2018 Non-GMO
Corn Silage Variety Trial

Dr. Heather Darby,

2018 NON-GMO CORN SILAGE VARIETY TRIAL

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In 2018, the University of Vermont Extension Northwest Crops and Soils Program evaluated yield and quality of 12 non-GMO corn silage varieties at Bridgeman View Farm in Franklin, VT. A non-GMO milk market has prompted some dairy farmers to start growing corn silage that has not been genetically modified. Conventional farmers have countless corn silage varieties available supported by performance data and trait information. To successfully convert to growing non-GMO corn, farmers are looking for more information on non-GMO varieties that are available and perform well in our region. While the information presented can begin to describe the yield and quality performance of these non-GMO corn silage varieties in this region, it is important to note that the data represent results from only one season and 9(t)-4(9I9nt)-4( ) 0.00000912 0 612

The trial was no-till planted into herbicide terminated winter rye on 18-May (Table 3). The UVM staff assisted with organization, planting, scouting, and harvesting of the trial. All other crop management was performed by the farmer and farm staff. Plots were scouted for disease and populations measured on 7-Sep by randomly selecting two 13' sections of each plot. In each section, the number of plants were counted and each plant was inspected for presence of foliar diseases. Harvested silage was captured in a wagon and weighed with a set of portable truck scales. An approximate 1 lb subsample was taken from each plot and dried to calculate dry matter content. The dried subsamples were then ground on a Wiley sample mill to a 2mm particle size and to 1mm particle size on a cyclone sample mill from the UDY Corporation. The samples were then analyzed for quality at the University of Vermont Cereal Testing Lab (Burlington, VT) with a FOSS NIRS (near infrared reflectance spectroscopy) DS2500 Feed and Forage analyzer.

Table 3. Non-GMO corn variety trial details, Franklin, VT, 2018.

Location	**Bridgeman View Farm Franklin, VT**
Soil type	Peru stony fine sandy loam
Previous crop	Corn silage w/winter rye cover crop
Tillage operations	No-till
Seeding rate (viable seeds ac^{-1})	33,000
Planting equipment	John Deere 7000 no-till corn planter
Treatments (varieties)	12
Replications	2
Row width (in.)	30
Plot size (ft)	7.5 x 610
Planting date	18-May
Weed control	2.7 qt. ac^{-1} Acuron applied 20-May
Starter fertilizer (at planting)	10 gal. ac^{-1} 19.6-8.4-2.8
Additional fertilizer (topdress)	125 lbs ac^{-1} 39-0-0 applied 22-

actual passage time through the rumen. 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.

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 due to 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

Table 4. Weather data for West Berkshire, VT, 2018.

West Berkshire, VT	May	June

The silage quality characteristics also varied statistically across varieties (Table 6). Crude protein averaged 7.42

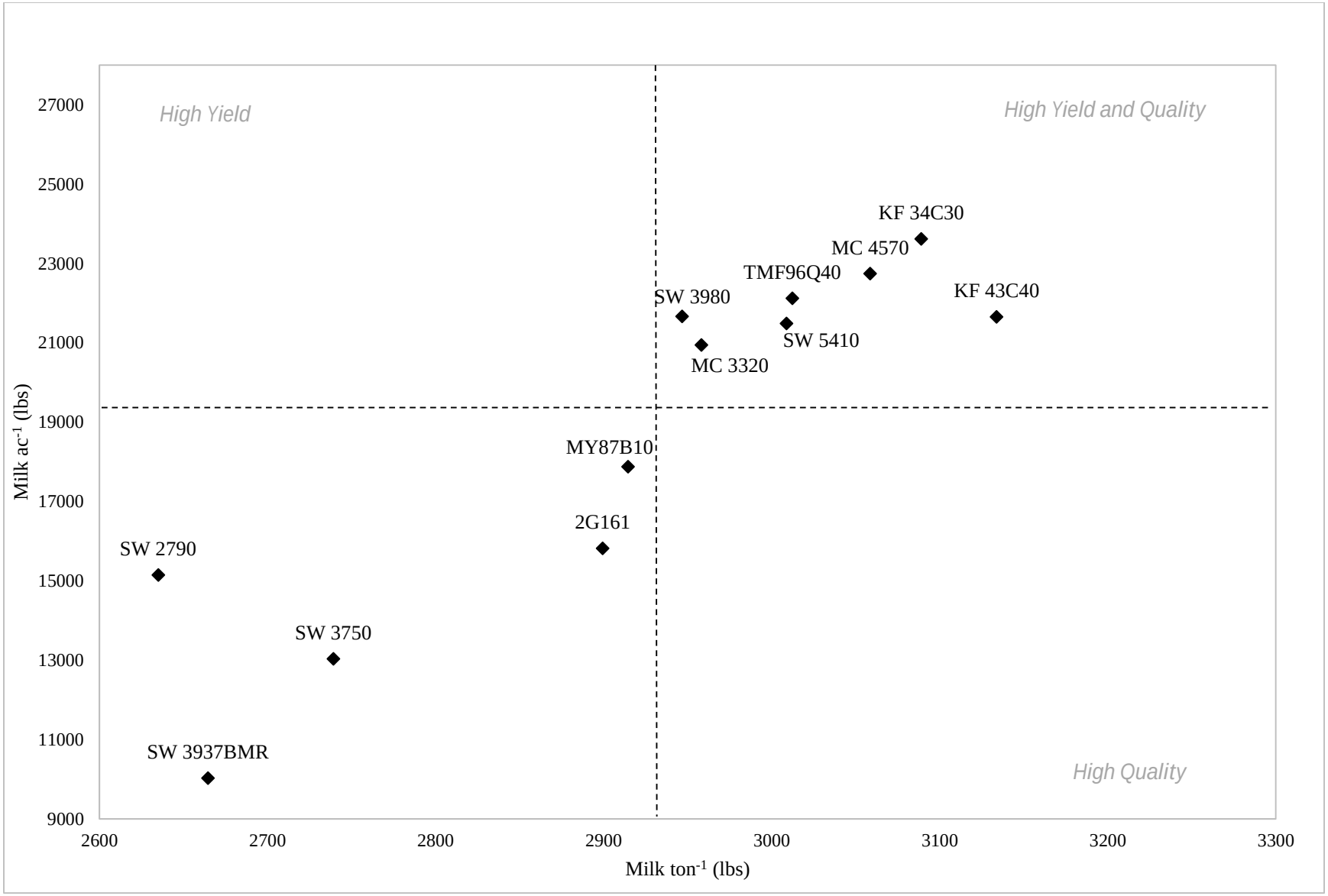

Figure 1. Milk production of 12 non-GMO corn varieties, Franklin, VT, 2018.
Shows relationship between milk per ton and milk per acre. Dotted lines represent the mean milk per ton and milk per acre for the trial.

DISCUSSION

Corn silage yield and quality varied across the 12 non-GMO corn varieties evaluated in this trial. Performing this trial on-farm presented limitations for the number of replications possible which consequently limits the ability for robust statistical analyses. However, these data demonstrate the variability that can be observed across varieties and thus the importance of careful varietal selection based on information generated from our region. Both short and long season varieties produced high yields in this trial. For example, the highest yielding variety, KF 34C30, has a relative maturity of 84 days which is one of the shortest season varieties in the trial which performed statistically similar to variety SW 5410 with 20.4 tons ac^{-1} which was the longest season variety in the trial with a relative maturity of 104 days. These data highlight the importance of varietal selection but also only represent one year of data. More data and other factors should be considered when making management decisions. As more non-GMO varieties become available, further and more replicated investigation is warranted to understand the yield and quality potential of these varieties in our relative matu-h0 612 792 reW* nBT/F1 11.04 Tf1 0 0 1 72.024 662.38500912 0 612 792