

**Forage Management**

**October 2018**

**2018 Corn Silage Overview**

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For many areas of the state corn silage harvest got off to an early and good start, but wrapping up the harvest has been challenged by wet conditions in many areas.

As 2018 corn silage sits in storage, hopefully fermenting for the next few months before being fed out, it is helpful to understand how this crop might feed compared to 2017. Using the New York and Vermont Corn Silage Hybrid Evaluation program as an indicator of corn silage performance gives us some idea of average performance. Data for the detailed hybrid-specific report of the trials is still being processed but we do have enough information to look at overall performance trends.

Keep in mind this is an average of certain locations in the region and your conditions may vary. On your own farm it is helpful to take samples of your forage at harvest and prior to feed-out to understand the opportunities and challenges as you begin to feed this year's crop. We also need to remember that while fresh samples can be a helpful indicator, some characteristics of the forage will change during fermentation, particularly starch digestibility.

Table 1a: NY & VT Corn Silage Trails, 80-95 RM, Weather Data

	Rainfall, inches						Growing Degree Days (GDD), 86/50					
	Alburgh, VT		Albion, NY		Willsboro, NY		Alburgh, VT		Albion, NY		Willsboro, NY	
	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*
May	<b>2.13</b>	3.94	<b>2.05</b>	2.66	<b>2.27</b>	3.47	<b>349</b>	316	<b>436</b>	314	<b>372</b>	315
June	<b>2.58</b>	4.89	<b>1.61</b>	3.39	<b>3.23</b>	4.64	<b>426</b>	471	<b>474</b>	491	<b>453</b>	480
July	<b>2.63</b>	4.53	<b>2.36</b>	3.93	<b>2.00</b>	3.83	<b>674</b>	621	<b>720</b>	643	<b>697</b>	644
August	<b>3.33</b>	4.36	<b>3.03</b>	3.43	<b>3.42</b>	3.48	<b>646</b>	572	<b>699</b>	604	<b>689</b>	600
September	<b>3.86</b>	4.02	<b>2.79</b>	3.14	<b>3.52</b>	3.04	<b>431</b>	388	<b>502</b>	418	<b>448</b>	411
May-August	<b>10.67</b>	17.72	<b>9.05</b>	13.40	<b>10.92</b>	15.43	<b>2094</b>	1979	<b>2328</b>	2053	<b>2210</b>	2039
May-September	<b>14.53</b>	21.74	<b>11.84</b>	16.54	<b>14.44</b>	18.46	<b>2525</b>	2367	<b>2830</b>	2471	<b>2658</b>	2450

\*Avg. - Represents averages of years: 2005-2018

Table 1b: NY & VT Corn Silage Trails, 96-110 RM, Weather Data

	Rainfall, inches						Growing Degree Days (GDD), 86/50					
	Alburgh, VT		Aurora, NY		Madrid, NY		Alburgh, VT		Aurora, NY		Madrid, NY	
	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*	2018	Avg.*
May	<b>2.13</b>	3.94	<b>2.14</b>	3.00	<b>1.76</b>	3.31	<b>349</b>	316	<b>414</b>	336	<b>364</b>	305
June	<b>2.58</b>	4.89	<b>2.74</b>	3.96	<b>2.60</b>	4.47	<b>426</b>	471	<b>439</b>	495	<b>423</b>	470
July	<b>2.63</b>	4.53	<b>5.01</b>	3.62	<b>3.43</b>	4.71	<b>674</b>	621	<b>660</b>	646	<b>684</b>	609
August	<b>3.33</b>	4.36	<b>4.85</b>	3.72	<b>4.63</b>	4.15	<b>646</b>	572	<b>659</b>	601	<b>652</b>	568
September	<b>3.86</b>	4.02	<b>4.13</b>	3.60	<b>3.17</b>	3.85	<b>431</b>	388	<b>471</b>	416	<b>432</b>	385
May-August	<b>10.67</b>	17.72	<b>14.74</b>	14.31	<b>12.42</b>	16.64	<b>2094</b>	1979	<b>2170</b>	2078	<b>2123</b>	1953
May-September	<b>14.53</b>	21.74	<b>18.87</b>	17.91	<b>15.59</b>	20.50	<b>2525</b>	2367	<b>2641</b>	2494	<b>2554</b>	2337

\*Avg. - Represents averages of years: 2005-2018



While some areas of the state had adequate to excess precipitation throughout the season, for much of the state the growing season was defined by below average precipitation, and above average heat (Tables 1a and 1b).

A defining difference between trial locations was the timing and amount of rainfall from late July to early September. While all locations realized some level of improvement in growing conditions with more frequent rainfall in late July and August, its timing and impact on the crop varied. In general, rain arrived at all locations in time to facilitate normal pollination of the crop but ear development varied by location.

The above average Growing Degree Days (GDD) accumulation throughout the season and particularly as the crop neared maturity resulted in fast dry down to target whole plant moisture contents for silage harvest. A noticeable characteristic at harvest in many corn fields, including trial fields, was a healthy green plant with a dry ear. The quick dry down and extended harvest period also means that some silage is going into storage at a higher dry matter content, which will impact fermentation, and these forages will need to be watched closely.

If we compare the 2017 and 2018 crop, the 2018 crop was able to reach maturity prior to a frost. This combined with lower plant yield, due to dry conditions through the early season, would suggest better total starch values than 2017. However, the effect on starch was site-specific as at some locations ear development was also affected by dry condition. So while the crop was able to mature, the number and size of kernels meant that total starch was not as high as one would hope at all locations (Table 2).

A very important indicator of forage quality is fiber digestibility. The undigested neutral detergent fiber (uNDF) offers an indicator of just how much forage the cow will be able to consume. Previous work has shown that dry conditions tend to improve uNDF, while excess rainfall (as we saw in 2017) hurts digestibility. Precipitation in August has been shown to have a particularly negative impact on digestibility. So while late season rainfall certainly helped ear (and overall plant) development it may have had a negative impact on fiber digestibility. See the average 240hr uNDF levels in Table 2.

Table 2: Whole Plot Mean For Key Corn Silage Performance Indicators

Relative Maturity Group	Growing Season	Location	Yield, 35% DM tons/acre	Dry Matter %	Starch % DM	Crude Protein % DM	Lignin % DM	aNDFom % DM	30 hr NDFDom % NDF	240 hr uNDFom % NDF	240 hr uNDFom % DM
80-95 day RM	2018	Albion, NY	19.2	36.2	39.2	8.3	2.4	34.2	56.1	29.0	10.0
		Willsboro, NY	18.5	35.0	34.9	8.2	2.5	35.7	62.0	27.0	9.7
		Alburgh, VT	18.3	33.3	31.0	7.8	3.1	39.0	56.2	30.0	11.8
	2017	Albion, NY	25.2	30.8	32.3	8.3	2.9	37.2	59.1	27.0	10.1
		Willsboro, NY	19.2	31.3	38.1	7.7	3.1	39.5	56.3	30.5	12.1
		Alburgh, VT	27.5	31.8	34.4	7.5	3.3	38.9	53.2	34.3	13.4
96-110 day RM	2018	Aurora, NY	21.7	38.2	38.8	7.3	2.6	35.3	59.9	29.4	10.4
		Madrid, NY	28.6	32.9	35.4	7.7	2.5	35.9	61.2	27.1	9.8
		Alburgh, VT	23.3	34.9	34.2	7.2	3.1	38.3	55.2	31.2	12.0
	2017	Aurora, NY	26.0	31.9	31.2	6.1	3.4	42.6	54.5	33.5	14.4
		Madrid, NY	31.9	35.2	34.8	7.4	3.7	41.3	50.6	38.1	15.9
		Alburgh, VT	28.5	32.7	35.3	7.2	3.3	39.8	52.7	35.7	14.3
2016	Aurora, NY	17.7	32.8	33.9	9.2	2.8	35.7	66.1	23.1	8.3	
	Madrid, NY	28.4	33.4	36.0	8.4	3.1	36.4	57.4	31.1	11.4	

Another way to look at these key parameters and compare to previous years is by looking at how the samples spread across a range of values for these parameters. Figures 1a and 1b show the differences in uNDF and starch for 2017 and 2018 with results combined from all locations (Albion, Willsboro, Aurora, Madrid and Alburgh). With uNDF240 (Figure 1a) we see a notable shift towards lower values (higher digestibility). For starch (Figure 1b) there is a slight shift in the positive direction but the position and shape of the curve is much closer to 2017.

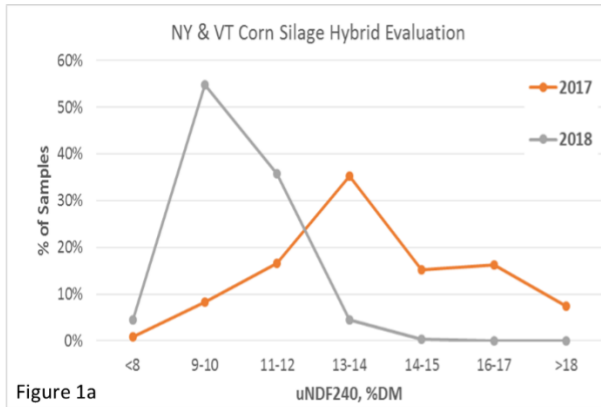


Figure 1a

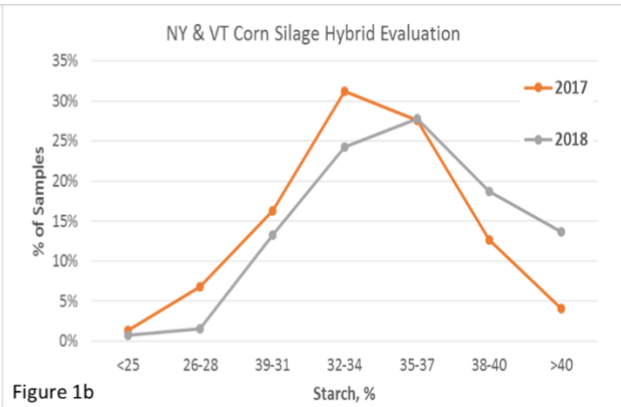


Figure 1b

For the Madrid and Aurora locations we now have three consecutive years of data. As we think back to 2016, we had below-average, but seemingly adequate, rainfall in Madrid with more pronounced drought stress conditions in Aurora resulting in poorer yields but higher digestibility.

At Aurora we see that uNDF240 in 2018 (Figure 2a) is similar but slightly worse than 2016 while starch tends to look better than either of the previous two years (Figure 2c). It is worth noting the stage of maturity, as reflected by higher average whole plant dry matter in 2018 (Table 2), which will also influence starch values. Fortunately, even with the stress of 2018, yields were improved relative to 2016 (Table 2).

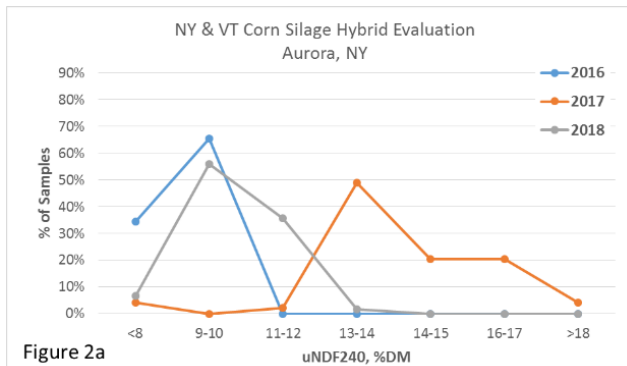


Figure 2a

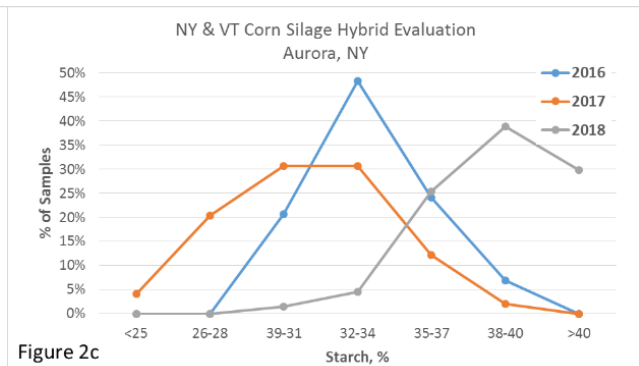


Figure 2c

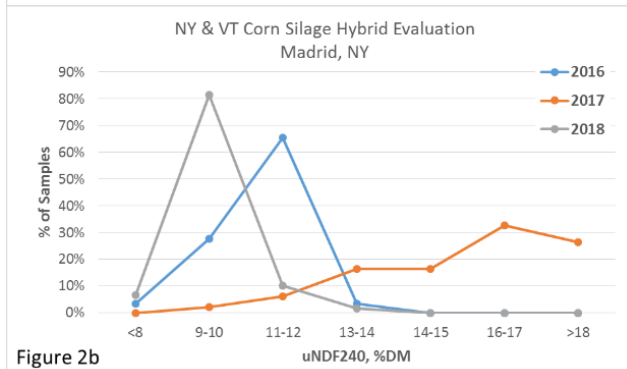


Figure 2b

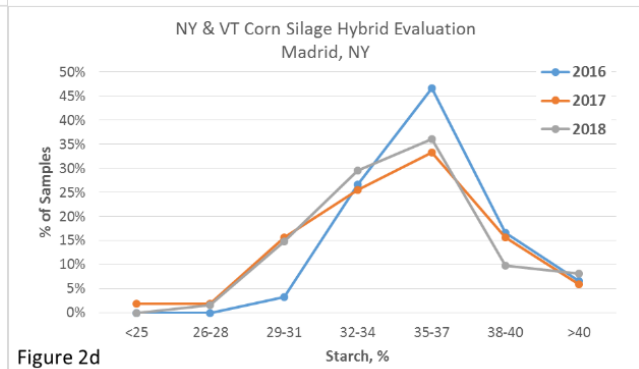


Figure 2d

At Madrid the overall digestibility (Figure 2b) looks improved compared to 2016, while the trend looks quite similar for starch (Figure 2d), and average yields were nearly identical (Table 2).

With a different group of hybrids each year, the same set of hybrids were planted at Madrid and Aurora the last three years. While both locations have received sufficient nutrient inputs to meet crop demands, and there are

other variables such as weather and soil type, it is worth noting the yield performance at Madrid (Table 2). One difference we do have well documented is manure history, with consistent manure applications at Madrid, and very little to no history of manure additions at Aurora. While this is observational, it is reasonable to suggest the consistent performance at Madrid across three very extreme growing seasons can in part be attributed to the manure history and the corresponding soil health related benefits.

Each year brings its own challenges and opportunities. Given the variation in growing conditions across the region, it is critical to test your own forages, but overall it appears the 2018 crop has better feeding attributes than we dealt with in 2017. With some corn silage harvested on the dry side, consideration should be given to monitoring fermentation and making plans to feed out less stable forages during the cooler months.