104	NonGMO
TA545-33EZ	TA Seeds	104	Agrisure 3122 E-Z Refuge
6538G3N	Chemgro	105	Agrisure 3000GT
6546R3P	Chemgro	105	Genuity / VT3P / RIB
CB599VPLfy	Brown's Genetics	105	LFY, NonGMO
F2F569	Mycogen	105	HXT / LL / RR2 / BMR
SW5430	Seedway	105	Genutiy / SSX / RIB

TA105-00	TA Seeds	105	NonGMO
TA550-00ND	TA Seeds	105	NonGMO
TMF2A637	Mycogen	105	SSX / LL / RR2 / RIB
SW5554GT	Seedway	106	Agrisure GT
TA566-00	TA Seeds	106	NonGMO
TA566-31	TA Seeds	106	Agrisure Viptera 3111
DKC57-92	DEKALB	107	GENSSRIB
N59B-3111A	Syngenta	107	Agrisure Viptera 3111
N61P-3000GT	Syngenta	107	Agrisure 3000GT
TA108-00	TA Seeds	108	NonGMO
TA583-00	TA Seeds	108	NonGMO
TA583-28	TA Seeds	108	Genuity / SSX / RIB
F2F627	Mycogen	109	SSX / LL / RR2 / BMR / RIB
N66V-3000GT	Syngenta	110	Agrisure 3000GT
SW6620	Seedway	110	Genutiy / SSX / RIB
TMF2H699	Mycogen	110	SSX / LL / RR2 / RIB
DKC61-88	DEKALB	111	VT3PRIB
TMF2H706	Mycogen	111	SSX / LL / RR2 / RIB
TMF2R737	Mycogen	112	SSX / LL / RR2

Agrisure Artesian 3011A - The Agrisure Artesian® 3011A trait stack combines Agrisure Artesian® water optimization technology with the Agrisure® 3000GT trait stack, for herbicide flexibility as well as protection from corn borer and corn rootworm.
Agrisure Duracade- effectively limits corn leaf, stalk, ear, and root feeding damage caused by lepidopteran and corn rootworm pests.
Agrisure GT - Agrisure® GT corn provides tolerance to in-crop applications of a broad range of glyphosate-based herbicides.
Agrisure 3000GT - This triple stack protects against both corn borer and corn rootworm with tolerance to in-season applications of both glyphosate and glufosinate herbicides
Agrisure Viptera 3111- The Agrisure Viptera® trait has been combined with the Agrisure® 3000GT trait stack to form the Agrisure Viptera® 3111 trait stack. This stack delivers broad-spectrum control of 14 yield- and quality-robbing insects, as well as tolerance to glyphosate and glufosinate herbicides.
Agrisure 3122 E-Z Refuge- The Agrisure® 3122, E-Z Refuge™ trait stack offers farmers a reduced-refuge trait stack featuring dual modes of action against corn borer and corn rootworm. The Agrisure® 3122 trait stack includes the trusted Agrisure® CB/LL trait, which protects against European corn borer the Agrisure® RW trait, which protects against corn rootworm; the HERCULEX® trait, which provides a second mode of action against corn borer; the HERCULEX® RW trait, which provides a second mode of action against corn rootworm; and the Agrisure® GT trait for glyphosate tolerance.
BMR- reduces lignin content increasing digestibility (forage trait)
CB-protects against corn borer.
Genuity - Genuity® corn products are protected from a broad range of above and below-ground insect pests of corn, including European corn borer, fall armyworm, corn earworm, Northern corn rootworm, Western corn rootworm, and black cutworm.
GT - Glyphosate tolerant.
Herculex – provides season-long control of insect pests including European corn borer, Western bean cutworm, fall armyworm, and black cutworm.
HXT – Herculex Xtra® provides season-long control of a variety of pests, including European corn borer, Western bean cutworm, corn rootworm, and black cutworm.
LFY – Conventional, leafy (forage trait).
LL – Glufosinate-ammonium herbicide (LibertyLink®) tolerant.
Refuge Advanced - Dow AgroSciences Refuge Advanced® hybrids deliver the required insect refuge hybrid incorporated in the bag.
RIB – RIB Complete® (Refuge In a Bag) means that refuge seed is blended into each bag of insect-protected corn seed.
RR – Roundup Ready corn is glyphosate herbicide (Roundup®) tolerant.
RR2 – Roundup Ready 2 corn is glyphosate herbicide (Roundup®, Touchdown®) tolerant.
SSX – SmartStax corn provides a broad spectrum of insect control, using multiple modes of action, as well as glyphosate herbicide (Roundup Ready®, Touchdown®) and glufosinate-ammonium (LibertyLink®) tolerance.
VT2P- provides two modes of action to protect from corn earworm and other above ground insect pests.
VT3P - provides two modes of action to protect from corn earworm and other above ground insect pests as well as one mode of action to protect against below ground pests.

The soil type at the Alburgh location was a Benson rocky silt loam (Table 3). The seedbed was fall chisel plowed and spring disked followed by spike tooth harrow. The previous crop was corn with a winter rye cover crop. Starter fertilizer (10-20-20) was applied at a rate of 150 lbs. per acre. Plots were 30 feet by 5 feet and replicated 3 times. The trial was planted with a John Deere 1750 corn planter over three dates: 8-May, 15-May and 22-May. Three dates were required to complete planting as some trial entries were late entries. The seeding rate was 34,000 seeds per acre. Plots were sprayed with the herbicide Lumax® (S-metolachlor, atrazine, and mesotrione) at 3 quarts per acre post-emergence on 24-May. Corn was harvested between 24-Sep and 30-Sep with a John Deere 2-row chopper, and forage was weighed in a wagon fitted with scales. Dry matter yields were calculated and then yields were adjusted to 35% dry matter.

Table 3. Long season corn variety trial details, Alburgh, VT, 2015.

Location	Borderview Research Farm – Alburgh, VT
Soil type	Benson rocky silt loam
Previous crop	Corn with winter rye cover crop
Tillage operations	Fall chisel plow, disk and spike tooth harrow
Seeding rate (viable seeds ac^{-1})	34,000
Planting equipment	John Deere 1750 corn planter
Treatments (varieties)	54
Replications	3
Row width (in.)	30
Plot size (ft)	5’ x 30’ (2 rows of corn)
Planting dates	8-May, 15-May, 22-May
Starter fertilizer (at planting)	150 lbs. ac^{-1} 10-20-20
Weed control	3 qt./acre Lumax®, spot treated 15-Jun
Additional fertilizer (topdress)	240 lbs. ac^{-1} 46-0-0
Harvest dates	24-Sep, 30-Sep

An approximate 2 lb. subsample of the harvested material was collected, dried, ground, and then analyzed at the University of Vermont’s Testing Laboratory, Burlington, VT, for silage quality. Dry matter yields were calculated and then adjusted to 35% dry matter.

Silage quality was analyzed using the FOSS NIRS (near infrared reflectance spectroscopy) DS2500 Feed and Forage analyzer. Dried and coarsely-ground plot samples were brought to the lab where they were reground using a cyclone sample mill (1mm screen) from the UDY Corporation. The samples were then analyzed using the FOSS NIRS DS2500 for crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), 30-hour digestible NDF (NDFD), and total digestible nutrients (TDN).

Mixtures of true proteins, composed of amino acids, and non-protein nitrogen make up the CP content of forages. The CP content of forages is determined by measuring the amount of nitrogen 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, non-protein 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 (NDFD). Evaluation of forages and other feedstuffs for NDFD 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 NDFD. Forages with increased NDFD will result in higher energy values and, perhaps more importantly, increased forage intakes. Forage NDFD can range from 20 – 80% NDF.

Net energy for lactation (NE_L) is calculated based on concentrations of NDF and ADF. NE_L can be used as a tool to determine the quality of a ration, but should not be considered the sole indicator of the quality of a feed, as NE_L is affected by the quantity of a cow's dry matter intake, the speed at which her ration is consumed, the contents of the ration, feeding practices, the level of her production, and many other factors. Starch can also have an effect on NE_L, where the greater the starch content, the higher the NE_L (measured in Mcal per pound of silage), up to a certain point. High grain corn silage can have average starch values exceeding 40%.

The silage performance indices of milk per acre and milk per ton were calculated using a model derived from the spreadsheet entitled "MILK2006," 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.

Yield data and stand characteristics were analyzed using mixed model analysis using the mixed procedure of SAS (SAS Institute, 1999). Replications within trials were treated as random effects, and hybrids were treated as fixed. Hybrid mean comparisons were made using the Least Significant Difference (LSD) procedure when the F-test was considered significant ($p<0.10$).

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 (LSDs) at the 0.10 level of significance 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

Hybrid	Yield
A	6.0
B	7.5*
C	**9.0***
LSD	2.0

can be sure that for 9 out of 10 times, 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, hybrid C is significantly different from hybrid A but not from hybrid B. The difference between C 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 C and A 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 top yielding hybrid C, indicated in bold.

RESULTS

Weather data was recorded with a Davis Instrument Vantage PRO2 weather station, equipped with a WeatherLink data logger at Borderview Research Farm in Alburgh, VT (Table 4). From May to September there were an accumulated 2501 GDDs, at a base temperature of 50° F. Above average temperatures and below average precipitation in early May allowed for very early corn planting for many growers. With the exception of June, all other months during the corn growing season were drier than normal. June had 2.73 inches more than the 30-year average (1981-2010). The temperatures in June were also slightly cooler than average. August and September were particularly dry having 3.91 and 3.3 fewer inches of rain than the long term average respectively. Dry late summer and fall weather allowed for earlier than normal harvest having harvest complete by the beginning of October.

Table 4. 2015 weather data for Alburgh, VT.

	May	Jun	Jul	Aug	Sep
Average temperature (°F)	61.9	63.1	70.0	69.7	65.2
Departure from normal	5.5	-2.7	-0.6	0.9	4.6
Precipitation (inches)	1.94	6.42	1.45	0.00	0.34
Departure from normal	-1.51	2.73	-2.70	-3.91	-3.30
Growing Degree Days (base 50°F)	376	399	630	626	470
Departure from normal	177	-75	-10	45	152

Based on weather data from a Davis Instruments Vantage Pro2 with WeatherLink data logger.
Historical averages are for 30 years of NOAA data (1981-2010) from Burlington, VT.

Plant populations, and harvest data were analyzed for all 54 corn varieties (Table 5). Plant populations were determined prior to harvesting. The average plant population per acre was 30,270. Populations varied quite considerably and may have been a result of low soil moisture at the time of planting followed by saturated soil conditions.

Table 5. Harvest data for 54 long season corn varieties, 2015, Alburgh, VT.

Variety	RM	Plant population	DM at harvest	Yield at 35% DM
		number ac^{-1}	%	tons ac^{-1}
4655	96	34558	54.5	31.1
DKC46-20	96	37849	54.2	32.8
TMF2Q413	96	29427	48.7	24.4
CB4825VP	97	30686	41.3	23.5
O.71-97N	97	31073	48.5	24.3
TA477-00	97	24200	51.5	23.2
4725	98	24974	50.6	30.0
CB4800	98	34170	43.2	27.3
O.58-98N	98	31750	47.3	26.2
O.6710	98	28943	46.6	20.7
SW3854RR	98	26620	47.0	21.7
SW3904LRR	98	30298	48.8	26.5
F2F499	99	39301	41.5	25.4
O.35-99N	99	18102	40.9	16.0
O.69-99N	99	27975	44.8	17.8
5045	100	37074	60.7	29.2
DKC50-84	100	36010	51.0	28.7
SW4018	100	25749	48.7	22.9
TA100-00	100	24006	42.9	21.9
TA506-22PRIB	100	32815	45.4	28.8
TMF2L505	100	30395	47.7	29.8
35-01N	101	32041	40.5	31.3
6169RSX	101	28266	48.4	22.4
N46T-5122	101	30976	48.7	23.8
TMF2L538	101	30492	43.2	26.5
6258G3A	102	30782	46.0	30.2
N49W-3000GT	102	29234	46.8	23.7
5452	104	34170	45.0	27.6
TA545-00	104	28943	45.3	27.4
TA545-33EZ	104	31944	41.3	29.9
6538G3N	105	29427	43.2	22.9
6546R3P	105	31750	44.1	32.4
CB599VPLfy	105	30105	40.8	28.6
F2F569	105	30395	45.1	23.0
SW5430	105	29040	40.3	30.8
TA105-00	105	27588	42.7	23.4

TA550-00ND	105	25458	42.4	29.1
TMF2A637	105	32041	39.6	29.7
SW5554GT	106	26426	40.8	21.2
TA566-00	106	27104	39.3	19.8
TA566-31	106	32331	40.2	28.1
DKC57-92	107	37946	58.3	31.8
N59B-3111A	107	30686	40.6	30.4
N61P-3000GT	107	23723	38.0	19.2
TA108-00	108	27104	40.0	29.4
TA583-00	108	31170	49.1	30.4
TA583-28	108	29524	40.6	22.0
F2F627	109	31460	43.6	23.6
N66V-3000GT	110	30008	42.6	30.5
SW6620	110	30395	47.7	33.2
TMF2H699	110	29330	45.2	35.7
DKC61-88	111	36687	48.5	36.6
TMF2H706	111	30879	42.6	31.0
TMF2R737	112	31170	46.4	34.2
LSD (p = 0.10)		5142	5.46	7.19
Trial Mean		30270	45.4	26.9

The average dry matter at harvest was lower than optimum and likely due to some varieties being impacted by leaf blight. In addition, ideal dry down conditions in the fall lead to crops maturing faster than anticipated. The average yield at 35% dry matter was 26.9 tons ac^{-1} (Figure 1). Yields ranged from 16.0 by variety 'O.35-99N' to 36.6 tons ac^{-1} by variety 'DKC61-88'. Other high yielding varieties included 'TMF2H699' (35.7 t ac^{-1}), 'TMF2R737' (34.2 t ac^{-1}), 'SW6620' (33.2 t ac^{-1}), and 'DKC46-20' (32.8 t ac^{-1}). Overall, 33 of the varieties produced yields over 25 t ac^{-1} with 15 of those producing over 30 t ac^{-1}. It is interesting to note that, of the 19 varieties that produced statistically similar yields to the top performer, 4 of them had relative maturities of 100 days or less.

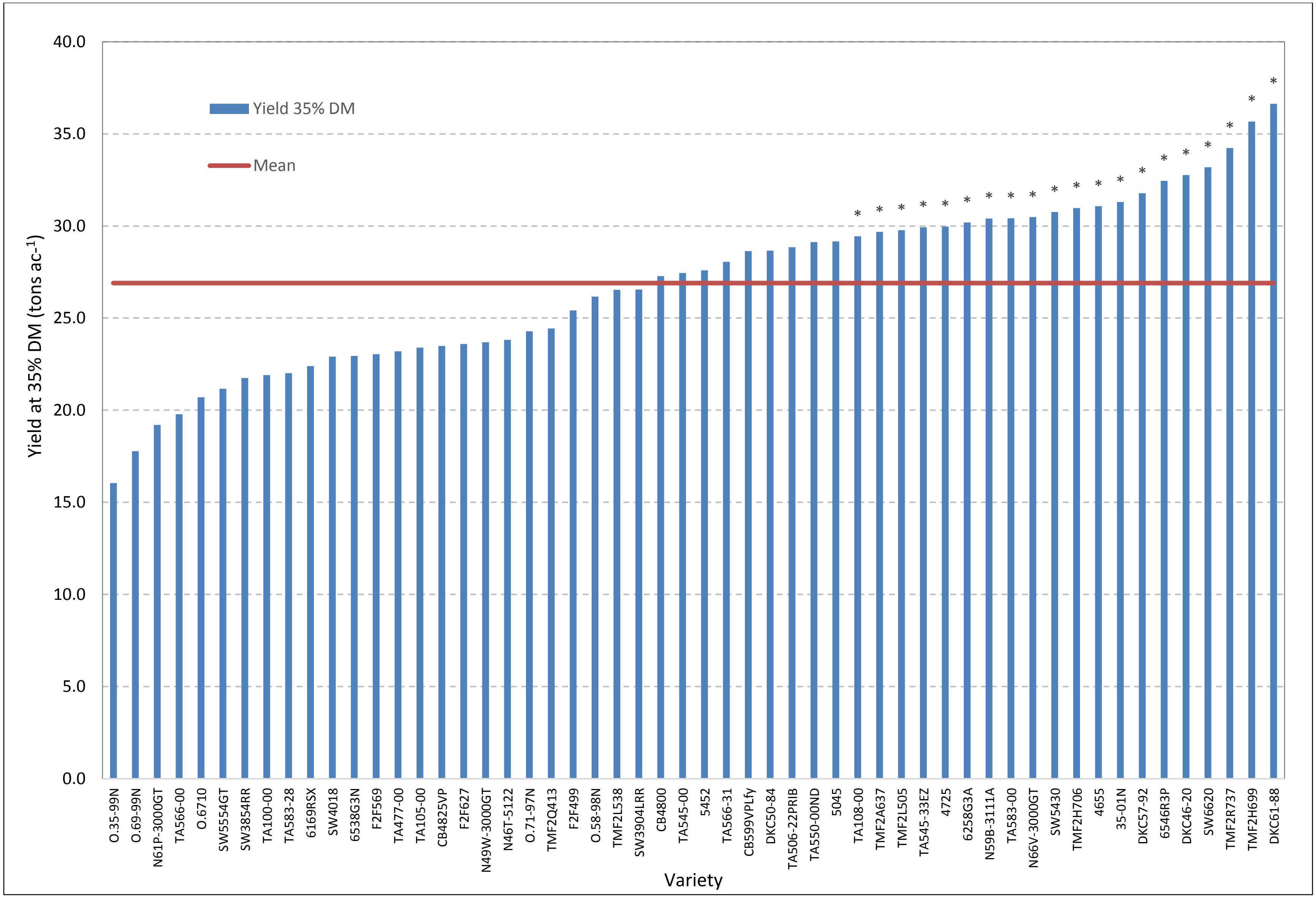


Figure 1. Yield at 35% DM of 54 long season varieties, 2015.

Varieties with an asterisk (*) above them did not differ significantly from the mean which is indicated by the red line.

Forage quality characteristics varied significantly by variety (Table 6). Crude protein ranged from 5.01 to 9.10% with the trial average being 6.50%. Protein was highest in the TA Seeds variety 'TA566-00' (9.10%), though did not statistically differ from eight other varieties. The Seedway variety 'SW5554GT' had the lowest ADF (20.0%) and NDF (37.7%), though not statistically different than twenty and twenty-four other varieties respectively. Digestible NDF (NDFD), or the amount of NDF that is digestible in a 30-hour period, varied significantly by variety, and averaged 44.7% of NDF. The top performer in NDFD was the Brownseed Genetics variety 'CB599VPLFY' (50.4%), though this was not statistically greater than seven other varieties. The NDFD ranged from 41.4% (varieties DKC57-92 and DKC50-84) to 50.4%.

Table 6. Forage quality data for 54 long season corn varieties, 2015, Alburgh, VT.

Variety	*Forage quality characteristics*						Milk	
	CP	**ADF**	**NDF**	**NDFD**	**TDN**	**NE_L**	**ton^{-1}**	**ac^{-1}**
	% of DM	% of DM	% of DM	% of NDF	% of DM	Mcal lb^{-1}	lbs	lbs
4655	6.50	22.6	44.7	44.7	63.1	0.64	2778	30098
DKC46-20	6.51	21.5	41.6	43.5	62.9	0.63	2757	31712
TMF2Q413	6.89	22.2	43.3	46.7	64.5	0.65	2868	24532
CB4825VP	6.69	21.5	39.7	48.2	68.6	0.69	3172	26091
O.71-97N	6.08	20.0	40.3	47.0	66.8	0.67	3040	26031
TA477-00	7.54	21.6	41.3	48.1	66.4	0.67	3003	23836
4725	7.19	22.8	44.8	44.7	63.1	0.64	2778	29456
CB4800	6.23	20.7	38.3	48.1	69.4	0.70	3234	31843
O.58-98N	5.95	21.7	41.1	48.0	68.3	0.69	3153	28873
O.6710	7.23	20.4	39.5	48.5	68.1	0.69	3129	22689
SW3854RR	7.57	22.1	40.7	48.2	66.9	0.67	3036	23091
SW3904LRR	7.63	23.2	42.4	48.2	67.5	0.68	3094	28494
F2F499	7.37	21.8	43.9	45.1	62.7	0.63	2739	24322
O.35-99N	7.30	22.7	46.0	47.6	63.4	0.63	2780	15521
O.69-99N	7.67	23.5	42.6	47.8	66.6	0.67	3026	18822
5045	5.88	25.2	49.8	43.3	59.1	0.59	2502	25509
DKC50-84	6.88	22.8	45.4	43.1	61.3	0.62	2651	26541
SW4018	7.13	23.1	42.8	47.3	66.1	0.67	2990	23956
TA100-00	6.74	23.6	43.7	46.4	65.0	0.65	2909	22136
TA506-22PRIB	7.50	22.0	41.9	47.5	66.7	0.67	3030	30578
TMF2L505	7.25	24.3	44.3	47.3	64.5	0.65	2867	29969
35-01N	5.07	26.6	47.5	47.4	64.3	0.65	2867	31477
6169RSX	7.65	22.0	40.8	47.8	67.0	0.67	3051	23907
N46T-5122	7.17	20.5	38.2	47.0	68.3	0.69	3149	26258

TMF2L538	6.64	24.5	44.7	48.2	65.8	0.66	2967	27571
6258G3A	7.63	22.7	41.0*	48.1	67.4	0.68	3081	32590
N49W-3000GT	7.42	20.6	38.9	47.5	68.1	0.69	3133	25908
5452	7.00	21.4	40.6	45.8	67.2	0.68	3079	29732
TA545-00	7.39	23.0	39.7	48.6	68.9	0.70	3189	30471
TA545-33EZ	7.34	22.2	39.7	49.8	69.0	0.69	3187	33415
6538G3N	7.32	23.0	39.5	49.7	70.3	0.71	3293	26451
6546R3P	7.43	23.1	41.7	48.5	67.9	0.68	3120	35469
CB599VPLfy	6.28	21.9	39.1	50.4	70.6	0.71	3311	33414
F2F569	8.78	20.1	38.8	47.0	65.5	0.66	2924	23301
SW5430	7.59	23.9	43.1	49.4	67.7	0.68	3103	33380
TA105-00	7.14	23.3	42.1	47.3	66.7	0.67	3035	24822
TA550-00ND	8.01	22.7	39.7	49.5	69.6	0.70	3241	32882
TMF2A637	8.71	22.6	41.1	49.1	67.3	0.67	3061	31811
SW5554GT	7.97	20.0	37.7	48.0	67.5	0.68	3070	22635
TA566-00	9.10	20.4	38.7	47.9	66.5	0.67	3001	20877
TA566-31	7.92	21.7	39.8	48.0	67.1	0.67	3049	29858
DKC57-92	6.03	26.0	51.8	41.4	56.6	0.57	2332	25935
N59B-3111A	7.32	21.9	39.7	48.3	67.8	0.68	3105	32965
N61P-3000GT	7.39	22.6	40.8	49.0	66.1	0.66	2969	20179
TA108-00	8.14	22.8	42.2	47.1	65.9	0.66	2974	30330
TA583-00	7.09	21.4	41.4	48.7	65.1	0.65	2888	30826
TA583-28	6.95	25.2	44.8	48.3	66.0	0.66	2980	23188
F2F627	7.14	25.6	48.2	47.1	61.4	0.61	2634	21714
N66V-3000GT	7.21	24.1	41.5	48.1	67.2	0.68	3069	32807
SW6620	7.98	21.9	40.1	48.9	67.0	0.67	3036	35292
TMF2H699	7.10	22.4	43.2	48.3	65.3	0.65	2915	36123
DKC61-88	6.65	22.5	42.8	45.4	64.9	0.66	2909	37207
TMF2H706	7.86	25.5	46.6	46.5	61.9	0.62	2673	28817
TMF2R737	7.11	23.8	43.7	48.0	65.1	0.65	2902	34866
LSD (*p* = .10)	1.25	2.06	3.73	1.72	2.76	0.03	199	7432
Trial Mean	6.50	22.6	44.7	44.7	63.1	0.64	2978	30098

Milk per ton and milk per acre can indicate the yield and quality of corn silage varieties (Figure 2). Milk per ton, an indicator of corn silage quality, was significantly highest in the Brownseed Genetics variety ‘CB599VPLfy’ (3311 lbs. per ton); this was not statistically different from 11 other varieties. Milk per ton ranged from 2502 to 3311 lbs. t^{-1} with an average of 2978 lbs. t^{-1}. Milk per acre, which takes into consideration the dry matter yield of each variety, was statistically different by variety. The average milk per acre was 27,974 lbs. ac^{-1}. The DEKALB variety ‘DKC61-88’ had the highest lbs. per acre at 37,207. Other top performing varieties include: TMF2H699 (36,123 lbs. ac^{-1}), 6546R3P (35,469 lbs. ac^{-1}), SW6620 (35,292 lbs. ac^{-1}) and TMF2R737 (34,866 lbs. ac^{-1}).

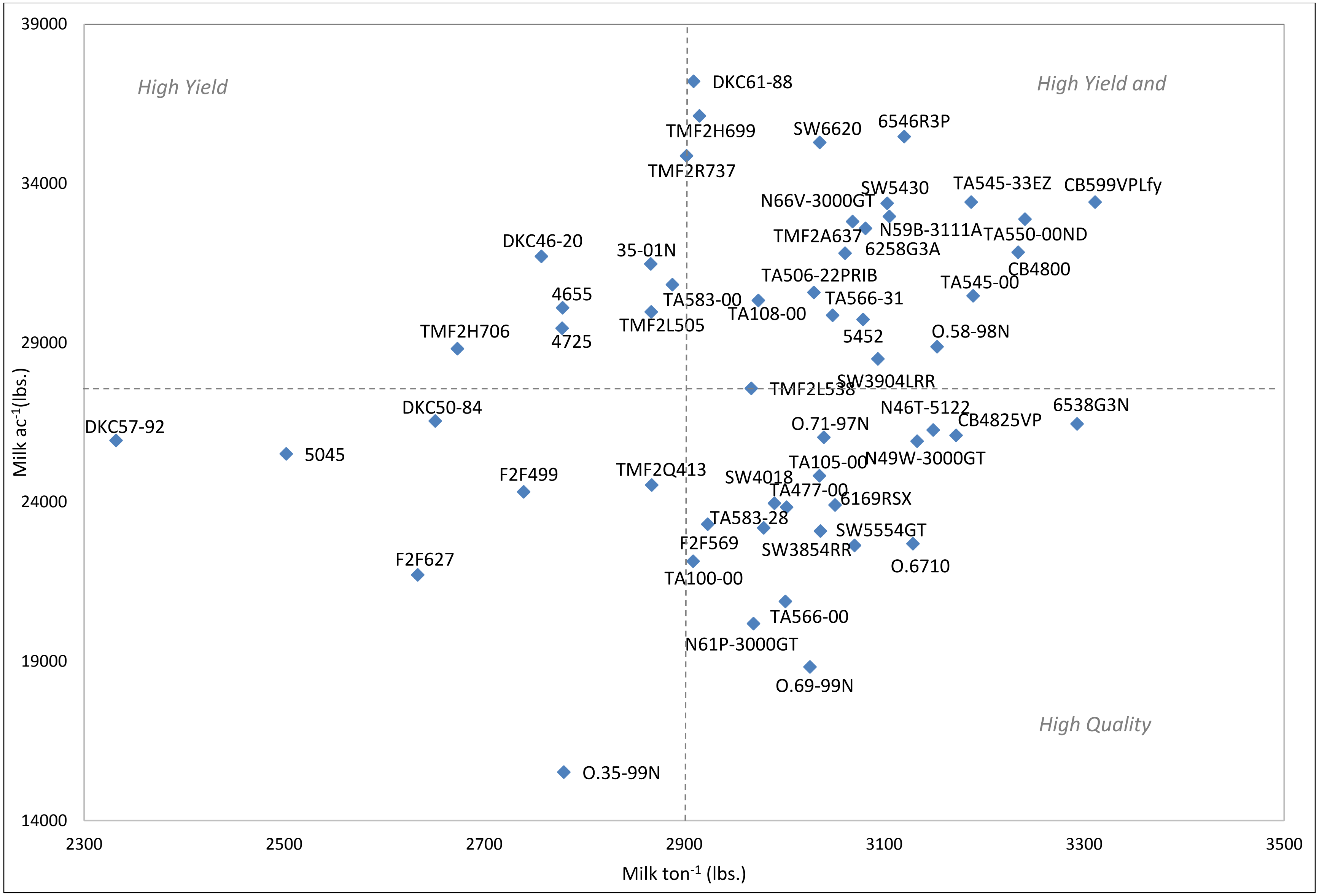


Figure 2. Milk production of 54 long season corn varieties, Alburgh, VT, 2015. Shows relationship between milk per ton and milk per acre. Dotted lines represent the mean milk per ton and milk per acre for the trial.

DISCUSSION

Favorable spring weather allowed for early corn planting in the first week of May. Excessive rain and cool weather in June slowed corn development but ideal conditions during the remainder of the season led to record yields for many farmers. The average yield and dry matter for this year's long season corn variety trial was 1.3 tons higher respectively than in 2014 (25.6 tons ac^{-1} at 35% dry matter and 45.4%). The fact that all of the varieties reached maturity, or surpassed the target dry matter of 35%, by the beginning of October in Northern Vermont, and produced yields over 25 and 30 tons ac^{-1} indicates that varieties with maturities ranging from 96-112 days, can reach maturity and produce high yields and quality feed. Table 7 below summarizes the top twelve performing varieties this year in yield and quality. It is important to remember that these data only represent one season in which we had very favorable weather. Had the weather been unfavorable in the spring delaying planting or slowing establishment, or in the fall delaying harvest, the outcomes may have been different. Consult additional research before making varietal selections or other agronomic decisions.

Table 7. Twelve varieties that were top performers in yield and quality indices.

Variety	***Harvest characteristics***		***Forage quality characteristics***						**Milk**	
	DM	**Yield at 35% DM**	**CP**	**ADF**	**NDF**	**NDFD**	**TDN**	**NE_L**	**ton^{-1}**	**ac^{-1}**
	%	tons ac^{-1}	% of DM	% of DM	% of DM	% of NDF	% of DM	Mcal lb^{-1}	lbs	lbs
CB599VPLfy	40.8	28.6	6.28	21.9	39.1	50.4	70.6	0.71	3311	33414
TA545-33EZ	41.3	29.9	7.34	22.2	39.7	49.8	69.0	0.69	3187	33415
TA550-00ND	42.4	29.1	8.01	22.7	39.7	49.5	69.6	0.70	3241	32882
CB4800	43.2	27.3	6.23	20.7	38.3	48.1	69.4	0.70	3234	31843
SW6620	47.7	33.2	7.98	21.9	40.1	48.9	67.0	0.67	3036	35292
6546R3P	44.1	32.4	7.43	23.1	41.7	48.5	67.9	0.68	3120	35469
CB4825VP	41.3	23.5	6.69	21.5	39.7	48.2	68.6	0.69	3172	26091
N49W-3000GT	46.8	23.7	7.42	20.6	38.9	47.5	68.1	0.69	3133	25908
O.58-98N	47.3	26.2	5.95	21.7	41.1	48.0	68.3	0.69	3153	28873
O.6710	46.6	20.7	7.23	20.4	39.5	48.5	68.1	0.69	3129	22689
TA545-00	45.3	27.4	7.39	23.0	39.7	48.6	68.9	0.70	3189	30471
TMF2A637	39.6	29.7	8.71	22.6	41.1	49.1	67.3	0.67	3061	31811

ACKNOWLEDGEMENTS

UVM Extension would like to thank Roger Rainville and his staff at Borderview Research Farm in Alburgh for their generous help with the trials. We would like to acknowledge Julija Cubins, Hillary Emick, Lindsey Ruhl, and Dan Ushkow for their assistance with data collection and entry. We would also like to thank the seed companies for their seed and cooperation in these study. The information is presented with the understanding that no product discrimination is intended and no endorsement of any product mentioned or criticism of unnamed products is implied.

UVM Extension helps individuals and communities put research-based knowledge to work.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Burlington, Vermont. University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status.