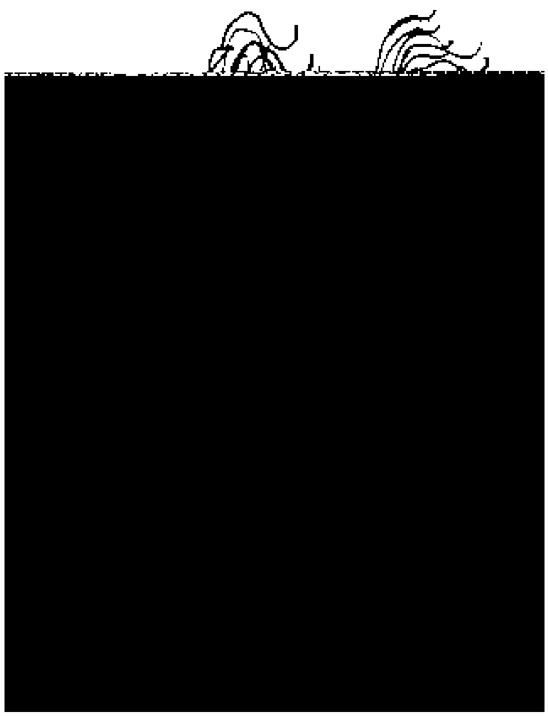
2013 Short Season Corn Silage Variety Trial



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2013 SHORT SEASON CORN SILAGE VARIETY TRIAL
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In 2013, the University of Vermont Extension Northwest Crops and Soils Team evaluated yield and quality of short season corn silage varieties at Borderview Research Farm in Alburgh, VT. While short season corn is an obvious choice in areas that accumulate fewer Growing Degree Days (GDDs), it also has a place in longer season areas. Past UVM Extension variety trials have shown that many shorter season corn varieties can have comparable yield and quality to longer season corn. Growing a shorter season variety can also provide other benefits such as an earlier harvest allowing for more time in the fall for planting of cover crops and manure applications. It is important to remember that the data presented in this report is from a single year. Hybrid-performance data from additional tests over several years should be compared before making varietal selections.

MATERIALS AND METHODS

Several seed companies submitted varieties for evaluation. Companies and contact names are listed in Table 1. Twenty-seven corn varieties were evaluated, ranging in relative maturity (RM) from 79 to 99 days. Specific varieties, their traits, and RM are listed in Table 2.

Table 1. Participating companies and local contact information.

Dekalb/Monsanto	Mycogen	Pioneer	Seedway	T.A. Seeds
Klaus Busch Territory Sales Manager Knox, NY 518-320-2462	Claude Fortin District Sales Manager Highgate, VT 802-363-2803	Jacob Bourdeau Bourdeau Bros. Sheldon, VT 802-933-2277	Ed Schillawski 3442 Rt. 22A Shoreham, VT 802-	

Mycogen	X13432S3R1	93	SmartStax	[redacted]

Table 3. 2013 short season corn trial specifics for Alburgh, VT.

	Borderview Research Farm Alburgh, VT
Soil type	Rocky silt loam
Previous crop	Sunflower
Row width (in.)	30
Planting date	14-May
Harvest date	25-Sep
Tillage operations	Spring disk, spike tooth harrow
Starter fertilizer	200 lbs ac^{-1} 10-20-20
Sidedress	200 lbs ac^{-1} Urea

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), starch, acid detergent fiber (ADF), neutral detergent fiber (NDF), 30-hour digestible NDF (NDFD), non-structural carbohydrates (NSC), total digestible nutrients (TDN), and milk per ton. Mixtures of true proteins, composed of amino acids, and nonprotein nitrogen make up the CP content of forages. 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

Non-structural Carbohydrate (NSC) are simple carbohydrates, such as starches and sugars, stored inside the cell that can be rapidly and easily digested by the animal. NSC is considered to serve as a readily available energy source and should be in the 30-40% range, on a dry matter basis.

Total digestible nutrients (TDN) report the percentage of digestible material in silage. Total digestible nutrients are calculated from ADF and express the differences in digestible material between silages.

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 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 below, hybrid C is significantly different from hybrid A but not from hybrid B. The difference between C and B is equal to 1.5,

RESULTS

Table 5

Figure 1 displays the relationship between milk per ton and milk per acre for varieties trialed in Alburgh, VT. The dotted lines dividing the figure into four quadrants represent the mean milk per ton and acre for the location. Hybrids that fall above or to the right of the lines performed better than the average, and hybrids below or to the left of the lines performed below average. There were many varieties at the Alburgh location that ranked above average in yield and quality. Varietal selection should be based on the goals of the farm as well as data compared from multiple sites and years.

Figure 1. Relationship between milk per ton and milk per ac^{-1} for short season corn silage varieties grown in Alburgh, VT. ***Dotted lines represent the mean milk per ton^{-1} and milk per ac^{-1}.***

incidence of corn leaf disease (Northern Corn Leaf Blight and Grey Leaf Spot) this year. This could be attributed to prolonged wetness and cool temperatures during late season corn growth.

All the protein levels were lower than in previous years. The highest protein level this year was 2.5% lower than in 2012. The overly wet conditions during